PARSONS

100 High Street • Boston, Massachusetts 02110-1713 • Phone (617) 946-9400 • Fax (617) 946-9777 • www.parsons.com

July 20, 2011

Mr. John Nohrstedt
U.S. Army Corps of Engineers
Engineering and Support Center, Huntsville
Attn: CEHNC-FS-IS
4820 University Square
Huntsville, Alabama 35816-1822

SUBJECT: Five-Year Review, Former Solid Waste Management Units SEAD 1, 2, 5, 13, 16, 17, 25, 26, 27, 32, 39, 40, 41, 43, 44A, 44B, 52, 56, 59, 62, 64A, 64B, 64C, 64D, 66, 67, 69, 71, 121C, 121I, 122B, 122E, and the Ash Landfill Operable Unit (SEADs 3, 6, 8, 14, and 15) at Seneca Army Depot Activity, Romulus, New York; Contract W912DY-08-D-0003, Task Order 0008

Dear Mr. Nohrstedt:

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit the Five-Year Review Report for Former Solid Waste Management Units (SWMUs) at the Seneca Army Depot Activity (SEDA) in Romulus, New York. This work was performed in accordance with the Scope of Work for Task Order 0008 under Contract No. W912DY-08-D-0003. This Report provides the findings of the Five-Year Review of former SWMUs at the Site that have closed under CERCLA but which have continuing long-term monitoring and maintenance requirements per the specifications of the Records of Decisions that have been approved by the U.S. Army and the U.S. Environmental Protection Agency, with concurrence from the New York State Department of Environmental Conservation.

The Army would like to highlight two items that are presented and discussed in the Five-Year Review Report that have been previously presented in Draft Annual Monitoring Reports submitted for SEAD-25 (the Fire Training and Demonstration Pad) and SEAD-16 and SEAD-17 (the former Abandoned and Existing Deactivation Furnace sites, respectively) at the Depot. For SEAD-25, the Army recommended in the Draft Fourth Annual Report issued May 25, 2011 that the groundwater monitoring frequency be modified from semi-annual (twice-a-year) events to an annual monitoring event, and that the number of wells sampled during each event be reduced from 10 to five beginning in February of 2012. This recommendation is made based on the history of the site, which indicates that sampling of all ten wells is frequently problematic during warmer periods of the year (mid-spring to mid- to late-fall), and in acknowledgement of the fact that the outer ring of wells (i.e., MW25-8, MW25-13, MW25-15, MW25-18, and MW25-19) have not shown contaminants of concern at levels in excess of groundwater standards since the completion of the remedial action at the site. For SEAD-16 and SEAD-17, the Army recommended in the Year 4 Draft Annual Report issued April 1, 2011 that groundwater monitoring at both sites be continued until the Five-Year Review Report was submitted and approved at which point the annual monitoring event be terminated. This recommendation stems from the Army's determination that the groundwater quality has not changed since the remedial action was completed at the two sites and on the basis that these sites are both located within the Planned Industrial / Office Development and Warehousing Area of the Depot where a groundwater access and use restriction is in effect. Additionally this area of the Depot is serviced by a potable water system that is derived from a non-groundwater source. Since the issue of these recommendations, the Army has not received comments on or approval of these recommendations, and using this document to again highlight these matters.

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

Sincerely,

Todd M. Heino, P.E.
Vice President

Enclosures

cc: S. Absolom, SEDA
R. Battaglia, USACE, NY District
K. Hoddinott, USAPHC

PARSONS

100 High Street • Boston, Massachusetts 02110-1713 • Phone (617) 946-9400 • Fax (617) 946-9777 • www.parsons.com

July 20, 2011

Mr. Julio Vazquez
USEPA Region II
Superfund Federal Facilities Section
290 Broadway, 18th Floor
New York, NY 10007-1866

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, Room 300
New York State Department of Health
547 River Street, Flanigan Square
Troy, NY 12180

SUBJECT: Five-Year Review, Former Solid Waste Management Units SEAD 1, 2, 5, 13, 16, 17, 25, 26, 27, 32, 39, 40, 41, 43, 44A, 44B, 52, 56, 59, 62, 64A, 64B, 64C, 64D, 66, 67, 69, 71, 121C, 121I, 122B, 122E, and the Ash Landfill Operable Unit (SEADs 3, 6, 8, 14, and 15) at Seneca Army Depot Activity, Romulus, New York; EPA Site ID# NY0213820830 and NY Site ID# 8-50-006

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

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit the Five-Year Review Report for Former Solid Waste Management Units (SWMUs) at the Seneca Army Depot Activity (SEDA) in Romulus, New York (EPA Site ID# NY0213820830 and NY Site ID# 8-50-006). This Report provides the findings of the Five-Year Review of former SWMUs at the Site that have closed under CERCLA but which have continuing long-term monitoring and maintenance requirements per the specifications of the Records of Decisions that have been approved by the U.S. Army and the U.S. Environmental Protection Agency, with concurrence from the New York State Department of Environmental Conservation.

The Army would like to highlight two items that are presented and discussed in the Five-Year Review Report that have been previously presented in Draft Annual Monitoring Reports submitted for SEAD-25 (the Fire Training and Demonstration Pad) and SEAD-16 and SEAD-17 (the former Abandoned and Existing Deactivation Furnace sites, respectively) at the Depot. For SEAD-25, the Army recommended in the Draft Fourth Annual Report issued May 25, 2011 that the groundwater monitoring frequency be modified from semi-annual (twice-a-year) events to an annual monitoring event, and that the number of wells sampled during each event be reduced from 10 to five beginning in February of 2012. This recommendation is made based on the history of the site, which indicates that sampling of all ten wells is frequently problematic during warmer periods of the year (mid-spring to mid- to late-fall), and in acknowledgement of the fact that the outer ring of wells (i.e., MW25-8, MW25-13, MW25-15, MW25-18, and MW25-19) have not shown contaminants of concern at levels in excess of groundwater standards since the completion of the remedial action at the site. For SEAD-16 and SEAD-17, the Army recommended in the Year 4 Draft Annual Report issued April 1, 2011 that groundwater monitoring at both sites be continued until the Five-Year Review Report was submitted and approved at which point the annual monitoring event be terminated. This recommendation stems from the Army's determination that the groundwater quality has not changed since the remedial action was completed at the two sites and on the basis that these sites are both located within the Planned Industrial / Office Development and Warehousing Area of the Depot where a groundwater access and use restriction is in effect. Additionally this area of the Depot is serviced by a potable water system that is derived from a non-groundwater source. Since the issue of these recommendations, the Army has not received comments on or approval of these recommendations, and using this document to again highlight these matters.

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

Sincerely,

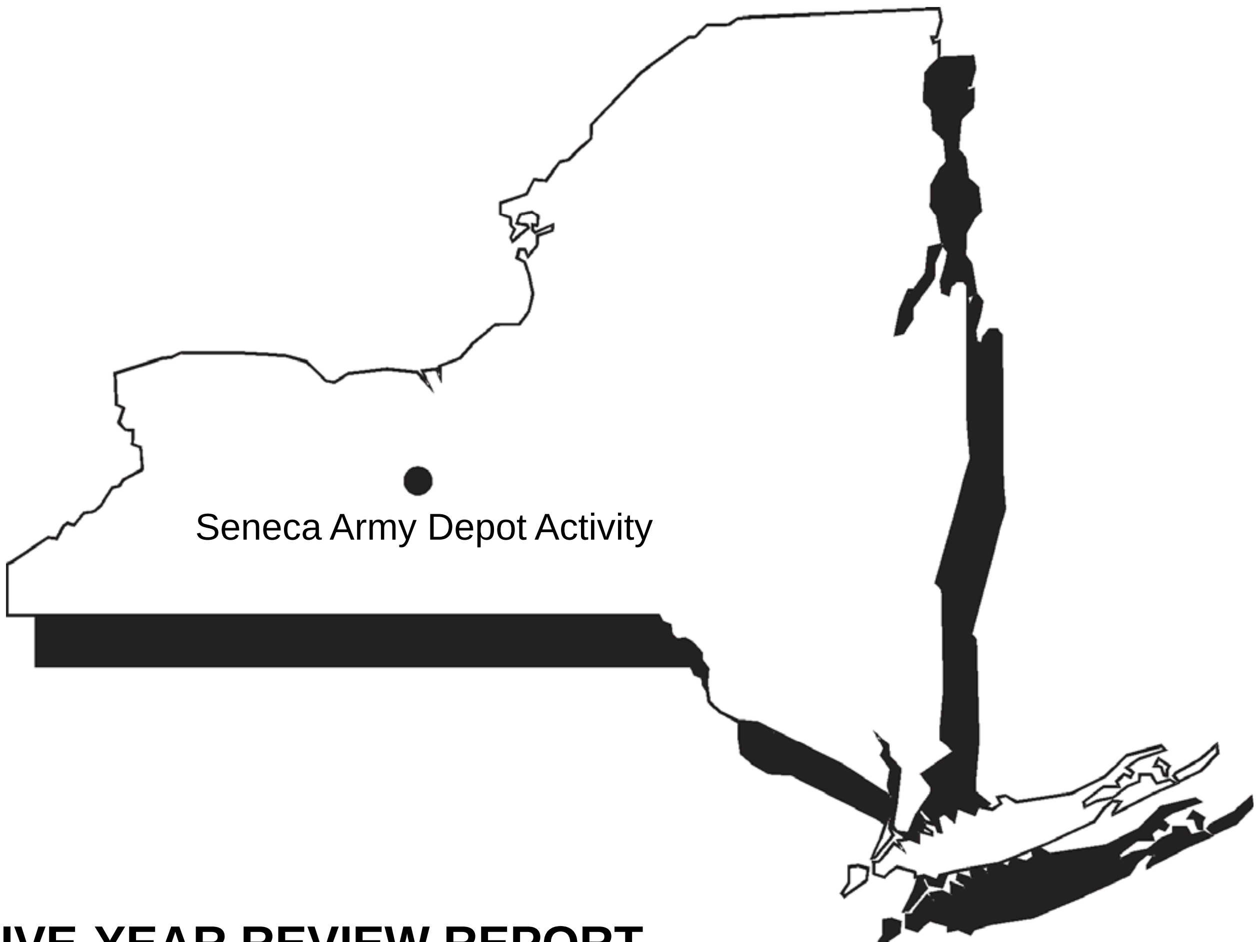
Todd Heino, P.E.
Vice President
Enclosures

cc: J. Nohrstedt, USACE, Huntsville
R. Battaglia, USACE, NY
M. Heaney, TechLaw
S. Absolom, SEDA
K. Hoddinott, USAPHC

US Army, Engineering & Support Center
Huntsville, AL

00048

Seneca Army Depot Activity
Romulus, NY



FIVE-YEAR REVIEW REPORT

FORMER SOLID WASTE MANAGEMENT UNITS
SEAD 1, 2, 5, 13, 16, 17, 25, 26, 27, 32, 39, 40, 41, 43, 44A, 44B, 52, 56, 59, 62, 64A, 64B, 64C, 64D, 66, 67, 69, 71, 121C, 121I, 122B, 122E, and the Ash Landfill Operable Unit (SEADs 3, 6, 8, 14, and 15)
SENECA ARMY DEPOT ACTIVITY

Contract No. W912DY-08-D-0003
Task Order No. 0008
EPA Site ID# NY0213820830
NY Site ID# 8-50-006

PARSONS

JULY 2011

FIVE-YEAR REVIEW REPORT

FORMER SOLID WASTE MANAGEMENT UNITS
SEAD 1, 2, 5, 13, 16, 17, 25, 26, 27, 32, 39, 40, 41, 43, 44A, 44B, 52, 56, 59, 62, 64A, 64B, 64C, 64D, 66, 67, 69, 71, 121C, 121I, 122B, 122E, and the Ash Landfill Operable Unit (SEADs 3, 6, 8, 14, and 15)

SENECA ARMY DEPOT ACTIVITY, ROMULUS, NEW YORK

Prepared for:

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

HUNTSVILLE, ALABAMA

And

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared by:

PARSONS
100 High Street
Boston, MA 02110

Contract Number W912DY-08-D-0003
Task Order No. 0008
EPA Site ID# NY0213820830
NY Site ID# 8-50-006

July 2011

Certification

I certify under penalty of perjury that the controls employed at the Controlled Property are unchanged from the time of implementation or that any changes to the controls employed at the Controlled Property were approved by USEPA and NYSDEC, and that nothing has occurred that would impair the ability of such control to protect the public health and environment or constitute a violation or failure to comply with the Remedial Design for such controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.

7/19/11

Peter M. Petrone, P.E
NYPE #057570

Date

Approved for Submittal

07/19/2011

Stephen M. Absolom
BRAC Environmental Coordinator
U.S. Army

Date

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name ***(from WasteLAN)*****:** **Seneca Army Depot**		
EPA ID ***(from WasteLAN)*****:** **NY0213820830**		
Region: 2	**State: NY**	**City/County: Romulus/Seneca**
SITE STATUS		
NPL status: X Final Deleted Other (specify)		
Remediation status (choose all that apply): X Under Construction X Operating X Complete		
Multiple OUs?* X YES NO	**Construction completion date:** ___ / ___ / __N/A_	
Has site been put into reuse? X YES NO		
REVIEW STATUS		
Lead agency: EPA State Tribe X Other Federal Agency U.S. ARMY		
Author name:		
Author title:	**Author affiliation:**	
Review period:** ___ / ___ / ______ to 08 / 30 / 2011		
Date(s) of site inspection: 04 / 06 / 2011 and 04 / 07 / 2011		
Type of review: X Post-SARA Pre-SARA NPL-Removal only Non-NPL Remedial Action Site NPL State/Tribe-lead Regional Discretion		
Review number: X 1 (first) 2 (second) 3 (third) Other (specify) __________		
Triggering action: Actual RA Onsite Construction at OU #____ Actual RA Start at OU#____ Construction Completion Previous Five-Year Review Report Other (specify)		
Triggering action date ***(from WasteLAN)*****:** ___ / ___ / ______		
Due date ***(five years after triggering action date)*****:** ___ / ___ / ______		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

Summarize issues (see Chapter 3).

N/A

Recommendations and Follow-up Actions:

Summarize recommendations and follow-up actions (see Chapter 3).

Continue implementation of land use controls and frequency of periodic reviews.

Protectiveness Statement(s):

Include individual operable unit protectiveness statements. For sites that have reached construction completion and have more than one OU, include an additional and comprehensive protectiveness statement covering all of the remedies at the site (see Chapter 4).

Based upon the review of the CERCLA sites at the former Seneca Army Depot conducted by the Army, it has been determined that the remedies selected for the LUC/IC and LTM sites at the former SEDA remain protective of human health and the environment. Remedies have not been selected for SEAD-12, SEAD-72, SEAD-70, SEAD-45, SEAD-46, SEAD-57, SEAD-007-R-01, and SEAD-002-R-01. Evaluation of the remedies will be included in the next 5-Year Review.

Other Comments:

Make any other comments here.

1.0 INTRODUCTION

Parsons Infrastructure & Technology Group Inc. (Parsons), in consultation with the U.S. Army (Army), conducted this Five-Year Review pursuant to Section 121 (c) of the CERCLA of 1980, as amended, Section 300.430 (f) (4) (ii) of the National Oil and Hazardous Substances Pollution Contingency Plan and OSWER Directive 9355.7-03B-P (June 2001). The purpose of a Five-Year Review is to evaluate the implementation and performance of a remedy in order to determine if the remedy is or will be protective of human health and the environment. Protectiveness is generally defined in the NCP by the risk range and the hazard index (HI, HIs hazard indices). The risk range and HI are estimated to determine the incremental probably of an individual developing health effects (carcinogenic or non-carcinogenic) over a lifetime because of exposure to a chemical of concern. Evaluation of the remedy and the determination of protectiveness should be based on and sufficiently supported by the data and observations. The Five-Year Review is required because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. This document will become part of the Administrative Record for the former Seneca Army Depot Activity (SEDA) Site.

The CERCLA sites will be reviewed individually within subgroups organized as follows:

- Land-Use Control/ Institutional Control and Long-term Monitoring and Maintenance Sites, and
- Pre-ROD Sites: Sites with RODs pending or planned.

This is the first Five-Year Review at the SEDA (**Figure 1-1**). In 1995, SEDA was designated for closure under the Department of Defense's (DoD's) Base Realignment and Closure (BRAC) process. To address employment and economic impacts associated with the SEDA's closure, the Seneca County Board of Supervisors established the Seneca Army Depot Local Redevelopment Authority (LRA) in October 1995. The primary responsibility assigned to the LRA was to prepare a plan for redevelopment of the SEDA property. Following a comprehensive planning process, a Reuse Plan and Implementation Strategy for Seneca Army Depot was completed and adopted by the LRA on October 8, 1996. The Seneca County Board of Supervisors subsequently approved this Reuse Plan on October 22, 1996. In 2005, after it had acquired portions of the former Depot from the Army, the Seneca County Industrial Development Agency (SCIDA) changed the planned use of land in many portions of the Depot. **Figure 1-2** depicts the intended future land uses for SEDA, as modified by the SCIDA.

The Five-Year Review CERCLA sites are provided in **Table 1** and a site chronology is presented below. A listing of all historic areas of concern (AOCs) that have been subject of CERCLA investigations at the Depot and their current deposition is provided in **Table 2**.

Event	Date
U.S. Army announced decision to build depot and acquires land (~10,600 acres).	June 11, 1941
U.S. Army begins construction of the Seneca Ordnance Depot	July 9, 1941
Last igloo finished.	November 19, 1941
First shipment of ammunition received.	January 6, 1942
Airfield built for Sampson AFB adjacent to depot southwest border.	1952-1953
1,120 acres at the north end of the depot was transferred to the New York District of the Corps of Engineers for construction of North Storage Activity.	February 2, 1955
North Depot Activity was established (Q Area).	October 2, 1956
The North Storage Activity was redesignated as North Depot Activity	December 1, 1957
Former Sampson AFB airstrip and facilities turned over to the depot.	November 14, 1958
Lake shore housing (~449 acres) transferred to SEDA.	1957-1960
Airfield (~629 acres) transferred to SEDA.	1958-1962
The North Depot Activity is consolidated with the Seneca Ordnance Depot.	January 1, 1962
Seneca Ordnance Depot facility is transferred from Chief of Ordnance to the U.S. Army Supply and Maintenance command, and the facility was renamed the Seneca Army Depot.	August 1, 1962
Facility name changed to Seneca Army Depot	January 1, 1963
Dedication of LORAN-C Transmitting Station located on a portion of the depot property.	August 2, 1978
SEDA proposed for the National Priorities List (NPL)	July 14, 1989
SEDA was finalized and listed in Group 14 on the Federal Section of the NPL.	August 30, 1990
The Federal Facility Agreement signed between EPA, NYSDEC, and the Army.	January 1, 1993
SEDA was approved for closure under BRAC.	October 1, 1995
Seneca Army Depot Local Redevelopment Authority (LRA) created by Seneca County Board of Supervisors.	October 1, 1995
The Reuse Plan was approved by the LRA and Seneca County Board of Supervisors.	October 22, 1996
The Environmental Baseline Study was completed (Nov 13 - Dec 12, 1995) and reported.	October 29, 1996
ROD signed for Former Open Burning Grounds Site.	June 14, 1999
Five Points Correctional Facility opens at extreme southeast end of former depot property.	June 1, 2000
KidsPeace National Center of NY, Inc Seneca Woods campus opens in the northern end of the former depot property.	July 1, 2000
Depot transfers Prison Parcel to New York state.	September 26, 2000
SEDA was officially closed.	September 30, 2000
Seneca County Industrial Development Agency were transferred 9,500 acres (7,000 acres from conservation area, 900 acres from Planned Industrial Development/Warehouse Area (PID Area), and 500 acres from airfield parcel).	September 30, 2003
ROD signed for Twenty No Action SWMUs and Eight No Further Action SWMUs.	November 12, 2003
26 acres of former depot property was transferred for creation of a county jail.	December 31, 2003
ROD signed for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas (SEADs 27, 64A, and 66).	September 28, 2004
ROD signed for the Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26).	September 29, 2004
KidsPeace National Center of NY, Inc Seneca Woods campus was transferred to Hillside Children's Center	December 1, 2004
ROD signed for the Ash landfill Operable Unit Including Sites (SEADs 3, 6, 8, 14, 15).	January 21, 2005
ROD signed for No Further Actions for SWMUs SEAD 50/54	September 28, 2005
ROD signed for Debris Area Near Booster Station 2131 (SEAD-58) and Miscellaneous Components Burial Site (SEAD-63)	September 28, 2006
ROD signed for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17)	September 29, 2006
ROD signed for the 17 SWMUs Requiring Land Use Controls (SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E)	July 3, 2007
SEAD-24, SEAD-50, SEAD-54, and SEAD-58 delisted from NPL.	April 28, 2008
ROD signed for the Defense Reutilization and Marketing Office (DRMO) Yard (SEAD-121C) and the Rumored Cosmoline Oil Disposal Area (SEAD-121I).	August 7, 2008
ROD signed for the Munitions Washout Facility (SEAD-4) and the Building 2079 Boiler Blowdown Pit (SEAD-38).	September 22, 2008
ROD signed for the Fill Area West of Building 135 (SEAD-59) and the Alleged Paint Disposal Area (SEAD-71).	March 31, 2009
ROD signed for Five Former SWMUs (SEAD 1, 2, 5, 24, 48)	May 6, 2009
ROD signed for the Old Construction Debris Landfill (SEAD-11)	September 25, 2009
A total of 9,808 acres transferred as of FY2009 with 878 acres remaining.	February 1, 2010

2.0 ENVIRONMENTAL SETTING

2.1 Physical Characteristics

SEDA is located approximately 40 miles south of Lake Ontario, near Romulus, New York (NY) as shown in **Figure 1-1**. The Depot lies immediately west of the Town of Romulus, NY, 12 miles south of the villages of Waterloo and Seneca Falls, and 2.5 miles north of the Town of Ovid, NY. The two closest major cities are Rochester, NY, which is located approximately 60 miles northwest, and Syracuse, NY, which is located approximately 60 miles northeast. Prior to the acquisition of the land and construction of SEDA in 1941, the property was privately owned and was used principally as homesteads and for agriculture.

SEDA is located in an uplands area, where the elevation ranges from approximately 600 feet (ft.) National Geodetic Vertical Datum (NGVD 1929) along the western boundary of the Depot to nearly 760 feet NGVD 1929 in the central portion of the eastern boundary. The uplands area where SEDA is located forms a divide separating two of the New York Finger Lakes: Cayuga Lake on the east and Seneca Lake on the west. Sparsely populated farmland covers most of the surrounding area. New York State Highways 96 and 96A border SEDA to the east and west, respectively. **Figure 2-1** presents an aerial view of SEDA.

Pleistocene age (Wisconsin event, 20,000 years ago) glacial till deposits overlies the shales. SEDA lies on the western edge of a large glacial till plain between Seneca Lake and Cayuga Lake. The till matrix, the result of glaciations, varies locally but generally consists of horizons of unsorted silt, clay, sand, and gravel. The soils at SEDA contain varying amounts of inorganic clays, inorganic silts, and silty sands. In the central and eastern portions of SEDA, the till is thin and bedrock is exposed or within 3 feet of the surface. The thickness of the glacial till deposits at SEDA generally ranges from 1 to 15 feet.

Darien silt-loam soils, 0 to 18 inches thick, have developed over Wisconsin age glacial tills. These soils are developed on glacial till where they overlie the shale. In general, the topographic relief associated with these soils is from 3 to 8 percent (%).

A cool climate exists at SEDA with temperatures ranging from an average of 23°F in January to 69°F in July. Marked temperature differences are found between daytime highs and nighttime lows during the summer and portions of the transitional seasons. Precipitation is well distributed, averaging approximately 3 inches per month. This precipitation is derived principally from cyclonic storms, which pass from the interior of the county through the St. Lawrence Valley. Seneca, Cayuga, and Ontario Lakes provide a significant amount of the winter precipitation and moderate the local climate. The annual average snowfall is approximately 100 inches. Wind velocities are moderate, but during the winter months, there are numerous days with sufficient winds to cause blowing and drifting snow. The most frequently occurring wind directions are westerly and west southwesterly.

SEDA is located in the Genesee-Finger Lakes Air Quality Control Region (AQCR). The AQCR is designated as non-attainment for ozone and attainment or unclassified for all other criteria pollutants. Data for the existing air quality in the area that surrounds the SEDA cannot be obtained since the nearest state air quality stations (Rochester of Monroe County or Syracuse of Onondaga County) are 40 to 50 miles away from the Depot and are not representative of the conditions at SEDA. A review of the data for Rochester, which is in the same AQCR as the SEDA, indicates that all monitored pollutants (sulfur dioxide, particulates, carbon monoxide, lead, and ozone) are below state and federal limits, with the exception of ozone. In 1987, the maximum ozone concentration observed in Rochester was 0.127 parts per million (ppm); however, this value is not representative of the SEDA area which is a more rural environment.

2.2 Land and Resource Use

In October 1995, the SEDA was designated for closure under the DoD's 1995 BRAC process. As part of the BRAC process, the Army commissioned an Environmental Baseline Survey (EBS) of the Depot. Under the EBS, all of the property identified as subject to transfer or lease at the facility is classified into one of the seven standard environmental conditions of property area types as defined by the Community Environmental Response Facilitation Act (CERFA) guidance and the DoD BRAC Cleanup Plan Guidebook. This is achieved by identifying, characterizing, and documenting the obviousness of the presence or likely presence of a release or a threatened release of a hazardous substance or petroleum product associated with the historical and current use of Seneca Army Depot Activity. Areas that are designated as Category 1, 2, 3, or 4 under the CERFA process are suitable for transfer or lease, subject to consideration of the qualifiers. Areas that are designated as Category 5, 6, or 7 are not suitable for transfer, pending further investigation and remediation, as may be needed. The complete details of the EBS are summarized in the document U.S. Army Base Realignment and Closure 95 Program; Environmental Baseline Survey Report, Seneca Army Depot Activity, New York (Woodward-Clyde Federal Services, 1997).

At the completion of the EBS, 113 BRAC parcels of land were identified and classified within the 10,634 acre Depot. Of the total area, approximately 8,690 acres were found to be suitable for lease or transfer (as designated by Categories 1 through 4), while the remaining area (approximately 1,945 acres) were designated as Categories 5 through 7 and were not deemed suitable for immediate transfer for reuse. Once SEDA was added to the 1995 BRAC list, the Army's primary objective expanded from performing remedial investigations and completing necessary remedial actions to include the release of non-affected portions of the Depot to the surrounding community for their reuse for other, non-military purposes (i.e., industrial, municipal, and residential). The designated future use of land within the SEDA was first defined and approved by the Seneca County Local Redevelopment Authority in 1996. The planned use for portions of the SEDA was modified by SCIDA in 2005.

Ecological site characterizations conducted at the Depot were based on compilation of existing ecological information and on-site reconnaissance activities. The methods used to characterize the ecological resources included site-walkovers for the evaluation of existing wildlife and vegetative communities; interviews with local, state, and SEDA resource personnel; and review of environmental data obtained from previous Army reports. Ecological communities identified at SEDA include successional old-field areas, successional shrub areas, and successional hardwoods areas. Animals that have been identified at the Depot during various ecological surveys include beaver, eastern coyote, deer, red and gray fox, eastern cottontail rabbit, muskrat, raccoon, gray squirrel, striped skunk, and the woodchuck. Bird species that have been identified include the blue jay, black-capped chickadee, American crow, mourning dove, northern flicker, ruffed grouse, ring-billed gull, red-tailed hawk, northern junco, American kestrel, white breasted nuthatch, ring-necked pheasant, American robin, eastern starling, turkey vulture, and pileated woodpecker. Vegetation across the Depot consists of successional old field, successional shrub, and successional hardwoods.

SEDA has a strong wildlife management program that is reviewed by the New York State Department of Environmental Conservation. The Army manages an annual white-tailed deer (Odocoileus virginiana) harvest and has constructed a large wetland called the "Duck Pond" in the northeastern portion of the facility to provide a habitat for migrating waterfowl.

The NYSDEC Natural Heritage Program Environmental Resource Mapper[1] (see **Figure 2-2**) indicates that there are extensive areas of State-Regulated Wetlands within the bounds of the former Depot, and that the Depot site is surrounded by areas that may contain federal- or state-designated threatened or endangered plant or animal species within a 2-mile radius of the sites. A list of protected rare, threatened, or endangered plants in the State of New York is available through a NYSDEC website[2]. A list of potential rare, threatened, or endangered plant species that have been identified as potentially or actually present within the limits of Seneca County is available through the New York Natural Heritage Program[3]. No site-specific information pertinent to the occurrence of rare, threatened, or endangered plants on the land of the former Seneca Army Depot was found in the literature. New York's list of rare, threatened, or endangered animals in the State of New York is available through a NYSDEC website[4]. Information provided by Army personnel indicate that Bald Eagles and Osprey have periodically been observed within the bounds of the former Depot. A number of the listed rare, endangered, and threatened birds have been observed at the Montezuma National Wildlife Refuge[5], which is located approximately 17 miles north, northeast of the former Depot. The only significant terrestrial resource known to occur at SEDA is the population of white-pelaged white-tailed deer, which inhabits the fenced portion of the Depot. Annual deer counting conducted at the Depot indicates that the size of the deer herd is approximately 600 animals of which approximately one-third (i.e., 200) are white-pelaged. Since the Depot is totally enclosed, the white pelaged deer is thought to result from inbreeding within the herd.

---

[1] See http://www.dec.ny.gov/imsmaps/ERM/viewer.htm, 5786 State Highway 96, Romulus, New York 14541

[2] See http://www.dec.ny.gov/regs/15522.html, Trees and Plants

[3] New York Natural Heritage Program, New York Rare Plant List June 2010, http://www.nynhp.org/

[4] List of Endangered, Threatened, and Special Concern Fish & Wildlife Species of New York State, http://www.dec.ny.gov/animals/7494.html

[5] See Montezuma National Wildlife Refuge listing, http://www.npwrc.usgs.gov/resource/birds/chekbird/r5/montezum.htm

2.3 Geology/Hydrogeology

The Finger Lakes uplands area is underlain by a broad north-to-south trending series of rock terraces mantled by glacial till. As part of the Appalachian Plateau, the region is underlain by a tectonically undisturbed sequence of Paleozoic rocks consisting of shales, sandstones, conglomerates, limestones and dolostones. In the vicinity of SEDA, Devonian age (385 million years ago) rocks of the Hamilton Group are monoclinally folded and dip gently to the south. No evidence of faulting or folding is present. The Hamilton Group is a sequence of limestones, calcareous shales, siltstones, and sandstones.

SEDA geology is characterized by gray Devonian shale with a thin weathered zone where it contacts the overlying mantle of Pleistocene glacial till. This stratigraphy is consistent over the entire SEDA facility. The predominant surficial geologic unit present at the site is dense glacial till. The till is distributed across the entire facility and ranges in thickness from less than 2 feet to as much as 15 feet although it is generally only a few feet thick. The till is generally characterized by brown to gray-brown silt, clay and fine sand with few fine to coarse gravel-sized inclusions of weathered shale. Larger diameter weathered shale clasts (as large as 6-inches in diameter) are more prevalent in basal portions of the till and are probably ripped-up clasts removed by the active glacier.

The bedrock underlying the site is composed of the Ludlowville Formation of the Devonian age, Hamilton Group. Merin (1992) also cites three prominent vertical joint directions of northeast, north-northwest, and east-northeast in outcrops of the Genesee Formation 30 miles southeast of SEDA near Ithaca, New York. Three predominant joint directions, N60^{o}E, N30^{o}W, and N20^{o}E are present within this unit (Mozola, 1951). These joints are primarily vertical. The Hamilton Group is a gray-black, calcareous shale that is fissile and exhibits parting (or separation) along bedding planes.

Regionally, four distinct hydrologic units have been identified within Seneca County (Mozola, 1951). These include two distinct shale formations, a series of limestone units, and unconsolidated beds of Pleistocene glacial drift. Overall, the groundwater in the county is very hard, and therefore, the quality is minimally acceptable for use as potable water.

Regionally, the water table aquifer of the unconsolidated surficial glacial deposits of the region would be expected to flow in a direction consistent with the ground surface elevations. Geologic cross-sections from Seneca Lake and Cayuga Lake have been constructed by the State of New York, (Mozola, 1951, and Crain, 1974). The geologic cross-sections suggest that a groundwater divide exists approximately half way between the two Finger Lakes. SEDA is located on the western slope of this divide and therefore regional groundwater flow is expected to be primarily westward towards Seneca Lake.

Local hydrogeology is overall consistent with the regional hydrogeology.

Surface drainage from SEDA flows to five primary creeks (see **Figure 2-1**). In the southern portion of the Depot, the surface drainage flows through man-made drainage ditches and streams into Indian and Silver Creeks. These creeks then merge and flow into Seneca Lake just south of the SEDA airfield. The central part and administration area of the SEDA drain into Kendaia Creek. Kendaia Creek flows in a predominant westerly direction, and discharges into Seneca Lake at a location north of Pontius Point and the SEDA's former Lake Shore Housing Area. The majority of the northwestern and north-central portion of the SEDA drains into Reeder Creek. Reeder Creek flows predominantly northwesterly and leaves the Depot at a point that is north of the Open Detonation Area (i.e., SEAD-45) and west of the former Weapons Storage Area or the "Q" (i.e., SEAD-12) before it turns to the west and flows into Seneca Lake. The northeastern portion of the Depot, which includes a marshy area called the Duck Pond, drains into Kendig Creek and then flows north into the Cayuga-Seneca Canal and to Cayuga Lake. Other minor creeks are also present and drain portions of the Depot.

2.4 History of Contamination

Between 1941 and 2000, SEDA was owned by the United States Government and operated by the Department of the Army. The Depot began its primary mission of receipt, maintenance and supply of ammunition in 1943. After the end of World War II, the Depot's mission shifted from supply to storage, maintenance and disposal of ammunition. SEDA was selected for closure by the DoD in 1995, and SEDA's military mission terminated in September 1999 and the installation was closed in September 2000.

Site contamination, is described below in Section 4; Remedial Actions, Technical Assessment, Issues, Recommendations and Follow-up Actions, and Protective Statements on an area of concern (AOC) Basis.

2.5 Initial Response

SEDA was proposed for the National Priorities List (NPL) in July 1989. In August 1990, the listing of SEDA as a NPL site was finalized in Group 14 on the Federal Section. After SEDA was listed on the NPL, the Army, U.S. Environmental Protection Agency, Region II (EPA), and New York State Department of Environmental Conservation (NYSDEC) identified 57 SWMUs (identified with the acronym SEAD and a unique number) where data or information suggested, or evidence existed to support, that hazardous substances or hazardous wastes had been handled and where releases to the environment may have occurred. Additionally, the EPA, NYSDEC, and the Army negotiated and finalized a Federal Facilities Agreement (FFA) for the Site in 1993.

The number of SWMUs was subsequently expanded to include 72 AOCs once the Army finalized the *SWMU Classification Report* (Parsons, 1994) for the Depot in 1994.

The SEDA was a generator and treatment, storage, and disposal facility (TSDF) for hazardous wastes and thus, subject to regulation under the Resource Conservation and Recovery Act (RCRA). Under the RCRA permit system, corrective action is required at all SWMUs, as needed. Remedial goals are the same for CERCLA and RCRA; thus, once the 72 SWMUs were listed, the Army recommended that they be identified as either areas requiring No Action or as AOCs under CERCLA and the FFA, where additional; investigation, study, or actions were needed. SWMUs listed as AOCs were then scheduled for investigations based upon data and potential risks to the environment. The 72 AOCs included four locations (SEAD-12 A and B; SEAD-44 A and B; SEAD-64 A, B, C, and D; and SEAD-65 A, B, and C) that consisted of multiple sites (79 sites to be investigated).

Once SEDA was selected and approved for closure as part of the BRAC 1995 process, the Army commissioned an Environmental Baseline Survey (EBS) to assess the condition of all property relative to its status under CERFA guidance and the DoD BRAC Cleanup Plan guidebook. At the conclusion of this effort, approximately 1,945 acres of land within the Depot, including all of the land previously designated as SWMUs and additional properties not previously designated as sites of interest were classified as CERFA Category 5, 6 or 7 sites (i.e., not suitable for transfer, pending further investigation and remediation). Subsequently in 1998, the Army authorized and conducted site inspections and limited site investigations of 32 additional potential sites identified as CERFA Category 5 – 7 properties, and because of these efforts an additional four sites (SEADs 121C, 121I, 122B, and 122E) were classified as SWMUs requiring further assessment and actions under CERCLA. Additionally, per requirements of BRAC properties where ordnance had been located, the Army also commissioned an Ordnance and Explosives (OE) Archives Search and conducted site inspections to: 1) identify all areas where ordnance activates occurred; 2) assess the likelihood that ordnance remained due to the historic activities; and 3) make recommendations regarding the areas that required further action or investigation. Based on these assessments and evaluations, two additional SWMUs (SEAD-007-R-01, and SEAD-002-R-01 that consisted of two separate areas, EOD-2 and EOD-3) were added to the list of sites that were to be assessed under CERCLA. Finally, in 1998, once the Army had completed its initial investigations of SEAD-12A and SEAD-12B, and had begun its more comprehensive remedial investigation (RI) of the former Radiological Burial Pit sites, the Army expanded the extent of its investigations at the north end of the Depot to include more area than comprised the suspect radiological waste burial pit sites. As part of this effort, SEAD-12A and SEAD-12 were consolidated into SEAD-12, and an area encompassing more than 350 acres at the north end of the Depot was subject of continuing CERCLA investigations. Based on these additions, sites investigated under CERCLA rose from the 72 listed in the FFA to include the 78 initially listed (SEAD-12A and SEAD-12B consolidated into SEAD-12), the four EBS sites (SEADs 121C, 121I, 122B, and 122E), and the two additional OE SWMUs (SEADs 002-R-01, including EOD-2) resulting in 84 sites.

3.0 REMEDIAL ACTIONS, TECHNICAL ASSESSMENT, ISSUES, RECOMMENDATIONS AND FOLLOW-UP ACTIONS, AND PROTECTIVE STATEMENTS ON A SITE BASIS

Section 4 reviews the CERCLA sites at the former Seneca Army Depot Activity. The CERCLA sites are individually reviewed within the following categories:

- Land-Use Control/ Institutional Control Sites and LTM Sites; and
- Pre-ROD Sites.

As of the date of this Report, RODs have been signed for 74 out of 84 SEADs at SEDA. SEADs with signed RODs are listed in **Table 1**. Consistent with CERCLA requirements a five-year statutory review is required for a site with a ROD signed on or after October 17, 1986 if upon completion of the remedial action, hazardous substances, pollutants, or contaminants will remain on site. As such, this document provides a Five-Year Review for the 37 SEADs listed in **Table 1** that require a Five-Year Review. Of the remaining SEADs 45 SEADs, 37 (39 sites, SEAD-65A, B, and C) have been closed with a No Action or No Further Action determination and are not addressed in this review. General background information is provided herein for the eight operable units that are currently under assessment and do not have signed RODs as of the date of this Five-Year Review.

Figure 3-1 identifies the CERCLA sites reviewed in the Five!-Year Review with the corresponding LUCs or ICs required by the RODs or are expected to be required (for sites currently awaiting ROD issuance). For real estate parcels that have been transferred, LUC/ICs have been implemented in the form of deed restrictions.

3.1 Land Use Control/Institutional Control and Long Term Monitoring and Maintenance Sites

3.1.1 Planned Industrial/Office Development and Warehousing Areas

3.1.1.1 History of Contamination, Initial Response and Basis for Taking Action

SEAD-1: Hazardous Waste Container Storage Facility (Building 307)

History of Contamination and Initial Response

SEAD-1 (Building 307, the former Hazardous Waste Container Storage Facility) is located approximately 3,500 feet southwest of the Depot's main entrance off State Route 96. Building 307 was constructed in 1981 and it was used for temporary storage of containerized hazardous wastes prior to their shipment offsite for disposal. Hazardous wastes stored at SEAD-1 included spent solvents; still bottoms; sludge from oil/grease separations; cleaning compounds; paper filters; waste polychlorinated biphenyls; and, spent battery acids. Most wastes stored within the building were stored in 55-gallon drums, but 5-gallon pails were also occasionally used. The storage of hazardous waste in Building 307 was subject to regulations promulgated under RCRA, 42 U.S.C. §§6901-63992k.

Building 307 is 40 feet wide by 50 feet long, with rafters located approximately 10 feet above the floor, while the peak of the roof is 18 feet above the floor. The building's floor is a 6-inch thick, monolithic reinforced concrete slab, surrounded by an integral, 6-inch thick and high concrete curb. The floor and containment curb are coated with chemical-resistant sealant and are level, except where a sloped access/egress ramp is located at the main entrance door (south side) of the structure. The floor and curb are surrounded by an exterior mounted, wooden-framed, pole barn structure, and the exterior walls and roof are constructed of zinc-coated, corrugated metal sheets. The building's roof is fabricated of single sheets of metal that extend from the roof's center ridge to a point beyond the exterior edge of the building's eastern and western walls. The eastern and western sheet metal walls begin 1 foot below the building's headers and continue to a point that is 6 inches below the top of the containment curb. The wall/roof and wall/containment curb air gaps provide passive ventilation for the building.

During Building 307's active life, the ground surrounding the building was kept clear of vegetation. Currently, the ground located immediately exterior to the building is a mixture of gravel and dirt, sparsely covered with native grass and weed vegetation. The gravel and dirt perimeter extends outwardly from the building for distances varying between 2 to 15 feet on all sides. Evidence of soil erosion is present along the exterior eastern and western sides of the building, where storm water run-off from the walls and the roof drops to the ground. Lesser erosion impacts are evident along the northern and southern faces of the building, which are perpendicular to the slope of the building's roof line. The soil and gravel located between the building's exterior walls and the erosion gullies are discolored. South of the building, the ground shows evidence of wear from vehicular and pedestrian traffic that enters/leaves the building.

On December 30, 1991, the Army submitted a RCRA Part A and Part B Permit Application for the Depot that included storage operations at Building 307. The Army's permit application was not processed or approved, and operations performed at Building 307 continued under Interim Status until September 2005 when NYSDEC accepted the Army's Closure Certificate for SEAD-1.

In April 1991, the Army reported a spill (Spill Number 9100990) inside Building 307 totaling approximately 45 gallons of material, which may have included polychlorinated biphenyl (PCB) containing oil. The spill was contained within the building's monolithic concrete floor and curb, and it was cleaned up using a Speedi-Dri® adsorbent followed by a soap and water wash of the floor. Recovered adsorbent and liquids were containerized and disposed off-site as hazardous waste. The NYSDEC indicated that no further action was needed and closed the incident once the cleanup was completed.

A RCRA Closure was implemented and completed for Building 307 (SEAD-1). The NYSDEC approved the RCRA Closure of the building in September of 2005, and indicated that the existing building should only be used for industrial operations in the future. However, the NYSDEC deferred comment or determination on the acceptability of the exterior soils to the CERCLA program.

Basis for Taking Action

Contamination

Twelve soil samples were collected from locations exterior of Building 307 and analyzed for volatile organic compound (VOC), semivolatile organic compound (SVOC), PCB, and metal contaminants as part of the RCRA Closure operations in 2003. Exterior soil samples were originally compared to NYSDEC's Technical and Administrative Guidance Memorandum #4046 (TAGM #4046) soil cleanup levels and EPA Region IX Preliminary Remediation Goals PRGs. Individual soil sample results were subsequently compared New York's Remedial Program Soil Cleanup Objective (SCO) levels, Title 6 New York Code of Rules and Regulations (6 NYCRR) Subpart 375-6.8 and to the EPA 2008 Regional Screening Levels (RSLs) for Industrial Soil. NYSDEC requires that soil sample results be compared to Unrestricted Use SCOs as a baseline measure, and allows consideration of other restricted SCO levels (residential, restricted residential, commercial, and industrial) based on foreseeable future land use. The Army compared the results of SEAD-1 soil samples to New York's SCOs defined for Unrestricted, Commercial, and Industrial Use.

The recommended (e.g., 95th) upper confidence limit of the sample population's mean (e.g., 95th UCL) was also compared to the identified reference values for each compound having individual sample results above the identified soil SCOs, PRGs, or RSLs. A complete set of the analytical results obtained are provided in the ROD (Parsons, 2009a). A review of soil sample results indicates that 66 chemicals were detected in one or more of the individual soil samples characterized at SEAD-1. Two of the identified analytes [benzo(a)pyrene and arsenic] were found at levels in individual samples that surpassed EPA's Industrial Soil RSLs; seven analytes [benzo(b)fluoranthene, Aroclor 1242, Aroclor 1254, lead, mercury, nickel, and zinc] were found in individual samples at concentrations in excess of NYSDEC's Unrestricted Use SCOs, and one analyte (zinc) was found in individual samples at a concentration that exceeded both NYSDEC's Commercial and Industrial Use SCOs. Analysis of the summary data also indicates that the 95th UCL computed for two compounds [benzo(a)pyrene and arsenic] surpassed EPA's Industrial Soil RSL values; three compound's 95th UCL (lead, nickel and zinc) exceeded their state Unrestricted Use SCOs; while no compound's 95th UCL value exceeded their respective Commercial or Industrial Use SCO levels.

Human Health Risk Assessment

Data from the exterior soil samples served as the basis of the risk assessment that was performed to assess potential site risks and hazards. The human health risk assessment was initially conducted using the maximum observed concentration as the EPC; subsequent determinations used the recommended UCL value for selected metal contaminants of concern (COCs).

The results of the risk assessment performed using the maximum detected concentrations for contaminants in soil and the reasonable maximum exposure (RME) scenario indicate that the cancer risks calculated at SEAD-1 for all receptors (i.e., industrial worker, construction worker, and adolescent trespasser) are 1×10^{-6} or less, which is consistent with EPA guidelines. The estimated non-cancer HIs for the industrial worker and the adolescent trespasser are both less than 1, while the non-cancer HI for the construction worker is 1.56. Aluminum, iron, manganese, vanadium, and zinc in soil contribute significantly to the construction worker's elevated HI.

A further review of the SEAD-1 soil data indicated that the maximum and recommended UCL concentrations for all of the aforementioned metals, exclusive of zinc, are lower than all referenced Federal and State soil screening or cleanup objective values. Even zinc was found at concentrations that are lower than the EPA's Region IX 2004 PRG and 2008 Regional Screening Levels (RSLs) for residential soil, and NYSDEC's cleanup objectives for restricted commercial and industrial soils. Furthermore, the concentrations reported for aluminum, iron, manganese and vanadium are all consistent with SEDA-wide background concentrations that were established during prior remedial investigations (RIs) at the SEDA.

The risk assessment (based on maximum concentrations) was recalculated using recommended UCL values in place of maximum AOC concentrations as the exposure-point concentrations (EPCs) for aluminum, iron, manganese, vanadium, and zinc, and maximum concentrations for all of the other identified COCs. The results of this recalculation indicate that the estimated cancer risks for all potential future human receptors at SEAD-1 are consistent with, and less than EPA's preferred upper limits, and that the HIs for the industrial worker and adolescent trespasser are below 1.0. The construction worker's HI drops to 1.08. This reduced HI still is based on the overly conservative RfC for manganese dioxide.

With specific reference to the noted elevated concentrations of zinc found in the soil at SEAD-1, all soil samples collected for the AOC came from locations immediately adjacent to the exterior walls of Building 307. As has been noted earlier, the walls and roof of Building 307 are constructed of zinc-coated, corrugated metal, which has been exposed to the elements for more than 20 years, and shows visible evidence of oxidation on its surfaces. There is a noticeable zone of soil that surrounds Building 307 that has a whitish powdery material intermixed with it, and this substance is presumed to be a zinc-oxide powder resulting from the oxidation and weathering of the zinc-coated sheet metal walls and roofing material that has been washed from the building's exterior by storm events. Given these considerations, it was concluded that chemicals detected in SEAD-1 soil do not pose a health risk to the construction worker.

Information and data presented in the ROD (Parsons, 2009a) indicates that hazardous constituents are present in the soil at SEAD-1 (Hazardous Waste Container Storage Facility) at levels that exceed Federal and State guidance values and thus, may pose elevated risks to selected future populations (e.g., future residents), that could use the land. However, these sites are located in areas where the planned future land use is defined as commercial and industrial, and potential future hazards or risks identified at both of these AOCs are either suitable for the defined use, or associated with compounds that are present at concentrations that are equal to or less than naturally occurring levels

SEAD-2: PCB Transformer Storage Facility (Building 301)

<u>History of Contamination and Initial Response</u>

SEAD-2, Building 301, is located in the east-central portion of SEDA, roughly 6,000 feet west, southwest of the Depot's main entrance off State Route 96. The building is located on the eastern side of Fayette Road, which separates the Planned Office / Industrial Development (PID) and Warehousing Area from the former munitions igloo storage area, which occupies the inner core of the former Depot.

Building 301 was originally constructed in 1942. It was upgraded in 1986 to meet hazardous waste storage requirements required by RCRA. Building 301 was used as a PCB Transformer Storage Facility beginning in 1980 and continuing until the Depot closed in 2000.

During its period of operations, Building 301 was used for the storage of materials associated with unserviceable transformers or other electrical equipment that were known, or suspected, to contain PCBs. Subsequent to their delivery to Building 301, the pieces were inspected, and if they were found to be leaking, they were placed into an overpack drum and surrounded by absorbent material to prevent the spread of contaminants. Any spilled material from the equipment was captured via application of absorbent that was swept up, containerized in a drum or similar suitable receptacle, and sent to Building 307 (SEAD-1) for storage pending characterization and disposal.

Non-leaking units were placed on pallets and stored, pending subsequent sampling of the contained fluid for determination of the concentration of PCBs present. Units containing PCB fluids were stored in Building 301 pending their final disposal by the Army.

The exterior of Building 301 measures approximately 35 feet 4 inches long by 23 feet 4 inches wide. The structure is partially bounded on its east and west sides, and completely on its north side, by a raised concrete loading dock, and access ramp and stairway assembly. The ramp slopes from the loading dock to the ground surface along the building's west side, and a stairway provides pedestrian access to the loading dock partway along the east side of the building. The loading dock's and ramp's surfaces were previously coated with a gravel/asphalt mixture to improve traction; the coating was removed during decontamination operations performed as part of the RCRA Closure of this building. However, inspection of the vertical edge of the loading dock and ramp structure show numerous locations where the asphalt/gravel mix extended over the side and dripped onto the adjacent soil.

Building 301's roof is constructed of pre-cast concrete planks supported by steel trusses. The roof is pitched to promote precipitation runoff away from the loading dock, ramp, stairway and entrance doors. A gravel and tar coating covers the roof's concrete planks. Visual evidence exists and indicates that asphaltic roofing material dripped over the edge of the roof at the time it was applied.

Access into the building is gained through two, 8-foot by 8-foot overhead doors; one door is located on the north side, while the second is located on the east side of the building. When Building 301 was first constructed, it did not include secondary containment within the building. This design inadequacy was corrected in 1986 during the Building 301 Upgrade Program when ramps were installed outside both access doors, and inside the building on the north side. Additionally, a new 6-inch thick, monolithic concrete slab floor with an integral 6-inch curb was added to the building during the upgrade effort. Once the improvements were completed, the estimated secondary containment volume within Building 301 was approximately 2,500 gallons.

A RCRA Closure was implemented and completed for Building 301 (SEAD-2). The NYSDEC approved the RCRA Closure of the building in September of 2005, and indicated that the existing building should only be used for industrial operations in the future. However, the NYSDEC deferred comment or determination on the acceptability of the exterior soils to the CERCLA program.

<u>Basis for Taking Action</u>

Contamination

Twelve samples of soil located outside of Building 301 were collected and analyzed for hazardous substances and other contaminants as part of the original RCRA Closure decontamination work sequence at SEAD-2 in 2003. A complete set of the analytical results obtained are provided in ROD (Parsons, 2009a). A review of the soil sample results for SEAD-2 indicates that 64 chemicals were detected in one or more of the individual soil samples characterized. Of the detected compounds, 20 were found in individual samples at concentrations that exceeded New York's Unrestricted Use SCO values [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, phenol, pyrene, Aroclor-1254, arsenic, cadmium, chromium, copper, lead, nickel, and zinc]; eight were observed in individual samples at concentrations that surpassed New York's Commercial Use SCO values [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, arsenic, and lead]; six were observed in individual samples at concentrations above EPA's Industrial Soil RSL values [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and arsenic]; and six were found in individual samples at concentrations that exceeded New York's Industrial Use SCO values [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and arsenic].

However, comparisons between 95th UCL concentrations and their SCO values indicated that only four compounds were found at concentrations above New York's Unrestricted Use SCOs, while six compounds were found at a 95th UCL concentration in excess of its respective EPA's Industrial Soil RSL value.

Human Health Risk Assessment

Data from these samples served as the basis of a risk assessment that was performed to assess potential site risks and hazards. The human health risk assessment was initially conducted using the maximum observed concentration as the EPC; subsequent determination used the 95th UCL values for selected metal COCs.

The results of the SEAD-2 risk assessment based on an RME scenario and maximum detected concentrations indicate that non-cancer risks for the industrial worker and the adolescent trespasser are less than 1. The HI computed for the construction worker is 1.48. This elevated HI is driven by the ingestion of soil and the inhalation of dusts containing metals. The predominant contributing metal is manganese, followed by iron, arsenic, aluminum and vanadium.

Data indicated that each of these metals, exclusive of arsenic, was found at levels that are lower than Federal and State cleanup guidance values. All of the collected soil samples did contain arsenic at concentrations in excess of EPA's PRG for Industrial Soil, and two of the collected samples also contained concentrations of arsenic in excess of the State's Unrestricted Use SCO level.

A further review of the AOC data indicated that maximum concentrations measured for aluminum, manganese, and vanadium are all lower than all comparative soil cleanup objective levels. Arsenic and iron are the only metals found at levels above any of the identified SCO levels, and iron only exceeds the Region IX PRG for residential soil, which has now been superseded by the EPA's Regional Screening Level for residential soil, (the RSL value is higher than the iron concentration found at SEAD- 2). Furthermore, the maximum concentrations of these metals found at SEAD-2 were also lower than the SEDA-specific background values.

The construction worker's HI decreased to 9E-011 when the UCL values for aluminum, arsenic, iron, manganese, and vanadium were substituted for the maximum detected levels.

The cancer risk calculated at SEAD-2 for the construction worker and adolescent trespasser were found to be within the EPA's recommended range (1 x 10^{-4} to 1 x 10^{-6}) based on the maximum detected concentration of the COCs and a RME exposure scenario. The cancer risk identified for the industrial worker at SEAD-2 was 5 x 10^{-4}, which exceeds the EPA's recommended range. The identified cancer risk for the industrial worker results primarily due to dermal contact with, and ingestion of soil containing carcinogenic polycyclic aromatic hydrocarbons (cPAHs), principally benzo(a)pyrene, benzo(b)fluoranthene, and dibenz (a,h)anthracene. The elevated results for these compounds at SEAD-2 were associated with the presence of a hardpack parking area around three sides of the building, the historic use of asphalt/tar traction aid on the loading dock and ramp, the use of a tar coating on the roof of the building, and the presence of vehicular and rail traffic in close proximity to the AOC. The risk assessment and the conclusions of the AOC investigations were reviewed and approved by the EPA.

Information and data present in the ROD (Parsons, 2009a) indicates that hazardous constituents are present in the soil at SEAD-2 (PCB Transformer Storage Facility) at levels that exceed Federal and State guidance values and thus, may pose elevated risks to selected future populations (e.g., future residents), that could use the land. However, these sites are located in areas where the planned future land use is defined as commercial and industrial, and potential future hazards or risks identified at both of these AOCs are either suitable for the defined use, or associated with compounds that are present at concentrations that are equal to or less than naturally occurring levels

SEAD-5: Sewage Sludge Waste Piles

History of Contamination and Initial Response

SEAD-5 is located in the east-central portion of SEDA, approximately 3,000 ft. west-southwest of the Depot's main entrance off State Route 96. SEAD-5 encompasses an area measuring approximately 150 ft. by 250 ft. in size. Between 1980 and roughly June 1992, sewage sludge from two Army wastewater treatment plants was stockpiled at this SWMU. The AOC previously contained five or six sewage sludge piles that ranged in height from 5 to 10 feet and that were covered with native grasses, weeds, and small scrub vegetation. This area was also used as a location where the Depot's Department of Public Works (DPW) type storage and staging area for heavy equipment, materials and supplies was located.

The northern boundary of SEAD-5 is defined by an east-west oriented, unnamed dirt road that runs from the intersection of South Avenue and Administration Avenue in the Depot's former administration area (east of SEAD-5) towards former Building 311 and SEAD-16 (west of SEAD-5). A small wooded area is located to the west of the AOC in SEAD-59 and a grassy area is located to its south. Buildings 130 and 128 are located in the area north and northeast of SEAD-5, respectively.

The topography surrounding SEAD-5 suggests a planned man-made, variable terrain. An intermittent drainage ditch originates at the northwestern corner of SEAD-5 (south of the unnamed dirt road) and slopes to the west towards SEAD-59. This ditch intersects a second, larger drainage ditch running north-south along the western boundary of SEAD-59. South of the AOC, the local terrain remains flat and grassy, interrupted by an intermittent east-west trending drainage ditch located roughly 250 ft. south of the AOC. South of this drainage ditch, the area remains flat and grassy until it is interrupted by railroad tracks that provide access into the southern PID Area of the Depot.

The historic sewage sludge waste piles have been removed from SEAD-5, and disposed at off-site landfills, in accordance with prevailing environmental requirements. A Time-Critical Removal Action (TCRA) was performed at SEAD-5 between 2003 and 2006 to address hazardous substance contamination that remained in soil underlying and surrounding the location of the historic sludge piles.

Confirmatory soil samples were collected from the base and the perimeter of the excavations completed at SEAD-5 in the area of the former sewage sludge piles. Additionally, shallow soil samples were collected exterior of the excavation areas for site delineation purposes. All of the soil data were combined and used in a risk assessment. Although groundwater samples were collected during an Expanded Site Investigation (ESI) in 1994, these data were not used in the risk assessment because all of the samples were collected using bailers and showed elevated levels of turbidity. The human health risk assessment was computed using the 95th upper confidence limit (UCL) of the mean as the EPC for each of the COCs.

<u>Basis for Taking Action</u>

Contamination

Prior to the preparation of the ROD, confirmation and delineation soil sample results were compared to New York's Part 375 Unrestricted, and Restricted Commercial and Industrial SCOs. In addition, the available soil data were also compared to EPA 2008 RSLs for Industrial Soils, and the results of each of these comparisons are summarized in the ROD (Parsons, 2009a).

These data indicate that there are seven cPAHs [benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] and one two metals (arsenic and lead) that exceed RSLs for Industrial Soil and of these nine hazardous substances, the 95th UCL concentrations for five of the cPAH compounds [benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] and one metal (arsenic) are above the EPA's RSL value. The data also indicate that 15 PAHs [acenaphthene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene] and eight metals (arsenic, chromium, copper, lead, mercury, selenium, silver, and zinc) exceed State's Part 375 Unrestricted Use SCO concentrations in one or more of the confirmatory and delineation samples evaluated. The data also show that 10 PAHs [benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene] and three metals (arsenic, lead, and mercury) are observed at concentrations that exceed State Commercial Use SCOs. Five of the computed 95th UCL concentrations for the PAHs also exceed their respective Commercial Use SCOs [benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene]. Seven PAHs [benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] and one metal (arsenic) were observed in individual samples at concentrations surpassing State Industrial Use SCOs. The 95th UCL computed for four of the PAHs are higher than their respective Industrial Use SCO values [benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene].

Human Health Risk Assessment

The non-cancer HIs for the industrial worker, construction worker, and the adolescent trespasser are all less than 1. The cancer risk calculated at SEAD-5 for the construction worker (1 x 10-5) and adolescent trespasser (2 x 10^{-6}) receptors are within the EPA's recommended range (1 x 10^{-4} to 1 x 10^{-6}). The calculated cancer risk for the industrial worker is slightly above the EPA's recommended range at a level of 1.3 x 10^{-4}.

The majority (55%) of the identified RME cancer risk results from the ingestion of soil, while the balance (45%) results from the industrial worker's dermal contact to the soil. The principal contaminant contributing to the cancer risk determined for SEAD-5 is benzo(a)pyrene, which contributes more than 61% of the risk associated with soil ingestion and 65% of the dermal contact risk. SEAD-5 is located in an area where heavy equipment and railroad operation use and idling cycles have historically occurred and it likely that these other activities contribute to the levels of cPAHs noted at the AOC.

Data for SEAD-5 (former Sewage Sludge Waste Storage Piles) indicates that hazardous substances and constituents are present at levels that are in excess of Federal and State soil guidance values, and at levels that pose potential risks to future industrial and commercial users or occupants of the land. The elevated risks are largely driven by concentrations of a single hazardous substance that are found at a few isolated, non-contiguous locations within the soil at the AOC, and which may be associated with asphalt pieces that have become intermixed with the soil at the AOC due to its historic use as a DPW-type storage and staging area.

SEAD-16/17: The former Abandoned Deactivation Furnace (SEAD-16) and the former Active Deactivation Furnace (SEAD-17)

History of Contamination and Initial Response

The former Abandoned Deactivation Furnace (SEAD-16) is located in the east-central portion of SEDA. SEAD-16 consists of 2.6 acres of fenced land with grasslands in the north, east, and west, a former storage area for empty boxes and wooden debris, and an unpaved roadway in the south. Also previously located onsite was the building that housed the deactivation furnace, a smaller abandoned building known as the Process Support Building, two sets of SEDA railroad tracks, and some utilities. Two underground storage tanks previously existed at SEAD-16 but have been removed.

The former Active Deactivation Furnace (SEAD-17) is located in the east-central portion of SEDA. SEAD-17 consisted of a deactivation furnace building that was surrounded by a crushed shale road. Beyond the perimeter of the crushed shale road was grassland. Two small sheds are located in the eastern portion of SEAD-17, and there is vehicular access to SEAD-17 from an unpaved road to the north. Access to SEAD-17 is restricted because it is located in the former ammunition storage area.

Both SEAD-16 and SEAD-17 were used for the demilitarization of various small arms munitions. The process of deactivation of munitions involved heating the munitions within a rotating steel kiln, which caused the munitions to detonate. The byproducts produced during this detonation were then swept out of the kiln through the stack.

SEAD-16 has been inactive and abandoned since the 1960s. SEAD-17 was constructed to replace the operation of the deactivation furnace at SEAD-16. However, SEAD-17 has been inactive since 1989 because of RCRA permitting issues.

All facilities that engage in the treatment, storage, and/or disposal of hazardous wastes are required to obtain a RCRA permit. The Deactivation Furnace at SEAD-17, which operated until 1989, was used to incinerate and deactivate or destroy small munitions and other materials associated with munitions or explosives. With the enactment of RCRA in 1976, waste explosives were classified as hazardous wastes, and thus the deactivation unit was classified as a hazardous waste treatment process. Because of the historical ongoing operations at the deactivation furnace at SEAD-17, the furnace at SEAD-17 was subject to RCRA permitting and is subject to RCRA closure requirements. The former Deactivation Furnace at SEAD-16 was not subject to RCRA requirements since it was not active subsequent to the enactment of RCRA in 1976. The State of New York has been delegated the RCRA program by the EPA for oversight and closure of the RCRA unit.

SEAD-17 consisted of two distinct units: (1) contamination in the surrounding soils and groundwater, and (2) contamination of the deactivation furnace, building, and equipment. Contamination in the soil and groundwater is being addressed under CERCLA, and remediation of these media was covered in the ROD (Parsons, 2005b). The FFA details the relationship between CERCLA and RCRA, and under the FFA, remediation of releases under CERCLA "obviate the need for further corrective actions under RCRA for those releases (i.e. no further corrective action shall be required) . . . and RCRA shall be considered an applicable or relevant and appropriate requirement." Therefore, in performing the remedy outlined in the ROD in a manner approved by EPA and NYSDEC, the substantive requirements of RCRA would be met for the soil and groundwater at SEAD-17.

The deactivation furnace, building, and equipment at SEAD-17 have been addressed during RCRA interim closure actions as outlined below.

The following summarizes the regulatory history of the deactivation furnace at SEAD-17:

- 1962-1980 - Deactivation Furnace operated to destroy small arms ammunition.
- 1976 – RCRA enacted; legislation allowed owners and operators of hazardous waste treatment, storage, and disposal facilities (TSDFs) that were in existence as of November 19, 1980 to operate under Interim Status until their RCRA permit was issued or their request was denied.
- 1980-1989 - The Army submitted a Title 6 New York State Codes Rules and Regulations (NYCRR) Part 373 Part A and a Part B permit application to permit the Seneca Army Depot as a TSDF. The Deactivation Furnace at SEAD-17 was listed as a hazardous waste incinerator for

small arms ammunition. As was customary at the time, all facilities that submitted Part A permit applications were allowed to continue to operate under Interim Status.

- 1980-1989 - Deactivation Furnace continued to operate under Interim Status.
- 1989 - Deactivation Furnace was shutdown to allow for the addition of a new air pollution control device (APCD) system. As part of the upgrade, NYSDEC required that the furnace be closed in accordance with RCRA Interim Status requirements.
- November 6, 1989 - RCRA Interim Closure Plan for the deactivation furnace was approved by NYSDEC.
- 1989-1991 - The Army undertakes interim closure actions at SEAD-17, which included the following:
  - Removal of all hazardous waste residues, containers, and removal of the baghouse filters, and dust.
  - Sampling the building, equipment, drains, and soils and subsequent decontamination and removal of releases.
- August 21, 1991 - Interim Closure of the Deactivation Furnace is approved by NYSDEC in a letter, pending an independent certification by NYS Professional Engineer (see Appendix C). The letter noted the following:
  - Interim closure measures were completed and accepted for equipment, drains, walls, and concrete.
  - The soil sampling determined contamination existed in and around the facility because of past operations. The Army, EPA, and NYSDEC agreed to address this contamination as an Area of Concern under the FFA. Because of the potential of recontamination of the building, the fact that contamination in soils will remain, and wipe samples of walls and floors failed to meet the criteria that was set, clean closure could not be achieved.
- March 3, 1992 - Independent certification by NYS Professional Engineer submitted to NYSDEC, on behalf of the Army, stating that the deactivation furnace was “dirty closed” (See Appendix C).
- 1995 - Base closure is announced; Army withdraws its RCRA permit application.
- 1989-2005 - The furnace was not used for wastes, test material was processed for the upgrade equipment prove-out, and a pilot study was performed to evaluate its use as a Low Temperature Thermal Desorption (LTTD) system for lightly contaminated soil, which was not considered hazardous.

At SEAD-16, debris was removed from inside Building S-311, the Abandoned Deactivation Furnace, and Building 366, the Process Support Building, and the floors were swept to reduce potential dust mobilization during demolition activities. Both of these buildings were demolished and removed from the site due to safety concerns.

At SEAD-17, Building 367, the Deactivation Furnace assembly and the supporting air pollution control device system were demolished. The Army elected to remove these buildings since it was more cost effective to remove them rather than decontaminating the buildings in order to comply with RCRA requirements. The detailed discussion of the building demolition actions can be found in the *Building Demolition and Cleaning Report* (Parsons, 2008c).

Basis for Taking Action

Contaminants

The primary constituents of concern at the former Abandoned Deactivation Furnace (SEAD-16) are arsenic, copper, lead, and zinc in surface soils and copper, lead, and zinc in surface water. Polycyclic aromatic hydrocarbon (PAH) compounds were detected in surface soils and sediments, and metals, PAHs, and nitroaromatics were detected in the building samples. The most impacted soils are those adjacent to the abandoned deactivation furnace. Many of these compounds were present in concentrations that exceeded their respective NYSDEC guidelines. All the constituents of concern are believed to have been released to the environment during the former deactivation furnace's period of operation (approximately 1945 to the mid 1960s).

Copper and lead were detected at concentrations above their respective New York State TAGM No. 4046 cleanup objectives in the majority of the surface soil samples. Arsenic and zinc exceeded their respective TAGM values in 8 and 23 of the 43 samples, respectively.

Seven metals (i.e., aluminum, antimony, iron, lead, manganese, sodium, and thallium) were detected in groundwater samples at concentrations that exceeded the NYSDEC Ambient Water Quality Standards (AWQS) Class GA or Federal Maximum Contaminant Level (MCL) standards. An additional round of groundwater sampling and analysis was performed to confirm whether thallium is present in the groundwater at both SEAD-16 and SEAD-17. The analytical results indicated that thallium was not detected in any of the monitoring wells. The detection limit for analyses conducted using furnace, atomic absorption techniques for thallium analyses was 1.5 µg/L, which is less than its MCL criteria of 2 µg/L. The prior results were likely due to laboratory errors from aluminum interference (the presence of aluminum in a sample can falsely elevate the reported concentration of thallium). Elevated thallium concentrations may also have been the result of high turbidity in the samples. Based on these results, it has been determined that thallium is not considered a parameter that is present in the groundwater.

PAHs, pesticides, antimony, cadmium, copper, lead, and nickel were found at elevated concentrations in all of the drainage ditches that were investigated at SEAD-16.

The primary constituents of concern at the former Active Deactivation Furnace (SEAD-17) are the metals, antimony, arsenic, copper, lead, mercury, and zinc, in soils. PAH and pesticide compounds found in sediments are also of significance. All of these compounds are likely to have been released to the environment during the active deactivation furnace's period of operation (approximately 1962 to 1989).

Antimony, copper, lead, and zinc were detected in almost all of the surface soil samples at concentrations above their respective TAGM No. 4046 cleanup objectives.

Generally, few chemical constituents were detected in the groundwater at SEAD-17. Low concentrations of SVOCs were detected, and metals, thallium and manganese, exceeded their respective MCL criteria values by a multiple of 3.5 or less during the first sampling round. Aluminum exceeded its MCL criteria value 3 times with a maximum detection more than 7 times greater than the MCL value and an average value almost triple the MCL value. Iron and sodium exceeded their respective NYSDEC AWQS Class GA standard. No VOCs, pesticides, PCBs, or nitroaromatics were detected in the samples. As discussed in groundwater results for SEAD-16, the results of the additional groundwater sampling and analysis program indicated that thallium was not detected in any of the wells at SEAD-17, and thus it is not considered a parameter that is present in the groundwater.

Copper, iron, lead, and selenium were detected at concentrations above the NYSDEC AWQS Class C surface water standards in some of the surface water samples collected at SEAD-17. Bis(2-ethylhexyl)phthalate was detected at two surface water samples at concentrations above the NYSDEC AWQS Class C surface water standards.

Antimony, arsenic, cadmium, copper, iron, lead, manganese, nickel, and zinc were detected at concentrations that exceeded their respective criteria values in most of the SEAD-17 sediment samples.

Human Health Risk Assessment

A baseline risk assessment (BRA) was conducted using data collected during the RI to estimate the risks associated with current and future conditions and anticipated uses at SEAD-16 and SEAD-17. The BRA estimated the human health and ecological risk that could result if no remedial action were taken at SEAD-16 and SEAD-17.

The primary constituents of concern at the former Abandoned Deactivation Furnace (SEAD-16) are four metals (i.e., arsenic, copper, lead, and zinc), PAHs, and nitroaromatics. At the former Active Deactivation Furnace (SEAD-17) the primary constituents of concern are six metals (i.e., antimony, arsenic, copper, lead, mercury, and zinc), PAHs, and pesticide compounds. Several of these compounds, including some PAHs and pesticides, are known to cause cancer in laboratory animals and are suspected to be human carcinogens.

The results of the BRA at SEAD-16 indicated that the HI is above the EPA target of 1.0 for the future industrial worker (HI=20), future on-site construction worker (HI=1), future day care center child (HI=6), and future day care center worker (HI=2). The cancer risk is within the target risk range of 10^{-4} to 10^{-6} for all receptors except the future industrial worker ($5x10^{-3}$).

The results of the BRA at SEAD-17 indicate that the cancer risks for all receptors evaluated were within the EPA target risk range and that the HI for all but one receptor was below the target value. The exception was the future day care center child, which had a HI equal to the acceptable EPA level of 1.

Ecological Risk Assessment

The reasonable maximum ecological exposure was also evaluated. The results of the ecological risk assessment presented in the RI report (Parsons ES, 1999a) concluded that there is negligible risk to the ecosystems of the SEAD-16 and SEAD-17 study areas. During the field evaluation, no overt acute toxic impacts were noted. In addition, there are no threatened, endangered, or sensitive species that would be expected to inhabit or frequent either SEAD-16 or SEAD-17. The quantitative ecological risk evaluation initially suggested that a possibility exists for the contaminants of potential concern (COPCs) to present a small potential for environmental effects because of soil, surface water, and ditch sediment/soils at both SEAD-16 and SEAD-17. However, given the conservative nature of the assessment, the poor quality of the SEAD-16 and SEAD-17 habitat, and the future land use designation as industrial, it is not likely that SEAD-16 and SEAD-17 support or will support a significant portion of the community of species that occupy the area surrounding and including these areas.

SEAD-25: Fire Training and Demonstration Pad

History of Contamination and Initial Response

The Fire Training and Demonstration Pad (SEAD-25) site is located in the east-central portion of SEDA **Figure 3-1**). The site is bounded to the east by Administration Avenue beyond which is undeveloped land covered by deciduous trees; to the south by Ordnance Drive beyond which is an open grassy field and a stand of coniferous trees; to the west by grassland, brush and conifers; and to the north by grassland and a baseball field.

The Fire Training and Demonstration Pad (SEAD-25) was in use from the late 1960s to the late 1980s. The pad was used for fire control training. During the 1980s, the pad was used twice for firefighting demonstrations, once in 1982 or 1983 and in 1987.

SEAD-25 is described in three reports issued prior to the Remedial Investigation (RI). The first report is the Work Plan for CERCLA Expanded Site Inspection (ESI) of Ten Solid Waste Management Units (SWMUs) written by Parsons Main, Inc. in January 1993. This report detailed the site work and sampling to be performed under the ESI. The second report is a SWMU Classification Report (Parsons ES, 1994a), which was undertaken to describe and evaluate the Solid Waste Management Units at SEDA. The third is an Expanded Site Inspection Report (Parsons ES, 1995), which describes a more detailed investigation of SEAD-25. The fieldwork for the ESI was conducted according to the Work Plan for CERCLA ESI of Ten Solid Waste Management Units (Parsons ES, 1994a). Based on the results of the ESI, a RI Work Plan was prepared and the RI field program was conducted. An RI and FS were completed for SEAD-25/26 in May 1998 and October 1998, respectively.

Basis for Taking Action

Contaminants

The primary COCs at the Fire Training and Demonstration Pad (SEAD-25) are VOCs, specifically benzene, toluene, ethylbenzene, and xylene (BTEX) compounds in both soil and groundwater, as well as lesser amounts of chlorinated ethene compounds in groundwater. In soils, these impacts were limited to the south-central and western portions of the pad, and several of these compounds were present in concentrations that exceeded their respective NYSDEC TAGM guidelines, which were adopted as cleanup standards for this site. The VOC contaminants are believed to have been released to the environment during fire training activities at the Pad. In addition, varying concentrations of SVOCs were also detected in the soil and sediment, mainly in the drainage ditches on the periphery of the site. Less significant impacts from other contaminants were also detected at the site.

Impacts to Soil

The primary impact to soils at the Fire Training and Demonstration Pad was from VOCs, mainly resulting from BTEX compounds; however, there were other impacts from metals and SVOCs. The impact from BTEX compounds occurred in the western half of the Pad and the vertical impacts extended from the land surface to a depth of 4 to 6 feet below the surface, which approximately corresponds to the top of competent shale bedrock. The contaminants that exceeded their respective NYSDEC TAGM cleanup guidelines were benzene, toluene, ethylbenzene, xylenes, benzo(a)anthracene, chrysene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene. Note that benzo(a)anthracene was found slightly above the TAGM (224 μg/Kg) in one sample during the ESI, and had an estimated concentration of 230 μg/Kg. However, this value was inadvertently omitted from Table 2-1C in the FS.

Impacts to Groundwater

The primary impact to the groundwater resulted from two overlapping VOC plumes that both originated at the southwestern portion of the Fire Training and Demonstration Pad, neither of which extended beyond Ordnance Drive. BTEX was not detected in the bedrock wells at SEAD-25. The primary plume was composed of hydrocarbon compounds that are typically associated with gasoline (BTEX), and it was approximately 200 feet long. Results of groundwater contour mapping indicated that groundwater flow is radial below the pad, with a strong horizontal gradient to the south and west. The radial groundwater flow that has developed below the pad at SEAD-25 is believed to be a local phenomenon that is present because of the influence of the anthropomorphic bedrock topographic mound located below the pad. The mapping also indicated that the groundwater flow in the deeper portion of the aquifer located in the competent shale zone is to the west and southwest.

The other plume contained lower concentrations of chlorinated ethenes and it was approximately 130 feet long. The following compounds in these plumes exceeded NYSDEC AWQS for Class GA water: benzene, toluene, ethylbenzene, xylene, trichloroethene, 1,2-dichloroethene (total), 1,1,1-trichloroethane, and 1,1-dichloroethane. Other compounds detected in groundwater above the AWQS were chloroform, 2,4-dimethylphenol, 2-methylphenol, 3,3’-dichlorobenzidine, 4-methylphenol, naphthalene, phenol, and thallium.

Impacts to Surface Water

In surface water, the inorganic compounds (or metals) aluminum, iron, copper, silver, zinc, and lead were found at concentrations above the NYS Class C AWQS; however, none of these are considered ARAR-based COCs for reasons discussed below. Aluminum and iron are present in concentrations that are consistent with background. Copper slightly exceeded the Class C standard in two samples, and zinc and silver were each detected once above the Class C Standard. Lastly, while lead exceeded the AWQS of 1.8 μg/L in four samples (maximum 7 μg/L), these elevated concentrations are believed to be attributed to high turbidity in the samples. In addition, the surface water in the ditches is intermittent and the ditches are not classified surface water bodies. Therefore, the NYSDEC Class C Standard is not applicable to the surface water in the ditches.

Impacts to Sediment

Impacts to sediment in the drainage ditches were mainly from SVOCs, pesticides, and heavy metals. The most significant impacts from SVOCs and metals were in the drainage ditch northwest of the Pad, whereas in the other ditch the most significant impact from SVOCs was found in an up-gradient location. The following SVOC and metal contaminants were found to exceed the NYS sediment criteria: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, phenanthrene, antimony, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc. Pesticides that exceeded the criteria are 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, heptachlor, and heptachlor epoxide.

Based on the results of the RI, a BRA was conducted to estimate the risks associated with current and future site conditions. The BRA estimated the human health and ecological risk that could result from the site if no remedial action were taken.

Human Health Risk Assessment

The results of the BRA at SEAD-25 indicate that for the future on-site construction worker, the HI was above the EPA target of 1, while the cancer risk for this receptor was within the target risk range. For the future on-site resident, both measures of risk (non-carcinogenic and carcinogenic risk) are above the EPA target risk range/value.

The current site worker did not exhibit excess risk of cancer above the EPA target range or a potential for adverse non-carcinogenic health threats.

The risk analysis of the future on-site construction worker receptor scenario indicated that the cancer risk is 4×10^{-6} and the HI is 4. The cancer risk is within the EPA target risk ranges, but the hazard index is above the EPA target risk value of 1. These risks are mainly due to inhalation of VOCs in the ambient air. The primary COC that is contributing to this risk is benzene in the soils, as presented in the ROD (Parsons, 2004b). Inhalation of ambient air during construction is responsible for 75% of the cancer risk and 98% of the hazard index.

The risk analysis for a future on-site resident showed that the excess cancer risk under this exposure scenario is 1×10^{-3} with a HI of 10 and 5 for child and adult, respectively. Both measures of risk are above the EPA target risk ranges. These risks are due primarily to potential exposure of receptors to on-site groundwater containing benzene as their sole drinking water source; groundwater ingestion is responsible for over 67% of the total cancer risk and over 80% of the HI. A smaller contributor to the cancer risk is ingestion of sediment, which contains PAHs.

Ecological Risk Assessment

The results of the ecological risk assessment presented in the RI report (Parsons ES, May 1998) concluded that there is negligible risk to the ecosystems of the SEAD-25 study area. During the field evaluation, no overt acute toxic impacts were noted. The quantitative ecological risk evaluation determined that a possibility exists for the COPCs to present a small potential for environmental effects due to sediment at SEAD-25.

At SEAD-25, aquatic-amphibian (current scenario) receptors were most affected by the contaminants. In sediment, the EQs that were greater than 1 were mostly driven by 4,4'-DDD (EQ=1300); heptachlor (EQ=33), lead (EQ=12), and silver (EQ=10). Terrestrial (current conditions) receptors are also likely to be most affected by iron (EQ=39) in the sediment at SEAD-25. Note that the highest concentrations of 4,4'-DDD, fluoranthene, heptachlor, lead, silver, and iron were all found in the drainage ditch northwest of the site.

SEAD-26: Fire Training Pit and Area

History of Contamination and Initial Response

The Fire Training Pit and Area (SEAD-26) site is located in the southeastern portion of SEDA (**Figure 3-1**). The site is bounded to the east and west by SEDA railroad tracks; on the south by grassland and low brush; and on the north by 7th Street. Vehicular access is provided to the site via a locking gate on 7th Street.

The Fire Training Pit and Area (SEAD-26) was in use from 1977 to 1994. The pit was approximately 75 feet in diameter and approximately 3 feet deep. A bentonite liner was installed in the pit in 1982 or 1983. The pit was used one to four times a year for firefighting training during which time various flammable materials were floated on water, ignited, and extinguished. Prior to 1977, the fire training area surrounding the pit may have also been used for fire demonstrations.

SEAD- 26 is described in three reports before the Remedial Investigation (RI). The first report is the Work Plan for CERCLA Expanded Site Inspection (ESI) of Ten Solid Waste Management Units (SWMUs) written by Parsons Main, Inc. in January 1993. This report detailed the site work and sampling to be performed under the ESI. The second report is a SWMU Classification Report (Parsons ES, 1994a), which was undertaken to describe and evaluate the Solid Waste Management Units at SEDA. The third is an Expanded Site Inspection Report (Parsons ES, 1995), which describes a more detailed investigation of SEAD-26. The fieldwork for the ESI was conducted according to the Work Plan for CERCLA ESI of Ten Solid Waste Management Units (Parsons ES, 1994a). Based on the results of the ESI, a RI Work Plan was prepared and the RI field program was conducted. An RI and FS were completed for SEAD-25/26 in May 1998 and October 1998, respectively.

Basis for Taking Action

Contaminants

At the Fire Training Pit and Area (SEAD-26), the primary contaminants detected included SVOCs and metals in the soil and sediments. In addition, low levels of volatiles were also detected in the groundwater at levels above NYSDEC GA Standards. However, the contaminants that exceeded NYSDEC GA Standards in the groundwater are no longer found in the soil of SEAD-26 due to attenuation of the contaminants in the soil.

Impacts to Soil

The primary impacts to soil at SEAD-26 were from SVOCs. These included PAHs [benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and dibenz(a,h)anthracene] and significant impacts from other compounds (2,4-dinitrophenol, 2-nitrophenol, 2-nitroaniline, and nitrobenzene), all of which were above the NYSDEC TAGM guideline and some of which were found to contribute to unacceptable risk at the site. Heavy metals that were elevated and considered in the risk assessment were arsenic, lead, thallium, and zinc.

Impacts to Groundwater

Groundwater impacts were primarily from VOCs, however, concentrations that exceeded the NYSDEC AWQS for Class GA waters were found in one well that was located on the southern side of the burning pit. The concentrations of benzene, ethylbenzene, xylene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, isopropylbenzene, n-propylbenzene, and p-isopropyl toluene in groundwater exceeded NYSDEC AWQS for Class GA waters. (Please note that the RI did not identify the standards for the later five volatile compounds noted above and, therefore, no exceedances were noted for them in the RI; standards for these compounds were later included in the FS). In addition, naphthalene was detected at a concentration of 15 μg/L in the well on the southern side of the burning pit, which is above the NYSDEC guidance value of 10 μg/L. Based on the groundwater data, no significant plume of volatiles and semi-volatiles exists on the site.

Impacts to Surface Water

Impacts to surface water were mainly from heavy metals. Most of the exceedances of the NYS Class C AWQS were for aluminum, iron, and zinc, which are base metal components of the surrounding bedrock (background). Other metals that exceeded the standard (by 1 to 2 times) were lead, nickel, and cyanide and these exceedances occurred at two locations. (Please note that the text of the RI mistakenly notes that arsenic and chromium, instead of nickel and cyanide, exceed the standard). The compound heptachlor (0.03 μg/L) was also found to exceed the AWQS (0.001 μg/L) at one location.

Impacts to Sediment

In sediment, impacts were mainly from SVOCs (i.e., PAHs), pesticides, and heavy metals. The organic compounds that exceeded the NYS sediment criteria were benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, acenaphthene, phenol, 4,4’-DDD, 4,4’-DDE, 4,4’-DDT, endosulfan I and II, and heptachlor epoxide, and Aroclor-1260. (Please note that in the FS, Aroclor-1260, having a maximum detection of 650 μg/Kg, should have been included in the column showing the number of hits above the criteria). The metals that exceeded the sediment criteria were arsenic, nickel, copper, mercury, manganese, zinc, lead, and iron.

Based on the results of the RI, a baseline risk assessment (BRA) was conducted to estimate the risks associated with current and future site conditions. The BRA estimated the human health and ecological risk that could result from the site if no remedial action were taken.

Human Health Risk Assessment

The results of the BRA at SEAD-26 indicate that the cancer risks for all of the receptors evaluated were within the EPA target risk range. With respect to non-carcinogenic risk, the child receptor under the future residential scenario had a HI that slightly exceeded the target value due to dermal contact with groundwater and ingestion of site soils. The current site worker did not exhibit excess risk of cancer above the EPA target range or a potential for adverse non-carcinogenic health threats.

The future on-site construction worker had a cancer risk and hazard index of 2×10^{-6} and 0.4, respectively. The cancer risk is within the EPA target risk ranges, and the hazard index is below the EPA target risk value.

The risk analysis for future on-site residents showed that the cancer risk under this scenario is 7×10^{-5}, and the HI for a child is approximately 1.3 and the HI for an adult is 0.4. The cancer risk is within the EPA target risk range, but at the higher end of the range. The hazard index is not above the EPA target risk value for the adult receptor; however, the HI for the child receptor slightly exceeded 1. The risk driver for this scenario is ingestion of on-site soils: 86% of the total cancer risk and 70% of the child hazard index is due to ingestion of on-site soils. The primary COCs contributing to the soil ingestion cancer risk are carcinogenic PAHs and arsenic. The COCs contributing to the soil ingestion HI are bis(2-ethyhexyl)phthalate, arsenic, and thallium. There were also lower, approximately equal sized (HI=0.3) contributions to the HI from dermal contact with groundwater and ingestion of ditch soils.

Ecological Risk Assessment

The results of the ecological risk assessment presented in the RI report (Parsons ES, May 1998) concluded that there is negligible risk to the ecosystems of SEAD-26 study area. During the field evaluation, no overt acute toxic impacts were noted. The quantitative ecological risk evaluation determined that a possibility exists for the COPCs to present a small potential for environmental effects due to sediment, soil, and surface water at SEAD-26.

At SEAD-26, terrestrial receptors are mostly affected by COPCs in the soil. For current conditions, the risk drivers are bis(2-ethylhexyl)phthalate (EQ=86.3) and zinc (EQ=24.3). For future conditions, the risk drivers are di-n-butylphthalate (EQ=5.7) and zinc (EQ=21.6). The highest EQs for aquatic- amphibian populations under current conditions were from the contaminants heptachlor (EQ=23.0), aluminum (EQ=21.4), iron (EQ=28.1), and zinc (EQ=2.7, revised from 15.4) in surface water, and benzo(b)fluoranthene (EQ=20), chrysene (EQ=20), and phenol (EQ=22) in the sediment. Note that the EPCs for heptachlor and chrysene in the sediment are conservative since they were calculated using the 95th UCL of the mean, which exceeded the max hit.

SEAD-27: Building -360, Steam Jenny Pit

History of Contamination and Initial Response

Building 360 is located in the eastern-central portion of the Depot (**Figure 3-1**) and is a building where old equipment was refurbished and reconstructed. Lathes, presses, metal-working machines were degreased with steam, high-pressure water and detergents in the cleaning area. No solvent materials were ever used in the cleaning operation. After steam cleaning, the equipment was moved to other portions of Building 360 for rehabilitation.

SEAD-27, the Steam Cleaning Waste Tank, is located within a high bay area of Building 360 that is located near the north end of the building and is separated from the remainder of the building by cinder block walls. The overall size of the cleaning area is 38 feet-6 inches long by 20 feet-6 inches wide. The Steam Cleaning Waste Tank, also known as the Steam Jenny Accumulation Pit, is a belowground, concrete tank above which track-mounted cars loaded with equipment requiring cleaning can be positioned and steam cleaned. The track-mounted cars are rolled into and out of the cleaning area via permanently installed tracks that extend through roll-up doors and out of the building. Equipment requiring cleaning can also be placed directly above the tank on the floor.

The floor surrounding and overlying the waste tank slopes towards the tank to channel all condensate and over spray back towards the tracks and collection grates. Under the metal grating is a trench system which slopes from a depth of 2 feet-0 inches at the west end of the overall cleaning area to a depth of 2 feet-10 inches toward the east end. Condensate and wastewater flowed through the trench system and fell into the Steam Cleaning Accumulation Pit, which is located at the east end of the overall cleaning area. The dimensions of the accumulation pit are 10 feet-6 inches wide by 3 feet long by 3 feet-4 inches deep. The maximum capacity of the Steam Cleaning Waste Tank is approximately 5,000 gallons when filled to near the top or 1,100 gallons to the 2-foot freeboard mark. This tank is no longer in use by the Army.

Use of the Steam Cleaning Waste Tank (i.e., Steam Jenny Accumulation Pit) began in 1976. After cleaning operations ceased on January 2, 1990, SEDA periodically monitored the depth of water in the accumulation pit to determine if water levels in the pit are affected by varying groundwater levels.

SEDA reports that there was never any evidence that groundwater entered the Steam Cleaning Waste Tank. A closure investigation was performed under the RCRA program in July of 1995 and the determination was made that the accumulation pit in Building 360 satisfied the RCRA requirements for clean closure (Parsons, 2004a). Monitoring of the water elevation in the waste tank and the removal of accumulated water (if present) ceased once RCRA closure was completed and certified.

Field activities were performed at SEAD-27 as part of the July 1995 Building 360 Closure Investigation (International Technology Corporation, 1995). They are as follows:

- Accumulation pit liquid waste characterization;
- Concrete coring and removal;
- Closure sampling (concrete and soil);
- Drilling and surveying;
- Groundwater monitoring and well installation;
- Closure sampling (monitoring wells and T-sump);
- Pressure washing of metal grating and interior building surfaces; and

- Ongoing periodic post-closure groundwater sampling (monitoring wells and T-sump).

More details of these activities can be found in the Building 360 Closure report. The results of the chemical analyses can be found in the Mini Risk Assessment - Appendix B, Tables B-1 and B-2 (Parsons, 2002a) for soil and groundwater, respectively. Although samples of water were collected from the T-sump during the period of February to May 1995 and were presented in the RCRA closure report in 1995, these results were not used in the risk assessment. The conclusion was that contaminants found in the water contained in the T-sump were derived from the DRMO Yard (SEAD-121C), which contained a trichloroethene (TCE) storage tank. The closure report did not find any evidence of contamination in core samples or soil samples collected at the Steam Cleaning Waste Tank. Available information indicates that it does not leak, and it is therefore isolated from the surrounding environment.

The RCRA Closure Work Plan required testing of all potential contaminants found at the site during the operation of the Steam Jenny Tank. Therefore, soil and groundwater samples were collected and analyzed for VOCs, PCBs, cadmium, chromium, and lead. Groundwater samples were also analyzed for SVOCs.

Basis for Taking Action

Contaminants

Soil

The four soil samples collected from SEAD-27 in 1995 were analyzed for VOCs, PCBs, cadmium, chromium, and lead. Of these compounds, only chromium and lead were detected. None of these detections exceeded recommended soil cleanup goals identified by NYSDEC in TAGM #4046 "Determination of Soil Cleanup Objectives and Cleanup Levels" (NYSDEC, 1994).

Steam Cleaning Waste Tank Wastewater

One representative, composite sample of wastewater contained within the Steam Cleaning Waste Tank was collected and analyzed for VOCs, pesticides, herbicides, PCBs, metals, and various classical chemical parameters prior to the beginning of closure of SEAD-27. Resulting analytical data indicated that there were no detectable levels of VOCs, herbicides or PCBs within the sample. Total cresol, lindane, 4,4`-DDE, 10 metals and numerous classical parameters were detected in the wastewater, and this data was used as the basis for recommending disposal and treatment of the wastewater at the Depot's wastewater treatment plant.

Concrete Core Samples

Six inch diameter concrete core samples were also collected from three locations in the bottom of the Steam Cleaning Waste Tank pit and analyzed for PCBs and toxicity characteristic leaching procedure (TCLP) cadmium, lead, and chromium. Each of these samples was split into three fractions, yielding nine final samples delivered for analysis. The first sample from each core represented concrete from the top portion of the core, the second from the middle portion of the core, and the third from the bottom of the core where it met underlying soil. Resulting data showed that only two detections of chromium were seen in any of the samples, and these concentrations were 22 and 12 μg/L, respectively from the top and middle portions of core CC-3. Both of these values are well below the federal regulatory limit value of 5000 μg/L.

Groundwater

The groundwater samples collected from SEAD-27 in 1995 were analyzed for VOCs, SVOCs, PCBs, cadmium, chromium, and lead. There were three exceedances of NYSDEC's GA groundwater criteria for 1,1-dichloroethane, and one exceedance each for 1,1,2,2-tetrachloroethane and total xylene. All of the observed exceedances occurred in the final round of samples collected (May 1995). 1,1-Dichloroethane was detected in MW-2, the downgradient well, at approximately 7 times the GA standard level, and in the two other wells at levels roughly equivalent to, though higher than, the standard (i.e., 5 μg/L). The concentration of 1,1,2,2-tetrachloroethane measured was slightly greater than NYSDEC's GA standard concentration, while the concentration of total xylene detected was twice NYSDEC's GA criteria level. The sample collected from the upgradient well contained the noted exceedances for total xylene and 1,1,2,2-tetrachloroethane.

T-Sump Water Sample

Water samples were also collected from the T-sump during each of the groundwater sampling events that were conducted during 1995 as part of the RCRA Closure program at SEAD-27. Lead and 1,1,1-trichloroethane were detected in each of the five samples collected from the T-sump, while, bromodichloromethane, bromoform, and dibromochloromethane were detected in the sample collected from the T-sump during the second sampling event. Finally, chromium was detected in the first T-sump sample. All of the concentrations reported for 1,1,1-trichloroethane (i.e., 14, 18, 20, 16 and 18 μg/L, respectively) exceeded its GA groundwater standard (5 μg/L), while three values reported for lead (197 μg/L, first event; and 30.5 and 38.5 μg/L, second event and duplicate, respectively) exceeded its GA standard (25 μg/L). In the conclusions of the RCRA Closure Report for the Steam Cleaning Waste Tank, the author states "Data and historical operations of the 1,1,1,-trichloroethane sump and adjacent storage tank suggests the constituents present in the T-sump groundwater are likely not related to past operation of the steam jenny pit area (i.e., Steam Cleaning Waste Tank) but are inherent to the operations of the 1,1,1-trichloroethane storage tank." This conclusion is based on the determination no elevated levels of any of either of these two compounds was found in any of the soil or concrete core samples collected from the Steam Cleaning Waste Tank. Although, lead and chromium were detected in the wastewater removed from the Steam Cleaning Waste Tank at the time of closure, evidence of their migration through the concrete and into the underlying soils were not confirmed. Thus, the T-sump water samples are excluded from this analysis.

Human Health Risk Assessment

A risk assessment was conducted for the Steam Jenny Pit site to estimate the risks associated with current and future site conditions. The risk assessment estimated the human health and ecological risk that could result from the site if no remedial action were taken. Maximum site concentrations were used as the exposure EPCs for each site.

The total cancer risk from all exposure routes for SEAD-27 is within the EPA target range for all three receptors under the industrial scenario. The total non-cancer HI from all exposure routes exceeds one for day care center child (HI=3), but is less than one for the industrial worker (HI=0.7) and the day care center adult worker (HI=0.7). The elevated HI for the day care center child is due solely to ingestion of groundwater, with naphthalene, acetone and chromium being the significant risk contributors.

A risk assessment was also conducted for a residential scenario. The total cancer risk from all exposure routes is within or below the EPA target range for both receptors (adult resident and child resident). The total non-cancer HI from all exposure routes exceeds one for the adult resident (HI=2) and the child resident (HI=7). The elevated HI for the adult is due solely to ingestion of groundwater and the elevated HI for the child is due to ingestion of groundwater and dermal contact of groundwater. Naphthalene and acetone are the significant risk contributors.

Significant concentrations of acetone were detected in one well in the second and third rounds of the four-month long groundwater sampling program. The fourth round showed that the acetone concentrations had decreased, though they were still present. Naphthalene was detected in the second well, though it was not detected until the fourth quarter of the sampling program. No additional samples have been collected to confirm the presence of naphthalene at the site. Neither of these two compounds has Class GA groundwater criteria, however, their hazard indices indicate that they contribute to risk due to ingestion of groundwater and to dermal contact of groundwater. Based on the current data, should SEAD-27 be used as a residential area, it would be necessary to place a Land Use Restriction on groundwater use. This would restrict the use of groundwater as a drinking water source, preventing exposure to groundwater. This restriction results in the non-cancer Hazard Indices being less than 1 for both child and adult receptors. No compounds of concern were detected in SEAD-27 soils. Therefore, no HIs were calculated for this site.

SEAD-39: Building 121 Boiler Blow Down Pit

History of Contamination and Initial Response

Building 121 is a boiler plant located in the administrative area (i.e., halfway along the eastern border) of the former SEDA. SEAD-39 is the historic blowdown leaching area that was located exterior to, and immediately north of, Building 121 (**Figure 3-1**). Use of the leaching area was terminated in 1979 or 1980 when boiler blowdown points within the Depot were connected to a sanitary sewer system. After the SEAD-39 blowdown point was connected to the sewer, the area of the historic discharge was regraded and covered with topsoil. The Army estimates that six inches (in.) of fill and topsoil were placed in this area; thus, no depression or indication of where the historic blowdown leaching area was previously located were visible. Center Street, which runs in an east-west direction, is located 50 ft. to the north of Building 121 and the suspected location of the former leach pit.

Prior to connecting the boiler blowdown points to the sewer in 1979-1980, blowdown was reportedly released three times a day, and the discharged liquid was allowed to flow onto the ground at the blowdown point where it either infiltrated into the ground or flowed into the street. Each boiler is reported to have discharged between 400 and 800 gallons of blowdown liquids per day. The boiler blowdown is suspected to have contained water, tannins, caustic soda (sodium hydroxide), and sodium phosphate.

A Time Critical Removal Action (TCRA) was completed at SEAD-39 in August 2003. The excavated area was backfilled and returned to its original grade. The north end of Building 121 and two paved roads helped define and limit the border of the excavation.

<u>Basis for Taking Action</u>

Contaminants

Site work performed at SEAD-39 included a Limited Sampling Program (LSP) in 1993and a TCRA, which included confirmatory sampling. The results of the investigations are summarized and presented below.

<u>Time Critical Removal Action - 2003</u>

Thirty-four (34) tons of soil were excavated at SEAD-39 to a depth of 1-foot in August 2003. The northern side of Building 121 and two paved roads helped define and limit the area excavated in 2003. Following the excavation, eight surface soil samples were collected for chemical analysis of VOCs, PAHs, and metals. Naphthalene was the only VOC that was detected in more than one of the confirmatory soil samples, but it was never found at a concentration that exceeded NYSDEC's TAGM value. Eight other VOCs were detected in the same sample, but again none of the measured concentrations exceeded NYSDEC's TAGM levels.

Eleven PAHs, including seven cPAHs, were also identified in one or more of the confirmatory samples. Each of the cPAH compounds was frequently found at concentrations that exceeded their individual TAGM levels, but in only two of the eight samples did the aggregate benzo(a)pyrene Toxicity Equivalent (BTEQ)[6] value exceed NYSDEC's guidance value of 10 ppm or mg/Kg. The BTEQ value calculation is based on the relative toxicity of the individual cPAHs, as cited by EPA Integrated Risk Information System (IRIS) database. One of these samples was collected from the soil directly beneath Building 121 roof's stormwater drip line, while the second was collected from the ground surface at a location between the southwestern edge of the excavation and the boiler house's stack.

Analytical results also showed elevated concentrations of arsenic, barium, and/or silver present in one or more of the soil samples collected.

The areas where the highest concentrations of PAHs were detected were further delineated in October 2003 by collecting eight additional soil samples to further document the extent of possible contamination. The review of these data indicated that although PAHs were still present in the area adjacent to Building

[6] BTEQ is uses as an indicator parameter to estimate the combined toxicity of the seven carcinogenic PAHs [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] based on toxicity equivalency factors. Generally, the higher the BTE value the greater the potential toxicity. A 10 ppm benchmark value is usually used at Seneca to indicate potential concerns.

121 and its smoke stack, concentrations found decreased at depth and at short distances away from the initial sampling points. Further, visual inspections conducted of the area under Building 121's storm water drip line indicated that significant quantities of asphalt-like paving or roofing materials were intermixed with the soil, and were probably responsible for the high levels of PAHs found in this area.

The average BTEQ level determined for the soil at SEAD-39 was 11.18 ppm, with individual sample values ranging from a low of 0.36 ppm to 121.16 ppm. The two highest concentrations were both found in samples that were collected from the limited unexcavated area between the southern end of the excavation area and the northern face of Building 121. This location is immediately beneath the roof's drip line, and there is visual evidence that asphalt-like materials from historic roofing operations are commingled with the soil. The average BTEQ level found at SEAD-39 after the excavation excluding these two non-representative samples is 2.695 ppm, which is well below the NYSDEC's guidance value of 10 ppm.

The target metal mercury was detected above the recommended soil cleanup criteria of 0.13 mg/Kg in two samples, which represent one sample location (SEAD39-PX-SS-004), with a maximum detection of 0.77 mg/Kg. Although exceedances were detected, the SEDA site-wide average for mercury (0.13 mg/Kg) did not exceed the recommended cleanup criteria of 0.13 mg/Kg for this analyte. The average concentrations of other metals detected at this AOC were also at levels consistent with SEDA site-wide background data. A summary of the confirmatory and delineation samples are presented in the ROD (Parsons, 2007a). Complete analytical results for the samples collected can be found in "VOC Sites – SEADs 39 and 40 Time-Critical Removal Action" (Weston, 2004). Based on the confirmatory and delineation samples, it was determined that further excavation would not be necessary at SEAD-39.

Limited Sampling Program – 1993/94

A LSP was performed at SEAD-39 to obtain evidence of a release. One soil boring was advanced to a depth of 5.7 ft. bgs, with a soil sample collected directly above the water table (3 ft. to 5 ft. bgs) for chemical analysis for TPH. Four surface soil samples were also collected in the area surrounding the soil boring.

TPH was detected at levels below 100 ppm in all soil samples collected with the exception of one, which had a level of 118 ppm. It could not be determined if the contaminants were a result of boiler blowdown liquids being released or if TPH was from other sources. Analytical results for the samples can be found in the "Action Memorandum and Decision Document, Time-Critical Removal Actions, Three VOC Sites," Final (Parsons, 2002b).

Human Health Risk Assessment

The presence of solid asphalt and tarry materials in the soil under Building 121 roof's drip edge is not representative of releases that would reasonably be associated with boiler blowdown. Although oil or other petroleum products may be intermixed with blowdown liquids and be released to the environment during blowdown events, it is unlikely that it would be released as granular or solid particles. Further, the location where the sample was taken is in the erosion channel formed by storm water dripping off Building 121's roof, and visual evidence exists to indicate that the same type of asphalt and tarry materials are present at other locations along this building's drip line that are remote to presumed boiler blowdown leaching pit. Given the concerns expressed above, it is also the Army's position that the PAH data collected from the identified location is not representative of the historic boiler blowdown operation and thus the data is eliminated from further consideration.

The human health risk at SEAD-39 was evaluated using the 95th UCL value for each COC determined from the 15 sample confirmatory soil sample data set as the EPCs. These EPCs were then evaluated in RME scenario for receptors including an industrial worker, a construction worker, an adolescent trespasser, and a daycare center child.

The results of the risk assessment indicate that HIs (non-carcinogenic risks) to all industrial receptors (industrial worker, construction worker, adolescent trespasser) were below the EPA acceptable limits (i.e., HI of 1 or less). The cancer risk for the industrial worker, construction worker, and adolescent trespasser were each in EPA's targeted cancer risk range of 10^{-4}-4 – 10^{-6} or less, while the cancer risk determined for the daycare center child was 1 x 10^{-4}.

The Army also completed a risk assessment for SEAD-39, which evaluated the likely risks associated with all chemicals identified at this AOC based on a central tendency exposure (CTE) scenario for the likely receptors. Although the elevated levels of PAHs found in the area of Building 121's roof line drip are not associated with the former blowdown operation, they are nonetheless present at this AOC. Again the EPCs were set at the 95th UCL value for each COC, only in this instance the UCL was derived for the full 16 sample confirmatory soil sample data set.

The results of the alternate risk assessment (industrial scenario, 95th UCL of 16 point data set, central tendency exposure) are presented in the ROD (Parsons, 2007a). The results of this evaluation again indicate that HIs for all industrial receptors were below the EPA acceptable limits (i.e., HI of 1 or less). Similarly, the cancer risk for the industrial worker, construction worker, and adolescent trespasser were each within or less than the EPA's preferred cancer risk levels (i.e., 10-4 – 10^{-6} or less). The cancer risk for the daycare center child under the CTE scenario was 4 x 10-4.

SEAD-40: Building 319 Boiler Blowdown Leach Pit

History of Contamination and Initial Response

SEAD-40 is a boiler plant located on 1st Street in the east-central portion of the Depot, as shown in **Figure 3-1**. The historic blowdown leach pit that constitutes SEAD-40 was located in a drainage ditch next to the railroad tracks located north of Building 319 (**Figure 3-1**). A drainage pipe originating in Building 319 is suspected to have carried blowdown liquids to the drainage ditch, where they were released and allowed to flow onto the ground. The drainage ditch originated at the mouth of the drainage pipe approximately 30 ft. northeast of Building 319. The drainage ditch continued for approximately 400 ft. to the north where it eventually leveled out into a grassy field. The ground surface to the north of Building 319 and to the south of the drainage ditch was covered with asphalt.

Prior to connecting the boiler blowdown points to the sewer in 1979-1980, blowdown was reportedly released three times a day, and the discharged liquid was allowed to flow onto the ground at the blowdown point where it either infiltrated into the ground or flowed into the nearby drainage ditch. Each boiler is reported to have discharged between 400 and 800 gallons of blowdown liquids per day. The boiler blowdown is suspected to have contained water, tannins, caustic soda (sodium hydroxide), and sodium phosphate.

A TCRA was completed at SEAD-40 in August 2003, and approximately 39 tons of soil were removed.

<u>Basis for Taking Action</u>

Contaminants

The investigative work at SEAD-40 included a LSP in 1993 and 1994 followed by a TCRA conducted in 2002 and 2003. The results of the investigations are summarized and presented below.

<u>Time Critical Removal Action – 2003</u>

Approximately 39 tons of soil were removed from SEAD-40 in August 2003. The impacted soil was excavated at one section to a depth of 1 ft. bgs and at another section to a depth of 6 ft. bgs. The excavation was limited in size by railroad tracks to the north and a parking lot to the south. Eighteen post-excavation samples were analyzed for VOCs, PAHs, and metals. Elevated levels of PAHs and non-target metals (arsenic, barium, and/or chromium) were reported. Subsequently, 29 delineation samples were collected in October 2003 to evaluate the need for further excavation at the site.

Based on the analytical results of the post-excavation and delineation samples, it was determined that the concentrations of PAH contaminants had been significantly reduced at SEAD-40; however, there were some results that exceeded the recommended soil cleanup objective criteria. An evaluation of the BTEQ values for each sample indicated that the average BTEQ value found at SEAD-40 was 7.3 ppm, with values ranging from a low of 0.067 ppm to a high of 48 ppm. BTEQ values were detected at levels greater than NYSDEC's recommended 10 ppm level in ten of the 47 samples. All of the samples where the BTEQ values were greater than 10 ppm were collected from four locations (SEAD40-PX-SS-006, SEAD40- PX-SS-007, SEAD40-PX-SS-012, and SEAD40-PX-SS-013), all of which were located on the edge of the excavations, beyond the limits of the drainage channel where the boiler blowdown was previously discharged.

Results of the additional delineation sampling conducted in October 2003 at these locations indicated that BTEQ concentrations were greater than the recommended 10 ppm screening value in samples collected from 12 in. bgs (i.e., 6 inches deeper than the original confirmatory sample) at sample locations PX-SS-012 and PX-SS-013; however, results from samples collected at depths of 6 and 12 inches bgs at sampling points moved 5 ft. out from the excavation at locations PX-SS-012 and PX-SS-013 indicated levels below the 10 ppm BTEQ value. This suggests that the lateral spread of PAHs in the direction of the nearby railroad tracks is limited. Results of the additional delineation sampling conducted on the other side of the drainage ditch indicated that BTEQ concentrations were less than the 10 ppm value in samples collected beneath the original confirmation sample (i.e., at a depth of 12 in. bgs at the original perimeter location). However, additional delineation samples collected 5 ft. away from the original perimeter sample locations, PX-SS-006 and PX-SS-007 (at depths of 6 and 12 in. bgs) indicated that concentrations in excess of the 10 ppm BTEQ value were present. This suggests that runoff from the adjacent parking area is contributing to the elevated levels observed in this area.

The average concentrations of metals at the AOC were also below the cleanup criteria. A summary of the confirmation and delineation samples may be found in the ROD (Parsons, 2007a). Analytical results for the samples collected are reported in “VOC Sites – SEADs 39 and 40 Time-Critical Removal Action” (Weston, 2004). It was determined based on the confirmation and delineation samples that further excavation would not be necessary at SEAD-40.

Limited Sampling Program – 1993/1994

Potential evidence of a release at SEAD-40 was evaluated with a LSP in 1993 and 1994. One soil boring was advanced in the ditch near the mouth of the drainage pipe to a depth of 5.8 ft. bgs, and one sample was collected from a depth of 4-6 ft. bgs. Four surface soil samples were also collected at this AOC. One surface sample was collected at the mouth of the drainage pipe near the 6 ft. boring, another was collected between Building 319 and the drainage ditch, and the remaining two were collected in the drainage ditch approximately 50 ft. and 100 ft. downstream of the mouth of the discharge pipe. All samples were submitted for chemical analyses and analyzed for TPH and pH.

TPH was detected in all samples collected at SEAD-40, with concentrations ranging from 270 mg/Kg to 1,640 mg/Kg. The second highest detection of TPH, 1,270 mg/Kg, was found at the sample collected at a depth interval of 4 to 6 ft. Complete analytical results for the samples can be found in the “Action Memorandum and Decision Document, Time-Critical Removal Actions, Three VOC Sites, Final” (Parsons, 2002b).

Human Health Risk Assessment

Data from the confirmatory sampling performed for the TCRA provided the basis of a risk assessment that was performed to assess potential site risks at SEAD-40. The human health risk assessment was conducted in accordance with recent EPA guidelines, evaluated industrial receptors and used the 95th UCL of the mean as the EPC for each of the COCs.

The results of the risk assessment indicated that risks to all residential receptors were below the EPA acceptable limits (i.e., HI of 1 or less and a cancer risk in the range of 10^{-4} – 10^{-6} or less).

SEAD-59: Fill Area West Of Building 135

History of Contamination and Initial Response

SEAD-59 (Fill Area West of Building 135) is approximately 6.2 acres in size and encompasses an area located along both sides of an unnamed east-west dirt road that runs from the intersection of 4th Avenue, Administration Avenue, and South Street in the Depot’s former Administration Area to the former location of Building 311 in SEAD-16. The entire western border of SEAD-59 is defined by a north-south trending drainage ditch. An east-west oriented drainage swale that parallels the SEDA railroad tracks forms the northern boundary of SEAD-59. Drainage ditches are also located on each side of the dirt access road to Building 311.

SEAD-59 was used for the disposal of construction debris and oily sludge. SEDA personnel have also indicated the area of SEAD-59 was used as the Army’s version of a local DPW yard where vehicles and materials were staged, and as a result a large quantity of miscellaneous "roads and grounds" debris remains, and has become intermixed with the native soils. Finally, results of test pitting operations [See Section 3.3 of Final SEAD-59 and 71 Phase I Remedial Investigation (RI) Report (Parsons, 2001)] completed during site investigation activities indicate that full and empty 15- and 55-gallon drums, one-, two- and five-gallon paint cans, 20-gallon waste cans, and chain-linked fence were also found buried at the site.

Prior investigations and interim remedial actions at SEAD-59 have consistently been conducted concurrently with actions performed at SEAD-71 (discussed later). . Work performed at SEAD-59 includes the ESI in 1994, a Phase I RI in 1997, a Time Critical Removal Action (TCRA) conducted in 2002, and a Phase II RI completed in 2006.

The 1994 ESI included geophysical investigations, soil investigations (including soil boring and test pitting), and groundwater monitoring well installation and sampling. The 1997 Phase I RI conducted at SEAD-59 included a soil gas survey, a geophysical survey, a test pitting program, a soil boring investigation, and groundwater monitoring well installation. The TCRA performed in 2002 included excavation and staging of impacted soils, sampling and analysis of excavated areas and stockpiled excavated soils, disposal of approximately 3,805 tons of contaminated soil (total from SEAD-59 and SEAD-71) at an approved off-site landfill, installation of groundwater monitoring wells, and backfilling and grading of open excavations with acceptable soil from the stockpiles. The Phase II RI included validating and evaluating the soil data generated during the 2002 TCRA, conducting groundwater monitoring, and performing risk assessments to characterize potential residual risks to human health and the environment.

<u>Basis for Taking Action</u>

Contaminants

<u>Soil Gas Survey</u>

The soil gas survey performed at the beginning of the Phase I RI involved the installation, sampling and analysis of soil gas samples from 241 points for total VOCs and the real-time results of this investigation were used as a preliminary screening too to identify potential focus points for subsequent soil sampling characterization during the RI. The highest soil gas concentrations reported were located within the boundaries of the fill area at SEAD-59. Several smaller areas of elevated soil gas concentrations, at or above 10 ppm, were detected at locations to the west and south of the fill area. Based on these data, soil samples were subsequently collected from locations shown to contain elevated VOC content, and these samples were submitted for analysis of Target Analyte and Target Compound List (TAL and TCL, respectively) analytes.

The soil sample data collected from locations exhibiting high soil gas concentrations (i.e., VOC concentrations greater than 10 ppm) did not confirm that VOCs were present in the soil at the AOC. All soil associated with soil gas results exhibiting concentrations greater than 20 ppm and most soil associated with soil gas results greater than 10 ppm was removed during the TCRA.

Soil Investigation

The excavation of soil and debris during the TCRA at SEAD-59, disturbed the soil matrix that was characterized during the Phase I RI at the site. Some of the excavated soil was transported off-site and disposed at licensed landfills, while other portions of the excavated soil that were determined not to be contaminated above approved levels were initially left staged in windrows at SEAD-59 and on adjoining land. The staged soil was subsequently used as part of the soil cover that was constructed over contaminated surface soil identified in SEAD-5. The following discussion provides a summary evaluation of the quality of the soil that remains at SEAD-59. The Army's analysis indicates that data from 185 surface soil [0-2 feet (ft) below grade or ground surface (bgs)] samples are representative of the current SEAD-59 surface soil conditions. Similarly, data for 14 subsurface soil (2- 15 ft bgs.) samples continue to be representative of SEAD-59 subsurface soil conditions. Results from 54 samples collected from staged piles of excavated soil that now are located in SEAD-5 beneath a constructed soil cover are also discussed for completeness.

During its assessment and evaluation of contaminants within soil at SEAD-59, the Army compared the pertinent soil data to SCOs for Unrestricted, Commercial, and Industrial Use presented under the New York Code of Rules and Regulations (6NYCRR) Subpart 375-6.8 and EPA Region IX PRGs)for industrial soils. The 95th upper confidence limit concentrations of the arithmetic means recommended by the EPA ProUCL program (hereafter referred to as UCLs) for compounds with individual sample exceedances of the NYSDEC SCOs or the Region IX PRGs found in the SEAD-59 soils are also summarized in the ROD (Parsons, 2009c).

The discussion of SEAD-59 soil is presented separately for in-situ (in place in the ground) soil and stockpiled soils.

SEAD-59 In-Situ Soils (Total, Surface and Subsurface)

Summary results of chemical analyses performed on in-situ soils in SEAD-59 and a complete copy of the analytical data for the surface and subsurface soil evaluated during the investigation of SEAD-59 are provided in the ROD (Parsons, 2009c).

Volatile Organic Compounds (VOCs)

Acetone (12 times) and methyl ethyl ketone (1 time) were the only VOCs found in SEAD-59 at concentrations above their respective Unrestricted Use SCO levels, while acetone was the only VOC observed to exceed any of the other comparative guidance values considered (i.e., Restricted Commercial).

Acetone was also the VOC found at the highest overall concentration in soil samples characterized, present at a level of 500 μg/Kg in the surface soil samples.

Semi-volatile Organic Compounds (SVOCs)

The seven cPAH compounds [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were the only SVOCs observed to exceed New York's Unrestricted Use SCO levels and this occurred in 37 or more of the 199 total samples characterized. Concentrations of indeno(1,2,3-cd)pyrene (51 times) and chrysene (50 times) were most frequently observed to exceed their respective Unrestricted Use SCOs, and the majority of these were found in surface soil samples. Further, the majority of all soil concentrations measured for cPAH compounds that were above their Unrestricted Use SCO levels were found in surface soils collected at SEAD-59. Six of the cPAH compounds [i.e., exclusive of dibenz(a,h)anthracene] were found in subsurface soil samples collected from SEAD-59 at levels that exceeded their Unrestricted Use SCO levels, and this only occurred in one or two individual samples for each compound. Four of the cPAH compounds [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene] were detected in in-situ soil samples collected from SEAD-59 that exceeded their Restricted Commercial Use SCO levels. Again, samples found to contain elevated levels of these cPAHs were primarily located in the surface soil samples and only benzo(a)pyrene was found in subsurface soils (2 times) at levels above New York's Restricted Commercial level. Similarly, two cPAH compounds [benzo(a)pyrene (47 times) and dibenz(a,h)anthracene (2 times)] were found in SEAD-59 in-situ soil samples at levels above New York's Restricted Industrial Use levels. The majority of these occurrences were limited to surface soil samples, as only one subsurface soil contained an elevated concentration of benzo(a)pyrene. Comparable trends are seen for the comparison of the cPAHs levels measured in SEAD-59 in-situ soils versus the EPA's Region IX PRGs for Industrial soil.

Pesticides and Polychlorinated Biphenyls (PCBs)

Four pesticides (i.e., 4,4'-DDD, 4,4'-DDE, 4,4'-DDT and endrin) were detected in soil samples at concentrations in excess of one of the federal or state comparative levels. The pesticide 4,4'-DDT was the compound found in samples at the highest individual sample concentration; the pesticide 4,4'-DDE was found in the greatest number of samples at concentrations above New York's Unrestricted Use SCO levels. Similarly, the other two identified pesticides were found frequently at concentrations above New York's Unrestricted Use SCOs. The 95th UCL values computed for all three of the 4,4'- pesticide species also exceeded the New York Unrestricted Use SCOs. Only one other pesticide, endrin, was found in any SEAD-59 in-situ soil sample at a level that exceeded its Unrestricted Use SCO level. Again the majority of the samples found to contain elevated levels of pesticides were located in the surface soils.

None of the pesticide or PCB compounds found in the SEAD-59 in-situ soil samples contained any levels of contaminant that exceeded either the New York Restricted Commercial or Industrial Use levels or the EPA Region IX PRG for Industrial SCOs.

Metals

Nine metals (i.e., arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver and zinc) were found in one or more of the soils at levels that exceeded New York's Unrestricted Use SCO levels, and of these nickel was found most frequently at levels above its SCO value (37 times.). Four other metals (lead, 14 times; mercury, 15 times; silver, 19 times; and zinc, 19 times) were also found in soil samples above their respective Unrestricted Use SCO levels. Lead was the only other metal that was found at elevated levels in more than 10 of the soil samples characterized. None of the metals was seen at 95th UCL concentrations that exceeded their respective Unrestricted Use SCO levels.

Arsenic and copper were the only metals that were observed to exceed New York's Commercial Use SCO level, and this occurred in two and one sample respectively. In all cases, these elevated levels were limited to the surface soil samples. Similarly, only arsenic was observed in any individual sample at a concentration that exceeded New York's Industrial Use SCOs; this occurred in two surface soil samples. Arsenic was found at concentrations above the EPA's Region IX PRG value for Industrial soil in every soil sample characterized, and the calculated 95th UCL value was also above the EPA guidance value. Antimony was also found in one surface soil sample at a level that exceeded its EPA Region IX PRG for Industrial soil.

<u>Stockpiled Soil in SEAD-59</u>

Summary analytical results and a complete copy of the analytical collected to characterize the previously staged windrows of excavated soil in SEAD-59 are provided in the SEAD-59 and SEAD-71 ROD (Parsons, 2009c). The soil windrows previously staged in SEAD-59 and adjoining land have been re-located and are now located in SEAD-5 where they have been used as part of the constructed soil cover over contaminated surface soil identified in this area.

VOCs

Acetone was the only VOC that was observed to exceed any of the comparative guidance values, surpassing New York's Unrestricted Use level in a single sample.

SVOCs

The seven cPAH compounds [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were observed to exceed New York's Unrestricted Use SCO levels in 45 or more of the samples characterized, with concentrations of indeno(1,2,3-cd)pyrene surpassing its Unrestricted Use SCO level most frequently. The 95th UCL computed for all of these cPAHs were also above New York's Unrestricted Use SCO levels. Five cPAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were detected in one or more of the samples at concentrations above New York's Commercial Use SCO levels, while three cPAHs [benzo(a)anthracene, benzo(a)pyrene, and dibenz(a,h)anthracene] were observed to exceed New York Industrial Use SCOs in one or more samples. Five cPAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were detected in one or more of the samples characterized at levels that exceeded EPA's Industrial soil PRG values.

Pesticides and PCBs

Three pesticides, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were detected in individual samples of previously stockpiled soil at levels above one or more of their respective New York Unrestricted Use SCO levels. The 95th UCL values computed for the three 4,4'- pesticide species also exceeded their New York Unrestricted Use SCO levels. None of the pesticides detected in the previously stockpiled soils were detected at concentrations in individual samples or with 95th UCL values that surpassed New York's Commercial or Industrial Use or EPA's Region IX Industrial Soil PRG levels.

Metals

Seven metals (i.e., chromium, copper, lead, mercury, nickel, silver and zinc) were found in one or more of the stockpiled soil samples at levels that exceeded New York's Unrestricted Use SCO levels, and of these metals, nickel was found most frequently at levels above it cleanup value (20 times.). Lead was the only other metal that was found at elevated levels in more than 10 of the soil samples characterized. Similarly, lead and nickel were the only metal species seen at 95th UCL concentrations that exceeded their respective Unrestricted Use SCO levels.

Lead was observed to exceed New York's Commercial Use SCO level, and this occurred in only one sample. None of the detected metals was observed in individual samples at concentrations that exceeded New York's Industrial Use SCOs, and none of the metals was observed at 95th UCL concentrations that were above either New York's Commercial or Industrial Use SCO levels. Arsenic was found at concentrations above the EPA's Region IX PRG value for Industrial soil in every sample, and its calculated 95th UCL value was also above this guidance value. Lead was found once at a concentration above its EPA Region IX PRG for Industrial soil.

<u>Groundwater Investigation</u>

SEAD-59 groundwater samples were collected from seven monitoring wells during the two 2004 Phase II RI sampling events. The maximum concentrations were compared to federal and state criteria including New York State Class GA Groundwater Standards, Federal MCLs, and the EPA's Region IX PRGs for Tap Water. The SEAD-59 groundwater sample summary results and complete groundwater data evaluated for SEAD-59 are provided in the ROD (Parsons, 2009c).

Organic compounds (i.e., VOCs, SVOCs, or pesticide/PCBs) were not detected in groundwater samples at any level in excess of state or federal comparative values.

Metals

Antimony, iron, manganese, and sodium concentrations were each detected above their respective NYSDEC GA Standards in one or more of the SEAD-59 groundwater samples characterized. Antimony was the only metal found at concentrations that exceeded another of its comparative guidance values, as it exceeded its MCL value in three samples.

<u>Human Health Risk Assessment</u>

SEAD-59 In-Situ Soil and Groundwater Exposure

<u>Carcinogenic Risks and Non Carcinogenic Hazards</u>

The RME cancer risks for all receptors are below the EPA upper limit of $1x10^{-4}$; cancer risks for the industrial worker, construction worker, and child trespasser are $2x10^{-5}$, $2x10^{-6}$, and $5x10^{-7}$, respectively. The total non-cancer HI for the adolescent trespasser is below the EPA target limit of 1. The non-cancer HIs determined for the industrial worker and construction worker are 1E+00 (HI=1.2) and 9E+00 (HI=8.9), respectively. For the industrial worker, the HI associated with SEAD-59 groundwater intake contributes 72% (HI = 0.8) to the total non-cancer HI reported. For the construction worker, inhalation of dust in ambient air and groundwater intake contribute 84% (HI = 7.5) and 9% (HI = 0.8), respectively, to the total non-cancer HI reported.

Antimony, iron, and manganese are the primary COPCs in SEAD-59 groundwater that contribute to the elevated non-cancer HIs determined for the industrial worker and the construction worker. In each case, the maximum COPC concentration measured at SEAD-59 was used as the EPC in the risk assessment.

Review of the data indicates that the maximum antimony, iron, and manganese concentrations recorded in SEAD-59 groundwater are lower than comparable maximums reported in the background groundwater monitoring wells at the Depot. Similarly, the average groundwater concentration recorded for the three COPC metals at SEAD-59 are also lower than comparable COPC averages found in the Depot's background groundwater set. Furthermore, the maximum concentrations reported for each of the SEAD-59 COPC metals was found in one of the two wells (i.e., MW59-3 and MW59-6) that are hydraulically upgradient of SEAD-59; the concentrations of the three COPC metals decrease as the groundwater flows through SEAD-59. Therefore, the elevated risks associated with exposure to metals in SEAD-59 groundwater result from metals that are associated with the native soils and waters in the geologic formation at the Depot and are not associated with a release from the AOC.

With further reference to the construction worker's non-cancer hazard index (i.e., 9E+00), aluminum and manganese in SEAD-59 soil are the only COPCs that contribute to the non-cancer hazard levels that are associated with the inhalation of dust (HI = 7.5). Exposure to manganese inhaled as dusts represents nearly 81% of the overall hazard index. Aluminum and manganese concentrations remaining in SEAD-59 soil are lower than Seneca background soils levels, and are less than federal and state guidance values that are defined as acceptable for more restricted types of future use (e.g., unrestricted use and residential). The future use of SEAD-59 is commercial or industrial.

In addition to the descriptive statistics comparison, both non-parametric (Mann-Whitney T test) and parametric (Student's T test) statistical test methods were used to determine if the SEAD-59 soil concentrations represented a statistically different population than those found in the SEDA background data set. The statistical test results are presented in Appendix H of the Phase II RI Report (Parsons, 2006d) and are summarized in Section 6.8.5.2 of the Phase II RI Report. Both tests conclude that the aluminum and manganese concentrations observed in SEAD-59 soil are not statistically above the Seneca background levels.

As is indicated above, the largest component of the construction worker's overall non-cancer HI results from inhalation of dust that contains manganese. This HI is based on a reference concentration for chronic inhalation exposure (RfC) derived in a study that deals with the inhalation of manganese dioxide dust, and to which the EPA assigns an uncertainty factor of 1000, which indicates the EPA's low degree of confidence in its value. The exact composition of the manganese identified in the soil samples collected from SEAD-59 is unknown, but it is highly unlikely that all of the manganese in the soil exists as manganese dioxide. Manganese can exist in numerous forms, including various oxides, salts, carbonates, and silicates, and thus it is unlikely that it is only present as manganese dioxide in the soil at SEAD-59. Therefore, the use of an RfC that is derived solely from a study of industrial worker's exposure to manganese dioxide at a battery manufacturing facility is not fully accurate, and is likely to over-estimate impacts to outside workers at a location where other forms of manganese are likely to be present. However, since the exact composition of the manganese in the soil is unknown, no quantitative adjustments to the HI can be made. Further, it is important to note that the inhalation reference dose used as the basis of the inhalation portion of the risk assessment is 4000 times lower than the American Conference of Governmental and Industrial Hygienists' threshold limit value4 (TLV) for manganese exposure in industrial situations, further emphasizing the very conservative nature of the RfC used in the calculation of risk at this site. Therefore, the elevated risks associated with potential inhalation of ambient air containing dusts from SEAD-59 soil are believed to be overestimated and likely attributable to background soil concentrations that are not associated with a release at the AOC.

SEAD-59 Groundwater and Stockpiled Soil

The risks/hazards anticipated due to exposure to SEAD-59 groundwater under this analysis are equivalent to those previously estimated under the SEAD-59 in-place (i.e., in the ground) and groundwater scenario discussed above.

The RME cancer risks for all receptors to SEAD-59 stockpiled soil and groundwater are below the EPA upper limit of $1x10^{-4}$. The cancer risks for the industrial worker, construction worker, and child trespasser are $6x10^{-5}$, $6x10^{-6}$, and $1x10^{-6}$, respectively. The total non-cancer hazard index for the adolescent trespasser is below the EPA target limit of 1. The non-cancer hazard indices for the industrial worker and construction worker are 1E+00 (HI = 1.2) and 2E+00 (HI = 1.5), respectively.

For the industrial worker and construction worker, the risks associated with groundwater intake contribute 73% (HI = 0.8) and 56% (HI = 0.8), respectively to the total non-cancer hazard levels identified. As previously discussed above, the elevated hazards associated with groundwater exposure result from background levels of antimony, iron and manganese that are present in the groundwater at SEAD-59, and which are not associated with releases that have occurred at the AOC. Absent the hazard index contribution from SEAD-59 groundwater, the HI levels computed for the industrial worker and the construction worker both fall to less than 1.

Metals in soil also contribute to the industrial worker's and construction worker's hazard indices under the stockpiled soil/groundwater exposure scenario. Ingestion of soils containing metals is the primary soil exposure route that contributes to the potential effects, followed by inhalation of dusts. Seven metals (aluminum, antimony, arsenic, iron, manganese, thallium and vanadium) show indication of effects via ingestion, while only two, aluminum and manganese, show potential effects via inhalation.

The comparison of SEAD-59 stockpiled soil versus SEDA background soil metal concentrations indicates that the metals that remain in the stockpiled soils at SEAD-59 are generally consistent with, and typically lower than, the levels of metals found in background soils at SEDA. The maximum concentrations of five of the seven COPC metals (all but antimony and vanadium) in SEAD-59 stockpiled soils are less than comparable metal concentrations in background soils. Additionally, five COPC metal average and 95th UCL: values (all but antimony and thallium) found in the SEAD-59 stockpiled soils are lower than SEDA background average and 95th UCL levels.

The SEAD-59 stockpiled soil EPC concentrations (i.e., 95th UCL) of all identified metals, exclusive of arsenic, are less than EPA Region IX residential and industrial soil PRGs. Additionally, the SEAD-59 stockpiled soil maximum concentrations of five (aluminum, iron, manganese, thallium and vanadium) of the COPC metals are lower than the EPA Region IX residential soil PRGs, and six of the maximum COPC metal stockpiled soil concentrations (all except arsenic) are lower than the EPA's Region IX industrial soil PRGs. Finally, the SEAD-59 stockpiled soil maximum and 95th UCL concentrations for arsenic and manganese are both lower than New York's unrestricted use SCO.

Therefore, SEAD-59 remaining stockpiled soil from the excavation is not expected to cause unacceptable risks to future industrial workers or construction workers that may occupy or work in this AOC in the future.

<u>Lead Risk Characterization</u>

The lead risk characterization results for SEAD-59 Stockpile soil exposure are presented in Appendix E of the ROD (Parsons, 2009c) Tables 10 and 11 for the industrial worker and construction worker, respectively. The 95th percentile PbB among fetuses of adult industrial workers are 4.7 and 7.1 µg/dL, assuming a homogeneous and a heterogeneous population, respectively. Both estimates are below the EPA target PbB level of concern (i.e., 10 µg/dL). The 95th percentile PbB among fetuses of adult construction workers are 5.0 and 7.4 µg/dL, for a homogeneous and a heterogeneous population, respectively. Both estimates are below the EPA target PbB level of concern (i.e., 10 µg/dL).

The lead risk characterization results for child with SEAD-59 Stockpile soil exposure are presented in Appendix E Table 12 of the ROD. It should be noted that a child resident was assumed by using the IEUBK model. As the exposure frequency for a child trespasser is much less than a child resident, the results were used as a screening tool to evaluate potential risk for the child receptor. As the 95th percentile PbB among child residents are below the EPA target PbB level of concern (i.e., 10 µg/dL), it is concluded that lead level in SEAD-59 Stockpile soil does not pose a health risk to the child trespasser receptor.

<u>Ecological Risk Assessment</u>

A SLERA was conducted and the results indicate that soil at SEAD-59 and in SEAD-59 stockpiled soil does not significantly impact ecological receptors in the area (i.e., deer mouse, American robin, short-tailed shrew, and red fox). No COCs were identified for SEAD-59 soil or SEAD-59 stockpiled soil.

SEAD-64A: Garbage Disposal Area

<u>History of Contamination and Initial Response</u>

SEAD-64A is located in the east-central portion of SEDA. The site is bounded to the north by a square storage pad, to the east by the SEDA railroad tracks beyond which is the area where the Fire Training site (SEAD-26) is located, and to the south and west by undeveloped grassland. This SWMU is located on land that is designated for warehouse use. The approximate location of this SWMU is shown on **Figure 3-1**.

SEAD-64A was used during the period from 1974 to 1979 when the on-site solid waste incinerator was not in operation. The types of wastes disposed at the site are suspected to be primarily household items, although according to the SWMU Classification Report (Parsons, 1994a), metal drums and other industrial items were reportedly disposed at this site. Test pitting was conducted as part of the ESI, and no evidence of metal drums or industrial waste was found. All materials identified in the test pit log were inert construction debris, such as reinforced concrete slabs, asphalt pieces, and Constantine wire, which are exempt from regulation under New York State Solid Waste Regulations, 6 NYCRR Section 360-7.1 (b)(i). SEDA personnel also reported the operation of small burning pits within this area when it was being landfilled. Debris (asphalt, wooden boards, concrete slabs, and corrugated drainpipe) was visible on the surface, though the site is mostly covered with dense vegetation.

A field investigation was conducted at SEAD-64A beginning in February 1994, as part of the Expanded Site Inspection for Seven Low Priority AOCs (Parsons, 1996). A geophysical survey was conducted. Twelve soil samples were collected and submitted for VOC, SVOC, pesticide, and metal analyses. Three groundwater samples were collected from SEAD-64A and were submitted for metals, pH, conductivity, temperature, and turbidity analyses.

Basis for Taking Action

Contaminants

Several cPAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene], phenol, and several metals (aluminum, arsenic, chromium, copper, lead, potassium, and zinc) were detected at levels that exceeded TAGMs in one or more soil samples.

During the ESI sampling, aluminum, iron, manganese, and thallium were detected in groundwater at levels that exceeded their respective comparative criteria levels. Results are summarized in the ROD (Parsons, 2004a).

Human Health Risk Assessment

A risk assessment was conducted for SEAD-64A based on the 1994 soil and groundwater data, and the results of total cancer risk and total non-cancer hazard index can be found in Table 3.5-10 of the Final Decision Document - Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002a).

The total cancer risks are below or within the EPA target ranges for all receptors under a warehouse land use scenario (i.e., warehouse worker, child trespasser, and construction worker). The total non-cancer hazard indices from all exposure routes are less than 1 for all receptors. The non-cancer hazard indices are overstated as the metal concentrations in groundwater were elevated due to the elevated turbidities in the groundwater samples.

In addition, risks to residential receptors (i.e., residential adult and residential child) have been evaluated based on the 1994 soil and groundwater data. The results of total cancer risk and total non-cancer hazard index were reported in Table V-3 of the Final Decision Document – Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002a). The total cancer risks are below or at the EPA upper target limit for all receptors. The total non-cancer hazard indices from all exposure routes are equal to or greater than 1 for residential receptors. Groundwater ingestion is the only exposure route that would result in significant risk to residential receptors; however, the non-cancer hazard indices are overstated as the metal concentrations in groundwater were elevated due to the elevated turbidities in the groundwater samples.

Ecological Risk Assessment

A risk assessment was also conducted to evaluate potential risks to deer mice, short-tailed shrews, and American robins posed by the COPCs detected in surface soils at SEAD-64A. The hazard quotients (HQs) estimated for all COPCs found in shallow soil were found less than one with the exception of benzo(a)pyrene, bis(2-ethylhexyl)phthalate, fluoranthene, and lead. The elevated risks driven by the listed compounds were associated with one surface soil sample. The HQs based on the average concentrations of the other four samples were less than one or slightly above one (i.e., less than five).

In addition, as a planned warehouse development, this site would most likely not support a balanced habitat. Based on the above discussion, it is concluded that SEAD-64A would not pose significant risk to potential ecological receptors. The results of the risk assessment are presented and described in detail within the Final Decision Document – Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002a).

SEAD-66: Pesticide Storage Area

History of Contamination and Initial Response

Pesticides were reportedly stored in a structure located in the vicinity of Buildings 5 and 6 during the Army's active use of the SEDA. The Pesticide Storage Area near Buildings 5 and 6 is located in the east-central portion of SEDA (**Figure 3-1**). Building 5 is located approximately 100 feet north of Building 6. Building 5 is an elongated building, approximately 350 feet long and 45 feet wide. It is located on Bundle Ammunition Pack Road and has three driveway areas between the road and the loading docks. The exact location of the pesticide storage area is unknown. The metal shed, which is suspected to be the former pesticide storage area, is adjacent to Building 5 on the south side. Building 6 is much smaller, approximately 50 feet by 50 feet. A concrete pad, which may have also been used as a former pesticide storage area, is located adjacent to Building 6 on the south side. Both buildings are located approximately 40 to 50 feet from the road. North-south trending railroad tracks are located approximately 20 feet to the west of the two buildings.

Aside from the paved road and driveways, the ground surrounding the buildings is covered with grass. There is little topographic relief in the area, and no surface water bodies are known to exist at the site.

SEAD-66 is located near the divide that separates the Reeder Creek and the Kendig Creek watershed. Run-off at the site is captured by roadside drainage ditches, which channel flow into the Kendig Creek watershed and then into the feeder creek that feeds the Duck Pond, a large surface water body located approximately 1 mile to the north of SEAD-66.

A Limited Sampling Program was performed at SEAD-66 in December 1993. Surface soil samples collected from SEAD-66 were analyzed for TCL pesticides according to the NYSDEC Contract

Laboratory Program (CLP) Statement of Work (SOW). Results of the chemical analyses for soil can be found in the Final Decision Document – Mini Risk Assessment (Appendix Q, Table Q-1) (Parsons, 2002a).

Basis for Taking Action

Contaminants

Nine soil samples were collected from SEAD-66. Two pesticides, 4,4'-DDE and 4,4'-DDT were both detected at levels exceeding TAGMs in sample SS66-8 that was taken from a depth of 0-0.2 ft. The soil data are presented in the ROD (Parsons, 2004a).

No groundwater samples were collected.

Human Health Risk Assessment

The total cancer risk from all exposure routes is within the EPA target range for all four receptors under the industrial scenario. Likewise, the total non-cancer HIs from all exposure routes is less than one for all four industrial receptors.

A risk assessment was also conducted for a residential scenario. The total cancer risk from evaluated exposure routes is within or below the EPA target range for the potential adult and child resident receptors. The total non-cancer HI exceeds one for the child resident (HI=1+). The elevated HI for the child receptor is due solely to ingestion of soil with 4,4'-DDT being the significant risk contributor.

While 4,4'-DDT was detected in most samples (8 out of 9), only the maximum value exceeded its TAGM. The maximum value used as the EPC in the risk assessment ranges from 300 to 10,000 times concentrations for all other pesticides identified. Results of a Grubb's Test for outliers analysis, which are summarized in Table 7-1of the ROD (Parsons, 2004a), indicate the 4,4'-DDT value used as the EPC in the risk assessment is an outlier. Furthermore, based on a review of the location from which the sample was collected (see Figure 2-16 of the Final Decision Document – Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002a), the sample was collected at a location (SS66-8) that is surrounded by three other sampling locations where measured concentrations are between 200 and 6500 times lower. This suggests that the value is indicative of an isolated "hot spot" of contamination instead of a systematic release.

These results indicate that the actual likely exposure to 4,4'-DDT at the site would be much lower. It is unlikely that the child would be exposed to only soils in the corner of the site from which the maximum value was taken. For these reasons, 4,4'-DDT is not considered a COC in soil at this site for this exposure scenario.

Ecological Risk Assessment

An ecological risk assessment, which is described and presented in Section 3.0 of the Decision Document (Parsons, 2002), was conducted at SEAD-66. No significant ecological risk was found.

SEAD-67: Dump Site East of Sewage Treatment Plant No. 4

History of Contamination and Initial Response

The SEAD-67 site is located in the central eastern portion of SEDA (**Figure 3-1**), immediately south of West Romulus Road and east of Sewage Treatment Plant No. 4 (SEAD-20). Five waste soil piles and two soil berms were formerly staged at the SEAD-67 site. A grass covered, 10-foot diameter waste soil pile (pile 1) and a 5-foot diameter waste soil pile (pile 2) were located approximately 50 ft. and 70 ft., respectively to the south of West Romulus Road. A 10-foot diameter waste soil pile (pile 3) and a 60-foot long brush-covered berm (pile 4) were located approximately 225 ft. south of the road. Continuing further south, a second, larger and irregularly shaped berm (pile 5) was found. The second berm structure was located approximately 50 feet south of the first, smaller berm structure. The second berm was approximately 110 feet in length, and was shaped roughly like a “Y” lying on its side. Two smaller waste soil piles (piles 6 and 7) were located to the south of the second berm. All waste soil piles and berms were approximately 3 to 4 ft. high; except for the 10-foot diameter pile that was approximately 5 ft. high. The origin of the berms and waste piles are unknown. Other portions of the SEAD-67 AOC were undeveloped and much of the site was heavily vegetated with low brush and deciduous trees.

The topography of this AOC slopes gently to the west towards an unnamed stream that is located approximately 250 ft. away the area of the AOC. The stream is an unclassified surface water body that flows north beneath West Romulus Road into a regulated wetland area. The wetland area provides tertiary treatment for the wastewater discharges from the treatment plant. Downstream of the wetland, the stream enters the Duck Pond and then Kendig Creek.

A TCRA to remove the waste soil was performed by Weston between 2002 and 2004. Initially, access routes to, and the area surrounding the waste soil piles/berms were cleared of vegetation and then the waste soil was excavated from the ground, and loaded into transports for shipment off-site. The excavated soil was classified as non-hazardous metal and PAH soil for treatment and disposal. Subsequently, the TCRA expanded to include the removal of surface soil underlying and surrounding the locations of the former piles and berms. Surface soils were excavated to a depth of 12 in. At the end of the TCRA, more than 1300 cubic yards (cy) of soil was removed from the SEAD-67 site. Due to the shallow nature of the final excavations, backfill was not used at SEAD-67; the sidewalls of the excavation were graded to smooth the contour differences between the original ground surface and the bottom of the excavation.

Basis for Taking Action

Contaminants

Previous work at SEAD-67 included an ESI in 1993 and a TCRA from 2002 to 2004. The results of the investigations are summarized and presented below.

Expanded Site Inspection – 1993

The ESI combined non-intrusive and intrusive sampling operations as part of the field investigation. The non-intrusive investigations included seismic refraction, electromagnetic, and ground penetrating radar (GPR) surveys. Intrusive investigations included excavation of five test pits, collection of eight soil samples, installation and subsequent testing of three monitoring wells, and the collection of two surface water/sediment samples. All samples collected as part of the ESI were analyzed for VOCs, SVOCs, pesticides/ PCBs, metals, and cyanide. A summary of the soil, groundwater, surface water, and sediment results summarized below can be found in the ROD (Parsons, 2007a). Analytical results for the samples collected can be found in "Decision Document for Removal Actions at SWMUs SEAD-24, SEAD-50, SEAD-54, and SEAD-67" (Parsons, 2002c).

Surface/Subsurface Soil

Soil formerly in the piles and berm structures at SEAD-67 were impacted by SVOCs, predominantly PAHs, and by mercury. Fifty (50) TCL/TAL compounds were detected in the soil samples, and 10 compounds, including five cPAHs and five metals, were detected at concentrations that exceeded their respective TAGM cleanup objective values. Compounds found at concentrations above TAGM values included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(a,h)anthracene, calcium, lead, manganese, mercury, and potassium. Lead exceeded its TAGM value of 24.8 mg/Kg once with a concentration of 40.9 mg/Kg. Mercury was detected in all eight samples and exceeded its TAGM value of 0.1 mg/Kg in three samples with a maximum detection of 4 mg/Kg.

Groundwater

Available data indicated that the groundwater has not been significantly impacted by historic operations at SEAD-67. Aluminum, iron, and manganese were the only compounds detected at concentrations exceeding the respective groundwater standards. Iron exceeded its GA standard of 300 μg/L in all three samples, with a maximum detection of 10,800 μg/L. Aluminum exceeded its Secondary Drinking Water Regulation value of 50 μg/L in all three samples, with a maximum detection of 5,790 μg/L. Elevated levels of turbidity were recorded in groundwater samples collected at SEAD-67. It is likely that the noted exceedances of aluminum, iron, and manganese were associated with the elevated turbidity levels.

Surface Water / Sediments

Surface water results indicated that the unnamed stream near SEAD-67 has not been significantly impacted by contaminants. Aluminum and iron were detected at concentrations above the designated NYSDEC AWQS Class C surface water criteria value. Sediment near SEAD-67 has been impacted by SVOCs (mostly PAHs), pesticides, and a few metals (copper, manganese, nickel, and silver).

The analytical results of the ESI provided the basis for conducting the TCRA at SEAD-67.

<u>Time Critical Removal Action – 2002/2004</u>

The TCRA was initiated at SEAD-67 in November 2002, with some field work continuing subsequently until it was completed in May 2004 as analytical results and funding became available. Initially approximately 250 cy of soil contained in aboveground soil piles and berms were removed and transported off-site for disposal at a licensed landfill. Confirmatory soil samples were then collected from the areas beneath and around the former piles/berms and these were analyzed for metals and PAHs. The initial soil results indicated elevated levels of contaminants, and based on these results additional soil from the area beneath and immediately adjacent the former piles/berms was excavated in June of 2003.

During this follow-up work, an additional 1059 cy of soil was removed from two subareas (Area 1, piles 1 and 2; Area 2, piles 3 - 7) of SEAD-67. At the conclusion of the SEAD-67 TCRA, approximately 1,308 cy of soil was excavated and removed from the site.

The soil removed from SEAD-67 was classified and profiled as non-hazardous metal and PAH contaminated soil for treatment and disposal. Analytical results for the confirmatory samples collected subsequent to the completion of the removal action are presented in "Time Critical Removal Action Metal Sites – SEAD-67" (Weston, 2005a).

Excavation Area 1

Waste piles 1 and 2 were removed in December 2002, and confirmatory samples were collected from the surface soils directly around the former pile locations. These initial samples exhibited concentrations of mercury (the constituent of concern) above the identified cleanup goal of 0.1 mg/Kg, with a maximum concentration of 0.32 mg/Kg. Three metals (beryllium, copper, and mercury) and five PAHs were also detected at concentrations exceeding their respective TAGM cleanup objective values.

In June 2003 an additional foot of soil from Area 1 was excavated and disposed off-site. The area where soil was removed was determined based on the collection and analysis of a series of split spoon soil samples set at 10 ft., 25 ft., and 50 ft. increments to the north, south, east, and west of the footprint of the former waste pile 1. Ten borings were advanced to a final depth of 4 ft. and samples were collected at one-foot intervals. Fourteen of these samples were subsequently analyzed [six for mercury and 10 for benzo(a)pyrene and dibenz(a,h)anthracene] and the results were used to determine the extent of the additional excavation needed in the area. Analytical results indicated that only the first foot of soil to the lateral limits of the soil borings should be removed. Confirmatory samples were not collected following the June 2003 soil removal.

In May 2004 in response to comments and requests made by the EPA and NYSDEC, the Army returned to SEAD-67 to collect final confirmatory samples from the perimeter and base of the excavation site. As part of this effort, seven confirmatory samples were collected from the floor of the Area 1 excavation and 15 soil samples were collected from the perimeter of the excavation. One of the floor samples and four of the perimeter samples were analyzed for the full suite of TAL metals and TCL PAHs, while the remaining samples were analyzed only for arsenic, mercury, and zinc.

Review of combined confirmatory soil sample results from Area 1 at SEAD-67 indicate that individual samples contain concentrations of target analytes that exceed NYSDEC's TAGM cleanup objectives, but the average concentrations of target analytes at this AOC are below recommended levels (i.e., 0.1 ppm for mercury and 10 ppm for BTEQs).

Excavation Area 2

The five waste piles (piles 3 – 7) located at Area 2 were removed in December 2002, and confirmatory samples were subsequently collected from locations that were directly beneath each of the excavated piles. The initial samples exhibited concentrations of mercury above the cleanup goal of 0.1 mg/Kg with a maximum concentration of 0.16 mg/Kg. Five other non-target metals (arsenic, copper, selenium, silver, and zinc) and two PAHs were also observed to exceed their respective TAGM cleanup objective values.

In June 2003, the Army returned to Area 2 and advanced and sampled eight soil borings that were terminated at a final depth of 4 ft. bgs. Soil samples were collected at one-foot intervals, and 10 of these soil samples were analyzed for mercury, benzo(a)pyrene, and dibenz(a,h)anthracene, and the results were used to define the limits of a subsequent soil removal action that was completed at Area 2. The additional excavation measured 135 ft. by 165 ft. by 1 foot in depth. The extent of the completed excavation fully surrounded the footprints of the five former piles and berms previously located in this area.

In May 2004, Weston returned to SEAD-67 to collect final confirmatory samples from the perimeter and base of the excavations completed. As part of this effort, 25 confirmatory samples were collected from the floor of the Area 2 excavation and 21 soil samples were collected from the perimeter of the excavation. Five of the floor samples and four of the perimeter samples were analyzed for the full suite of TAL metals and TCL PAHs, while the remaining samples were analyzed only for arsenic, mercury, and zinc.

Review of combined confirmatory soil sample results from Area 2 at SEAD-67 indicate that individual samples contain concentrations of target analytes that exceed NYSDEC's TAGM cleanup objectives, but the average concentrations of target analytes at this AOC are below recommended levels (i.e., 0.1 ppm for mercury and 10 ppm for BTEQs).

Human Health Risk Assessment

SVOC data from the confirmatory sampling performed for the TCRA provided the basis of a risk assessment that was performed to assess potential site risks at SEAD-67. The human health risk assessment was conducted in accordance with recent EPA guidelines, evaluated industrial (i.e., industrial worker, construction worker, daycare center child, daycare center worker) and residential (adult resident, child resident, and lifetime resident) receptors and used the 95th UCL of the mean as the EPC for each of the SVOC COCs.

The results of the risk assessment indicated that risks to all industrial and residential receptors were below or within the EPA's acceptable limits (i.e., HI of 1 or less and a cancer risk in the range of 10^{-4} – 10^{-6} or less).

SEAD-71: Alleged Paint Disposal Area

History of Contamination and Initial Response

SEAD-71 (the Alleged Paint Disposal Area) is wedge shaped and is located west of 4th Avenue near Buildings 114 and 127. The entire AOC is approximately 2.4 acres in size and bounded on the north and south by railroad tracks serving Buildings 114 and 127. The topography is relatively flat with a gentle slope to the southwest.

The blunt end of the wedge-shaped AOC (i.e., eastern side) is surrounded by a chain-link fence, and this area is hereafter referred to as the "Fenced Area." The Fenced Area is situated between Buildings 114 and 127 and is bisected by a single east-west railroad track. The Fenced Area is generally paved or covered with a mixture of crushed stone and broken asphalt. Pieces of asphalt and concrete can be observed on the ground surface within the Fenced Area. Additional east-west trending railroad tracks are located between the southern edge of Building 114 and the northern bound of the Fenced Area and between the northern edge of Building 127 and the southern bound of the Fenced Area. The sharp side of the wedge-shaped AOC (i.e., western side) is a grassy area that is interrupted by a gravel roadway that enters from the north, turns westerly, and then exits the AOC to the south. The storage areas north and east of SEAD-71 contain numerous white transformers, large spools of cable, and other assorted equipment.

Prior to the RI, rumors suggested that paints and/or solvents were disposed at SEAD-71 in burial pits. The results of the RI test pitting operations failed to confirm the paint and oil disposal rumors, but did indicate that the area had been used for the disposal of construction debris, including sheet metal, asphalt, chain link fencing, sand and stone, piping, railroad ties, wood and cinders. No dates of disposal are available nor is there any information on the number of suspected disposal pits that may have been used.

An ESI, consisting of geophysical investigations, soil investigations (including soil boring and test pitting), and groundwater monitoring well installation and sampling was performed. The Phase I RI conducted at SEAD-71 included a ground penetrating radar survey, a surface soil investigation, and a test pitting program. The TCRA performed in 2002 included excavation and staging of impacted soils, sampling and analysis of excavated areas and stockpiled excavated soils, disposal of approximately 3,805 tons of contaminated soil (total from SEAD-59 and SEAD-71) at an approved off-site landfill, installation of groundwater monitoring wells, and backfilling and grading of open excavations with acceptable soil from the stockpiles. For both AOCs, the Phase II RIs included validating and evaluating the soil data generated during the 2002 TCRAs, conducting groundwater monitoring, and performing risk assessments to characterize potential residual risks to human health and the environment.

Basis for Taking Action

Contaminants

Soil Investigation

The investigation of soil within SEAD-71 included the analysis of 77 total samples, including 69 surface soil (0-2 ft bgs.) and eight subsurface soil samples (2-15 ft bgs.). Of the total number of soil samples collected and characterized, 58 were collected at locations exterior to the Fenced Area, including 54 surface samples and four subsurface samples.

Summary results of chemical analyses performed on all SEAD-71 soil samples, and a complete copy of the analytical data for the all SEAD-71 surface and subsurface soil evaluated during the investigation are provided in the ROD (Parsons, 2009c).

During its assessment and evaluation of contaminants within soil at SEAD-71, the Army compared the pertinent soil data to SCOs for Unrestricted, Commercial, and Industrial Use presented under the New York Code of Rules and Regulations (6NYCRR) Subpart 375-6.8 and EPA Region IX PRGs)for industrial soils. The 95th UCL for compounds with individual sample exceedances of the NYSDEC SCOs or the Region IX PRGs found in the SEAD-71 soils are also summarized in The ROD (Parsons, 2009c).

VOCs

Acetone was the only VOC observed in any sample collected in SEAD-71 to exceed any of the comparative guidance values considered, and it was found in two surface soil samples collected exterior to the Fenced Area at concentrations that exceeded New York's Unrestricted Use SCOs.

SVOCs

PAH and cPAH compounds were generally the most frequently detected SVOCs observed in the SEAD-71 soils, and were also those that were detected at the highest concentrations. The cPAH compounds were the species that also exhibited sample concentrations above New York's SCOs and the Region IX PRGs for Industrial soil. The maximum concentrations of cPAHs detected throughout SEAD-71 were typically found in surface soils, with the overall highest cPAHs found within the surface soils that were collected within the Fenced Area. Generally, the cPAH concentrations reported for samples within the Fenced Area were an order of magnitude higher than those found exterior of this portion of SEAD-71.

cPAHs were found at concentrations above their respective New York SCO levels in both surface and subsurface soil samples within the Fenced Area, but they were not found above their respective New York Restricted Commercial or Industrial Use SCOs in the subsurface soils located exterior to the Fenced Area. Concentrations of selected cPAH compounds in samples collected inside and exterior of the Fenced Area also exceeded their EPA Region IX Industrial PRGs.

The Fenced Area is paved in some locations and covered with crushed stone in other locations. Elevated PAH concentrations detected in surface soil within the Fenced Area result from the asphalt and hard fill that was used to construct the area. At the time of construction, the Army typically utilized hard fill consisting of oiled crushed stone to form a sturdy base for areas subjected to heavy vehicular traffic and storage operations. The oil was used to help in the compaction of the crushed stone and aided in dust suppression. The presence of asphalt is noted in the boring log of MW71-1 and field notes recorded while surface soil samples were collected within the Fenced Area. The crushed asphalt materials in the hard fill and the oil used in the construction of the storage area were likely the cause of the consistently elevated PAH concentrations throughout the Fenced Area.

Pesticides and PCBs

Concentrations measured for Aroclor-1260 in two samples exceeded its New York Unrestricted Use SCO level in the Fenced Area.

Three pesticides and one PCB compound (i.e., 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and Aroclor-1260) were found at concentrations above New York's Unrestricted Use SCO guidance values in samples that were collected exterior to the Fenced Area, while these four compounds plus endrin were found at concentrations above their Unrestricted Use SCO values in soil samples collected from inside the Fenced Area. 4,4'-DDD was the only pesticide or PCB compound that was observed at concentrations that exceeded any of the other comparative guidance values, and this was found in surface soil samples only collected within the Fenced Area at concentrations that exceeded New York's Restricted Commercial Use SCOs.

Metals

Seven metals (i.e., arsenic, chromium, copper, lead, mercury, nickel and zinc) were observed to exceed their respective Unrestricted Use SCOs in soil samples collected exterior of the Fenced Area, while six of these seven metals (i.e., exclusive of arsenic) plus cadmium and silver were observed to exceed their respective Unrestricted Use levels in soil samples collected in the Fenced Area. The metals most frequently detected at concentrations above Unrestricted Use levels were lead, zinc and nickel. Lead and cadmium were the only metals observed at concentrations in excess of New York's Restricted Commercial Use levels in samples collected from the Fenced Area, while only lead was detected at a concentration above New York's Restricted Commercial value in soil samples outside of the Fenced Area. All metals detected in soil samples were detected at concentrations below their respective New York Restricted Industrial Use levels. Arsenic and lead were the only metals observed to exceed EPA's Region IX PRGs for Industrial soil, in samples collected inside and outside of the Fenced Area in SEAD-71.

<u>Groundwater Investigation</u>

SEAD-71 groundwater samples were collected from four monitoring wells during the two 2004 sampling events. The maximum concentrations detected in SEAD-71 groundwater and the comparison with the guidance values and the complete groundwater data evaluated for SEAD-71 are provided in the ROD (Parsons, 2009c).

VOCs

No VOC was detected in any SEAD-71 groundwater sample at a level above any of its comparative values.

SVOCs

The concentration reported for 4-nitroaniline in one sample of SEAD-71 groundwater exceeded its New York GA standard, and it's Region IX PRG for Tap Water.

Pesticides and PCBs

No pesticide or PCB was detected in any SEAD-71 groundwater sample at a level above any of its comparative values.

Metals

Antimony, iron, manganese, and sodium concentrations were detected in SEAD-71 groundwater above their respective NYSDEC GA standards, and of these metals sodium exceeded its GA standard most frequently (4 times). Antimony was observed at concentrations above its GA standard value and its federal MCL in three samples, while manganese was the only metal observed at a concentration in excess of its Region IX PRG value for Tap Water.

Human Health Risk Assessment

Carcinogenic Risks and Non Carcinogenic Hazards

Results for two RME scenarios are presented in the ROD (Parsons, 2009c); one including all SEAD-71 soil (i.e., inside and outside of the Fenced Area) and one considering only soil located exterior to the Fenced Area.

The potential cancer risks associated with all soil (i.e., inside and outside of Fenced Area) and groundwater at SEAD-71 are $1x10^{-5}$ for both the construction worker and the adolescent trespasser. The potential cancer risk determined for the industrial worker is $2x\ 10^{-4}$.

The cancer risks associated with soil ingestion (24%) and soil dermal contact (66%) contribute 90% to the total cancer risk determined for the industrial worker. Elevated cPAH concentrations were detected in the shallow soils collected from within the Fenced Area that is located between Building 114 and Building 127 and these compounds are the primary COPCs contributing to the cancer risk that is determined for the AOC. This area served as a secure, external storage area, and the storage pad was constructed of a combination of asphalt and crushed rock to create a firm base that could withstand vehicular traffic wear-and-tear during all kinds of meteorological conditions. Oil was applied to the crush stone portion of the base as a combination dust suppressant and soil stabilizing/compaction agent. The asphalt/crushed stone pavement is known to be as thick as 0.1 ft at several sample locations within the Fenced Area, and the surface soil samples collected from this portion of the AOC were collected either from locations beneath the pad, or from locations where breaches existed in the pad, at a depth of 0-0.2 ft bgs. Due to the location of the sample collection, it is likely that fragments of the asphalt/oil coated crushed rock became entrained in the samples and resulted in the presence of elevated levels of cPAHs.

Review of the sample data for samples collected within the Fenced Area indicate that the cPAH concentrations detected are generally elevated compared to comparable contaminant concentrations in shallow soil samples collected outside of the Fenced Area. As an example, the maximum benzo(a)pyrene concentration found within the Fenced Area is 120 mg/Kg, while the maximum benzo(a)pyrene concentration detected in other portions of SEAD-71 is 22 mg/Kg. Similarly, the arithmetic mean of all SEAD-71 surface soil samples (including samples interior and exterior of the Fenced Area) is 7.7 mg/Kg, while the arithmetic mean of surface soil samples excluding samples within the Fenced Area is only 1.0 mg/Kg.

Further analysis of the data from the Fenced Area indicates that only the surface soils are impacted by cPAHs. Using benzo(a)pyrene toxicity equivalence (BTEQ) as a generic indicator of the level of cPAH compounds that are present in soil shows that all soil samples with BTE levels above 10 mg/Kg were detected in surface soil (0-0.2 ft bgs.). The cPAH concentrations in the deeper soil samples (i.e., 1, 2.5 and 3 ft bgs) from test pit TP71-2 within the Fenced Area were at least one order of magnitude lower than the cPAH concentrations detected in surface soil samples.

Based on the above discussion, it is concluded that the elevated cPAH concentrations in surface soil within the Fenced Area at SEAD-71 are not associated with any release at the site, but are directly associated with the pavement and crushed rock pad that is still in place at the AOC. Therefore, a risk assessment was conducted for SEAD-71 in which all soil data from the Fenced Area was excluded from the risk evaluation.

For exposure to SEAD-71 soil and groundwater outside the Fenced Area, the cancer risks for all receptors are below the EPA upper limit of $1x10^{-4}$. The total non-cancer hazard index for the adolescent trespasser is below the EPA target limit of 1. The non-cancer hazard indices for the industrial worker and construction worker are 3.5 and 13, respectively. For the industrial worker, the risk associated with groundwater intake contributes 91% (3.1) to the total non-cancer hazard index. For the construction worker, the risks associated with inhalation of dust in ambient air and groundwater intake contribute 68% (8.6) and 25% (3.1), respectively, to the total non-cancer hazard level.

A comparison of the iron and manganese concentrations in SEAD-71 groundwater with the corresponding concentrations in the Seneca groundwater background data set was conducted in accordance with the EPA (2002) Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites. According to EPA (2002). As the data set size for SEAD- 71 groundwater is small (total sample number is eight), the comparison with background was conducted by comparing the descriptive statistics between the SEAD-71 groundwater data set and the SEDA background data set (see SEAD59/71 Draft Final Phase II Remedial Investigation Report, Appendix B, Parsons 2006e).

Table 7-8 in the ROD (Parsons, 2009c) shows that the 25th percentile and the median concentrations of iron and manganese in SEAD-71 groundwater are below the corresponding concentrations in SEDA background. For iron, the arithmetic mean, the 75th percentile, and the 90th percentile of the SEAD-71 data set are greater than, but within two times of the corresponding values for the SEDA background data set. For manganese, the arithmetic mean, the 75th percentile, and the 90th percentile of the SEAD-71 data set are greater than two times of the corresponding values for the SEDA background data set. The two highest manganese hits were detected in MW71-2 and MW71-1, upgradient of the source area in SEAD-71. Monitoring well MW71-2 was dry most of the time during the groundwater sampling events (i.e., 1994 and 2004 groundwater sampling). Therefore, the manganese concentration reported for MW71-2 may be overstated due to limited water volume and potentially elevated turbidity. In general, the amount of groundwater and the rate of groundwater re-charge present at SEAD-71 is limited compared to other SEDA sites. Three of the four groundwater monitoring wells (MW71-1, -2, and -3) have measured saturation thickness of less than 4 feet during the 2004 sampling events.

In addition, the iron and manganese concentrations detected in a monitoring well downgradient and within the suspected source areas at SEAD-71 (i.e., $MW71^{-4}$) are 0.023 to approximately 0.148 μg/L and non detect (ND, reporting limit = 0.296) to approximately 0.0081 μg/L for iron and manganese, respectively. The concentrations are below the corresponding 25th percentiles of the SEDA background data set.

Additionally, it should further be noted that it is extremely unlikely that groundwater will be used as drinking water source at SEAD-71, since there is an alternative potable water supply readily available throughout the PID Area of the Depot. Furthermore, the shallow aquifer underlying both SEAD-59 and SEAD-71 is not believed to be productive enough to supply the drinking water needs at the sites.

In summary, the iron and manganese concentrations in SEAD-71 groundwater are generally comparable with the SEDA background. Elevated manganese concentrations in upgradient wells may be overstated due to limited volume and potentially elevated turbidity. The iron and manganese concentrations detected in the downgradient monitoring well are consistent with the SEDA background. Therefore, iron and manganese in SEAD-71 groundwater are not identified as COCs.

Aluminum, manganese, and naphthalene in SEAD-71 soil outside the Fenced Area are the only COPCs contributing to the non-cancer risks associated with inhalation of dust in ambient air and contribution from naphthalene being negligible (i.e., < 0.001%). As is shown in Table 7-9 of the ROD (Parsons, 2009c), aluminum and manganese concentrations remaining in SEAD-71 soil exterior of the Fenced Area are lower than Seneca background soils levels, and are less than federal and state guidance values that are deemed acceptable for more restricted types use (e.g., unrestricted use and residential). Like SEAD-59, SEAD-71 is located in a portion of the Depot where the future land use is intended to be commercial or industrial.

In addition to the descriptive statistics comparison, both non-parametric (Mann-Whitney T test) and parametric (Student's T test) statistical test methods were used for the background comparison analysis. One-tailed (one-sided) Mann-Whitney tests and Student's T tests were conducted. Both tests assumed 0.05 as the significance level. The statistical test results are presented in Appendix H of the Phase II RI Report. As shown in Appendix H of the Phase II RI Report, the results from the Student's T tests are consistent with the Mann-Whitney test results. Both tests conclude that the aluminum and manganese concentrations observed in SEAD-71 soils outside the Fenced Area are not statistically above the Seneca background levels.

Lead Risk Characterization

The lead risk characterization results for SEAD-71 soil exposure are presented in Appendix E Tables 13 and 14 of the ROD (Parsons, 2009c) for the industrial worker and construction worker, respectively. The 95th percentile PbB among fetuses of adult industrial workers are 5.0 and 7.4 µg/dL, assuming a homogeneous and a heterogeneous population, respectively. Both estimates are below the EPA target PbB level of concern (i.e., 10 µg/dL). The 95th percentile PbB among fetuses of adult construction workers are 5.5 and 8.0 µg/dL, for a homogeneous and a heterogeneous population, respectively. Both estimates are below the EPA target PbB level of concern (i.e., 10 µg/dL).

The lead risk characterization results for child with SEAD-71 soil and groundwater exposure are presented in ROD Appendix E Table 15. It should be noted that a child resident was assumed by using the IEUBK model. As the exposure frequency for a child trespasser is much less than a child resident, the results were used as a screening tool to evaluate potential risk for the child receptor. As the 95th percentile PbB among child residents are below the EPA target PbB level of concern (i.e., 10 µg/dL), it is concluded that lead level in SEAD-71 soil and groundwater does not pose a health risk to the child trespasser receptor.

Ecological Risk Assessment

A SLERA was conducted and the results indicate that soil at SEAD-71 does not significantly impact ecological receptors in the area (i.e., deer mouse, American robin, short-tailed shrew, and red fox). No COCs were identified for SEAD-71 soil for ecological receptors.

SEAD-121C: Defense Reutilization and Marketing Office (DRMO) Yard

History of Contamination and Initial Response

SEAD-121C, the DRMO Yard, is a triangular-shaped gravel lot, approximately 8.75 acres in size, located roughly 4,000 ft. southwest of the former Depot's main entrance off State Route 96. The DRMO Yard is surrounded by a chain link fence and access into the AOC is controlled through a single, normally locked gate located at its southeast corner. The surface of the DRMO Yard is graded to allow surface water to drain towards the man-made ditches that bound the AOC on its northwest and south sides. The major pathway of surface water flow is to these drainage ditches, which then flow to the west towards a wetland area and the headwaters of Kendaia Creek.

Several other man made features are prominent within the DRMO Yard; these include: one storage building; an earthen bottomed, open storage cell in the southwest corner of the AOC; an elongated, segmented, rectangular shaped, open concrete storage structure immediately adjacent to, and located halfway along the northwest perimeter fence of the AOC; and a multi chambered, open storage cell adjacent to the east perimeter fence, near the northern-most point of the DRMO Yard. This latter storage area sits between abandoned railroad tracks and is located in an area where broken asphalt pavement is present and intermixed with the soil.

The DRMO Yard was used by the Army to store scrap metal, vehicles, and other items that were no longer needed for national defense, or that did not comply with legislative and regulatory requirements. The group using the yard was responsible for property reuse (including resale), hazardous property disposal (off site, at licensed/permitted facilities), precious metals recovery and recycling program support.

Two environmental investigations were conducted to document the environmental conditions present at SEAD-121C, the DRMO Yard. In addition, a removal action were also performed independently at SEAD-121C, and confirmatory soil sample data were developed as part of the removal action activities.

Initially, a limited EBS was performed to determine if hazardous substances were present in select environmental media at SEAD-121C. The EBS work was limited to the collection and analysis of surface and subsurface soil and groundwater samples at SEAD-121C. This work was performed in 1998 – 1999 and is reported in the document Final Investigation of Environmental Baseline Survey Non-Evaluated Sites [SEAD 119A, SEAD 122 (A, B, C, D, E), SEAD 123 (A, B, C, D, E, F), SEAD 46, SEAD 68, SEAD 120 (A, B, C, D, E, F, G, H, I, J), and SEAD 121 (A, B, C, D, E, F, G, H, I)] (Parsons ES, 1999b). In the conclusions of this effort, the Army recommended "that additional soil and groundwater sampling be performed to determine the extent of the impacts from semivolatiles, pesticides, and metals at SEAD-121C. At this time, there are an insufficient number of data points to perform a Mini Risk Assessment" (Parsons ES, 1999b, pg. 38).

<u>Basis for Taking Action</u>

Contaminants

Conditions present at SEAD-121C were thoroughly investigated during a multimedia RI conducted in 2002 and 2003. Samples of surface and subsurface soil, groundwaterSEAD-121C, surface water, and "ditch soil" found in man-made culverts adjacent to the AOC were collected and analyzed for TCL/TAL compounds. The results of this effort were reported in the Remedial Investigation Report for Two EBS Sites in the Planned Industrial Development Area (SEAD-121C and SEAD-121I) Final (Parsons, 2006e). Additional data pertinent to the existing environmental conditions remaining at the AOC was subsequently developed during the interim removal action that was performed at the site.

These data are provided in the Construction Completion Report for SEAD-121C that describes and summarizes the results of the interim removal action that was performed at SEAD-121C for the elevated levels of lead.

Analytical data collected during the site investigation and construction effort were compared to prevailing state and federal standards and reference values. State reference values and standards considered included New York's TAGM No. 94-HRW-4046 SCOs and Title 6 New York Code of Rules and Regulations (6NYCRR) Subpart 375-6.8 Remedial Program SCOs for soil; and New York's Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (Technical and Operation Guidance Series [TOG] 1.1.1) for groundwater and surface water. The TAGM soil guidance values were replaced by New York's 6NYCRR Subpart 375-6.8 regulations in 2006, and data comparisons previously made to the TAGM values have been eliminated from all material presented in the ROD (Parsons, 2008d).

Federal reference values considered during the evaluation of analytical data included EPA Region IX PRGs for residential and industrial soils and PRGs for tap water, as well as MCLs for Drinking Water.

Results obtained from the analysis of all of the samples and sample duplicates are provided in the appendices of this ROD. Summary tables presenting results obtained by comparing sample data to regulatory reference values merges sample and its associated sample-duplicate results into a single value for each compound that is reflective of the average condition found at a sampling location. The combined analytical results of the EBS, the RI, and completed construction activities are summarized and discussed below.

Samples of surface soil, ditch soil, groundwater, and surface water were collected and analyzed as part of the EBS and RI at SEAD-121C, the Rumored Cosmoline Oil Disposal Area. Confirmation soil samples were collected and analyzed during the lead removal action that was performed in 2007. The sampling and analyses were performed in 1998 (EBS) and between 2002 and 2003 (RI); the results of this effort were reported in the RI Report (Parsons, 2006e). The sampling and analysis conducted during the cleanup action are presented in the Completion Report for SEAD-121C, and are summarized in Section 3 of the ROD (Parsons, 2008d). The combined analytical results of the EBS and the RI are summarized and discussed below.

Soil Investigations

The EBS and RI for soil at SEAD-121C initially included the collection and analysis of samples from 48 surface soil, 10 ditch soil, and 20 subsurface soil locations. Fifty-three (53) surface soil samples and duplicates, 20 subsurface soil samples, and 11 ditch soil and duplicates were collected and characterized. Eight surface soil samples and four subsurface soil samples were collected during the EBS. Forty surface soil samples, 10 ditch soil samples, and 16 subsurface soils were collected during the RI. A compilation of all the EBS and RI sample and sample duplicate results for surface, subsurface, and ditch soil samples is provided in Appendix D, Table 1 of the ROD (Parsons, 2008d).

Lead contaminated soil in the northern corner of SEAD-121C was removed during the interim remedial action. Analytical results for lead only associated with soil that was excavated from five locations during the interim action were removed from the SEAD-121C dataset once the action was completed. Additionally, confirmatory sample results for lead from 31 new locations were added to the SEAD-121C data to update the estimate of the level of lead that remains at SEAD-121C. Analytical data from the updated and original SEAD-121C dataset are reported below for lead, while data summaries for the original dataset only are provided for all other chemicals identified in the soil at SEAD-121C.

Tables 6-1, 6-2, and 6-3 in the ROD (Parsons, 2008f) provide the summary soil results for SEAD-121C compared to three sets of reference values, NYSDEC's Unrestricted Use and Industrial Use SCOs, and EPA Region IX Industrial Soil PRGs. Each of the listed tables identifies the compounds that were detected in total soil, surface soil only, subsurface soil only, and ditch soil only; identifies the number of times the detected compounds were found in one of the categories of soil; and, identifies how many samples contained a concentration in excess of the referenced reference value. In addition, the 95th UCL of the mean is computed for the total soil data set developed, and this value is compared directly with each regulatory reference value.

Volatile Organic Compounds (VOCs)

Eleven VOCs were detected at the 78 total soil locations characterized during the EBS and the RI at SEAD-121C. The identified VOCs included acetone, benzene, carbon disulfide, chloroform, ethyl benzene, meta/para xylene, methyl ethyl ketone, methylene chloride, ortho-xylene, styrene, and toluene. Acetone and toluene were the two VOCs most frequently detected, present in 37% and 17% of the total soil samples, respectively. Acetone was found in all types of soil analyzed (i.e., surface, subsurface, and ditch soil), while toluene was only found in surface and subsurface soils characterized. Five VOCs (acetone, benzene, ethyl benzene, meta/para xylene, and methyl ethyl ketone) were detected in one or more samples each at concentrations in excess of the NYSDEC Unrestricted Use SCOs. Three of these compounds (benzene, ethyl benzene, and meta/para xylene) had 95th UCL values that exceeded their respective Unrestricted Use SCOs, but in each case the elevated UCL value was driven by one or two sample concentrations above the reference value.

Ethyl benzene and meta/para xylene were found collocated in one surface soil sample collected from location SBDRMO-9, which is located in the southeastern corner of the DRMO Yard at concentrations of

3,300 "J"[7] µg/Kg for ethyl benzene, and 4,400 J µg/Kg for meta/para xylenes. Benzene, ethyl benzene, and meta/para xylenes also were observed to exceed NYSDEC's Unrestricted Use SCOs once each in subsurface soil, and each of the elevated concentrations were found collocated in a sample collected at SBDRMO-9, located near the southeastern corner of the DRMO Yard.

Benzene was the only VOC that was observed to exceed its EPA PRGs for industrial soil, with an exceedance in the subsurface soil collected from location SBDRMO-9. None of the detected VOCs were found in any sample at concentrations that exceeded NYSDEC's Industrial Use SCO values.

Semivolatile Organic Compounds (SVOCs)

Twenty-seven SVOCs, including most of the PAHs, some phthalates, and other compounds were detected in the 78 soil sample locations characterized at SEAD-121C. Tables 6-1, 6-2, and 6-3 within the ROD present summary statistics and results of the comparison of sample concentrations to the various comparative cleanup objectives.

Generally, the PAHs and the cPAHs were the most frequently detected SVOCs, the analytes found at the highest concentrations, and the analytes most frequently found at levels above the various cleanup objective values. Pyrene was the PAH found at the highest overall concentration (34,000 µg/Kg); fluoranthene was the PAH found most frequently, present in 45 of the 78 soil sample locations analyzed; while benzo(a)pyrene and benzo(b)fluoranthene, both cPAHs, were the two compounds found to exceed their comparative cleanup objectives most frequently. Benzo(a)pyrene concentrations detected were above NYSDEC's Industrial Use reference values and EPA's Industrial Soil PRGs most frequently, while measured concentrations of benzo(b)fluoranthene were most frequently above NYSDEC's Unrestricted Use SCOs.

The seven cPAHs and 3- or 4-methylphenol were the only SVOCs that were found at levels above any of their respective SCO levels. Each of the eight SVOCs was detected in at least one sample at a concentration above its NYSDEC Unrestricted Use SCO value. Benzo(b)fluoranthene exceeded its Unrestricted Use SCO value in eight samples. Benzo(a)pyrene and benzo(b)fluoranthene were the only two compounds to exceed NYSDEC's Industrial Use SCO values in any soil samples, while four of the cPAHs were detected at concentrations above their respected Industrial Soil PRG levels in one or more samples.

The 95th UCL computed for five of the cPAHs [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene] were higher than NYSDEC's Unrestricted Use SCO value, while three surpassed EPA's Industrial Soil PRGs, and only benzo(a)pyrene was higher then its NYSDEC Industrial Use SCO level.

Further review of the data indicates that the SVOCs are generally found most frequently and at higher concentrations in the shallower soil samples. Based on the ditch soil sample results, it appears that higher concentrations are found exterior to the DRMO yard at locations that are upgradient of the AOC.

---

[7] The "J" is a data qualifier that indicates that the concentration is estimated.

Pesticides and Polychlorinated Biphenyls (PCBs)

Fourteen pesticides and three PCBs were found in one or more of the soil samples collected from SEAD-121C. The most frequently detected pesticide was endosulfan I, which is an insecticide and an acaricide[8] that is used extensively on crops and as a wood preserver. This analyte was found in 19 of the 78 sample locations characterized at SEAD-121C, with a maximum concentration of 185 μg/Kg. Other frequently detected pesticides included 4,4'-DDE, and 4,4'-DDT, present in 18, and 16 samples, respectively.

The most frequently detected PCB was aroclor-1254, which was found nine times; this analyte also exhibited the maximum concentration for PCBs in SEAD-121C, with a concentration of 930 μg/Kg. Aroclor-1260 was found in eight of the samples characterized.

Six pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, dieldrin and endrin) and aroclor-1254 and aroclor-1260 were found at concentrations that exceeded NYSDEC's Unrestricted Use SCO values. The pesticides 4,4'-DDE (15 times) and 4,4'-DDT (11 times) were the pesticides most frequently found at concentrations above their respective Unrestricted Use SCOs. Aroclor-1254 ranked third in the number of times it was detected in soil samples at concentrations above its Unrestricted Use SCO. Aroclor-1254 was also the only pesticide or PCB compound that was detected above its Industrial Soil PRG reference value. None of the pesticides or PCBs were detected in soil samples at concentrations that exceeded their respective Industrial Use SCO values.

Review of the data also indicates that the pesticides and PCB compounds are found most frequently and at higher concentrations in the shallower soil samples. All but three (endrin, endrin ketone, and aroclor-1260) of the maximum concentrations detected for pesticides and PCBs in soils at SEAD-121C were found in the surface soil samples. The highest levels of the other three compounds were found in subsurface soil samples.

Metals and Cyanide

Twenty-three metals were detected in one or more of the 78 soil sample locations collected from SEAD-121C during the EBS and RI. Tables 6-1, 6-2, and 6-3 of the ROD provide summary statistics and a summary of comparison of soil sample data to the three comparative cleanup objective values.

Fourteen metals (aluminum, arsenic, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, vanadium, and zinc) were detected in every soil sample analyzed. The frequency of detection in samples for the remaining eight metals ranged from a low of 15% for thallium to a high of 97% for beryllium. A majority (14) of the maximum concentrations measured for the individual metals were found in shallow soil samples, while five maximum concentrations were found in the ditch soil samples, and four were found in subsurface soils.

Nine metals were found in one or more soil samples at concentrations that exceeded NYSDEC's Unrestricted Use SCO values. Of these metals, nickel was most frequently (52 times) found at

---

[8] Acaricide: a chemical agent used to kill mites, a pesticide.

concentrations above the Unrestricted Use SCO. Zinc was found at concentrations above the Unrestricted Use reference value second most frequently, followed by lead at third. All nine of the metals that surpassed NYSDEC's Unrestricted Use SCO levels were found in surface soils; seven of the nine metals observed to surpass the Unrestricted Use SCO levels were observed at elevated concentrations in subsurface soil and ditch soil samples.

Two metals, arsenic and lead, were observed to exceed EPA Industrial Soil PRG levels in soil samples, and only lead was observed to surpass NYSDEC's Industrial Use SCO value in soil samples collected from SEAD-121C. Arsenic surpassed the Region IX Industrial Soil PRG value (1.59 mg/Kg) in 76 of the 78 sample locations characterized. Lead exceeded the EPA's Industrial Soil PRG in five samples and NYSDEC's Industrial Use SCO level in two samples.

As is discussed previously, soil containing elevated concentrations of lead was removed during the interim removal action that was performed at SEAD-121C. Lead results associated with this soil were eliminated from the original EBS/RI dataset, and lead data reflecting the new confirmatory soil samples were added to update the SEAD-121C dataset. The confirmatory sample data are independently presented and summarized in Table 3-1 of the ROD (Parsons, 2008d). A review of the blended dataset developed for residual levels of lead present at the site indicates that there are no concentrations in excess of 1,780 mg/Kg in soil, which is below the New York's Industrial SCO of 3,900 mg/Kg.

Groundwater Investigation

Two temporary groundwater monitoring wells (i.e., MW121C-1 and MW121C–2) were installed and sampled using bailers during the EBS in 1998. During the RI, four permanent monitoring wells were installed, and two rounds (i.e., February and May of 2003) of groundwater samples were collected and analyzed at three of the permanent wells (MW121C-3, MW121C-4, and MW121C-6) using low flow sampling techniques. Samples could not be collected from the fourth permanent monitoring well (i.e., MW121C-5) during either of the 2003 sampling events because the well was dry.

Analytical results collected during the EBS sampling event are not considered representative of the conditions that exist at the AOC because both wells were temporary installations, the wells were not fully developed and stabilized before sampling, and samples were collected using bailers. The collection of samples using bailers is likely to introduce silt and sediment into the samples analyzed, which can lead to exaggerated analyte concentrations due to the presence of materials sorbed onto the surface of the entrained silt and sediment. The results of the EBS groundwater sampling did provide the basis for the installation of the permanent monitoring wells, and the use of the EPA's recommended low-flow, purge and pump sampling process. Nevertheless, brief summaries of the EBS and RI sampling events are provided below. The RI results are discussed first, due to their higher degree of credibility.

Groundwater data developed for SEAD-121C were compared to Federal and State guidance values including New York State Class GA Groundwater Standards, MCLs, and EPA Region IX PRGs for tap water. The MCLs and the State's GA Standards are ARARs, while the Region IX PRGs are considered TBC values.

VOCs

VOCs were not detected in groundwater samples characterized during the 2003 RI sampling program. Seven VOCs (i.e., 1,4-dichlorobenzene, acetone, bromochloromethane, bromoform, carbon disulfide, chlorobenzene, and vinyl chloride) were detected in the groundwater samples collected during the EBS.

The compound 1,4-dichlorobenzene, which was detected once at 36 μg/L at sample location MW121C-2 was the only VOC observed to exceed a promulgated standard (i.e., GA standard of 3 μg/L. Monitoring well MW121C-2 is located within the AOC and situated near the southwestern corner of the AOC. Four other VOCs (bromochloromethane, bromoform, chlorobenzene, and vinyl chloride) were also detected once in the sample collected from MW121C-2, but each of these analytes was present at a concentration less than any identified standard.

SVOCs

Two SVOCs, bis(2-ethylhexyl)phthalate and di-n-butylphthalate were each detected once during the 2003 RI groundwater sampling events. Neither SVOC exceeded its respective GA standard or EPA's Region IX PRGs for tap water. Both of the concentrations measured for these compounds were detected at levels slightly above their respective detection limits.

Eight SVOCs [i.e., bis(2-ethylhexyl)phthalate, butylbenzylphthalate, diethylphthalate, di-n-butylphthalate, fluorene, hexachlorobutadiene, phenanthrene, and pyrene] were detected in the groundwater samples collected during the EBS at SEAD-121C. None of the compounds identified exceeded state or federal standards.

Pesticides and PCBs

No pesticides or PCBs were detected in groundwater samples collected from the permanent wells during the RI.

Nineteen pesticides were detected in one or two of the groundwater samples collected during the EBS; PCB congeners were not identified in any groundwater sample collected during the EBS.

Seven pesticides (i.e., 4,4'-DDD, 4,4'-DDT, alpha-BHC, beta-BHC, delta-BHC, dieldrin, and heptachlor epoxide) were found at concentrations exceeding their respective GA standard in both of the EBS groundwater samples collected. Two other pesticides (i.e., 4,4'-DDE and heptachlor) were found at concentrations exceeding their respective GA standard once each. The exceedance of heptachlor was detected in monitoring well MW121C-1, while the exceedance of the GA standard for 4,4'-DDE was observed in the groundwater sample collected from well MW121C-2. The maximum concentration of dieldrin (0.2 J μg/L) was 50 times its GA standard (0.004 μg/L); the maximum concentration of beta-BHC (0.33 J μg/L) was eight times greater than its GA standard (0.04 μg/L); the maximum concentration of delta-BHC (0.16 J μg/L) was four times its GA standard (0.04 μg/L); the maximum concentrations of heptachlor (0.14 J μg/L) and 4,4'-DDD (0.81 J μg/L) were approximately three times their respective GA standard (0.04 μg/L and 0.3 μg/L, respectively).

Metals and Cyanide

Nineteen metals were detected in samples collected from the permanent wells at the DRMO Yard during the RI.

Aluminum, antimony, iron, manganese, and sodium exceeded their respective groundwater standard in two or more of the groundwater samples characterized during the RI sampling events. None of the groundwater concentrations measured for metals exceeded EPA's Region IX PRGs for tap water.

Antimony exceeded the GA standard twice during the February 2003 sampling round. Iron exceeded its GA standard three times; twice during the February 2003 sampling event, and once in May 2003. Sodium exceeded its GA standard in three samples; twice in February and once in May 2003. Manganese exceeded its GA standard once during the February 2003 sampling event, in one member of a sample-duplicate pair; the average for the two samples was less than the GA standard (i.e., 286 μg/L). Sample results reported for samples collected in February 2003 were higher than the results from the round conducted in May 2003, which is likely due to more complete stabilization of the water in the wells and seasonal variation.

<u>Surface Water Investigation</u>

No permanent surface water body is located within the bounds of the DRMO Yard. Drainage ditches are located exterior of SEAD-121C, along the southern and northwestern bounds. The man-made drainage culverts convey storm and snow-melt runoff waters away from land located within the SEDA's former administrative, maintenance and warehousing areas, which are located to the north-northeast, east, and south-southeast, of SEAD-121C to Kendaia Creek that is located to the west. Land within the DRMO Yard is sloped towards the bordering drainage ditches so runoff from the site flows into these ditches as well. Surface water flow in the abutting drainage ditches is an episodic event, and thus, there is no NYSDEC designation assigned to surface water (i.e., runoff) found in the channels.

Surface water samples were collected from 10 locations during the SEAD-121C RI; nine of these samples were collected exterior to the DRMO Yard, while the last was collected from a puddle that accumulated after a storm event. Surface water data were compared to New York State's Class C AWQSs and to the EPA's Region IX PRGs for tap water for comparative purposes.

VOCs

VOCs were not detected in any of the surface water samples collected and characterized from the vicinity of the DRMO Yard.

SVOCs

Bis(2-ethylhexyl)phthalate was detected in one sample collected from location, SWDRMO-2, at a concentration of 4.2 J μg/L. SWDRMO-2 is located upgradient of, exterior to, and southwest of the AOC in drainage ditch #2. Surface water found at this location originates from locations to the east and southeast of SEAD-121C, the DRMO Yard. This value exceeds the NYSDEC Class C AWQS (i.e., 0.6 μg/L), but is below EPA's Region IX PRG for tap water.

Pesticides and PCBs

Pesticides and PCBs were not detected in the surface water collected from locations in the vicinity of the DRMO Yard.

Metals and Cyanide

Twenty-two metals were detected in surface water samples collected from the vicinity of the DRMO Yard.

Ten metals (i.e., aluminum, barium, calcium, copper, iron, lead, magnesium, potassium, sodium, and zinc) were detected in every sample analyzed; two others (i.e., arsenic and selenium) were observed in one sample each. Eleven metals (aluminum, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, silver, vanadium, and zinc) exceeded their respective Class C AWQSs for surface water. Lead exceeded its Class C criteria in every sample analyzed, while aluminum and iron was found above their respective Class C criteria value in five samples each. All the other metals listed were found at concentrations above their respective Class C criteria value in two samples, apiece. Six metals (arsenic, cadmium, iron, manganese, thallium, and vanadium) exceeded their respective Region IX PRGs for tap water. Iron and thallium concentrations exceeded the Tap Water criteria values in two samples each, while the other four metals were observed at concentrations above their respective Tap Water PRG values in one sample each.

The surface water sample collected from location SWDRMO-2 contained the maximum concentration recorded for metals in surface water for 18 of the 22 metals detected in samples. Location SWDRMO-2 is upgradient of, exterior to, and southwest of the AOC. Surface water concentrations found for 13 metals in this sample also exceeded their respective Class C AWQSs, Regions IX PRGs for Tap Water or both criteria. The location immediately downstream of SWDRMO-2 (i.e., SWDRMO-3) contained the next highest number of metal exceedances of the Class C AWQSs and Region IX PRGs for tap water for 11 metals, and the second highest measured concentrations found in surface water samples for 16 metals; it also contained the highest reported concentrations of calcium and potassium reported in surface water for the AOC. These results suggest that the source of most of the metals observed in the bordering southern drainage culvert originate upgradient and decrease as they move past the AOC, probably due to dilution effects.

Only aluminum, iron, lead, and thallium were detected in samples from locations other than SWDRMO-2 and SWDRMO-3 at levels greater than Class C or Region IX PRGs.

<u>Human Health Risk Assessment</u>

Non-Carcinogenic and Carcinogenic Risk Results

Complete details of the human health risk assessment for each exposure route evaluated are presented in Appendix E of the Final RI report (Parsons, 2006e) for soil, ditch soil, groundwater, and surface water exposure.

RME non-carcinogenic risks calculated for the construction worker, industrial worker, and adolescent trespasser/visitor at SEAD-121C are all below HIs of 1. RME carcinogenic risks calculated for the construction worker, industrial worker, and adolescent trespasser/visitor are all within or below the EPA's recommended range of 10^{-4} to 10^{-6}.

Lead Risk Characterization Results

Soil

Lead risk characterization results for surface soil exposure for the industrial worker at SEAD-121C are presented in Table 7-3 of the ROD (Parsons, 2008d). The 95th percentile PbB among fetuses of adult industrial workers are 7.8 and 9.8 µg/dL, for a homogeneous and a heterogeneous population, respectively. Both estimates are below the EPA target PbB level of concern (i.e., 10 µg/dL). The results are presented in Table 7-4 of the ROD. Nevertheless, the 95th percentile PbB levels among residential children are below the EPA target PbB level of concern (i.e., 10 µg/dL).

Ditch Soil

The lead risk characterization results for SEAD-121C ditch soil exposure are presented in Tables 7-5 of the ROD for the industrial worker. The 95th percentile PbB levels among fetuses of adult industrial worker are 5.2 and 6.8 µg/dL, assuming a homogeneous and a heterogeneous population, respectively. Both estimates are below the EPA target PbB level of concern (i.e., 10 µg/dL). The results for the adolescent trespasser are presented in Table 7-6 of the ROD. The 95th percentile PbB levels among residential children are below the EPA target PbB level of concern (i.e., 10 µg/dL).

Ecological Risk Assessment

Summary of SLERA Risk Results

Preliminary HQ results computed based on Steps 1 and 2 of the SLERA process, which assume the use of maximum detected site concentrations, 100 percent bioavailability, that all food is derived from the SWMU, and the use of the NOAEL values as the screening ecotoxicity value are presented in ROD Table 7-7A for SEAD-121C soil and surface water exposure, ROD Table 7-7B for SEAD-121C ditch soil and surface water exposure.

Once the screening level HQs were computed, the Army applied the EPA's recommended refinement of COC process to the results of the SLERA to determine if evaluation of ecological risks was warranted at SEAD-121C, the DRMO Yard.

Summary of Ecological Risks after the Refinement of COC Process

After application of the refinement of COC process, no COCs were identified for SEAD-121C soil, SEAD-121C ditch soil, or SEAD-121C surface water and the rationales are summarized below. The reader is referred to the Final RI Report (Parsons 2006f) Section 7.6.2 through 7.6.4 for specific details of the Refinement of COC Process.

1. Preliminary COCs were identified for SEAD-121C soil, ditch soil, and surface water. However, alternative HQs calculated during the refinement of COCs (Step 3.2), especially the HQs based on the mean concentrations and LOAEL SEVs are either below 1 or close to 1 (with the highest at 5). Therefore, no final COCs were identified for any medium at SEAD-121C.

2. The planned future land use for SEAD-121C is industrial / office development. Thus, the AOC is not expected to support, sustain, or attract ecological receptors and therefore is not expected to be a wildlife habitat. The presence of ecological receptors is expected to be generally curtailed at SEAD-121C where habitat conditions are poor and current and future human activity levels are sufficiently disruptive to discourage wildlife use.

Based on the above discussion, soil, ditch soil, surface water, and groundwater at SEAD-121C are not expected to significantly impact ecological receptors and no further action is warranted at SEAD-121C based on the ecological risk assessment.

SEAD-121I: Rumored Cosmoline Oil Disposal Area

History of Contamination and Initial Response

SEAD-121I, the Rumored Cosmoline Oil Disposal Area, encompasses four rectangular-shaped, open grass and dirt covered areas that are bounded by 3rd and 7th Streets (north and south ends, respectively) and Avenues C and D (west and east sides, respectively). The northern end of SEAD-121I is located roughly 4,500 ft. south-southwest of the Depot's main entry off State Route 96. The AOC extends roughly 2,600 ft. further to the south from this point, and the AOC measures approximately 300 ft. in width throughout its length; the overall size of the AOC is approximately 16.8 acres. Approximately 1.2 acres of this area were previously used for the staging of strategic stockpiles of ferromanganese ore. This AOC is located 2,000 to 4,000 ft. northwest of the topographic high point within the Depot.

Buried reinforced concrete storm drains convey runoff storm water from east to west through the AOC along 3rd St., 4th St., 5th St., 6th St., and 7th St.

A railroad spur line enters SEAD-121I from the south and extends to the northern end of the AOC where it terminates near the intersection of 3rd St. and Avenue C. Two sidings branch off the main spur line; one terminates in the first (north to south) block and the other terminates in the third (north to south) block. There are concrete loading docks located in the first and third blocks next to the railroad lines.

The Army indicated that the rail spur and sidings were used for delivery of equipment and machinery that was frequently packed in Cosmoline (oil). Cosmoline oil is a commonly used substance that prevents corrosion on metal parts and components. During delivery and unpacking of the equipment and machinery, oil from the packing may have been deposited on the ground.

The U.S. Government historically staged strategic stockpiles of ferromanganese ore in portions of SEAD-121I, and these stockpiles were present during the EBS and RI sampling events and into the early part of 2007. The strategic stockpiles were located in the second and fourth blocks (north to south) of the AOC, along the western edge of the AOC, close to Avenue C. The Government sold and removed the stockpiles, and the historic staging areas have had all ore residuals removed. Parallel rows of warehouses border the eastern and western sides of the AOC, across the bounding north south running Avenue C and Avenue D.

Two environmental investigations were conducted to document the environmental conditions present at SEAD-121Ithe Rumored Cosmoline Oil Disposal Area. In addition, removal actions were also performed at SEAD-121I, and confirmatory soil sample data were developed as part of the removal action efforts.

Initially, a limited EBS was performed to determine if hazardous substances were present in select environmental media at AOC. The EBS work was limited to the collection and analysis of surface soil samples at SEAD-121I. This work was performed in 1998 – 1999 and is reported in the document Final Investigation of Environmental Baseline Survey Non-Evaluated Sites [SEAD 119A, SEAD 122 (A, B, C, D, E), SEAD 123 (A, B, C, D, E, F), SEAD 46, SEAD 68, SEAD 120 (A, B, C, D, E, F, G, H, I, J), and SEAD 121 (A, B, C, D, E, F, G, H, I)] (Parsons ES, 1999b). For SEAD-121I, the Army recommended "that additional soil sampling be performed to determine the extent of the impacts from semivolatiles. At this time there are an insufficient number of data points to perform a Mini Risk Assessment" (Parsons ES, 1999b, pg. 48).

Basis for Taking Action

Contaminants

Conditions present at SEAD-121I were more thoroughly investigated during a multimedia RI in 2002 and 2003. Samples of surface and subsurface soil, surface water and "ditch soil" found in man-made culverts adjacent to the AOC were collected and analyzed for TCL/TAL compounds. The results of this effort were reported in the Remedial Investigation Report for Two EBS Sites in the Planned Industrial Development Area (SEAD-121C and SEAD-121I) Final (Parsons, 2006e). Additional data pertinent to the existing environmental conditions remaining at the AOC was subsequently developed during the interim removal actions that were performed for the AOC.

These data are provided in the Removal Action Letter for SEAD-121I that describes and summarizes the results of the interim removal action that has been performed at the former stockpile locations in SEAD-121I to address manganese residuals.

Analytical data collected during the site investigations and construction efforts were compared to prevailing state and federal standards and reference values. State reference values and standards considered included New York's TAGM No. 94-HRW-4046 SCOs and 6NYCRR Subpart 375-6.8 Remedial Program SCOs for soil; and New York's Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (Technical and Operation Guidance Series [TOG] 1.1.1) for groundwater and surface water. The TAGM soil guidance values were recently replaced by New York's 6NYCRR Subpart 375-6.8 regulations, and data comparisons previously made to the TAGM values have been eliminated from all material presented in the ROD (Parsons, 2008d).

Federal reference values considered during the evaluation of analytical data included EPA Region IX PRGs for residential and industrial soils and PRGs for tap water, as well as MCLs for Drinking Water.

Results obtained from the analysis of all of the samples and sample duplicates are provided in the appendices of this ROD. Summary tables presenting results obtained by comparing sample data to regulatory reference values merges sample and its associated sample-duplicate results into a single value for each compound that is reflective of the average condition found at a sampling location. The combined analytical results of the EBS, the RI, and completed construction activities are summarized and discussed below.

Samples of surface soil, ditch soil and surface water were collected and analyzed as part of the EBS and RI at SEAD-121I, the Rumored Cosmoline Oil Disposal Area. Confirmation soil samples were collected and analyzed during the post strategic stockpile termination cleanup action that was performed in 2007.

The sampling and analyses were performed in 1998 (EBS) and between 2002 and 2003 (RI); the results of this effort were reported in the RI Report (Parsons, 2006e). The sampling and analysis conducted during the cleanup action are presented in the Completion Report for SEAD-121I, and are summarized in the ROD (Parsons, 2008d). The combined analytical results of the EBS and the RI are summarized and discussed below.

Soil Investigation

Fifty-five samples and duplicates were collected from five soil boring, 34 surface soil, and 12 ditch soil locations and analyzed as part of the investigation of soil at SEAD-121I. As the exact operating practices used at the Rumored Cosmoline Oil Disposal Area are unknown, the implemented soil investigation included the collection and analysis of soil samples from within the AOC and beyond the defined bounds of the AOC to identify areas of impacted soil.

Four surface soil samples and two ditch soil samples were collected during the EBS. Thirty surface soil samples, 10 ditch soil samples, and five shallow soil samples from soil borings were collected during the RI. The results for all 51 of the soil sample locations are discussed together as field observations indicate that all of these environmental “media” are equivalent in characteristic and nature. Generally, the ditch soil samples were collected from locations on the AOCs surface where erosion channels were observed due to surface water flow off the AOC’s surface to the underlying storm sewer locations. Similarly, the soil boring sampling was terminated at relatively shallow depths because bedrock was encountered very close to the grounds surface throughout the AOC.

Ore residuals, soil and asphalt were excavated from the historic stockpile locations in SEAD-121I during the post-mission removal action. Analytical results for manganese and iron associated with soil that was excavated from 10 locations during the removal action were removed from the SEAD-121I dataset as a result of the action. Additionally, confirmatory sample results for lead from 16 new locations were added to the SEAD-121I data to update the estimate of the level of these metals that now remains at SEAD-121I.

Analytical data from the updated and original SEAD-121I dataset are reported below for manganese and iron, while data summaries for the original dataset only are provided for all other chemicals identified in the soil at SEAD-121I.

Volatile Organic Compounds (VOCs)

Eight VOCs were detected in the soil samples analyzed. The eight VOCs detected included: acetone, benzene, ethyl benzene, meta/para xylene, methyl ethyl ketone, methylene chloride, ortho xylene, and toluene.

Acetone was the VOC most frequently detected, present in 36 of the samples characterized. The highest reported concentration for acetone was 150 μg/Kg. Acetone was the only VOC that was observed to exceed any of the comparative cleanup criteria evaluated; it was found at concentrations in excess of NYSDEC's Unrestricted Use SCO level in three of the samples characterized. The 95th UCL computed for acetone also exceeded NYSDEC's Unrestricted Use criteria value for soil. Acetone is a common laboratory contaminant and the level found in most of the soil samples characterized are within the range that is considered =associated with laboratory contamination. It is also noted that acetone is an artifact of the soil sample collection, preservation, and preparation procedure used for these samples.

Each of the remaining VOCs was observed in fewer than 25% of the samples and at relatively low concentrations. None of the measured concentrations exceeded any of NYSDEC's or EPA's comparative criteria. The maximum concentration measured for benzene was 41 μg/Kg. The maximum concentration measured for toluene was 31 μg/Kg, and the maximum concentration measured for all other VOCs was below 10 μg/Kg.

Semivolatile Organic Compounds (SVOCs)

Twenty-eight SVOCs, including PAHs, the cPAHs, and mixed phthalates, were detected in the surface soil samples collected from SEAD-121I.

Four of the SVOCs [benzo(b)fluoranthene, fluoranthene, phenanthrene and pyrene] were each found in 48 of the 51 samples analyzed. Conversely, five SVOCs (3'3-dichlorobenzidine, di-n-octylphthalate, isophorone, nitrobenzene, and phenol) were only found once, each collocated in the sample collected from location SD121I-7. Generally, the seven cPAH compounds were found most frequently in the soil samples, while the phthalates were generally detected least frequently.

The seven cPAHs [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k) fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were the only SVOCs observed to exceed their respective state and federal cleanup levels. Generally, benzo(a)pyrene exceeded its comparative criteria most frequently, found at concentrations above EPA's Industrial Soil PRG 30 times, NYSDEC's Unrestricted and Commercial Use criteria 15 times, and NYSDEC's Industrial Use Criteria 14 times.

Each of the cPAHs was found at a concentration that exceeded NYSDEC's Unrestricted Use criteria in at least nine of the 51 sample locations characterized, and concentrations reported for benzo(k)fluoranthene and chrysene were found at levels above their respective Unrestricted Use criteria values 16 times. The 95th UCL values computed for each of the seven cPAH compounds based on the collected soil samples from SEAD-121I also surpassed their respective Unrestricted Use SCO values. Five of the cPAHs were also observed to exceed NYSDEC's Commercial and Industrial Use criteria in at least one of the samples characterized, while six (all but chrysene) were found at concentrations above EPA's Industrial Soil PRGs. Four of the computed 95th UCL values [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene] computed based on the collected data surpassed their respective Commercial Use SCOs, and the 95th UCL values computed for benzo(a)pyrene and dibenz(a,h)anthracene also surpassed NYSDEC's Industrial Use values. Five of the 95th UCL concentrations computed for cPAHs [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene] surpassed their respective Industrial Soil PRG values.

Pesticides and PCBs

Seven pesticides and two PCBs were detected in the soils at SEAD-121I. Frequency of detection for pesticides ranged from a low of 4% for dieldrin and endrin to a high of 53% for endosulfan I. Most of pesticides detected were found at locations along the edge of Avenue C and Avenue D at low concentrations. Pesticides and PCBs were not detected in the downgradient ditch soil locations. Endosulfan I was the pesticide compound found most frequently, present in 24 of the 45 samples characterized. All of the other pesticides and PCBs were found in fewer than nine samples analyzed.

None of the pesticides or PCBs detected in the soil samples from SEAD-121I were found at concentrations that exceeded their respective Industrial Soil PRG value or their respective Commercial or Industrial Use SCOs. Five of the pesticides were detected at concentrations in one or more samples that exceeded their respective Unrestricted Use SCOs. 4,4'-DDE was found at concentrations above NYSDEC's Unrestricted Use criteria in five samples, followed by aldrin in three samples, 4,4'-DDT and dieldrin in two samples and endrin in one sample. The 95th UCL value computed for four of the pesticides (all except endrin) that showed individual sample exceedances for samples also surpassed their respective Unrestricted Use criteria levels.

Metals and Cyanide

Twenty-three metals plus cyanide were detected in the soil samples collected at or around SEAD-121I.

Thirteen metals (aluminum, arsenic, calcium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, vanadium, and zinc) were detected in all samples. The frequency of detection for the remaining ten detected metals ranged from a low of 14% for silver to a high of 96% for beryllium and mercury. Cyanide was detected with a frequency of 8%.

Ten metals (arsenic, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, and zinc) found in soils at SEAD-121I were found at concentrations that exceeded their respective NYSDEC Unrestricted Use SCOs in at least three samples each. Nickel (17 times) was the metal observed to exceed its Unrestricted Use SCO most frequently, followed by zinc (14 times) and manganese (11 times). The 95th UCL values computed for eight of the ten metals (all except cadmium and lead) observed to be present in individual samples within the AOC also exceeded their respective Industrial Soil PRG criteria levels.

Three metals (arsenic, manganese and thallium) were detected at concentrations that exceeded EPA PRGs for Industrial soil in at least one sample. Of these metals, arsenic was found at concentrations above its Industrial Soil PRG in 34 samples while the other two metals were found at elevated concentration in four or fewer samples, each. The 95th UCL of the mean computed for arsenic and manganese exceeded their respective Industrial Soil PRGs. Similarly, three metals (arsenic, manganese and nickel) were also detected at concentrations that exceeded NYSDEC's Commercial Use SCO in one or more samples. Manganese exceeded its Commercial Use SCO value most frequently (6 times). Arsenic and manganese were also detected in some samples at levels that exceeded NYSDEC's Industrial Use SCOs. Manganese was again found at concentrations above its Industrial Use SCO value in six samples. The 95th UCL computed for arsenic and manganese exceeded their respective Commercial and Industrial Use SCOs.

Manganese (310,000 mg/Kg), calcium (298,000 mg/Kg) and iron (58,400 mg/Kg), respectively, were the metals that exhibited the highest single sample concentrations in soil samples collected at SEAD-121I. Most of the higher concentrations observed for iron and manganese were found collocated in samples collected in the immediate vicinity of the two strategic ferromanganese ore piles, while most of the higher concentrations of calcium were observed in samples at locations away from the two ore piles.

Site observations and historic records note the long-term staging of a strategic stockpile of ferromanganese ore in the second and fourth blocks at SEAD-121I, in close proximity of where the elevated iron and manganese concentrations are found. As such, the stockpiles are presumed to be the source of the elevated levels of these metals in the AOC soils. Figures 6-6 and 6-7 in the ROD (Parsons, 2008d) also show that many of the elevated concentrations of arsenic, chromium, thallium and zinc that are observed at SEAD-121I, are also located in close proximity to the ore piles.

Residual levels of manganese and iron left at SEAD-121I decreased once the strategic stockpiles of ore were removed and the underlying storage pads and surrounding soils were excavated. The maximum concentration of manganese now found at SEAD-121I decreases from 310,000 mg/Kg to 11,100 mg/Kg. Similarly, the 95th UCL concentration determined for manganese at SEAD-121I after the removal action was completed fell from 89,533 mg/Kg to 2,438 mg/Kg. The maximum level of iron now found at SEAD 121 is 31,300 mg/Kg. The post cleanup action non-carcinogenic HIs for future industrial workers is now estimated to be less than 1, while the HI for future construction workers is estimated at approximately 1.5.

<u>Surface Water Investigation</u>

Seven surface water samples were collected and analyzed as part of the investigation of SEAD-121I. Results of the surface water analyses were compared to State of New York ambient water quality standards for Class C surface waters and EPA's Region IX PRGs for tap water.

VOCs

VOCs were not detected in the surface water at SEAD-121I.

SVOCs

Two SVOCs were detected in the surface water at SEAD-121I. Butylbenzylphthalate was detected in one sample at the northwestern corner of SEAD-121I, SW121I-10, at a maximum concentration of 1.1 J µg/L. Fluoranthene was also detected at a maximum concentration of 1.1 J µg/L in one sample, SW121I-6, located inside SEAD-121I. Neither of these values exceeded their respective Tap Water PRG value.

There are no Class C surface water criteria for these compounds.

Pesticides and PCBs

Pesticides and PCBs were not detected in the surface water samples collected from SEAD-121I.

Metals

Eighteen metals were detected in the surface water at SEAD-121I; of the 18 metals, seven (i.e., aluminum, calcium, magnesium, manganese, potassium, sodium, and zinc) were found in every sample. Four of the identified metals [aluminum (3 times), iron (2 times), lead (4 times), and zinc (1 time)] exceeded their respective AWQS Class C standards. None of the surface water concentrations measured exceeded the EPA's Region IX PRG for tap water. Aluminum and zinc were detected in all seven samples, iron was detected in five samples, and lead was detected in four samples.

The maximum detections of aluminum, iron, lead, and zinc (2,050 μg/L, 3,410 μg/L, 26.3 μg/L, and 190 μg/L, respectively) were collocated at SW121I-6, which is located immediately north of the former southern ore pile inside SEAD-121I. The second highest concentrations of aluminum, iron, and lead (1,490 μg/L, 3,080 μg/L, and 21 μg/L, respectively) were found at SW121I-10, which is located north of the former northern ore pile within the boundary of SEAD-121I.

Based on the data, the Army has concluded that hazardous substances do exist at both of the AOCs at concentrations above defined cleanup objectives. There is no strong and direct correlation between the hazardous substances found in AOC-specific soils and groundwater as no definitive plumes have been identified at SEAD 121C, and no groundwater was encountered at SEAD-121I. There is some evidence that identified hazardous substances have been mobilized by overland flow of storm-event water.

Human Health Risk Assessment

Non-Carcinogenic and Carcinogenic Risk Results

The post-cleanup action non-carcinogenic hazard indices and carcinogenic risk results for the scenarios evaluated are summarized in Table 7-9 of the ROD (Parsons, 2008d). Details of the revised human health risk assessment for each exposure route are presented in Appendix E of the ROD for soil, ditch soil, and surface water exposure.

The RME non-carcinogenic hazard index calculated for the construction worker at SEAD-121I (i.e., 1.5E+00 or 1.50) is above EPA's desired HI of 1. The HI for the industrial worker and the adolescent trespasser are both less than the EPA's target HI of 1. RME carcinogenic risks calculated for the construction worker, industrial worker, and adolescent trespasser/visitor are all within or below the EPA's recommended range of 10^{-4} to 10^{-6}.

The construction worker's HI results principally due to the inhalation of dusts contaminated with manganese, and due to the ingestion of soils contaminated with manganese and other metals. Of these exposure pathways, inhalation of dusts represents the largest identified HI (8.3E-01), which represents roughly 56% of the overall HI identified. The construction worker's ingestion of soil represents another 42% (i.e., 6.3E-01) of the construction worker's overall, while dermal contact with contaminated soils representing the balance (i.e., ~2%) of the overall HI.

With specific reference to the inhalation pathway, the inhalation of manganese contaminated dust accounts for more than 99% of the estimated inhalation HI. The HI calculated for manganese is based on a reference concentration for chronic inhalation exposure (RfC) derived in study that deals with the inhalation of manganese dioxide dust, and to which the EPA assigns an uncertainty factor of 1000, which is indicative of a low degree of confidence in its value. The exact composition of the manganese identified in the confirmatory samples collected in SEAD-121I is unknown, but it is highly unlikely that all of the manganese in the soil exists as manganese dioxide.

The known source of manganese at SEAD-121I was the HC (high carbon) ferromanganese ore that was previously stockpiled at the AOC. As such, the ore was a complex mixture of various naturally occurring minerals, including various oxide, salt, carbonate, and silicate forms. Thus, while manganese dioxide may be a component of ferromanganese ore, it is not the only constituent, and the use of an RfC that is derived solely from a study of industrial worker's exposure to manganese dioxide at a battery manufacturing facility is not fully accurate, and is likely to over-estimate impacts to outside workers at a location where other forms of manganese are present. However, since the exact composition of the manganese ore is unknown, no quantitative adjustments to the HI can be made. Further, it is important to note that the inhalation reference dose used as the basis of the inhalation portion of the risk assessment is 4,000 times lower than the American Conference of Industrial Hygienists' (ACGIH's) threshold limit value[9] for manganese exposure in industrial situations, further emphasizing the very conservative nature of the RfC used in the calculation of risk at this site.

Additionally, observations made in the field indicated that a large portion of the residuals left after the removal of the ore piles were present as small ore fragments, and these fragments range in size from grains of sand to pea- and pebble-sized debris. In these forms, the high density characteristic (i.e., between 4 and 6) of the native ore would limit the amount of material that becomes airborne as fugitive dusts.

Furthermore, much of the debris and soil sampled during the post-excavation confirmatory process was trapped in the abundant crevices and valleys that are evident in the exposed shale bedrock surface underlying the former staging pads. The presence of this mixture in the crevices and valleys of the jagged bedrock surface also works against it becoming airborne, as the bedrock ridges protect the finer particles from surface winds. Additionally, the irregular and jagged nature of the exposed bedrock surface makes a poor road surface, and it is likely that vehicle tires will be damaged if they are exposed to repeated trips over the rough and jagged surface.

Additional factors that add further conservatism to this HI value is the fact that the construction worker's HI was also based on a 250-day exposure period (i.e., one calendar year, exclusive of weekend days and two weeks of vacation), which represents EPA's default value. At present, there are no known plans for the development of this location, so the exact duration of the exposure period is also unknown, and could be either shorter or longer that also affects the level of uncertainty that is associated with the observed HI.

Further, the dust-loading factor used in the calculation of the HI assumes dry conditions, which is again very conservative as it ignores rainy periods and times when the ground at the Depot is frozen, snow covered, or muddy due to snowmelt or storm water. Finally, most of historic construction near SEAD-

[9] The concentration of a substance to which most workers can be exposed without adverse effects.

121I is slab on grade due to the shallow nature of the irregular underlying bedrock, and once a slab was poured over the bedrock, future exposures to material trapped in crevices and valleys of the bedrock would become inaccessible to workers located above grade.

Given the large degree of uncertainty that is associated with the HI computed for inhalation of manganese contaminated dust, it is likely that the construction worker's overall HI is an overestimate of the real conditions that exist at SEAD-121I now that the ore piles have been removed, and the areas cleaned up.

Therefore, it is concluded that no further action is required at SEAD-121I due to the possible presence of trace metals, including manganese in the soil. While the results of the risk assessment suggest that current and future construction workers may be subject to elevated non-cancer health impacts associated with residual levels of manganese in the soil at SEAD-121I, these probable impact represent a ceiling level, and one that is likely to be overstated. The predominant contributor to the observed elevated HI is inhalation of dusts containing manganese, and this impact is associated with a compound (i.e., manganese dioxide) which while it may be present at the site at some levels is not present as a pure material at the AOC. Further, the reference dose used in the calculation of the inhalation portion of the construction worker's HI is approximately 4000 less than is permitted in industrial workspaces for occupational exposures to manganese. Therefore, now that the ore piles have been removed and the former staging areas cleaned up, the most significant contributing COPC (i.e., manganese) was reduced to levels below commercial and industrial cleanup objective levels, and the associated risk at SEAD-121I is considered suitable for its continuing use as industrial or commercial property.

Lead Risk Characterization Results

Lead was not identified as a COC in soil or ditch soil. Lead was identified as a COC in surface water, but there is no reliable model for quantifying risk from lead due to contact with surface water.

<u>Ecological Risk Assessment</u>

Summary of Risk Results and Preliminary Contaminant of Concern Identification

Preliminary HQ results computed based on Steps 1 and 2 of the SLERA process, which assume the use of maximum detected site concentrations, 100% bioavailability, that all food is derived from the SWMU, and the use of the NOAEL values as the screening ecotoxicity value are presented in Table 7-11A of the ROD (Parsons, 2008d) for SEAD-121I soil and surface water exposure, Table 7-11B for SEAD-121I ditch soil and surface water exposure.

Once the screening level HQs were computed, the Army applied the EPA's recommended refinement of COC process to the results of the SLERA to determine if evaluation of ecological risks was warranted at SEAD-121I, the Rumored Cosmoline Oil Disposal Area.

Summary of Ecological Risks after the Refinement of COC Process

After application of the refinement of COC process, no COCs were identified for SEAD-121I soil, ditch soil, or surface water and the rationales are summarized below. The reader is referred to the Final RI Report (Parsons 2006f) Section 7.6.5 through 7.6.7 for specific details of the Refinement of COC Process.

1. Preliminary COCs were identified for SEAD-121I soil, ditch soil, and surface water. However, alternative HQs calculated during the refinement of COCs (Step 3.2), especially the HQs based on the mean concentrations and LOAEL SEVs are either below 1 or close to 1 (with the highest at 5). Therefore, no final COCs were identified for any medium at SEAD-121I.
2. The planned future land use for SEAD-121I is industrial / office development. Thus, the AOC is not expected to support, sustain, or attract ecological receptors and therefore is not expected to be a wildlife habitat. The presence of ecological receptors is expected to be generally curtailed at SEAD-121I where habitat conditions are poor and current and future human activity levels are sufficiently disruptive to discourage wildlife use.

The source of the metal contamination at SEAD-121I was the strategic stockpiles of ferrous-manganese ore previously stored at the AOC. These stockpiles were removed in 2007, and a post-mission cleanup action was taken to remove residues associated with the historic stockpiling activities. Based on the above discussion, soil, ditch soil, and surface water at SEAD-121I are not expected to significantly impact ecological receptors and no further action is warranted at SEAD-121I based on the ecological risk assessment.

3.1.1.2 Remedy Selection

SEADs 27, 66, and 64A

The Record of Decision ("ROD") for the Sites Requiring Institutional Controls in the Planned Industrial/Office Development and Warehousing Areas ("PID/Warehouse Area") (Parsons, 2004a) required the establishment of the following institutional controls ("ICs") at SEAD 27, 66, and 64A ("Controlled Property").

- Prohibit the development and use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds.
- Prevent access to or use of the groundwater until the Class GA Groundwater Standards are met.
- In addition, at SEAD-64A only, a land use control prohibiting digging within the bounds of the site will be established.

The LUCs will continue until the concentration of hazardous substances in the soil and the groundwater beneath have been reduced to levels that allow for unlimited exposure and unrestricted use.

The Army recommended that the land use restrictions proposed for SEAD 27, 64A, and 66, exclusive of the proposed no digging restriction proposed for SEAD-64A alone, also be imposed and maintained on all the property within the PID/Warehouse Area, as defined in the "Reuse Plan and Implementation Strategy for the Seneca Army Depot Activity" (RKG Associates, Inc., 1996). The proposed boundary for the land use restrictions is shown on **Figure 3-1** (Note: original reference to Figure 1-3 of the ROD (Parsons, 2004a)).

The Army's proposed establishment of an area-wide set of land use restrictions was consistent with the planned reuse of the property by the SCIDA and simplified IC implementation by having a single set of land use restrictions for the entire PID/Warehouse Area. Further, the extent of the proposed land use restrictions was consistent with the area that is within the bounds of a Township of Romulus, NY ordinance that requires future developers/owners to provide details of all construction/building/renovation projects that may be performed within this area to the Army and to the town managers for review and approval. Additionally, the Army contended that the proposed boundaries for the area of the proposed ICs were consistent with existing geographic, cultural, demographic, or other historic features and were supported, to the fullest extent possible, by the available analytical data collected at identified sites that are in proximity to the proposed boundary.

Generally, the area where the Army proposed to implement the institutional controls is defined by historic and existing security fence lines and roadways that exist at the site. This provides a high degree of visibility, and thus certainty, as to the extent of the proposed boundary without necessitating the installation of new identification markers. Finally, with respect to recommended groundwater use/access restriction, the proposed bounds envelop an area of the former Depot where an ample public water supply is available so that a site-wide groundwater use restriction will have a minimal adverse impact on the future land use.

The Army acknowledged that portions, but not all, of the PID/Warehouse Area for which it recommended that ICs be implemented as a remedial measure contains sites where hazardous wastes and materials have been used, stored, and treated or disposed. In response to this acknowledgement, the Army, under conditions of regulatory oversight, review, and approval/acceptance, implemented numerous investigations and studies to identify areas where potential risks from exposure to environmental contaminants continued to exist. Further, as potential sites have been investigated and assessed the Army has, and will continue to, propose and implement necessary remedial actions to eliminate, lessen or control contaminants found. Finally, in accordance with requirements delineated under CERCLA section 120(h)(3), transfers of certain property by deed must also include a covenant by the United States of America through the Secretary of the Army that all remedial action necessary to protect human health and the environment has been taken prior to transfer, a covenant by the United States of America through the Secretary of the Army to undertake any further remedial action found to be necessary after transfer, and a clause granting access to the transferred property in case remedial action or corrective action is found to be necessary after transfer.

The PID Area includes sites that have been closed out under the CERCLA process as No Action/No Further Action sites (“NA/NFA Sites”). The NA/NFA ROD (Parsons, 2003) identified sites at which either no remediation is required or no further remediation is required. The NA sites located in the PID Area include SEADs 9, 10, 20, 22, 33, 36, 37, 42, 47, 49, 55, and 68. The NFA sites located in the PID Area include SEADs 28, 30, 31, and 34. These sites are shown on **Figure 3-1**. The sites listed in the NA/NFA ROD will continue to be subject to PID/Warehouse Area site-wide land use restrictions. However, upon request by a future property owner, the Army, EPA, and NYSDEC will evaluate requested variance for land use restrictions in a designated area on a site-by-site basis. A copy of the NA/NFA ROD is available at the Information Repository at SEDA.

Data and information used to support the proposed boundary definition have been collected from existing reports that have been prepared for the encompassed and neighboring sites at the Depot.

Once Seneca Army Depot was listed on the NPL, the Army, EPA, and NYSDEC identified a list enumerating 57 solid waste management units (SWMUs) where historic data or information suggested, or evidence existed to support, that hazardous materials or hazardous wastes had been handled and may have possibly been released and migrated into the environment. Each of these sites was identified in the Federal Facilities Agreement (FFA) (EPA, NYSDEC, Army, 1993) signed by the three parties, and this list subsequently expanded to include 72 sites when the Army completed the SWMU Classification Report, Final (Parsons, 1994), which was required under the terms of the FFA. Subsequently, when SEDA was approved for closure under BRAC in 1995, the Army commissioned an EBS of the entire Depot, where all property and facilities were evaluated, assessed, and classified in accordance with requirements of the Community Environmental Response Facilitation Act [CERFA 42 USC §9620(h)(4), (5)]. As a result of this work, additional sites within, and near, the areas where the ICs are proposed have been investigated and analytical data are available. These data have been reviewed and the Army believes that they support the proposed boundary for the area where the ICs were imposed.

A primary criterion used by the Army to define the proposed boundary of the area where the proposed ICs will be applied is the review of data from previous sampling events from SWMUs or EBS sites identified within and near, the bounded area. Specifically, existing analytical data and information from SEADs 2, 9, 17, 25, 26, 49, 50/54, 55, 66, 67, 68, 121B, 121C, 121D, 121E, 121F, 121G, and 121I support the Army's recommendation of the identified boundary. In all cases, the SEADs either define the limit of area requiring land use controls or are sufficiently close to defining the limits given the large buffer area between the outermost sampling points and the nearest boundary. Thus, the Army contends that the proposed boundary for the area where ICs will be implemented is sufficient to ensure that the surrounding areas are suitable for their intended future use. Further, the proposed extent of the area within the bounded area encompasses a number of sites that the Army currently plans to retain pending the completion of ongoing or scheduled investigations and remedial actions. These sites, the "Retained Sites," include: SEAD 1, 2, 5, 16, 17, 25, 26, 39, 40, 50, 54, 59, 67, 71, 121C, 121I, and 121J.

The boundary of the area where the Army is proposing to implement land use restrictions is shown in Figure 1-3 of the ROD (Parsons, 2004a) and is approximately defined by:

1. Northeast Boundary – The former Depot's perimeter security fence line; this segment is supported by data from SEAD-9.
2. East Central Boundary – The inner fence line that separated the former Depot's Administration Area from the area that is designated as the property of the Elliot Acres Family Housing Area to the east; this segment supported by data from SEADs 121G, 121F, 25, and 68.
3. Southeast Boundary – The former Depot's perimeter security fence line to the southeast; this segment supported by data from SEAD-50/54 and SEADs 49 and 55.
4. South Boundary – Equivalent to the northern boundary of the land that was subject of a federal agency to federal agency transfer where the Loran Transmitter is located to the southeast and the boundary that separated the proposed PID Area from the land transferred to New York for the construction of the Five Points Correctional Facility; this boundary supported by data from SEAD-49, 55 and 26.

5. Southwestern and West Central Boundary – An internal security fence that separates the former warehousing, industrial and administration area from the former Munitions Storage Area to the southwest and along 3rd Street in the west central portion of the site; this boundary supported by data from SEADs 26, 64A, 121I, 121B, 121C and 17.
6. Northwestern Boundary – Along the eastern side of Fayette Road from the west central portion of the site and extending towards the northwest until Fayette Road intersects with West Romulus Road; this portion of the boundary is supported by data from SEADs 2 and 66.
7. Northern Boundary – Along the southern edge of West Romulus Road from the intersection with Fayette Road to the perimeter security fence; this portion of the boundary is supported by data from SEAD-20 and 67.

Additional information substantiating the Army's proposed boundary for the LUCs is provided in Appendix C of the ROD (Parsons, 2004a).

SEADs 25 and 26

The Record of Decision ("ROD") titled "The Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26) (Parsons, 2004b) required the following remedies and establishment of institutional controls ("ICs") at SEAD-25 and SEAD-26.

SEAD-25

The elements that composed the remedy include:

- Excavate soil at the source in an area approximately 60 feet by 100 feet to a depth of 6 feet (approximately 1,350 cy);
- Excavate a volume of sediment approximately 780 feet long, 3 feet wide and 2 feet deep (approximately 175 cy) from the northwest ditch;
- Dispose of excavated soils in an appropriate off-site facility;
- Dewater the excavation pit;
- Treat groundwater that is recovered during excavation and during dewatering of excavation pit with an on-site air stripper;
- Replace excavated soil with clean backfill and establish a ground cover to avoid soil erosion;
- Conduct groundwater monitoring of the plume until NYSDEC Class GA groundwater standards are achieved (approximately 10 years);
- Establish and maintain land use controls to prevent access to or use of groundwater until cleanup standards are met;
- Complete a review of the selected remedy every five-years (at minimum), in accordance with Section 121(c) of the CERCLA;
- Prepare a contingency plan that may include additional monitoring and air sparging of the plume, as necessary; and
- Once groundwater cleanup standards are achieved, the groundwater use restriction may be eliminated.

The cleanup standards for groundwater at the site are NYSDEC Class GA groundwater standards. Until the contaminant levels in the groundwater meet the cleanup standards, a land use control (or institutional control) in the form of a groundwater use restriction will be a part of the remedy.

<u>SEAD-26</u>

The preferred remedy consists of the following elements:

- Excavate surface soils with total carcinogenic PAH concentrations above 10 ppm, for an estimated total of 1050 cy;
- Dispose of excavated soils in an appropriate off-site facility;
- Conduct groundwater monitoring until the groundwater cleanup standards are met (approximately 20 years) in order to ensure that the VOCs present do not migrate off-site;
- Establish and maintain groundwater use controls to restrict groundwater access and use until cleanup standards are achieved;
- Complete a review of the selected remedy every five-years (at minimum), in accordance with Section 121(c) of the CERCLA;
- Prepare a contingency plan that may include additional monitoring and air sparging of the plume, as necessary, which would protect against VOC contamination migrating off-site; and
- Remove groundwater use restrictions once groundwater cleanup standards are achieved.

The cleanup goal for the PAHs is a value of 10 ppm for total carcinogenic PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene] at each sample location. It should be noted that a review of the available site data suggests that the highest concentrations of the greatest contributors to carcinogenic risk (benzo(a)pyrene and dibenz(a,h)anthracene) that would remain on-site following a removal action with 10 ppm as a cleanup goal would be 1200 μg/Kg and 410 μg/Kg, respectively.

The cleanup standards for groundwater at the site are NYSDEC Class GA groundwater standards. Until the contaminant levels in the groundwater meet the cleanup standards, a land use control (or institutional control) in the form of a groundwater use restriction will be a part of the remedy, as specified in the discussion of the remedy for SEAD-25. A summary of the SEAD-25 and SEAD-26 Land Use Controls is provided below.

SEAD-25 AND 26 Land Use Control Performance Objectives

The LUC performance objectives for SEAD-25 and 26 are to:

- Prevent access or use of the groundwater until cleanup levels are met; and
- Maintain the integrity of any current or future remedial or monitoring system.

The land use controls would be implemented over the area bounded by the site boundary at SEAD-25 and SEAD-26. The LUCs will continue until the groundwater beneath has been reduced to levels that allow for unlimited exposure and unrestricted use. With the approval of EPA, once groundwater cleanup standards are achieved, the groundwater use restrictions may be eliminated and the site may be released for unrestricted use.

SEADs 39, 40, and 67

The Army completed a Record of Decision (Parsons, 2007a) titled, "Seventeen No Action/No Further Action SWMUs Requiring Land Use Controls (SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E)" for seventeen sites that include LUCs as part of the remedy. The Sites identified in the ROD to be included in the PID/Warehouse Area were SEADs 39, 40, and 67.

The Record of Decision ("ROD") for the Sites Requiring Institutional Controls in the Planned Industrial/Office Development and Warehousing Areas ("PID/Warehouse Area") (Parsons, 2004a) was previously signed by the Army and EPA for land within the Planned Industrial/Office Development (PID) and Warehousing Area of the former Depot. The PID Area encompasses numerous historic Seneca Army Depot SWMUs. The PID Area-wide land use restriction imposes LUCs that:

- Prohibit residential housing, elementary and secondary schools, childcare facilities and playgrounds activities; and,
- Prohibit access to or use of the groundwater until Class GA Groundwater Standards are met.

These use restrictions result from determinations made specifically for SWMUs designated as SEAD-27 (Building 360 Steam Cleaning Waste Tank), SEAD-64A (Garbage Disposal Area), and SEAD-66 (Pesticide Storage near Buildings 5 and 6) in the PID Area. These land use restrictions were applied to three AOCs discussed in this Record of Decision (Parsons, 2007a) and designated as:

- SEAD-39 (Building 121 Boiler Blow Down Pit);
- SEAD-40 (Building 319 Boiler Blow Down Pit); and,
- SEAD-67 (Dump Site East of Sewage Treatment Plant No. 4).

Future land owners or users of sites located in the PID Area may request a variance to the LUCs identified above on a location-by-location basis. However, the future owner/user seeking the variance will need to provide relevant data to substantiate the validity of its request. Once a request is received, the Army, EPA, and NYSDEC will evaluate and assess waiver requests for land in the PID Area on a case-by-case basis. Otherwise, the LUCs will remain in effect until the concentrations of hazardous substances in the soil and the groundwater beneath the sites have been reduced to levels that allow for unlimited exposure and unrestricted use of the land.

SEADs 1, 2, 5, 16, 17, 59, 71, 121C, and 121I

The RODs titled "The Abandoned Deactivation Furnace SEAD 16 and the Active Deactivation Furnace SEAD 17" (Parsons, 2005b), the "Defense Reutilization and Marketing Office (DRMO) Yard (SEAD 121C) and the Rumored Cosmoline Oil Disposal Area (SEAD-121I)" (Parsons, 2008d), the" Fill Area West of Building 135 (SEAD 59) and the Alleged Paint Disposal Area (SEAD 71)" (Parsons, 2009c) and the" Five Former Solid Waste Management Units (SWMUs), SEAD 1 (Hazardous Waste Container Storage Facility), SEAD 2 (PCB Transformer Storage Facility), SEAD 5 (Sewage Sludge Waste Piles), SEAD 24 (Abandoned Powder Burn Pit) and SEAD 48 (Row E0800 Pitchblende Storage Igloos)" (Parsons, 2009a) require the establishment of institutional controls ("ICs"). The sites identified in theses RODs (SEAD 1, 2, 5, 16, 17, 59, 71, 121C and 121I) are all located within the PID/Warehouse Area.

SEADs 1, 2, and 5

The common elements of the selected remedies at SEADs 1, 2, and 5 include:

- Establishing, maintaining, monitoring, and reporting on a land use control (LUC) that prohibits residential housing, elementary and secondary schools, childcare facilities and playgrounds until unrestricted use and unlimited exposure criteria are attained within the areas of concern (AOCs); and,
- Establishing, maintaining, monitoring, and reporting on a second LUC that prohibits access to and use of groundwater at the AOCs until its quality allows for unrestricted use and unlimited exposures.

In addition, at SEAD-5, the selected remedy requires:

- Covering of contaminated soils (including those originating at SEADs-59 and 71) with at least one foot of clean fill that meets New York's Restricted Commercial Use soil cleanup objectives (SCOs);
- Placing demarcation fabric (e.g., colored "snow" or safety fence) between the contaminated soil and the clean fill; and,
- Establishing, maintaining, monitoring, and reporting on a third LUC that prohibits unauthorized excavations or activities that might compromise the integrity of the engineered cover.

As the selected remedies for the latter three AOCs (i.e., SEADs 1, 2, and 5) do not allow unrestricted use and unlimited exposures, the Army or its successors will be required to complete a review of the selected remedies at least once every five years, in accordance with Section 121(c) of the CERCLA.

The common LUC performance objectives for SEADs 1, 2, and 5 are to:

- Prohibit access to, or use of, the groundwater until groundwater cleanup standards are achieved; and,
- Prohibit the use of the land within the AOCs for residential housing, elementary and secondary schools, childcare facilities, and playground activities.

At SEAD-5, the additional LUC performance objective is to:

- Prohibit unauthorized excavation or other activities that could compromise the integrity of the engineered cover.

SEADs 1, 2, and 5 represent a small portion of a larger tract of land located in the east-central portion of the former SEDA that comprises the Planned Industrial/Office Development and Warehousing (PID) Area that has been transferred to the SCIDA, exclusive of any Army retained property. Based on an agreement reached between the Army, the EPA, and the NYSDEC, the entire PID Area, exclusive of Army retained property, is subject to equivalent LUCs (i.e., prohibit groundwater access/use; prohibit residential housing/elementary and secondary schools/childcare facilities/playgrounds) as are proposed for imposition at SEADs 1, 2, and 5. The referenced LUCs comprised the remedy selected in a 2004 ROD

(Parsons, 2004a) for SEADs 27, 64A, and 66, three other AOCs within the PID Area, due to levels of contaminants that were identified at those AOCs. At the time of the 2004 ROD, the Army, EPA, and NYSDEC agreed that these LUCs should be applied to all land within the greater PID Area, pending the provision and evaluation of new data for specific sites within the PID Area if a future owner or occupant wished to apply for a variance from the specified LUCs. The PID Area LUCs were implemented when the PID Area was transferred to the SCIDA by the Army, but they are not applied to the land comprising SEADs 1, 2, or 5, as these parcels were retained by the Army at the time of the greater PID Area's transfer, pending completion of necessary investigations and studies, the evaluation of potential remedial actions, and the selection of an approved remedy for SEADs 1, 2, and 5. The Army will ensure that the LUCs selected in this ROD will be maintained and enforced, until such time as the Army transfers these properties to other owners. The locations of SEADs 1, 2, and 5, and the land that is subject to institutional controls in the PID Area are shown in **Figure 3-1**.

The unauthorized excavation LUC for SEAD-5 will be implemented only at that location where the protective cover is established over SEAD-5 soils. The location where engineered cover is installed will be documented during the Remedial Design phase, and formally documented subsequent to the completion of the remedial action at this AOC.

The Army shall, through the on-site Commander's representative or other designated official, implement, maintain, inspect, report on, and enforce the remedy described in the ROD (Parsons, 2009a). The ROD (Parsons, 2009a) selected as the remedy for SEAD-1, SEAD-2, and SEAD-5, LUCs (i.e., prohibit unauthorized excavations, SEAD-5 only; and groundwater access/use and land use limitations, SEAD-1, SEAD-2, and SEAD-5) to be imposed by an environmental easement at the time when land comprising SEAD-1, SEAD-2, or SEAD-5 is transferred from Army ownership to another party, as well as the prohibition of any pre-transfer use inconsistent with the LUCs. Although the Army may later transfer these responsibilities to another party, the Army shall retain ultimate responsibility for remedy integrity.

<u>SEADs 16 and 17</u>

The selected remedy for SEAD-16 and SEAD-17 addresses contaminated soil, building debris, and groundwater. The selected remedy will result in the removal of soil and groundwater as a pathway for potential receptors. Groundwater will be monitored to ensure that soil contamination left on-site does not further degrade groundwater quality.

The elements that compose this remedy include:

- Conduct additional sampling as part of the pre-design sampling program to further delineate the areas of excavation;
- Remove, test, and dispose of the SEAD-16 building debris off-site;
- Excavate approximately 275 cy of ditch soil with lead concentrations greater than 1250 mg/Kg until cleanup standards are achieved;

- Excavate approximately 1760 cy of surface soils at SEAD-16 with lead concentrations greater than 1250 mg/Kg, and polycyclic aromatic hydrocarbon (PAH) and metal concentrations greater than risk-based derived cleanup standards;
- Excavate approximately 67 cy of subsurface soils at SEAD-16 (areas around SB16-2, SB16-4, and SB16–5) with lead concentrations greater than 1250 mg/Kg, and PAH and metal concentrations greater than risk-based derived cleanup standards;
- Excavate approximately 2590 cy of surface soils at SEAD-17 with lead concentrations greater than 1250 mg/Kg and metal concentrations greater than risk-based derived cleanup standards;
- Stabilize soils from SEAD-16 and SEAD-17 and building debris from SEAD-16 exceeding the toxicity characteristic leaching procedure (TCLP) criteria in order to attain Land Disposal Restrictions (LDR);
- Dispose of the excavated material in an off-site landfill;
- Backfill the excavated areas with clean backfill;
- Conduct groundwater monitoring at SEAD-16 and SEAD-17 until concentrations are below the GA criteria;
- Submit a Completion Report following the remedial action;
- Establish and maintain land use controls (LUCs) to prevent access to or use of the groundwater and to prevent residential use until cleanup standards are met; and
- Complete a review of the selected remedy every five years (at minimum), in accordance with Section 121(c) of the CERCLA.

To complete Resource Conservation and Recovery Act (RCRA) closure of the deactivation furnace at SEAD-17, the Army will either further decontaminate or demolish and dispose offsite the structures that failed to meet closure standards during the interim closure (i.e., concrete slabs and block walls).

The LUC performance objectives for SEAD-16 and SEAD-17 are to:

- Prevent access to or use of the groundwater until cleanup levels are met; and
- Prevent residential housing, elementary and secondary schools, childcare facilities and playgrounds activities.

The LUCs would be implemented over the area bounded by the boundary at SEAD-16 and SEAD-17. The boundary of SEAD-16 is defined as the fence; SEAD-17 is bounded by the fence to the east and by natural boundaries, such as ditches. It should be noted that land within the Planned Industrial/Office Development (PID) area, which includes SEAD-16 and SEAD- 17, is also subject to a separate Proposed Plan and ROD that include institutional controls (ICs) (Parsons, 2004a). Groundwater use restrictions will continue until groundwater constituent concentrations have been reduced to levels that allow for unlimited exposure and unrestricted use. With EPA approval, once groundwater cleanup standards are achieved, the groundwater use restrictions may be eliminated.

SEADs 59 and 71

The selected remedies for SEAD-59 and SEAD-71 address contaminated soil and groundwater. The selected remedies will result in the removal of soil and groundwater as exposure pathways for potential receptors.

The elements that compose the selected remedies at SEAD-59 and SEAD-71 include land use controls (LUCs) that:

- Prohibit access to or use of the groundwater until unrestricted use and unlimited exposure criteria are attained; and,
- Prohibit the development or use of the property for residential housing, elementary and secondary schools, childcare facilities and playgrounds until unrestricted use and unlimited exposure criteria are attained at SEAD-59 and SEAD-71.

Soils excavated from SEAD-59 and SEAD-71 that remain staged in stockpiles in the vicinity of the two AOCs will be moved to SEAD-5 where they will continue to be managed by the Army. Although these soils contain measureable concentrations of hazardous substances, they are not hazardous by characteristic determinations (i.e., toxicity characteristic, ignitability, corrosivity, and reactivity). It is possible that the stockpiled soil will subsequently be used as part of a multi-layered cap that may be constructed over SEAD-5 soil to address conditions that have been identified at that AOC.

SEAD-59 and SEAD-71 represent a small portion of a larger tract of land located in the east-central portion of the former SEDA that comprises the Planned Industrial/Office Development and Warehousing (PID) Area that has been transferred to the SCIDA, exclusive of any Army retained property. Based on an agreement reached between the Army, the EPA, and the NYSDEC, the entire PID Area, exclusive of Army retained property, is subject to equivalent LUCs (i.e., prohibit groundwater access/use; prohibit residential housing/elementary and secondary schools/childcare facilities/playgrounds) as are proposed for imposition at SEAD-59 and SEAD-71 in this ROD. The referenced LUCs were the remedy selected in a 2004 ROD (Parsons, 2004) for SEAD 27, 64A, and 66, three other AOCs within the PID Area, due to levels of contaminants that were identified at those AOCs. At the time of the 2004 ROD, the Army, EPA, and NYSDEC agreed that these LUCs should be applied to all land within the greater PID Area, pending the provision and evaluation of new data for specific sites within the PID Area if a future owner or occupant wished to apply for a variance from the specified LUCs. The PID Area LUCs were implemented when the PID Area was transferred to the SCIDA by the Army, but they are not applied to the land comprising SEAD-59 and SEAD-71, as these parcels were retained by the Army at the time of the greater PID Area's transfer, pending completion of necessary investigations and studies, the evaluation of potential remedial actions, and the selection of an approved remedy for SEAD-59 and SEAD-71.

The Army shall, through the on-site Commander's representative or other designated official, implement, inspect, report on, and enforce the remedy described in the ROD (Parsons, 2009c). The ROD (Parsons, 2009c) selected as the remedy for SEAD-59 and SEAD-71 LUCs (i.e., groundwater access/use and land use limitations) to be imposed by an environmental easement at the time when land comprising SEAD-59 or SEAD-71 is transferred from Army ownership to another party, as well as the prohibition of any pre-transfer use inconsistent with the LUCs. Although the Army may later transfer these responsibilities to another party, the Army shall retain ultimate responsibility for remedy integrity.

SEDAs 121C and 121I

The selected remedies for SEAD-121C and SEAD-121I address contaminated soil and groundwater. The selected remedies will result in the elimination of soil and groundwater as exposure pathways for potential receptors.

The elements that compose the selected remedies at SEAD-121C and SEAD-121I include:

- Establish and maintain land use controls (LUCs) that prohibit residential housing, elementary and secondary schools, childcare facilities, and playgrounds until unrestricted use and unlimited exposure criteria are attained at the two AOCs; and,
- Establish and maintain LUCs that prohibit access to, and use of, groundwater until its quality allows for unrestricted use and unlimited exposure.

As the selected remedies for the AOCs do not allow unrestricted use and unlimited exposures, the Army or its successors will be required to complete a review of the selected remedies every five years (at minimum), in accordance with Section 121(c) of the CERCLA.

The LUC performance objectives for SEAD-121C and SEAD-121I are to:

- Prohibit access to or use of the groundwater until New York State's GA groundwater standards are achieved; and,
- Prohibit residential housing, elementary and secondary schools, childcare facilities and playgrounds activities.

The LUCs will be implemented over the land contained within the boundaries of SEAD-121C and SEAD-121I. Equivalent LUCs have been implemented over other land that is located within the greater Planned Industrial/Office Development and Warehousing Area (PID Area) at the Depot, but these LUCs were not imposed on parcels of land within the PID Area that were retained by the Army, pending completion of the CERCLA regulatory process. The existing PID Area-wide LUCs were implemented as a result of conditions identified in SEADs 27, 64A, and 66 and these conditions are presented in the Record of Decision (Parsons, 2004a). The location of SEAD-121C, SEAD-121I, and the land that is subject to institutional controls in the PID Area are shown in **Figure 3-1** (Note: original reference to Figure 1-1 of the ROD (Parsons, 2008d)). Under the 2004 PID Area-wide ROD, LUCs have been implemented for those properties within the PID Area that are the subject of the 2004 PID ROD to prohibit residential housing, elementary and secondary schools, childcare facilities, and playground activities, and to prohibit access to and use of the groundwater. The restrictions may be removed at specific AOCs or specific portions of the PID Area upon a determination by the Army and EPA, with concurrence from the NYSDEC, that soil and groundwater constituent concentrations at such areas are at levels that allow for unrestricted exposure and unrestricted use.

3.1.1.3 Remedy Implementation and Remedial Systems

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") (USACE, 2006) implemented land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). This SEAD LUC RD exempted 14 sites, or parcels, identified as Army Retained Sites. Two of those parcels were identified as SEAD-25, Fire Training and Demonstration Pad and SEAD-26, Fire Training Pit and Area. Subsequently, the Army completed the remediation of those two parcels and implemented LUCs thereon, pursuant to the September 29, 2004 Record of Decision. Addendum 1 to the SEAD LUC RD (USACE, 2007) included these sites in accordance with the SEAD LUC RD Supplementation provision. Addendum 2 to the SEAD LUC RD (USACE, 2008a) included SEADs 39, 40, and 67 (among others) in accordance with the SEAD LUC RD Supplementation provision. Addendum 4 to the SEAD LUC RD (USACE, 2009) included SEADs 1, 2, 5, 16, 17, 59, 71, 121C and 121I in accordance with the SEAD LUC RD Supplementation provision.

The Remedial Design ("RD") and subsequent Addendums containing the land use controls ("LUCs") that are required by the aforementioned RODs are described in the following paragraphs. These ICs were chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan.

Summary of the Remedial Actions

<u>SEAD-25 and 26</u>

This Construction Completion Report (Parsons, 2006a) for the Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26), describes remedial action activities at SEAD-25 and SEAD-26 and presents sample collection and laboratory test results, record survey data, record (as-built) drawings, and photo documentation to demonstrate compliance with the requirements set forth by the ROD (Parsons, 2004b) and the Remedial Design Work plan and Design Report (Parsons, 2005a).

<u>SEAD-25</u>

The excavation of the BTEX impacted soil at the pad at SEAD-25 began on November 15, 2005 and was completed on December 1, 2005, with soil removal totaling 961 cy. The depth of excavation extended to shale bedrock, approximately 4.5 feet below ground surface (bgs). Ten confirmatory soil samples (plus one duplicate sample) were collected from the sidewalls of the excavation area and analyzed for VOCs and SVOCs. All confirmatory soil samples representative of soil remaining onsite at the pad achieved the site-specific cleanup goals, and the soils at SEAD-25 do not require further action. The excavation of the soil at the pad removed the source of groundwater contamination.

Excavation of the SVOC impacted swale at SEAD-25 began on November 7, 2005 and was completed on November 8, 2005. The excavation extended from the toe of slope on one bank to the toe of slope on the other bank, resulting in the removal and off-site disposal of the swale soil (761 cy) at SEAD-25. Since the swale bottom consisted of exposed competent bedrock following excavation, no native material remained in the swale and confirmatory samples were not collected.

A total of 1,722 cy (approximately 2,600 tons) of soil were excavated from the pad and the swale at SEAD-25 and disposed off-site at Ontario County Landfill. The pad excavation was backfilled and restored to the existing grade.

SEAD-26

The initial excavation at SEAD-26 began on November 9, 2005 and was completed on November 15, 2005. Five distinct areas at SEAD-26 were excavated to a depth of 1 foot bgs, and a total of 828 cy (1,248 tons) of soil was excavated and disposed off-site. Forty-two (plus three duplicates) confirmatory soil samples were collected from the perimeter and the base of each of the five excavation areas and were analyzed for cPAHs. The edges of the five excavation areas were smoothed. All confirmatory samples representative of soil remaining on-site met the soil cleanup goals. Additional remediation of soils at SEAD-26 is not required.

SEAD-5

The Construction Completion Report (CCR) for the Former Sewage Sludge Waste Piles (SEAD-5) located at the Seneca Army Depot Activity (SEDA or Depot) Seneca County, New York (Parsons, 2010c) provided record documentation of the completed remedial action construction activities. It provides documentation that accessible soil remaining in the area of the former sludge pile locations meets the remedial goals defined in the Record of Decision for the former area of concern (AOC).

Parsons Infrastructure & Technology Group, Inc. (Parsons) and the selected earthwork contractor, S. St George Enterprises, Inc. (St. George), mobilized to SEAD-5 on June 30, 2009. After the completion of pre-construction activities, construction activities began on July 6, 2009. The scope of activities are delineated in the final Remedial Action Operations Plan, Former Sludge Waste Piles (SEAD-5), Seneca Army Depot Activity (Parsons, 2009e). The purpose of the SEAD-5 construction activities was to construct a soil cover to inter a portion of SEAD-5 where analytical results from soil samples indicated that elevated levels of certain hazardous substances, including benzo(a)pyrene were present at concentrations that posed potential human health risks to future industrial occupants and users of the land.

Stockpiled soil from a prior removal action at other neighboring areas of concern was removed from its staging locations then spread within the defined boundaries of the proposed soil cover; after spreading, the soil was graded and compacted. A layer of demarcation fabric was placed atop the initial layer of spread stockpile soil to delineate the lateral extent of the covered soil. One foot of on and off-site borrow material of quality that meets Restricted Commercial Use soil cleanup objectives (SCOs) defined by the State of New York Department of Environmental Conservation (NYSDEC) was then placed over the interred soil, the initial cover layer, and demarcation fabric as a protective barrier layer. The on-site borrow material consists of clean crushed concrete and gravel; the off-site borrow material consists of bank run sand obtained from an approved off-site source.

Confirmatory samples collected from the crushed concrete, the gravel, and the bank run sand were collected and analyzed in accordance with the requirements of the Final Work Plan. Results of the chemical characterization samples confirm that each of the identified borrow material is suitable for use as cover material in accordance with NYSDEC Commercial Use SCOs as concentrations of VOCs, SVOCs, pesticides/PCBs, and metals fall below the guidance values.

The initial cover layer soil consists of approximately 5,620 cy of SEAD-59/71 stockpile soil. This soil covered approximately 68,720 square feet (1.57 acres) or 1.57 acres of land. The final cover layer consists of approximately 2,400 cy of off-site borrow material and 600 - 650 cubic yards of crushed concrete and gravel. The crew demobilized from SEAD-5 on July 14, 2009. In early November 2009, the area of the soil cover was seeded with winter wheat to promote growth of vegetation to stabilize the soil cover.

The remedial objectives for SEAD-5 have been achieved and no further construction activities are required. The approved remedy for SEAD-5 requires that three Land Use Controls (LUCs) be implemented, monitored, maintained, and that the continuing protectiveness of the soil cover and the Seneca Army Depot Activity Final Construction Completion Report for SEAD-5 LUC remedial action be assessed and periodically reported during future years. As a continuance of the remedial action, the Army prepared, submitted, and implemented a LUC remedial design (USACE, 2009) that details and implements the three LUCs. Additionally, the Army or the future owner of the land will conduct periodic inspections to document and ensure ongoing LUC compliance and the integrity of the soil cover, and provide summary reports of findings and recommendations to the Environmental Protection Agency, Region II (EPA) and the NYSDEC.

SEADs-16 and 17

The Construction Completion Report (CCR) (Parsons, 2008e) for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), located at the Seneca Army Depot Activity (SEDA or the Depot) in Romulus, New York provides documentation of the removal action construction activities completed at the two historic solid waste management units (SWMUs). In addition, post-remediation groundwater sampling results indicate that groundwater has not been significantly impacted by site activities, and recommends annual groundwater monitoring and reevaluate as part of the Five-Year Review. The CCR provides documentation that all soil exceeding cleanup goals were removed and no further action is required for soil at the SWMUs.

SEAD-16

During April and May 2007, prior to the commencement of the remedial action (RA), pre-excavation soil samples were collected outside of the planned excavation area to supplement the existing analytical data from the remedial investigation (RI) and to delineate the full extent of the excavation area. Once the analytical results from the pre-excavation samples were reviewed and assessed, Parsons and the selected earthwork contractor, S. St George Enterprises, Inc., (St. George) mobilized to SEDA on July 9, 2007 to conduct necessary construction activities.

The initial (Phase I) excavation area at SEAD-16, which was delineated, based on metal and carcinogenic polycyclic aromatic hydrocarbon (cPAH) concentrations measured in the pre-construction activity soil samples, was excavated to a depth ranging from 1 foot to 3 feet below ground surface (bgs) as specified in the Final Work Plan. Once the Phase I excavation was completed, floor, perimeter, and sidewall confirmatory soil samples were collected and analyzed for selected metals and cPAH compounds.

Confirmatory soil samples were collected at a frequency of one sample for every 2,500 square feet (sf) or less of excavation floor, and at a frequency of one perimeter or sidewall sample for every 50 linear feet (lf) or less of excavation perimeter. Sidewall samples were collected instead of perimeter samples when the completed excavation extended deeper than 2 feet bgs. The soil samples were analyzed for metals (antimony, arsenic, cadmium, copper, lead, mercury, thallium, and zinc), while selected samples were also analyzed for cPAHs. The resulting metal and cPAH concentrations for confirmatory samples were compared to the cleanup goals defined in the Final Work Plan.

The Phase I excavation soil sample results indicated that samples collected from eight locations failed to meet the established cleanup goals. As such, Parsons and St. George returned to SEAD-16 and completed additional excavations (i.e., the Phase II excavations) to ensure that all soil left at the SWMU met the cleanup goals established in the Final Work Plan for metals and cPAHs. The Phase II excavation at SEAD-16 was completed on August 2, 2007. When Phase II confirmatory samples were collected and analyzed, analytical results indicated that all Phase II samples met the cleanup goals.

The extent of excavations completed at SEAD-16 is documented and verified by the analytical results obtained for 34 (plus three field duplicates) floor samples, 35 (plus three field duplicates) perimeter samples, and seven (plus one field duplicate) sidewall samples, which were collected in accordance with the frequency requirement identified in the Final Work Plan. The final depth of excavation completed at SEAD-16 varied from 1 foot to 3 feet.

During remedial action construction activities, the excavated soil was temporarily staged within the limits of the excavation area before it was loaded out, transported off-site, and disposed at a licensed landfill by Riccelli Enterprises, Inc. A total of 2,532 tons, or approximately 1,862 cy, of soil were excavated from SEAD-16 and disposed at Ontario County Landfill in Flint, New York (NY).

<u>SEAD-17</u>

Pre-construction activity soil samples were also collected from the area of the planned excavation at SEAD-17 prior to the commencement of the remedial action. The resulting analytical results were used to supplement the available RI data from SEAD-17 and to delineate the extent of the excavation area.

Parsons and St. George initiated excavations at SEAD-17 during the week of July 9, 2007. The Phase I excavation performed at SEAD-17 extended to a depth of approximately 1 foot bgs as specified in the Final Work Plan, and was delineated laterally using metal concentrations observed in soil samples obtained during the RI and pre-construction activity sampling and analysis sequences. Once the Phase I excavation was completed at SEAD-17, floor and perimeter confirmatory soil samples were collected and analyzed for designated metals of interest. Confirmatory soil samples were collected at the frequency specified in the Final Work Plan (i.e., one excavation floor soil sample for every 2,500 sf or less of area, and one perimeter sample for every 50 lf or less of excavation perimeter). Each of the soil samples was analyzed for metals (antimony, arsenic, cadmium, copper, lead, mercury, thallium, and zinc). The reported concentrations for the confirmatory samples were compared to the cleanup goals, and the SEAD-17 Phase I excavation results indicated that samples collected from 16 locations failed to meet the cleanup goals. Additional Phase II excavations were subsequently completed in the areas where confirmatory soil sample concentrations exceeded cleanup goals to ensure that all soil left at the SWMU met the cleanup goals for metals. The Phase II excavation was completed on August 2, 2007. Phase II confirmatory soil samples were subsequently collected and analyzed and the analytical results indicate that all Phase II samples met the established cleanup goals.

The extent of excavation completed at SEAD-17 is documented and verified by the analytical results for 37 (plus one field duplicate) floor samples and 25 (plus one field duplicate) perimeter samples, which were collected in accordance with the frequency requirement identified in the Final Work Plan. The final depth of excavation after all of the phases were completed varied from 1 foot to 2 feet.

During each excavation phase performed at SEAD-17, the excavated soil was temporarily staged within the excavation area, prior to load out, transport and disposal at a licensed landfill by Riccelli Enterprises, Inc. A total of 3,540 tons (approximately 2,565 cy) of soil were excavated from SEAD-17 and disposed at Ontario County Landfill in Flint, NY.

Once the excavations and confirmatory sampling were completed at both SEAD-16 and SEAD-17, areas that were excavated to a depth of 2 feet or greater, as well as the excavation areas surrounding railroad tracks, were backfilled with clean bank-run gravel. SEAD-16 and SEAD-17 were graded to promote positive drainage. SEAD-16 was not seeded since it was not previously vegetated. Areas of SEAD-17 that were vegetated prior to construction were seeded to promote re-vegetation.

The cleanup objectives for SEAD-16 and SEAD-17 have been achieved and no further action is required for soil at either of the SWMUs. Post-remediation groundwater sampling conducted in 2007 at SEAD-16 and SEAD-17 confirms that groundwater has not been impacted by site activities, though some metals were detected above their respective New York State Department of Environmental Conservation (NYSDEC; 1998 with addendum) Class GA groundwater standards. Therefore, the Army will continue to monitor the groundwater at SEAD-16 and SEAD-17 annually and reevaluate during the Five-Year Review.

<u>SEADs-59 and 71</u>

The Construction Completion Report (CCR) for the Former Sewage Sludge Waste Piles (SEAD-5) located at the Seneca Army Depot Activity (SEDA or Depot) Seneca County, New York (Parsons, 2010c) provided record documentation of the completed remedial action construction activities for SEADs 59 and 17. Stockpiled soil generated during the SEAD-59/71 remedial actions was used as the initial cover layer at SEAD-5. The SEAD-59/71 stockpiles were staged on plastic sheeting at various locations in, and adjacent to, SEAD-5. According to the Final Work Plan, approximately 5,428 cy of stockpiled soil was staged at SEAD-59. Prior to relocating any stockpile material to SEAD-5, Parsons and St. George confirmed with the Army that only those stockpiles that originated from the SEAD-59/71 remedial action projects, and not others, were used as initial fill at SEAD-5. SEAD-59/71 stockpiles could be distinguished from others that had been subsequently staged in the area based on the presence of plastic beneath the piles that originated from the remedial action work.

In accordance with the Final Work Plan, samples were not collected from the stockpiles associated with the SEAD-59/71 TCRA. The character and quality of this material has been determined and is documented in the Draft Final, Phase II Remedial Investigation Report, Fill Area West of Building 135 (SEAD-59) and the Alleged Paint Disposal Area (SEAD-71) (Parsons, 2006d). This soil was compared to the NYSDEC Restricted Commercial Use SCOs.

The majority of the concentrations detected above NYSDEC Restricted Commercial Use SCOs were cPAHs; one concentration exceeded the lead SCO. Based on sampling, analysis, and a human health risk assessment, the stockpiled soil was found to contain residual levels of hazardous substances including PAHs, cPAHs, and selected metals at concentrations that do not pose unacceptable risk to future commercial and industrial occupants of the area. Additionally, the stockpiled soil was determined not to be a characteristic hazardous waste. As such, this material had been retained by the Army pending its future use as fill at another site where the designated use was either commercial or industrial. During the development and finalization of the Proposed Plan and the Record of Decision for SEAD-5, the Army, the EPA, and the NYSDEC agreed that this would be used as part of the soil cover constructed over cPAH-contaminated soils at the site. At the completion of the application and grading of the initial soil cover layer, 68,720 square feet (1.57 acres) of land within SEAD-5 was covered.

LUC Objectives and Land Use Restrictions

The PID/Warehouse Area ROD LUC Objectives at the Controlled Property are as follows:

- Prevent residential housing, elementary and secondary schools, childcare facilities and playground activities.
- Prevent access to or use of the groundwater until NYS Class GA Groundwater Standards are met.
- Prevent unauthorized excavation at the SEAD-64A Controlled Property.
- Maintain the integrity of any current or future remedial or monitoring system at the SEAD-25 and SEAD-26 Controlled Property.
- Prohibit unauthorized excavation or other activities that could compromise the integrity of the engineered cover at SEAD-5.
- Conduct groundwater monitoring at SEAD-16 and SEAD-17 until concentrations are below the GA criteria.

Specifically, the residual contamination at the Controlled Property will not pose an unacceptable threat to human health and the environment provided the following Land Use Restrictions are employed:

1. Commercial/Industrial Use Restriction.

   The Controlled Property shall be used solely for commercial and industrial purposes and not for residential purposes, such real property having been remediated only for commercial and industrial uses. Commercial and industrial uses include, but are not limited to, administrative/office space, manufacturing, warehousing, restaurants, hotels/motels, and retail activities. Residential use includes, but is not limited to, housing; day childcare facilities; schools (excluding education and training programs for persons over 18 years of age); assisted living facilities; and outdoor recreational activities (excluding recreational activities by employees and their families incidental to authorized commercial and industrial uses on the Controlled Property).

2. Groundwater Restriction.

   Other than for the installation of and obtaining samples from groundwater monitoring wells, there shall be no access to or use of the groundwater on the Controlled Property for any purpose without the prior written approval of the U.S. Department of the Army (the "Army"), the U.S. Environmental Protection Agency Region II ("EPA Region II"), and the New York State Department of Environmental Conservation ("NYSDEC").

3. Excavation Restriction.

   No digging or excavation shall be permitted on the SEAD-64A Controlled Property without prior written approval of the Army, EPA Region II, and NYSDEC.

   Prevent unauthorized excavations or activities that might compromise the integrity of the engineered cover (applies to SEAD-5).

A map showing the location of the PID/Warehouse Area and the boundaries of the land use restrictions is attached hereto as the Land Use Restriction Map (**Figure 3-1**).

Note - The PID/Warehouse Area ROD also proposed establishment of an area-wide set of land use restrictions for the PID/Warehouse Area. The area wide land use restrictions simplify IC 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 PID/Warehouse Area also includes No Action/No Further Action ("NA/NFA") sites. These sites may be suitable for uses other than industrial. Upon request by a future property owner, the Army, EPA Region II, and NYSDEC will evaluate any requested variances to the land use restrictions regarding a NA/NFA site on a site-by-site basis.

Implementation Actions

The following LUC Implementation Actions were achieved and implemented to prevent future violation of the LUC Objectives and Land Use Restrictions:

1. Lease restrictions – N/A for the PID/Warehouse Area.

2. Environmental Easement - The Army prepared environmental easements consistent with N.Y. Code Env. Section 27-1318(b) that provide for NYSDEC monitoring of the LUCs set forth in the RD, which were recorded immediately prior to the transfer of the PID/Warehouse Area from the federal government. The environmental easements will ensure the ability of NYSDEC to enforce the LUCs in the future. Notifications about the existence of the environmental easements were identified in the deeds associated with the parcel transfer. The Easements do not negate or transfer the Army's ultimate responsibility under CERCLA Section 120(h)(3) and the Seneca Army Depot Federal Facilities Agreement ("FFA").

3. Deed restrictions –

a. The PID/Warehouse Area property was transferred with the land use restrictions, consistent with the LUC Objectives defined above. The deeds for the PID/Warehouse Area incorporate by reference the land use restrictions set forth in the Environmental Easements. The deeds were recorded in the Seneca County Clerk's Office on March 4, 2008 and June 10, 2011. The Army provided copies of the executed PID/Warehouse Area deeds to EPA Region II and NYSDEC.

b. CERCLA Notice and Covenant. The deeds include a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

c. Reservation of Access. The deeds also contain a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deeds contain appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

4. Annual Certification – The Army and/or future property owner shall annually, or within such time as NYSDEC may allow (with the consent of EPA Region II and the Army), submit to NYSDEC, with a copy to EPA Region II (and to the Army, if the certification is submitted by a future property owner), a written statement in accordance with N.Y. Code Env. Section 27-1318(c). The statement will prepared by an expert NYSDEC may find acceptable certifying under penalty of perjury that the controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls employed at the Controlled Property were approved by NYSDEC, and that nothing has occurred that would impair the ability of such control to protect the public health and environment or constitute a violation or failure to comply with this Remedial Design for such controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.

5. Five-Year Review - The Army will review the LUC remedy as part of the Five-Year Review and Report. The report will address the effectiveness of the LUC remedy and whether any LUC Objective, Land Use Restriction, or Implementation Actions should be modified.

Enforcement

1. Army LUC Enforcement. If the Army becomes aware of an action that interferes with or violates a LUC Objective or Land Use Restriction, it will attempt to resolve the matter informally with the responsible party (i.e., the property owner or occupant). The Army will notify EPA Region II and NYSDEC regarding the matter within three (3) days of becoming aware of the violation. If the matter is not resolved, the Army will notify EPA Region II and NYSDEC regarding the result of

its informal resolution efforts (e.g., any corrective action) within ten (10) days of discovery of the violation.

2. NYSDEC LUC Enforcement. If the NYSDEC becomes aware of an action that interferes with or violates a LUC Objective or Land Use Restriction, it will take action to resolve the matter in accordance with the enforcement procedures set forth in the Environmental Easement. The NYSDEC will notify the Army and EPA Region II regarding the matter within three (3) days of becoming aware of the violation. If the matter is not resolved, the NYSDEC will notify the Army and EPA Region II regarding the results of its resolution efforts (e.g., any corrective action) within ten (10) days of discovery of the violation.

3. If a LUC Objective or Land Use Restriction violation is not resolved within ten (10) days of the Army and/or the State becoming aware of it, the Army, EPA Region II, and NYSDEC will consult on appropriate actions to reestablish protectiveness. These actions may range from continued informal resolution efforts with the property owner or the violator, to the initiation for judicial action under state property law or CERCLA. It should be noted that the U.S. Department of Justice (DOJ) has the ultimate authority for bringing legal actions on behalf of federal agencies to enforce deed restrictions or other institutional controls. Under the LUC RD, the Army is responsible for requesting that DOJ seek judicial enforcement of the LUC Objectives and Land Use Restrictions. Nothing in this provision shall be construed to limit the ability of the EPA Region II, and NYSDEC to take appropriate enforcement measures against the party or parties responsible for LUC Objective or Land Use Restriction violations.

Modification

Future property owners may seek modifications of the LUC Objectives or Land Use Restrictions (e.g., approval to excavate at the SEAD-64A Controlled Property) or Implementation Actions (e.g., changing the frequency of the annual certification) in writing to the Army, EPA Region II, and NYSDEC. If the Army, EPA Region II, and NYSDEC determine that it is appropriate to modify the LUC Objectives or Implementation Actions, the Army, EPA Region II, and NYSDEC will provide written approval of the modification request and the Army will revise the RD accordingly.

Note –To the extent that modification of this RD requires a concurrent amendment to the Environmental Easement, the Environmental Easement may be amended only by a written amendment executed by the NYSDEC Commissioner and filed with the Seneca County Clerk's Office.

Termination

The LUC RD and its Objectives, Specific Restrictions, and Implementation Actions shall remain in effect until such time as the Army, EPA Region II**,** and NYSDEC agree that concentrations of hazardous substances or hazardous constituents have been reduced to levels that allow for unrestricted use of and unrestricted exposure at the Controlled Property (e.g., the groundwater contamination levels are below the New York State groundwater quality standards and the soil contamination levels are below levels that equate to an excess lifetime cancer risk between 1 x 10^{-4} and 1 x 10^{-6} and a Hazard Index of 1.0 or less). If any LUC Objectives, Land Use Restrictions, and/or Implementation Actions may no longer be needed, the Army will request a meeting with EPA Region II and NYSDEC to determine whether any such provision of this RD may be terminated.

The Environmental Easement referred to above may be extinguished by the NYSDEC Commissioner, but only after termination of the LUCs pursuant to Section 7 of the RD. The extinguishment of the Environmental Easement shall be filed with the Seneca County Clerk's Office in the manner prescribed by Article 9 of the Real Property Law.

3.1.1.4 Systems Operations/Operation & Maintenance

Not applicable; no active remedy.

3.1.1.5 Data Review

3.1.1.5.1 Institutional Control Review

The Land Use Control Remedial Design (LUC RD) For SEAD 27, 66, and 64A ("SEAD LUC RD") implemented land use controls for the entire SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 1 to the SEAD LUC RD added SEAD 25, and 26 in accordance with the SEAD LUC RD Supplementation provision. Addendum 2 to the SEAD LUC RD added SEAD 39, 40, and 67. Addendum 4 to the SEAD LUC RD added SEADs 1, 2, 5, 16, 17, 59, 71, 121C and 121I in accordance with the SEAD LUC RD Supplementation provision.

Environmental Easement

An Environmental Easement for the Warehouse/Planned Industrial Development Area was executed on January 31, 2008 and recorded in the Seneca County Clerk's Office on March 4, 2008. A second Environmental Easement that included properties that had been retained by the Army in 2008 was executed on Febriuary 14, 2011 and was recorded in the Seneca County Clerk's office on June 10, 2011. These Environmental Easements were reviewed during the preparation of this report with the following findings:

1. The environmental easements were granted by the United States of America (the Grantor) by an instrument that complies with the requirements of section 5-703 of the general obligations law.
2. As evidenced by the Department's acceptance of the Easements, the Grantor furnished to the Department abstracts of title and other documents sufficient to enable the Department to determine that the easements shall be enforceable. The environmental easements are in a form prescribed by the Department. The environmental easements describe the property encumbered by the easements by adequate legal description. The environmental easements:
    a. name the state, acting through the department, as grantee;
    b. contain a complete description of the use restrictions and engineering controls to which the property is subject;
    c. run with the land, binding the owner of the land and the owner's successors and assigns;
    d. include an acknowledgment by the Commissioner of acceptance of the easement by the Department; and

e. include an agreement to incorporate, either in full or by reference, the environmental easement in any leases, licenses, or other instruments granting a right to use the property that may be affected by such easement.

3. Contain a requirement that until such time as the environmental easement is extinguished, the property deed and all subsequent instruments of conveyance relating to the subject property shall state in at least fifteen-point bold-faced type: "This property is subject to an environmental easement held by the New York State Department Of Environmental Conservation pursuant to title 36 of article 71 of the environmental conservation law."
4. Contain a requirement that each instrument transferring an interest in the area affected by the easement shall include a specific reference to the recorded easement.
5. Contain requirements that the environmental easement may be extinguished or amended only by a release or amendment of the easement executed by the commissioner and filed with the office of the recording officer for the county or counties where the land is situated in the manner prescribed by article nine of the real property law.
6. The environmental easements were duly recorded and indexed as such in the office of the recording officer for Seneca County in the manner prescribed by article nine of the real property law.
7. The environmental easements are enforceable in law or equity by the grantor, by the state, or any affected local government as defined in ECL Section 71-3603, against the owner of the burdened property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. No general law of the state which operates to defeat the enforcement of any interest in real property shall operate to defeat the enforcement of any environmental easement unless such general law expressly states the intent to defeat the enforcement of such easement or provides for the exercise of the power of eminent domain. It is not a defense in any action to enforce the environmental easements that:

   a. it is not appurtenant to an interest in real property;
   b. it is not of a character that has been recognized traditionally at common law;
   c. it imposes a negative burden;
   d. it imposes affirmative obligations upon the owner of any interest in the burdened property;
   e. the benefit does not touch or concern real property;
   f. there is no privity of estate or of contract; or
   g. it imposes an unreasonable restraint on alienation.

8. Agents, employees, or other representatives of the state may enter and inspect the property burdened by the environmental easements in a reasonable manner and at reasonable times to assure compliance with the restrictions.

Deed Restrictions

The PID/Warehouse Area property was transferred to the Seneca County Industrial Development Agency with a Quitclaim Deed dated September 30, 2005. This deed excepted SEADs 1, 2, 5, 16, 17, 25, 26, 39,40, 59, 67, 71, 121C, and 121I which were known as the “PID Retained Parcels” and still under control of the Army at the time. The “PID Retained Parcels were subsequently transferred to the Seneca County Industrial Development Agency with a Quitclaim Deed executed on May 27, 2011.

These Deeds were reviewed during the preparation of this report with the following findings:

1. The PID/Warehouse Area property was transferred with the land use restrictions, consistent with the LUC Objectives as defined in the LUC RD. This deed for the PID/Warehouse Area incorporates by reference the land use restrictions set forth in the Environmental Easement. The property deed states in at least fifteen-point bold-faced type:

   > **"This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant to title 36 of article 71 of the Environmental Conservation Law."**

   The September 2005 deed was recorded in the Seneca County Clerk’s Office on March 4, 2008 and the May 2011 deed was recorded on June 10, 2011. The Army provided a copy of the executed PID/Warehouse Area deed(s) to EPA Region II and NYSDEC. CERCLA Notice and Covenant. The deed included a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

2. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

3.1.1.5.2 Long Term Monitoring Review

SEAD 5

The first site inspection of the SEAD-5 cover was conducted as part of the April 6 and 7, 2011 site tour of the Seneca Army Depot Activity.

SEADs 16 and 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 (Parsons, 2005b) and as outlined in the Final Work Plan (Parsons, 2007c). 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 (Parsons, 2008e). 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, 2009d). The third year (Year 3) groundwater sampling event was conducted in November 2009 for SEAD-16 and SEAD-17, and the results of the Year 3 sampling event are documented in the Draft Final Annual Report – Year 3 (Parsons, 2010a). Final regulatory approval of this report is still pending. The fourth year (Year 4) groundwater sampling event was conducted in December 2010 for both AOCs, and the results are presented and discussed in Draft Annual Report 2010 – Year 4 (Parsons, 2011b).

LTM Groundwater Data Trends

An evaluation of all pre- and post-RA groundwater results from SEAD-16 and SEAD-17 is provided for each AOC independently in the Year 4 Report (Parsons, 2011b). Summaries of the Year 4groundwater monitoring exceedances reported for SEAD-16 and SEAD-17 are provided in Table 6A and Table 6B of the Year 4 Report, respectively. The complete dataset for the Year 1, Year 2, Year 3, and Year 4 events are provided for SEAD-16 and SEAD-17 in Appendix D Table 1 and Appendix D Table 2, respectively of the report.

Review of Groundwater Trends at SEAD-16

ESI and RI Data

Review of SEAD-16 data presented in the RI Report (Parsons, 1999a) indicates that one or more concentrations measured for 14 metals (i.e., arsenic, antimony, barium, beryllium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, sodium, and thallium) in 19 unfiltered groundwater samples collected during the expanded site investigation (ESI) or the RI exceeded New York State GA or Federal MCL standards in effect at the time of analysis. Of the 39 total instances where measured groundwater concentrations exceeded standards, 22 were associated with samples that were collected using peristaltic pumps (ESI sampling event) while the remaining 17 were found in samples that were collected using low-flow bladder pump sampling procedures. Sample water turbidities recorded during the RI sampling events were significantly lower than those recorded during the ESI sampling event, and thus are believed to be more representative of the water quality located at the site prior to the remedial action. Examination of the RI groundwater data only indicates that six metals (i.e., antimony [2 times], iron [5 times], lead [1 time], manganese [2 times], sodium [3 times] and thallium [4 times]) were detected at concentrations in excess of GA or MCL standards in effect at the time of analysis. Of these detections, antimony was only detected at concentrations above its standard in well MW16-3 with a maximum concentration of 12.3 μg/L; iron was found at elevated concentrations in three wells (i.e., MW16-1 [maximum], MW16-2, and MW16-3) with a maximum concentration of 2,400 J[10] μg/L; lead was found only in MW16-3 with a maximum concentration of 24.1 J μg/L; manganese was detected at elevated concentrations only in MW16-6 with a maximum level of 1,380 μg/L; sodium was detected in two wells

[10] The “J” data qualifier is used to indicate that the reported concentration is estimated.

(i.e., MW16-5 and MW16-6 [maximum]) with a maximum concentration of 409,000 µg/L; and thallium was detected in three wells (i.e., MW16-2, MW16-5, and MW16-6 [maximum]) with a maximum level of 11 µg/L.

<u>Post-Remedial Action Data</u>

Over the four years since the completion of the remedial action at SEAD-16, 29 unfiltered and 14 filtered groundwater samples have been collected from the six wells located at the site.

Sixty-two exceedances of GA or MCL standards have been detected in the samples characterized, distributed across five metals (i.e., antimony [20 times], iron [11 times], lead [2 times], manganese [1 time], and sodium [28 times]). Of the 62 groundwater standard exceedances, 19 were observed in the filtered samples and 43 were detected in unfiltered samples.

Noted exceedances of antimony were at the highest frequency in wells MW16-2 and MW 16-7 where samples collected and characterized contained concentrations in excess of antimony's 3 µg/L GA standard. Sporadic detections of antimony above the GA limit were noted in well MW16-4 (i.e., 3 times, one filtered and two unfiltered samples) and MW16-5 (1 unfiltered sample). Filtered and unfiltered sample results for antimony from wells MW16-2 and MW16-7 are generally comparable, suggesting that the metal is present as a dissolved species and the highest concentrations are found consistently in well MW16-7 where the overall maximum (16.15 µg/L) is found in the sample/duplicate pair collected during the 2010 Year 4 sampling event. This number is approximately equivalent to what was observed in the groundwater at MW16-3 prior to the remedial action.

Iron GA standard exceedances were noted 11 times, spread across wells MW16-4 through MW 16-7. Iron concentrations noted in filtered samples are generally lower than concentrations found in unfiltered samples indicating that the noted iron concentrations are somewhat dependant of turbidity levels found in the groundwater at the time of sampling. The highest post remedial action iron concentration detected in the groundwater at SEAD-16 is 1,200 µg/L, which is roughly half of what was detected in the groundwater at the site prior to the remedial action.

Lead has been detected less frequently (i.e., 15 of 62 samples post RA; 11 of 19 samples pre-RA) and at lower concentrations (i.e., 2 exceedances post RA) in groundwater during the four years of post-RA monitoring. The two noted post-RA exceedances of the lead MCL both occurred in well MW16-7 during the first and second post-RA sampling events. Both of these samples were unfiltered, and since the last exceedance at MW16-7, lead levels in both the filtered and the unfiltered samples collected from this well have trended downward.

Sodium is a persistent contaminant identified in SEAD-16 wells, as it has been identified in every sample collected from the site, and at levels in excess of its GA standard in 28 of the 62 samples characterized. Levels found in the groundwater are currently higher than what was found prior to the remedial action, with these being affected by the known county highway salt pile operation that is operated by the Seneca County Highway Department that is located approximately 1,000 feet upgradient (east, northeast) of SEAD-16.

A statistical analysis could not be performed on the available SEAD-16 pre (one to three samples per well) and post remedial action (four 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.

Review of Groundwater Trends at SEAD-17

ESI and RI Data

Review of SEAD-17 data presented in the RI Report indicates that one or more concentrations measured for five metals (i.e., iron, lead, sodium, and thallium) in 12 unfiltered groundwater samples exceeded New York State GA or federal MCL standards in effect at the time of analysis. Of the 16 instances where measured groundwater concentrations exceeded standards, 10 were associated with samples that were collected using peristaltic pumps (ESI sampling event) while the remaining six were found in samples that were collected using low-flow bladder pump sampling procedures. As was indicated above for SEAD-16, sample water turbidities recorded during the RI sampling events were lower than those recorded during the ESI sampling event, and thus the analytical results from the RI samples are believed to be more representative of the water quality present at SEAD-17. Examination of the RI groundwater data only indicates that three metals (i.e., iron [1 time], sodium [2 times], and thallium [3 times]) were detected at concentrations above GA or MCL standards in effect at the time of analysis. Of these detections, iron was found at an elevated concentration in one well (MW17-1 with a concentration of 572 J µg/L; sodium was detected in two wells (i.e., MW17-3 [maximum] and MW17-4) with a maximum concentration of 30,100 µg/L; and thallium was detected in two wells (i.e., MW17-1 [sample/duplicate, with maximum] and MW17-5) with a maximum level of 7.1 µg/L (5.75 µg/L average of sample/duplicate).

Post-Remedial Action Data

Since the completion of the remedial action at SEAD-17, 20 unfiltered and 10 filtered groundwater samples have been collected from the five wells that are located at the site. Sixteen exceedances of GA or MCL standards have been detected distributed across five metals (i.e., antimony [2 times], iron [7 times], lead [1 time], manganese [2 times], and sodium [4 times]). Of the 16 groundwater standard exceedances, three were observed in the filtered samples and 13 were detected in unfiltered samples. No exceedance of groundwater standards has been observed in well MW17-1 since the start of post-remedial action LTM, while six exceedances have been observed in MW17-2, five exceedances have been observed in well MW17-3 and each of these is for iron, three in MW17-4 and two, both for sodium, have been observed in MW17-5.

Exceedances of the 3 µg/L MCL for antimony were only recorded at MW17-2 during the first and third sampling events, both in unfiltered samples. The paired filtered sample from MW17-2 collected during the Year 3 event did not contain a level of antimony in excess of the 3 µg/L MCL standard. The maximum concentration reported for thallium was 3.7 µg/L in the MW17-2 Year 3 unfiltered sample. The antimony concentration in the filtered sample from this well was 2.2 µg/L.

Iron GA standard exceedances were noted seven times, found distributed between three wells (MW17-2, [1 time], MW17-3 [5 times] and MW17-4 [1 time]). The maximum iron concentration recorded was found in the well MW17-2 unfiltered sample collected during the third annual event. Iron was not detected in the filtered sample collected during this event; therefore this result is presumed attributable to elevated turbidity in the sample, which may also affect a few of the other metal detections reported (i.e., antimony, lead, and manganese) in this sample, which are not confirmed by the results in the filtered sample from this well and sampling event. Iron concentrations found in five samples from MW17-3 (three unfiltered and two filtered) all were above iron's 300 μg/L GA standard. Iron results from the third sampling event's filtered and unfiltered pair suggest that turbidity may impact the results found in this round, but iron in the filtered sample still surpassed the GA standard level.

Lead has only been detected above the federal MCL action level once in SEAD-17 wells since the completion of the RA, this being found in well MW17-2 in the unfiltered sample collected during the third sampling event. The presence of lead was not confirmed by the results of the filtered sample, where lead was not detected at a level of 2.9 U[11] μg/L.

Manganese concentrations reported for samples collected from MW17-2 (unfiltered, Year 3 post-RA event) and MW17-4 (unfiltered, Year 2 post-RA event) exceeded its GA standard of 300 μg/L. The MW17-4 sample had the highest manganese concentration (911 μg/L), and the filtered sample from MW17-2 did not confirm the exceedance of manganese in this well, as a concentration of 1.5 J μg/L was reported in this sample.

Sodium was detected at levels in excess of its 20,000 μg/L GA standard four times in samples collected from MW17-2, MW17-4 and MW17-5. Of these detections, the sample results from MW17-5 are the most notable as the paired filtered/unfiltered sample collected from the Year 3 post-RA event both exceeded 360,000 μg/L. Year 2 and 4 post-remedial action sampling event sodium results for this well were all below 10,000 μg/L, suggesting the Year 3 results are possibly a seasonal anomaly.

In general, post-remedial action LTM results indicate that groundwater quality at SEAD-17 is not impacted by historic operations conducted in this area. Many of the identified groundwater quality exceedances appear to be affected by turbidity issues (MW17-2 samples), while other noted exceedances of iron, manganese, and sodium either random occurrences (e.g., sodium, MW17-5) or may be attributable to regional iron and manganese groundwater impacts that are present in Seneca County.

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-RA (4 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.

---

[11] The "U" data qualifier is used to indicate that this compound was not detected at a concentration above this level.

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

As reported in the Year 4 Report, the wells at SEAD-16 are in acceptable condition. Well MW16-5's well upriser had lifted slightly into the metal protective casing's lid which initially prevented the lid from being opened; the metal lid was stuck with a 2-pound hammer three times which cause the upriser to recede enough to permit the metal lid be opened and the well to be sampled. This action did not affect the groundwater quality observed at this well as only iron was observed at levels in excess of groundwater standards and the levels reported for iron during the Year 4 sampling event are consistent with other reported for other post-remedial action events. All other metal results observed in this well remain similar to prior post-remedial action sampling event results.

Observations made during Year 3 indicated that roots may have breached wells MW17-2, MW17-3, and MW17-5. However, no root material or obstructions were observed in wells MW17-4 or MW17-5 during the Year 4 sampling event. An obstruction was noted at well MW17-2 during the Year 4 sampling event, which prevented use of the water level gauge and DO probe below a depth of 6.4 feet from the top of the well upriser. Necessary samples from this well were obtained during the Year 4 sampling event, and the results recorded for this location continue to be consistent with prior events, which suggest that water quality at this well are not adversely affected by the obstruction.

LTM Remedy Evaluation

As discussed in Section 2.5 of the Year 4 Report (Parsons, 2011b), 4,427 cy of metal- and PAH-impacted soil were removed from SEAD-16 and SEAD-17 during the remedial action conducted in the summer of 2007. The impacted soil was removed to minimize or eliminate 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 four years shows that the soil removal remedy has been effective in minimizing the migration of the identified metal COCs from soil to groundwater. Pre-remedial action groundwater quality concerns associated with arsenic, barium, beryllium, chromium, copper, iron, lead, mercury, nickel and thallium have been eliminated, as each of these metals, except lead, have not been detected in the groundwater at SEAD-16 in excess of groundwater quality standards since the action was completed. Lead was found twice at levels in excess of its MCL action level, but these were confined to a single well (i.e., MW16-7) during the Year 1 and Year 2 post-action sampling events, and they have not been repeated during either the Year 3 or Year 4 sampling events. While iron and manganese are still detected at concentrations in excess of GA groundwater quality standards, these results appear to be partially affected by turbidity issues or are attributable to the regional groundwater quality, and are not attributable to the site. Noted sodium exceedances found in the groundwater at SEAD-16 appear to originate from an off-site salt storage source operated by the Seneca County Highway Department that is located upgradient of SEAD-16. Antimony continues to be observed in at concentrations above the GA standard, but these are limited to two wells where concentrations have remained consistent since the removal action was completed.

The groundwater quality at SEAD-17 appears to have improved since the completion of the remedial action. The few noted groundwater quality exceedances for metals other than iron and manganese are limited to initial Year 1 or Year 2 post-remedial action sampling events or a sample where a turbidity impact is suspected (i.e., Year 3 MW17-2 sample), and where groundwater quality has improved since the exceedances were reported. The noted iron exceedances reported for SEAD-17 are isolated and are most likely attributable to regional quality.

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 if the LUCs are being maintained. During the Year 4 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.

<u>LTM Conclusions and Recommendations</u>

Conclusions

- The soil excavation remedy at SEAD-16 and SEAD-17 has been effective controlling, and in some cases eliminating, the migration of COCs from soil to the groundwater based on the four post-action LTM sampling rounds.
- The results of the Year 4 LTM event demonstrate that field filtering is an effective tool for identifying turbidity impacts 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.

Recommendations

Based on the pre-remedial groundwater data and the data collected during Years 1, 2, 3, and 4 of the LTM program at SEAD-16 and SEAD-17, the Army recommends that the groundwater monitoring be discontinued. The Army's recommendation is based on its determination that groundwater has not been adversely impacted by the remedial action and that a Land Use Control (LUC) is in place that prohibits access to, and use of groundwater. The LUC is sufficient to protect human health and the environment by restricting the use of the groundwater. Since the groundwater use restriction is area-wide and not

AOC-specific, and the post-RA monitoring shows no additional impacts to the groundwater, there is no requirement for continued monitoring.

SEADs 25 and 26

In accordance with the Record of Decision (ROD) for the Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26) (Parsons, 2004b) and the Final Remedial Design Work Plan and Design Report (RDR) for the Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26) (Parsons, 2005a), a remedial action was completed in November 2005 for both AOCs, and the results of the actions were documented in the Construction Completion Report for SEAD-25 and SEAD-26, Final (CCR) (Parsons, 2006a). Long-term groundwater monitoring is being performed at SEAD-25 as part of the continuing PCMM operations.

There have been eight rounds of groundwater monitoring conducted at SEAD-25, which have been documented in four Long Term Monitoring reports, (Parsons, 2007b; Parsons, 2008a; Parsons, 2011a; and Parsons, 2011d). These reports provide a review of LTM conducted at the Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26) at the Seneca Army Depot in Seneca County, New York between January 2006 and February 2011and provided recommendations for future LTM at the area of concern (AOC). These documents also provide a review of the effectiveness of the remedy implemented at SEAD-25 and SEAD-26 in 2005.

Groundwater monitoring was initially required at both AOCs as a condition of the ROD since contaminant concentrations found in the groundwater at the AOCs prior to the remedial action exceeded applicable groundwater standards. Groundwater monitoring at SEAD-26 was terminated by the Army, with the approval of the EPA (EPA, March 2007) and the NYSDEC (NYSDEC, September 2007), after the first year of sampling and analysis indicated that no COCs were present in the groundwater at concentrations above defined cleanup goals. Semi-annual (i.e., twice each year) groundwater monitoring continued at SEAD-25.

Review of Groundwater Trends at SEAD-25

RI

Based on the RI results, the primary impact to the SEAD-25 groundwater was associated with two overlapping VOC plumes located in the overburden that both originated in the southwestern portion of the Fire Training and Demonstration Pad near the locations of the contaminated soil. BTEX and chlorinated ethenes were not detected in the bedrock wells at SEAD-25. The primary plume observed measured approximately 200 feet long and was composed of aromatic hydrocarbon compounds that are typically associated with gasoline (benzene, toluene, ethyl benzene, and xylene [BTEX]). The maximum concentration of total BTEX detected in the groundwater during the RI was 6,220 μg/L at well MW25-2. The maximum concentration of total chlorinated organics, 96 μg/L, was also detected at well MW25-2 during the Expanded Site Investigation (ESI).

Post-Remedial Action

Current total BTEX concentrations have decreased from pre-RA groundwater levels to concentrations that are now two to three orders of magnitude lower, although current (Round 8) concentrations measured for most of the BTEX compounds remain above applicable groundwater standard concentrations at the monitoring well that is located closest to the former soil source area. Furthermore, the pre-RA plume has diminished in length to the point where BTEX contaminants are currently only periodically observed in the two or three wells (i.e. MW-25-2, MW25-9, and MW25-3) that are closest to the former source excavation site. BTEX concentrations measured in MW-25-9 and MW25-3 appear sporadically, whereas BTEX compounds are persistently observed in well MW25-2.

Chlorinated organic compound concentrations observed in site wells have also decreased, and have all but disappeared from all site wells, exclusive of MW25-2, since the completion of the soil removal action at the site. Single random detections of chlorinated compounds were observed in wells MMW25-9 and MW25-10 during Year 1 sampling events (Round 1 and Round2), and in MW25-19 during one of the Year 2 (Round 3) sampling event. Chlorinated compound detections in MW25-2 have been more persistent than in the other wells, initially characterized as sporadic during the Year 1 and Year 2 events and becoming persistent during the Year 3 and Year 4 events. The Year 3 and Year 4 events also show that chlorinated compound concentrations have risen recently in well MW25-2, but still remain less than 30% of what they were prior to the RA. The Year 4 data for well MW25-2 also show an increase in the concentrations of vinyl chloride and dichloroethene concentrations coincident with increases in the level of BTEX that is present, suggesting that natural attenuation of both the historic BTEX and chlorinated organic plumes is continuing.

The geochemical parameter data collected at SEAD-25 wells also provides an indirect indication of the natural attenuation of the plumes. Methane was detected in wells MW25-2 and MW25-3 during the August 2010 (Year 4, Round 7) sampling event and in wells (MW25-2, MW25-3, MW25-9, MW25-15, MW25-17, MW25-18, and MW25-19) during the February 2011 (Year 4, Round 8) sampling events. During both sampling events, the maximum detection of methane was collocated in well MW25-2 along with the maximum detections of BTEX and total chlorinated solvents.

LTM Remedy Evaluation

As discussed in Section 2.4 of the Fourth Long-Term Monitoring and Site Assessment Report (Parsons, 2011d), 961 cy of BTEX impacted soil at the SEAD-25 pad was excavated between November 15, 2005 and December 1, 2005. All confirmatory soil samples representative of soil remaining on-site at the pad achieved the site-specific cleanup goals, and the Army determined that soils at SEAD-25 did not require further action. Excavation of the SVOC impacted soil in the swale at SEAD-25 began on November 7, 2005 and was completed on November 8, 2005. The soil excavation extended to bedrock from the toe of slope on one bank to the toe of slope on the other bank, resulting in the removal and off-site disposal of 761 cy of soil from SEAD-25. After the excavation, the swale bottom consisted of exposed competent bedrock, and since no native overburden soil remained in the swale, no confirmatory samples were collected or analyzed. The EPA and NYSDEC concurred with this determination based on the approval of the Construction Completion Report. The excavation of the soil at the pad removed the source of groundwater contamination.

Eight hundred and twenty-eight (828) cy of soil was excavated from the five areas at SEAD-26 and disposed off-site. All confirmatory samples representing soil remaining on-site met the soil cleanup goals. No additional remediation is required at SEAD-26.

The remedies for SEAD-25 and SEAD-26 required the implementation and maintenance of LUCs at sites. The LUC requirements are detailed in Addendum 1 in the *Land Use Control Remedial Design for SEAD 27, 66, 64A, Final* (2006). The selected LUCs for SEAD-25 and SEAD-26 are as follows:

- Prevent residential housing, elementary and secondary schools, childcare facilities and playground activities, and
- Prevent access to and use of groundwater at SEAD-25 and SEAD-26, for purposes other than required monitoring, until NYS Class GA Groundwater Standards are met.

As part of the LTM program, the Army inspected the areas of SEAD-25 and SEAD-26 to determine that the LUCs are being maintained. While performing the groundwater sampling, it was confirmed that no prohibited facilities have been constructed and no access to or use of groundwater, other than the collection of required LTM samples of groundwater, was evident. Wells that are no longer required as part of the continuing long-term groundwater monitoring events at SEAD-25 and SEAD-26 were decommissioned during 2010 and early 2011.

<u>LTM Conclusions and Recommendations</u>

Conclusions

Based on the post-RA monitoring event results for SEAD-25 the Army currently reports that:

- The concentrations of BTEX in the groundwater at SEAD-25 have decreased by up to two orders of magnitude since 1994;
- Chlorinated VOCs were not detected above cleanup goals except at MW25-2;
- The VOC plumes at SEAD-25 are attenuating to levels close to or lower than applicable groundwater standards;
- Groundwater impacts are not noted beyond the immediate area of the former Fire Training and Demonstration Pad, and downgradient wells (MW25-8, MW25-13, MW25-15 and MW25-19) have not shown evidence of BTEX or VOC contamination since the removal action was completed;
- The soil excavation remedy at SEAD-25 has been effective; and
- Land and groundwater restrictions imposed at SEAD-25 continue to be maintained, and there are no signs of unauthorized use or access.

Based on the post-RA monitoring event results for SEAD-26 the Army currently reports that:

- The soil excavation remedy at SEAD-26 has been effective; and
- Land and groundwater restrictions imposed at SEAD-26 continue to be maintained, and there are no signs of unauthorized use or access.

Based on the historical data and the results of the Round 7 (2010Q3) and Round 8 (2011Q1) semi-annual LTM events at SEAD-25, the Army recommended that:

- Monitoring at the downgradient wells in SEAD-25 (i.e., MW25-8, MW25-13, MW25-15 and MW25-19) be terminated as no COCs have been found at these wells during any of the post-RA sampling events.
- The monitoring schedule for SEAD-25 should be reduced from semi-annual to annual and occur during a period (e.g., first or second quarter, annually) when there is sufficient water to allow for sample collection at all wells. The annual monitoring should focus only on wells MW25-2, MW25-3, MW25-9, MW 25-10 and MW25-17 where historic information indicates that COCs of interest have been found.

Comments from the EPA or the NYSDEC are pending on the Army's proposal.

3.1.1.6 Site Inspections

The Army inspected the SEDA Site on April 6 and 7, 2011 to assess whether required LUCs imposed by approved RODs are being maintained. A survey was conducted throughout the PID/Warehouse area with AOC- specific inspections being conducted at SEADs 1, 2 ,5, 16, 17, 25, 26 ,27, 39, 40, 59, 64A, 66, 67, 71, 121C, and 121I. Five-Year Review-site visit photo logs are contained in Appendix A and completed Five-Year Review site inspection checklists are contained in Appendix B.

The following observations were made during the site inspection:

- What appears to be a small animal burrow was noted at SEAD-5 (Figure A-3), but it did not appear to reduce the effectiveness of the remedy.
- At SEAD-16, monitoring wells used for LTM were unlocked, but within the fenced portion of the PID and not accessible to the public. Consistent with observations in the Year-4 LTM report (Parsons, 2011b), some monitoring well uprisers were lifted slightly.
- At SEAD-17, monitoring wells used for LTM were unlocked, but within the fenced portion of the PID and not accessible to the public.
- At SEAD-25, monitoring wells used for LTM were unlocked and inner covers were missing. Some ponding of water was observed outside of the former excavation area; but it did not appear to impact or reduce the effectiveness of the remedy implemented at the site. SEDA had received heavy rainfall on day before the site visit.

The site inspection confirmed that no prohibited facilities have been constructed and no access to or use of groundwater was evident.

3.1.1.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Remedial Actions required by completed RODs for SWMUs within the PID/Warehouse Area have been completed and documented. No continuing active remediation is required in the PID/Warehouse Area.

Based on a review of Closure Reports, Long Term Monitoring Reports, Land Use Control Remedial Designs, environmental easements and transfer deeds and a site visit conducted on April 6 and April 7, 2011, all remedies are functioning as intended by the decisions documents.

Long-term monitoring of groundwater is continuing at SEAD-16, SEAD-17, and SEAD-25, in accordance with provisions of RODs (Parsons, 2005b for SEADs 16 and 17; Parsons, 2004b for SEAD-25) that have been finalized and approved for these AOCs that are within the PID/Warehouse Area. Groundwater monitoring at SEAD-26, which was required by the ROD approved for SEAD-26 (Parsons, 2004b) was terminated by the Army, with the approval of the EPA (EPA, March 2007) and the NYSDEC (NYSDEC, September, 2007), after the first year of sampling and analysis indicated that no COCs were present in the groundwater at concentrations above defined cleanup goals.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site since completion of remedial action activities and implementation of Land Use Controls that would affect the protectiveness of the remedy selected for the PID / Warehouse Area of the former Seneca Army Depot Activity.

The underlying assumptions support the selected remedies in remaining protective for the following reasons:

- The current/future LUC/IC restrictions minimize potential exposure pathways and eliminate groundwater ingestion; and
- Soil and groundwater investigations used protective criteria including NYS Soil Clean-up Objectives contained in TAGM #4046 (NYSDEC, 1996) or Part 375-6 (NYSDEC, 2006) and NYSDEC Ambient Water Quality Standards and Guidance Values (NYSDEC, 2000).

The NYS Clean-up Objectives contained in TAGM 4046 that were used in RODs prior to 2006 were compared to 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives. TAGM 4046 soil cleanup objectives are found to be lower than the restricted commercial clean-up objectives contained in Table 375-6.8(b) and for many contaminants lower than unrestricted clean-up objectives contained in Table 375-6.8(a).

An Addendum to NYSDEC Ambient Water Quality Standard and Guidance Values was issued by NYSDEC in 2004 and amended the standards for three contaminants, none of which are COCs at SEDA.

As a result, the clean-up levels and Remedial Action objectives from earlier RODs are considered still valid.

Since the soil and groundwater cleanup standards for the remedy are equivalent to, or more stringent than human-health-based promulgated standards and cleanup criteria, the cleanup standards remain protective of human health.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no new information that would affect the protectiveness of the remedy.

3.1.1.8 Technical Assessment Summary

According to the data reviewed, the site inspection, and the interviews, the remedy is functioning as intended by the RODs for the Planned Industrial/Office Development and Warehousing Areas. On-going remedial operation, maintenance and monitoring activities include periodic evaluations of the effectiveness of the remedy. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs cited in the RODs remain protective of human health and the environment.

3.1.1.9 Recommendations

Based on this Five-Year Review, the Army makes the following recommendations;

- Continuing the implementation of Land Use Controls and the annual frequency of periodic reviews.
- Discontinuing the annual groundwater monitoring at SEAD-16 and SEAD-17 after 2011
- Continue groundwater monitoring on a semi-annual basis at SEAD-25 until the 2010 – 2011 (Fourth Year) sampling cycle is completed. Subsequently, it is recommended that groundwater monitoring continue on an annual basis, and be conducted during a season (e.g., winter – early to mid spring) when an adequate quantity of water is likely to be present in the overburden aquifer to support the required sampling

3.1.1.10 Protectiveness Summary

The remedy implemented for Planned Industrial/Office Development and Warehousing Areas is protective of the environment and protects human health. Currently, there are no unacceptable exposures to human or environmental receptors from source area contaminants and none are expected to occur during the next five years.

3.1.2 SEAD-13 - Inhibited Red Fuming Nitric Acid (IRFNA)

3.1.2.1 History of Contamination, Initial Response and Basis for Taking Action

<u>History of Contamination and Initial Response</u>

SEAD-13 is located in the northeast portion of the former Depot and includes two historic disposal areas, SEAD-13-East and SEAD-13-West, which are located on the eastern and western sides of the Duck Pond's southern end, respectively (**Figure 3-1**). Historically, SEAD-13 was used during the early 1960s to dispose of quantities of unserviceable Inhibited Red-Fuming Nitric Acid (IRFNA), an oxidizer used in missile liquid propellant systems. It was originally thought that both areas had disposal pits but observations recorded during the geophysical survey performed in 1993/1994 indicated that SEAD-13-East was the only area that contained pits, with six (possibly seven) elongated pits being observed. The pits, which were each generally 20 to 30 ft. long, were oriented east to west, and marked by sparse vegetation, crushed shale and 1-inch limestone pieces at the surface. The SEAD-13-West area exhibited no visible evidence of disposal pits at the surface as found at SEAD-13-East; however, an area within SEAD-13-West was characterized by sparse vegetation and some crushed shale.

During the operation of the IRFNA Disposal Site, the pits were utilized as a neutralization area for IRFNA. Barrels of unserviceable IRFNA were brought to the site from other locations within the Depot, and were temporarily staged on pallets near the disposal pits. Each barrel of unserviceable IRFNA was emptied through a water pressure powered stainless steel ejector that was fitted onto one barrel at a time while water was flowing through the ejector. The IRFNA mixed with water in the ejector and the mixture was then discharged to the disposal pit through a long polyethylene hose that discharged beneath the surface of the water in the pit being used. The disposed IRFNA/water solution mixed with the limestone in the pit to facilitate the neutralization of the acid. Ten barrels were typically discharged into each pit during one day of operation.

Site investigations performed at SEAD-13 included an ESI in 1993 and 1994, followed by a Supplemental Investigation performed in 2001. The ESI work included geophysical investigations, surface and subsurface soil sampling, monitoring well installations, groundwater sampling, surface water/sediment sampling, and chemical analyses. The supplemental investigation included additional soil borings (with surface and subsurface soil sampling), monitoring well installations, groundwater sampling, and chemical analysis.

Complete analytical results from both investigations are presented in “Decision Document Mini Risk Assessment SEAD-13, Inhibited Red Fuming Nitric Acid (IRFNA) Disposal Area,” Final (Parsons, 2004d).

<u>Basis for Taking Action</u>

Contamination

A result of the site investigations discussed above is presented below.

<u>Surface / Subsurface Soils</u>

SVOCs were found in the surface soil samples collected at SEAD-13, but were not detected at depth. In general, the concentrations of SVOCs were low, with concentrations of 4-methylphenol, benzo(a)pyrene, dibenz(a,h)anthracene, and phenol exceeding their NYSDEC TAGM #4046 cleanup objective level values in one sample. Analytical results for the surface and subsurface samples are summarized in the ROD (Parsons, 2007a).

One pesticide compound was detected at SEAD-13. The pesticide, 4,4'-DDE, which was found in one surface sample (SB13-2-1, SEAD-13-East), at an estimated concentration of 3.6 µg/Kg, was below the TAGM value of 2,100 µg/Kg.

Several metals were detected in the surface and subsurface samples at SEAD-13. Thirteen metals exceeded their respective TAGM values in surface soils (aluminum, arsenic, beryllium, chromium, copper, lead, magnesium, manganese, nickel, potassium, sodium, thallium, and zinc) and twelve metals (aluminum, arsenic, barium, chromium, copper, iron, magnesium, nickel, potassium, silver, sodium, and thallium) exceeded their respective TAGM values in subsurface soils.

Groundwater

During the 2001 and 2002 sampling rounds, five SVOCs (2-methylnaphthalene, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, diethyl phthalate, and pyrene) were detected in the groundwater. The only SVOC with a criteria value, bis(2-ethylhexyl)phthalate, was detected in two samples at concentrations below its groundwater standard. During the ESI investigation, one SVOC, bis(2-ethylhexyl)phthalate, was detected in the groundwater twice with a maximum concentration of 23 μg/L. Both detections exceeded the GA standard of 5 μg/L. This compound was determined to be a common laboratory contaminant and is not attributed to conditions present at the AOC.

Seven metals (aluminum, antimony, iron, magnesium, manganese, selenium, and sodium) were found in the groundwater samples from the 2002 sampling round at concentrations above their respective GA standards. Turbidity readings for the groundwater samples collected in 2002 were low, ranging in value from 1.25 Nephelometric Turbidity Units (NTUs) to 13.7 NTUs. During the 2001 sampling round, nine metals (aluminum, arsenic, chromium, iron, lead, magnesium, manganese, nickel, and sodium) were found in the groundwater samples at concentrations above their respective Class GA standard levels. The turbidity in the samples collected in 2001 was elevated, with a maximum turbidity level recorded of 999 NTUs. The elevated metal concentrations for chromium, iron, magnesium, and manganese were measured during the 2001 sampling round when turbidity was high. Lower turbidity readings in the 2002 sampling round showed a significant decrease in concentrations. In 2002, manganese was detected in a sample with the lower turbidity reading at a concentration of 397 μg/L, which is greater than the GA value of 300 μg/L. A summary of detected analytes in groundwater are presented in the ROD (Parsons, 2007a) and complete analytical results are presented in the "Decision Document Mini Risk Assessment SEAD-13, Inhibited Red Fuming Nitric Acid (IRFNA) Disposal Area", Final (Parsons, 2004d).

The groundwater samples were analyzed for nitrate/nitrite-nitrogen and fluoride, which were considered indicator compounds based on the types of materials disposed in the pits at SEAD-13. Five of the ten groundwater samples had nitrate (expressed as nitrogen) concentrations above the criteria value of 10 mg/L.

The maximum nitrate value detected was 731 mg/L in sample MW13-13, which was located downgradient from the former IRFNA pits in SEAD-13-East. The nitrite concentrations were all below the criteria value of 1 mg/L, except the concentrations detected at MW13-11 and MW13-14, which were 2.1 mg/L and 1.1 mg/L, respectively. Fluoride was detected at concentrations ranging from 0.1 mg/L to 0.45 mg/L. All of the reported fluoride concentrations were below the Class GA Standard of 1.5 mg/L.

Surface Water/Sediment

Three sediment and surface water sample sets were collected from within the Duck Pond during the ESI in 1993 to assess the potential impact of the IRFNA disposal pits on adjacent surface water bodies. Sediment and surface water samples collected during the ESI were analyzed for VOCs, SVOCs, explosives, pesticides/PCBs, herbicides, metals, cyanide, nitrate/nitrite-nitrogen, and fluoride. Surface water samples collected in 1993 exhibited unusually high aluminum concentrations. Consequently, additional samples were collected in January 2000 at sample locations SW13-4, SW13-5, and SW13–6 to confirm the presence of aluminum. In 1993, turbidity in the surface water samples collected was noted as being high. The turbidity readings associated with the follow-up sampling in 2000 were extremely low, ranging from 3 NTUs to 5.7 NTUs. The correlation between the higher turbidity and higher concentrations and the lower turbidity and lower concentrations indicate that the aluminum and iron values were consistent with the lower concentrations. However, since the set of 1993 data recorded turbidity as a sample observation and not an actual value, both sets of results were used in the Risk Assessment evaluation. In 2001, surface water samples were collected at five of the six surface sample locations adjacent to SEAD-13 (SW13-1, SW13-2, SW13-3, SW13-4, and SW13-5), and sediment samples were collected at all six locations. Surface water and sediment samples were analyzed for SVOCs, metals, cyanide, and nitrate/nitrite-nitrogen.

Nitrate/nitrite-nitrogen was detected in six out of nine of the surface water samples at SEAD-13, with concentrations ranging from 0.02 mg/L to 0.11 J mg/L. The maximum concentration, 0.11 J mg/L, was found in sample SW13-5 near the point of groundwater discharge to the pond. Fluoride was also detected in the surface water samples. The reported concentrations ranged from 0.27 mg/L to 0.39 mg/L. There are no surface water standards for nitrate/nitrite-nitrogen or fluoride.

Twenty-two metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, vanadium, and zinc) were detected in the sediment samples collected at SEAD-13. Of these, cadmium, chromium, copper, iron, lead, manganese, nickel, and sodium were detected at concentrations greater than NYSDEC guidance values for sediment. Cadmium exceeded the criteria (0.6 mg/Kg) in five samples, with a maximum detection estimated at 0.96 mg/Kg at SD13-4. Nickel was detected in all ten sediment samples at concentrations that exceeded the criteria level of 16 mg/Kg, with a maximum concentration of nickel of 35.4 mg/Kg in sample SD13-4. Sodium was detected at concentrations that exceeded its criteria (1 mg/Kg) in four samples. The maximum concentration estimated at 326 J mg/Kg was found at sample location SD13-4.

The manganese criteria of 460 mg/Kg was exceeded in three samples. The maximum concentration of manganese, 778 mg/Kg, was detected in sample SD13-3. The chromium criteria, 26 mg/Kg, was exceeded in three sediment samples, with a maximum concentration, 27.7 mg/Kg, detected at SD13-4. The copper criteria of 16 mg/Kg was exceeded in all ten samples, with the maximum concentration of 20.7 mg/Kg detected in SD13-4. The iron criteria of 20,000 mg/Kg was exceeded in nine of the ten sediment samples collected, with the maximum concentration of 29,400 mg/Kg detected in sample SD13-4.

SVOC concentrations in sediment did not exceed the NYSDEC Sediment Criteria for Benthic Aquatic Life Chronic Toxicity, with the exception of 4-methylphenol at SD13-4.

Nitrate/nitrite-nitrogen was detected in seven of the ten sediment samples analyzed. The maximum concentration detected was 6.4 J mg/Kg in sample SD13-6. Fluoride was detected in all four of the sediment samples analyzed for fluoride. The reported concentrations ranged from 188 mg/Kg to 270 mg/Kg.

The available groundwater data from SEAD-13 indicate that there is limited, defined groundwater plume containing nitrate/nitrite-nitrogen originating in the vicinity of the former IRFNA pits in SEAD-13-East that is flowing towards the west. The plume extends to the Duck Pond. No groundwater plume of nitrate is observed on the western side of the Duck Pond, in the area of SEAD-13-West. Concentrations of nitrate observed in the surface water within the Duck Pond are below federal and state standards for drinking water.

Human Health Risk Assessment

Data from the AOC investigations served as the basis of a mini risk assessment that was performed to assess potential risks. The human health risk assessment was conducted using the 95% UCL of the mean as the EPC. The maximum detected concentration was used as the EPC for the ecological risk assessment. For comparison purposes, risk to residential receptors was also evaluated.

The results of the risk assessment indicated that risks to all recreational and residential receptors were below the EPA acceptable limits (i.e., HI of 1 or less and a cancer risk in the range of 10^{-4} – 10^{-6} or less) if exposure to groundwater were to be limited. The total non-cancer HI from all exposure routes is less than 1 for the construction worker, but exceeds 1 for the park worker (HI=7) and the recreational visitor (HI=3). The elevated HI for both receptors is due to ingestion of groundwater, with nitrate/nitrite-nitrogen, aluminum, and manganese in groundwater as the largest contributors to risk for both receptors. When the groundwater pathway is eliminated, the total HIs for these receptors are 0.08 and 0.07, which meets the EPA HI criteria of less than 1. The cancer risk for the park worker, recreational visitor, and the construction worker were at acceptable limits.

Risks to a future resident were also calculated, which serves to evaluate receptors under the new land use scenario, Resort/Residential. The cancer risk for the resident (adult), 2 x 10^{-4} is greater than the EPA acceptable limit of 1 x 10^{-4}; and the cancer risk for resident (child), 1 x 10^{-4}, is at the acceptable limit. The cancer risk is due to ingestion of groundwater. If the groundwater pathway were eliminated, the cancer risk value for future residents would be within acceptable limits.

Ecological Risk Assessment

An ecological risk assessment was completed and no COCs were identified.

3.1.2.2 Remedy Selection

A groundwater use/access restriction was selected in the ROD (Parsons, 2007a) for SEAD-13: Inhibited Red-Fuming Nitric Acid (IRFNA) Disposal Site.

The groundwater use/access restriction is intended to eliminate human contact with groundwater, thereby reducing risk to within acceptable levels for potential human receptors. There is risk associated with the use of the groundwater at SEAD-13, driven by the concentrations of nitrate, aluminum, and manganese identified. The risk from the presence of metals is associated with the suspended solids contained in the collected groundwater samples and not from the groundwater itself.

The presence of nitrate is likely related to past activities conducted in the area. The extent of the nitrate plume is defined and restricted to the area located between the historic disposal pits observed in SEAD-13-East and the Duck Pond to the west. Groundwater data from monitoring wells in the SEAD-13-West side of this AOC does not show evidence of a nitrate plume in this area of the AOC which is hydraulically downgradient of SEAD-13-East and the Duck Pond. Chemical analysis of surface water in the Duck Pond indicated that the nitrate/nitrite-nitrogen concentrations are below the levels established for drinking water sources nationally and within the State of New York.

Therefore, a LUC has been implemented over the geographic area of SEAD-13 to prohibit access to or use of the groundwater. This restriction will remain in effect until the concentrations of hazardous substances in groundwater beneath the AOC have been reduced to levels that allow for unlimited exposure and unrestricted use. Once groundwater cleanup standards are achieved, the groundwater use/access restriction may be eliminated, with EPA approval.

3.1.2.3 Remedy Implementation and Remedial Systems

<u>LUC Objectives and Land Use Restrictions</u>

A Record of Decision ("ROD") titled "Seventeen SWMU Requiring Land Use Controls (SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and122E) " signed on July 3, 2007 requires the establishment of institutional controls ("ICs") at the following sites:

For SEADs 13 and 64D

- Prevent access or use of the groundwater until cleanup levels are met; and
- Maintain the integrity of any current or future remedial or monitoring system.

For SEADs 64B and 64D

- No unauthorized excavation
- Maintenance of the existing soil cover

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") dated December 2006 implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 2 expanded the LUC RD from the PID area to include sites that are in the area formerly known as the Conservation Area and the Airfield parcels.

SEADs 13, 64B and 64D are located on the property known as the Conservation Area Parcel and are still under the control of the Army. The designated reuse of land within the Depot was revised in 2005 by SCIDA and is reflected in **Figure 1-2**. The new future land uses for three SWMUs that were previously in the Conservation/Recreation area (SEADs 13, 64B, and 64D) are Residential/Resort for SEAD-13 and

Training Area for SEADs 64B and 64D. The Training Area classification suggests that the areas will be used in a manner consistent with light industrial areas.

Implementation Actions

The LUC Implementation Actions specified in the SEAD LUC RD (USACE, 2006) and Addendum 2 (USACE, 2008a) will be achieved and implemented to prevent future violation of the LUC Objectives and Land Use Restrictions, as necessary.

Enforcement

Addendum 2 (USACE, 2008a) applied the SEAD LUC RD enforcement provisions to SEAD-13.

Modification

Addendum 2 (USACE, 2008a) applied the SEAD LUC RD modification provisions to SEAD-13.

Termination

Addendum 2 (USACE, 2008a) applied the SEAD LUC RD termination provisions to SEAD-13.

3.1.2.4 Systems Operations/Operation & Maintenance

Not applicable; no active remedy.

3.1.2.5 Data Review

3.1.2.5.1 Institutional Control Review

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") dated December 2006 implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 2 expanded the LUC RD from the PID area to include sites that are in the area formerly known as the Conservation Area and the Airfield parcels. SEADs 13, 64B and 64D are located on property known as the Conservation Area Parcel and are still under the control of the Army.

Environmental Easement

The Army remains in control of SEAD-13 and therefore has not prepared an environmental easement consistent with N.Y. Code Env. Section 27-1318(b). The Army will prepare an environmental easement to be recorded at the time of property transfer.

Deed Restrictions

The Army remains in control of SEAD-13 and therefore retains the responsibility to implement the Land Use Controls.

3.1.2.5.2 Long Term Monitoring Review

There are no long-term monitoring requirements for SEAD-13.

3.1.2.6 Site Inspection

The Army inspected the site on April 6, 2011 to determine that the LUCs are being maintained. A survey was conducted throughout SEDA with site-specific inspections being conducted at SEAD-13. Five-Year Review - site visit photo log is contained in Appendix A and completed Five-Year Review site inspection checklist is contained in Appendix B.

The following observations were made during the site inspection:

- Four monitoring wells were recently decommissioned in accordance with NYSDEC guidelines in SEAD-13 West and 7 wells were decommissioned in SEAD-13 East.

The site inspection confirmed that no prohibited facilities have been constructed and no access to or use of groundwater was evident.

3.1.2.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

No active remedial action was required by the ROD for SEAD-13 and no continuing active remediation is required for SEAD-13.

Based on a review of the Land Use Control Remedial Design Addendum 2 and a site visit conducted on April 6, 2011, the remedy is functioning as intended by the decision documents.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the AOC since implementation of LUCs that would affect the protectiveness of the remedy.

The risk assessment indicated that risks to all recreational and residential receptors were below the EPA acceptable limits (i.e., HI of 1 or less and a cancer risk in the range of 10^{-4} – 10^{-6} or less) if exposure to groundwater was limited. The risk assessment suggests that restricting access/use of groundwater at SEAD-13 will ensure protection of human health and the environment by reducing the hazard indices and cancer risk to within an acceptable range.

The selected remedy for SEAD-13 was protective of human health and the environment through implementation of a groundwater use restriction until groundwater cleanup standards are achieved. The land use controls implemented under the selected remedy ensure that risks to all recreational and residential receptors are eliminated by preventing access to site groundwater.

The underlying assumptions support the selected remedy in remaining protective for the following reasons:

- The current/future LUC/IC restrictions minimize potential exposure pathways and eliminate groundwater ingestion; and

- Soil and groundwater investigations used protective criteria including NYS Soil Clean-up Objectives contained in TAGM #4046 (NYSDEC, 1996) and NYSDEC Ambient Water Quality Standards and Guidance Values (NYSDEC, 2004).

The NYS Clean-up Objectives contained in TAGM #4046 that were used were compared to 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives. TAGM 4046 soil cleanup objectives are found to be lower than the restricted commercial clean-up objectives contained in Table 375-6.8(b) and for many contaminants lower than unrestricted clean-up objectives contained in Table 375-6.8(a).

The most recent NYSDEC Ambient Water Quality Standard and Guidance Values were utilized in the ROD for SEAD-13.

As a result, the clean-up levels and remedial action objectives for SEAD-13 are considered still valid.

Since the soil and groundwater cleanup standards for the remedy are equivalent to or more stringent than human-health-based promulgated standards and cleanup criteria, the cleanup standards are expected to remain protective of human health.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no new information that would affect the protectiveness of the remedy.

3.1.2.8 Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD for SEAD-13. On-going remedial operation, maintenance and monitoring activities include periodic evaluations of the effectiveness of the remedy. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs cited in the RODs remain protective of human health and the environment.

3.1.2.9 Recommendations

Based on this Five-Year Review, the Army makes the following recommendations:

- Continue the implementation and monitoring of LUCs and the annual frequency of periodic reviews for the AOC.

3.1.2.10 Protectiveness Summary

The remedy for SEAD-13 is protective of the environment and will protect human health when it is completed. Currently, there are no unacceptable exposures to human or environmental receptors from source area contaminants and none are expected to occur during the next five years.

3.1.3 SEAD-23 - Open Burning Ground

3.1.3.1 History of Contamination, Initial Response and Basis for Taking Action

History of Contamination and Initial Response

The OB Grounds site occupies approximately 30 acres on gently sloping terrain in the northwest corner of SEDA as shown in **Figure 3-1**. The OB Grounds is bounded on the east by Reeder Creek, which is a perennial creek that is generally less than 1 foot deep and eventually flows into Seneca Lake. The quality of surface water in Reeder Creek has been designated by the State of New York as a Class C water body. Seneca Lake is located approximately 10,000 feet west of the site and is used as a source of drinking water for SEDA and surrounding communities. The site is sparsely vegetated with grasses and brush and there are no permanent structures within the area other than small concrete bunkers.

The stratigraphy on the OB grounds site generally consists of between 2 and 10 feet of glacially derived till below which is a zone of weathered bedrock. The bedrock at this site is shale, which grades into competent shale at depth. The thickness of the weathered shale zone below the till ranges from approximately 1 foot to as much as 15 feet across the site but is generally only a few feet thick. Below this depth is competent shale, which is expected to extend for hundreds of feet. The borings performed at the site did not extend past the upper several feet of weathered shale. The depth to groundwater in the till/weathered shale aquifer varies seasonally between approximately 2 and 7 feet below the ground surface. Infiltration of precipitation is the sole source of groundwater for the overburden aquifer and the direction of groundwater flow in the till/weathered shale aquifer is generally to the east toward Reeder Creek. A possible groundwater divide has been noted during various monitoring episodes. The location of the divide represents a high point of the upgradient groundwater flow regime. The divide diverts a portion of the groundwater to the west, away from Reeder Creek to the east. The flow regime of groundwater flowing to the west is not completely known. Sampling results from these former wells do not suggest that the quality of groundwater has been impacted and therefore the significance of the divide is considered minimal.

Groundwater at Seneca Army Depot is classified as GA by the State of New York, which means that it is designated as suitable source for potable water. Surface water run-off is to the east-northeast via a series of drainage ditches and culverts towards Reeder Creek. The ditches and culverts were created during the construction of the burn pads and access roads. The construction of the pads also resulted in the formation of areas where surface water collects. These areas drain slowly due to the clay content in the soil and have resulted in the formation of low-lying wet areas; 38 wet areas have been identified in and around the OB Grounds. A more comprehensive description of the site and the associated groundwater resource is presented in the Remedial Investigation (RI) Report (Parsons ES, 1994b).

The land at the OB Grounds had been used for demilitarization of munitions for approximately forty years. The open burning procedure involved the preparation of combustible beds of pallets and wooden boxes on the pads followed by the placement of ammunition or the components to be demilitarized on the beds. A trail of propellant was placed on the ground leading to the combustible bed. Once ignited the energetic material was allowed to burn until only ash and casing residues remained. Items burned included various military munitions such as propellants and projectiles.

The burning of munitions had been performed at designated burning pads, which ranged in size from approximately 100 by 100 feet to 300 by 800 feet. Previously there were nine pads at the OB Grounds. The burning pads at the site were built on top of the natural glacial till soils. Originally, demilitarization of munitions was performed via open burning on the ground surface. Difficulties in sustaining the burning process were noted due to the poor drainage characteristics of the soil. Subsequently, individual burn pads were built up with crushed shale and soils to provide a drier environment in which to perform the burning. Each burn pad had from 1/2 to 2 feet of crushed shale at the surface. Below this material were the pre-existing agricultural soils overlying the glacial till. Berms surround each of the burning pads on three sides.

Designated munitions waste was open-burned on the nine separate burning pads until 1987. After 1987, munitions were destroyed by burning them within an aboveground steel tray to minimize the impact of the burning on the environment.

An elongated, low hill is located in the southern portion of the open burning area. The exact origin of the hill is unknown but was suspected to have been formed during the clearing activities, early in the history of the OB Grounds.

The open burning of waste munitions was identified as a Resource Conservation and Recovery Act (RCRA) regulated process. Due to the nature of SEDA's former mission, it was necessary for the facility to treat, store, and dispose of hazardous wastes including waste munitions. Consequently, a RCRA permit was a regulatory requirement for SEDA to perform these operations as a Treatment, Storage, and Disposal (TSD) facility.

SEDA applied for a RCRA Part A and Part B permit on May 1, 1987 and operated the facility under the interim status provisions of RCRA. Interim status allows a facility to operate as a TSD facility during the RCRA Part B permit application process.

Final closure of the OB Grounds under RCRA guidelines was deferred when SEDA was nominated for inclusion of the NPL in July 1989; SEDA was listed on the NPL in Group 14 on the Federal Section. Following SEDA's NPL listing, the Army, EPA, and NYSDEC agreed that any corrective actions required for any targeted problem sites would be regulated under CERCLA guidelines. RCRA requirements are an Applicable or Relevant and Appropriate Requirement (ARAR) pursuant to Section 121 of CERCLA.

<u>Basis for Taking Action</u>

Contamination

The primary media investigated at the OB Grounds included soil, surface water and sediment (from Reeder Creek, on-site areas and drainage swales), and groundwater. On-site soil and sediment in Reeder Creek were found to be the media that had been impacted. Lead was found at a maximum concentration of 56,700 mg/Kg in soil.

Criteria, guidelines and standards were used as an initial evaluation of site conditions and were useful in determining if impacts to various media had occurred. Where applicable, these criteria, guidelines and standards have been included for comparison. However, individual media sample exceedances of a criteria, guideline or standard did not constitute the need for a remedial action. This decision has been based upon the baseline risk assessment.

COCs were identified following the process described in Chapter 6, the risk assessment, of the RI (Parsons ES, 1994b). This process involved eliminating all compounds that were not detected in any sample for that media. For soil and groundwater, statistical comparisons to either background levels in the case of soils or, upgradient conditions in the case of groundwater, were made to refine the list of COCs. Frequency of detection and contribution to risk as a percentage of product of the maximum detected value and the chemical toxicity were also used to refine the list of COCs. Each media was screened in a similar manner to focus the risk assessment on those chemicals that have the greatest risk potential.

The primary COCs identified included metals, PAHs, explosive compounds, and phthalates. These components were likely released to the environment during the historic open burning activities. Summaries of the RI data are presented, by media, in the following sections.

<u>Impacts to Soils</u>

Guidelines for soil cleanup are presented in the NYSDEC TAGM #4046 soil cleanup objectives values were sued to assess soils. Details of this comparison are presented in Chapter 4 of the RI (Parsons ES, 1994b). Concentrations above these guidance values imply that conditions at the site that may pose a threat to human health and the environment. The analytes that exceeded these guidance values are the PAH compounds [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and dibenz(a,h)anthracene], metals (barium, cadmium, chromium, copper, lead, mercury, thallium and zinc) and 3-nitroaniline, dieldrin, and 4,4’-DDT.

The distribution of metals and semivolatiles found during the RI were generally highest in the surface of the burn pads and the berms when compared to the concentrations in the areas around the burn pads. Generally, only the upper two feet of the burn pads were affected with constituents while the berms were likely affected throughout. The most significantly affected area off the pads was between Pad B and Pad C.

<u>Impacts to Groundwater</u>

Two rounds of groundwater sampling were performed. The first round of groundwater sampling performed in January, 1992 involved analysis of both non-filtered and filtered samples. The concentrations of metals, in the filtered samples, were all below detectable limits. However, for the non-filtered samples, measured concentrations of lead were above the New York State, GA standard in 15 of the 28 monitoring wells sampled. Other metals were also measured above the GA groundwater quality standard in the non-filtered samples. This suggests that the dissolved concentration of lead is below the GA standard and the concentration of metals in groundwater is influenced by the turbidity of the sample. For purposes of the risk assessment and comparisons to groundwater standards, only the filtered data were used. However, in some instances, such as the presence of explosives in groundwater, the unfiltered sample data influenced the selection of chemicals that were evaluated in the risk assessment. Where the compound was not detected in the filtered sampling results, but was detected in the unfiltered data, the compound was retained for evaluation in the risk assessment. The concentration used to evaluate risk was then set at one-half the detection limit for the filtered data. A second round of groundwater sampling was conducted using low-flow sampling techniques. Using low-flow techniques, the number of groundwater quality standard exceedances decreased from what were reported for the first round unfiltered samples.

Lead concentrations exceeded the New York Class GA groundwater standard of 25 µg/L and the Federal Action Level for drinking water of 15 µg/L in two of the 36 monitoring wells sampled. The wells that exceeded the NYSDEC GA standard for lead in groundwater were MW-19 and MW-14. The concentrations of lead in these two wells were 36 µg/L and 86 µg/L, respectively. Elevated turbidity levels measured in these two samples are believed to contribute to the elevated concentrations of lead determined. Iron and manganese were also detected in groundwater above their GA standard levels. Aluminum and magnesium were detected above NYS guidance values.

Concentrations of the explosives RDX, trinitrotoluene (TNT), and dinitrotoluene (DNT) were also detected in four of the 28 monitoring wells sampled during the first sampling effort but were all at concentrations below New York AWQS GA criteria. There are no federal standards for RDX, TNT and DNT. None of these compounds were detected in the second round of groundwater sampling data.

Following the comparison of groundwater data to the NYSDEC GA standards, the risk assessment screening was performed to select COCs for evaluation in the risk assessment. The initial list COCs for groundwater included both organic compounds and inorganic chemicals.

<u>Impacts to Surface Water</u>

Surface water data was collected from both on-site surface water and from Reeder Creek. Reeder Creek flows adjacent to the northeastern boundary of the OB Grounds and surface water from the OB Grounds drains to Reeder Creek. The on-site surface water bodies sampled were small pools that were present following a rainfall event. Reeder Creek is a perennial flowing stream, although the stream flow volume fluctuates during the year. The highest flow is generally observed during the late winter and early spring seasons whereas the lowest flow generally occur during the late summer and early fall seasons.

Since this media is surface water, the NYS AWQSs were considered appropriate screening criteria. The data were initially compared to the Class D standard because the RI was conducted at a time when NYSDEC classified the portion of Reeder Creek adjacent to the OB Grounds as Class D. The NYSDEC subsequently classified all of Reeder Creek as a Class C surface water body. The surface water concentrations of aluminum and iron in Reeder Creek exceeded the NYS AWQS Class C standards. Only iron exceeded the AWQS Class D standard in Reeder Creek. The maximum concentration of aluminum in Reeder Creek was 300 µg/L, which is above the NYSDEC Class C standard of 100 µg/L. There is no aluminum standard for a Class D water body. Vanadium was detected at a maximum concentration of 39 µg/L in Reeder Creek, which is above the NYS AWQS of 14 µg/L for a Class C water body but is not above the Class D criteria of 190 µg/L.

The surface water pools at the OB Grounds have not been classified by the NYSDEC and comparisons to the NYS AWQS did not apply to the surface water that accumulated at the OB Grounds. For the risk assessment, the on-site surface water data was separated from the surface water data collected from Reeder Creek. This is because of the exposure routes that were considered in the risk assessment. For example, off-site residences could swim and wade in Reeder Creek but could not perform the same activities on-site. Due to the shallow nature of the on-site surface water pool, swimming would be a physical impossibility, requiring the data to be separated.

Impacts to Sediment

The NYSDEC Sediment Criteria are guidelines that were used to assess sediment data collected from Reeder Creek and on-site sediment found in the intermittent surface water pools. Concentrations of chemicals above the NYSDEC Sediment Guidelines were used to determine if impacts to sediment were likely to have occurred. The list of COCs was then refined during the data evaluation portion of the risk assessment. In 1993, the NYSDEC updated the Sediment Criteria that resulted in slightly difference values being used for clean up than the Sediment Criteria values considered in the RI. The sediment data from Reeder Creek and the on-site areas were separated into two datasets for evaluation during the risk assessment process to determine the impacts to on-site sediment and sediment in Reeder Creek.

During the ecological survey at the OB Grounds, on-site sediment was determined to be more characteristic of terrestrial soil than sediment found in aquatic conditions. This is likely a result of the continual cycle of collection and storage of surface water in the on-site pools followed by the loss of the surface water through evaporation. As a result, the on-site sediment was evaluated as sediment but was also added to the on-site surficial soil database and evaluated as part of the impacts to surficial soil during the risk assessment process.

Exceedances of this guideline for sediment in Reeder Creek were noted for the metals copper and lead. The maximum concentration of lead in sediment in Reeder Creek was 332 mg/Kg. The 1989 NYSDEC sediment guideline for lead was 27 mg/Kg 1993. The 1993 NYSDEC sediment guideline for lead is 31 mg/Kg. The maximum concentration of copper was found to be 2,380 mg/Kg. The 1989 NYSDEC sediment guideline was 19 mg/Kg. The 1993 NYSDEC sediment guideline for copper is 16 mg/Kg. Other exceedances were also noted, the maximum concentration of arsenic was 7.4 mg/Kg. The 1989 NYSDEC sediment guideline for arsenic was 5 mg/Kg. The 1993 NYSDEC sediment guideline for arsenic is 6 mg/Kg. The maximum concentration of cadmium was 3.4 mg/Kg, the 1993 NYSDEC sediment guideline is 0.6 mg/Kg. The maximum concentration of manganese was 596 mg/Kg, the 1993 NYSDEC sediment guideline is 460 mg/Kg. The maximum concentration of mercury was 0.7 mg/Kg, the 1993 NYSDEC sediment guideline is 0.15 mg/Kg. The maximum concentration of nickel was 42 mg/Kg, the 1993 NYSDEC sediment guideline is 16 mg/Kg. The maximum concentration of zinc was 497 mg/Kg, the 1993 NYSDEC sediment guideline is 120 mg/Kg.

Exceedances of the NYSDEC sediment guideline for sediment in on-site wetlands were also noted for several metals including copper, lead and zinc. The maximum on-site concentration of lead was 7,400 mg/Kg. The 1989 NYSDEC sediment guideline for lead was 27 mg/Kg. The 1993 NYSDEC sediment guideline is 31 mg/Kg. The maximum on-site concentration of copper in sediment was found to be 3,790 mg/Kg. The 1989 NYSDEC sediment guideline was 19 mg/Kg. The 1993 NYSDEC sediment guideline for copper is 16 mg/Kg. The maximum concentration of zinc was found to be 1,200 mg/Kg. The 1989 NYSDEC sediment guideline for sine was 85 mg/Kg. The 1993 NYSDEC sediment guideline is 120 mg/Kg. Other exceedances were also noted, for example, the maximum on-site concentration of arsenic was 10 mg/Kg. The 1989 NYSDEC sediment guideline for arsenic was 5 mg/Kg. The 1993 NYSDEC sediment guideline for arsenic is 6.0 mg/Kg. The maximum concentration of cadmium was 10 mg/Kg. The 1989 NYSDEC sediment guideline was 0.8 mg/Kg. The 1993 NYSDEC sediment guideline for cadmium is 0.6 mg/Kg. The maximum concentration of manganese was 1520 mg/Kg, the 1989 NYSDEC sediment guideline was 428 mg/Kg. The 1993 NYSDEC sediment guideline is 460 mg/Kg. The maximum concentration of mercury was 2 mg/Kg, the 1989 NYSDEC sediment guideline was 0.11 mg/Kg. The 1993 NYSDEC sediment guideline is 0.15 mg/Kg. The maximum concentration of nickel was 64 mg/Kg, the 1989 NYSDEC sediment guideline was 22 mg/Kg. The 1993 NYSDEC sediment guideline for nickel is 16 mg/Kg.

Human Health Risk Assessment

Table 7-3 in the ROD (Parsons, 1999c) summarizes the results for total carcinogenic risks and non-carcinogenic hazard. The risk assessment results indicate that no media at the site posed an unacceptable risk to human health. The exposure scenario evaluated during the OB Grounds risk assessment included current on-site OB Grounds workers (Industrial Scenario), current off-site residents (Residential Scenario), and future on-site residents (Residential Scenario). The carcinogenic risk for the worst-case exposure scenario (future resident on-site) estimated an excess cancer risk level of 1.0×10^{-5}, within the EPA's acceptable range. The associated non-carcinogenic HI for the future resident was estimated as 0.33.

The estimated carcinogenic risk level for the on-site worker was 6.3×10^{-6}, with a non-carcinogenic HI of 0.23. The estimated risk to off-site residents was 3.9×10^{-7}, and their non-carcinogenic HI was 0.007.

The Army used this area as an open burning ground for destruction of military ordnance. Burning was later performed in an aboveground steel tray. This use continued from the initial days of the Depot until base closure. Following base closure, the future intended land use, as recommended by the Seneca Depot LRA was as a conservation/recreational area; the SCIDA did not alter this intended use this land when they modified potential uses for other areas of the Depot in 2005. As a result, an on-site residential exposure scenario was not used as a basis for establishing remedial action goals even though this exposure scenario was considered in the baseline risk assessment. The OB Grounds was remediated to meet ecological standards, which are more stringent than residential requirements.

Ecological Risk Assessment

The ecological risk assessment for the OB Grounds began by evaluating the COCs found at the site in conjunction with the site-specific biological species/habitat information. The risk assessment involved a qualitative and quantitative appraisal of the actual or potential toxic effects of hazardous waste sites on aquatic, wetland, and terrestrial biota. The risk assessment considered plant and animal exposures from acute chemical concentrations, chronic concentrations leading to potential lethal and sublethal effects, and food chain transfers of chemicals possessing biomagnification potential. Plants and animals that are or in the future could be experiencing lethal and sublethal effects from exposure to toxic substances were considered.

The conclusions determined from field efforts indicated a diverse and healthy aquatic and terrestrial environment. No overt acute toxic impacts were evidenced during the field evaluation.

The quantitative evaluation, which involved comparison of the 95th UCL of the mean with the media specific criteria, suggested potential chronic risk from heavy metals, specifically lead and copper. The acute effects from these metals were not observed during fieldwork, i.e., the ecological community appeared diverse and normal, however long term chronic impacts are subtler. The RI was completed in 1992 and issued final in 1994, therefore, the sediment guideline used during the RI was the 1989 version. NYSDEC updated the sediment guidelines in 1993. For completeness, both the 1989 and the 1993 versions of the sediment guidelines were presented in the ROD

For the protection of aquatic life in contact with contaminated sediments, the 95th UCL for both copper and lead exceeded both the 1989 NYSDEC sediment guidelines and the Limits of Tolerance (LOT) criteria for the protection of benthic macro invertebrates. For copper, the 1989 NYSDEC “no effect” and “lowest effect” level, sediment guideline for protection of aquatic life that is in contact with sediments was 19 mg/Kg. The 1993 NYSDEC, Lowest Effect Level (LEL) sediment guideline, for protection of aquatic life that is in contact with sediments containing copper was 16 mg/Kg. The 95th UCL for copper in all sediments, including on-site areas and Reeder Creek, is 401 mg/Kg. For lead, the 1989 NYSDEC “no effect” and “lowest effect” level, sediment guideline was 27 mg/Kg. The 1993 NYSDEC, Lowest Effect Level (LEL) sediment guideline, for protection of aquatic life that is in contact with sediments containing lead is 31 mg/Kg. The 95th UCL of the mean for all sediment samples, including on-site areas and Reeder Creek, is 652 mg/Kg. Combining all sediment data was deemed to be appropriate as wildlife could consume species from both on-site areas as well as off-site areas.

Soil concentrations considered phytotoxic to terrestrial vegetation were obtained from the scientific literature. Copper and lead at the 95th UCL of the mean for all data exceeded the range of concentrations considered phytotoxic to vegetation in soils. Surface water criteria for the protection of aquatic life did not exceed the guidelines for copper and lead. However, the maximum surface water concentration and the 95th UCL of the mean for aluminum and vanadium did exceed the NYS AWQSs for protection of aquatic species. For aluminum in Reeder Creek, the maximum surface water concentration was 300 µg/L; the 95th UCL of the mean for the samples collected in Reeder Creek is 139 µg/L. For aluminum, the NYS AWQS for a Class C stream is 100 µg/L, there is no value for a Class D stream. For vanadium in Reeder Creek, the maximum surface water concentration was 39 µg/L; the 95th UCL of the mean is 19 µg/. For vanadium, the Class C NYS AWQS designation for a Class C stream is 14 µg/L..

In summary, soils and sediment, in particular on-site soils and sediment in the low lying wet areas suggest that site conditions may pose an elevated ecological risk due to the presence of heavy metals, especially copper and lead. This risk is increased in the low-lying areas where sediment from runoff accumulates. Sediments in Reeder Creek may also pose an elevated ecological risk due to the presence of heavy metals, such as copper and lead.

3.1.3.2 Remedy Selection

The selected remedy for soil and sediment remediation involved excavation, treatment, and off-site disposal of the on-site soils and Reeder Creek sediments as shown in Figure 11-1 and Figure 11-2 of the ROD (Parsons, 1999c). The selected remedy included the following:

- The OB Grounds was used for surface burning of explosive trash and propellants. The concern for OE below the surface, at depth, at this site is small. Although OE is not expected to be found at depth at this site, through a combination of geophysics, excavation, sifting, removal and soil cover, the Army will nevertheless remediate OE to meet the Department of Defense Explosive Safety Board (DDESB) requirements for unrestricted use or put into place land use restrictions as may be required by the DDESB.
- Excavation of soils with lead concentrations above 500 mg/Kg and sediments from Reeder Creek with concentrations of copper and lead above the NYSDEC criteria of the 16 mg/Kg and 31 mg/Kg, respectively.
- Treatment of soils exceeding the Toxicity Characteristic Leaching Procedure (TCLP), estimated to be approximately 3,800 cy of the excavated soil, via solidification /stabilization will be performed to remove the RCRA characteristic of toxicity. This will allow the soil to be landfilled, in accordance with the requirements of the Land Disposal Restrictions (LDR) of RCRA.
- Disposal of the excavated and solidified soil in an off-site Subtitle D landfill. The total quantity of soil to be disposed of is estimated to be 17,900 cy, including the 3,800 cy of solidified soil.
- Construction of a soil cover of at least 9 inches of compacted soils in the areas of the OB Grounds with soils remaining on the site with lead concentrations above 60 ppm. The area to be covered is estimated to be approximately 27.5 acres, which encompasses most of the area of the OB Grounds. The cap will be vegetated with indigenous grasses to prevent erosion and to prevent direct contact and incidental soil ingestion by terrestrial wildlife. The monitoring program will ensure that the 9-inch soil/vegetative cover is maintained after the remedy is complete.
- Control of surface water runoff, as necessary, to prevent erosion of the vegetative cover and solids loading to the creek. This will be accomplished with vegetation, regrading of site topography and drainage swales.
- Conducting a monitoring program for site groundwater and sediment in Reeder Creek. This program will monitor metals. For groundwater, the level of detection will be to below 15 µg/L, the federal action level for lead in groundwater. For sediment, the detection limit for lead will be to 10 mg/Kg. Should a significant exceedance be noted, the exceedance will be confirmed through additional sampling and, if confirmed, appropriate corrective measures will be implemented to eliminate the threat posed by the exceedance. For groundwater, this action may include metals removal via filtering. A similar process will apply for a sediment exceedance observed in Reeder Creek. First, the source of the exceedance will be identified and confirmed.

If the exceedance is determined to originate from the OB Grounds site, then maintenance of or improvements to the existing erosion control systems will be instituted to reduce the threat due to erosion of on-site soils to the Creek. This may include revegatation or the construction of drainage control swales or structures.

The Army, EPA, and NYSDEC believe that the preferred alternative will be protective of human health and the environment, will comply with ARARs, will be cost effective, and will use permanent solutions and treatment technologies to the maximum extent practicable. The remedy also will meet the statutory preference for the use of treatment as a principal element via the use of stabilization of wastes.

The selected remedial action will improve the quality of the on-site surface water by preventing interactions with any remaining on-site soils, thereby minimizing the potential for exposure. Erosion will also be controlled during construction activities and as part of a permanent design.

3.1.3.3 Remedy Implementation and Remedial Systems

The OB Grounds Soil and Sediment Remediation Completion Report documents the remediation at the OB Grounds in accordance with WESTON's Revised Draft Work Plan dated April 1999, Parsons' Section C - Technical Specifications dated August 1998, and the ROD (Parson ES, 1999c). The primary activities completed by WESTON to achieve the remediation objectives for the Site included excavation and disposal of soils with concentrations of lead greater than 500 mg/Kg, removal of sediment from Reeder Creek in areas adjacent to the OB Grounds, application of 9 inches of clean soil cover to areas where lead concentrations exceed 60 mg/Kg, and establishment of a vegetative cover to prevent soil erosion.

Remediation activities at the site were conducted between June 1999 and May 2004. Work was conducted over this five year period in several different mobilizations and included the following tasks:

- Mobilization and site preparation, including surveying and excavation area layout.
- Decommissioning of 33 groundwater monitoring wells and one ground boring where a monitoring well (MW-28) had reportedly been installed but was not found at the time of the fieldwork.
- Excavation of approximately 88,000 cy of Case I soil (>800 milligrams per kilogram (mg/Kg) total lead), Case II soil (500 mg/Kg – 800 mg/Kg total lead), and Case III soil (<500 mg/Kg total lead).
- Diversion of Reeder Creek and excavation of approximately 2,300 cy of creek sediments.
- Post-excavation confirmation sampling and characterization sampling.
- Stabilization of soils and sediments to meet Toxicity Characteristic Leaching Procedure hazardous waste disposal criteria.
- Off-site disposal of approximately 7,000 tons of untreated soil and 50,400 tons of treated (stabilized) soils and sediment as non-hazardous material at a licensed disposal facility.

- Off-site disposal of approximately 283,300 gallons of wastewater generated from site activities.
- Site restoration including: backfilling, grading, and seeding the site.

Following a review of the confirmatory soil sample results, it was concluded that the horizontal and vertical extents of lead in soil at the burn pad locations has been sufficiently delineated and removed from the OB Grounds to below 60 mg/Kg (20.6 mg/Kg average). In addition, all adjacent surface soils (within the 1-ft cut and site perimeter) have been reduced to below 500 mg/Kg (89.6 mg/Kg average). Combined, the burn pad, 1-ft cut, and site perimeter total lead average is 55.1 mg/Kg (based on 274 samples).

A total of approximately 2,300 cy of sediment from Reeder Creek was removed and disposed of off-site, 32 monitoring wells were decommissioned, approximately 50,426 tons of soil were stabilized on-site prior to off-site disposal, and approximately 57,424 tons of soil was disposed of as RCRA Subtitle D Non-Hazardous soil at an approved facility.

A total of 25 grids encompassing an area of approximately 7 acres were backfilled to a depth of 9 inches using excavated soils containing less than 60 mg/Kg total lead. All accessible areas of the OB Grounds were fine-graded and seeded.

3.1.3.4 Systems Operations/Operation & Maintenance

Not applicable; no active remedy.

3.1.3.5 Data Review

3.1.3.5.1 Institutional Control Review

3.1.3.5.2 Long Term Monitoring Review

Long-term monitoring is an integral component of the approved remedy implemented at the OB Grounds. The "Record of Decision (ROD) Former Open Burning Grounds Site, Final" (Parsons, 1999c) indicated that monitoring of groundwater and the vegetated soil cover at the OB Grounds, and of the sediment within Reeder Creek was required. Specifically, the ROD required:

- Periodic monitoring of groundwater quality at the OB Grounds for lead and copper content;
- Periodic monitoring of the vegetated, compacted soil cover placed over the lead contaminated soil remaining at the OB Grounds to assess whether evidence of erosion or protective cover breaching were present, which could result in the potential migration of contaminated soil; and,
- Periodic monitoring of the sediment in Reeder Creek for lead and copper content.

The LTM that is being conducted at the OB Grounds is being performed in accordance with the "Long-Term Monitoring Plan for the Open Burning Grounds, Final" (LTM Plan) (Parsons, 2007d). The collection of groundwater quality data is needed to monitor the effectiveness of the implemented remedy at the site for preventing future impacts to groundwater at the OB Grounds and to sediments in Reeder Creek. Additionally, monitoring of the vegetated compacted soil cover placed over the buried soils at the OB Grounds is required to assure its long-term integrity and to prevent direct contact to, and incidental ingestion of, soils containing lead at concentrations up to 500 mg/Kg by terrestrial wildlife at the site.

Part of the OB Grounds annual monitoring includes a qualitative assessment (i.e., visual inspection) for evidence of migration of material via surface water flow or groundwater transport of contaminants into the remediated section of Reeder Creek adjacent and downgradient to the OB Grounds. The visual inspection consists of walking the creek bed (or embankment) looking for evidence of soil erosion or sloughing from the OB Grounds side of the creek embankment and/or the accumulation of sediment along the stream bed. Groundwater transport of contaminants is monitored by the annual groundwater sampling of the OB Grounds wells. Presently quantitative monitoring of sediment quality (i.e., submitting samples for analysis) is not included in the annual monitoring; the Army, the EPA, and the NYSDEC agreed that until such time as data indicating that either a groundwater pathway of contaminant flow or soil transport from the OB Grounds was occurring, sampling and analysis of creek sediments would not be required.

The overall objectives of the OB Grounds' LTM program is to monitor the effectiveness of the remedial actions completed at the site with respect to preventing future groundwater quality deterioration and the erosion or breaching of the vegetated, soil cover. The soil cover is intended to prevent incidental contact and ingestion of contaminated soil left buried at the site by indigenous terrestrial wildlife, and the potential mobilization and migration of lead contaminated soil interred beneath the cover. In addition to assessing the quality of site groundwater and the integrity of the cover, the results of the periodic monitoring will be used to assess the need for design and implementation of any sediment monitoring program that may subsequently be needed to assess potential OB Grounds impacts to the sediment quality found in Reeder Creek.

When LTM was implemented at the OB Grounds site, it was scheduled to occur on a quarterly basis. The first round of post-remedial action LTM was conducted in November 2007. The OB Grounds cover was first inspected in January 2008. The results of the first LTM event were presented in a technical memo submitted on January 25, 2008. The second round of LTM sampling and cover inspections were completed in February 2008. The results of the second LTM event were presented in a technical memo submitted on May 19, 2008. The third round of LTM sampling and cover inspections were completed in May 2008. The results of the third monitoring event were presented in a technical memo submitted on September 16, 2008. The fourth round of groundwater sampling and cover inspections were completed in August 2008. The results of the fourth monitoring event were presented in a technical memo submitted on November 13, 2008.

The results of the first four LTM events were combined and summarized in the OB Grounds LTM Annual Report and Year One Review; this document was initially submitted as a draft in December 2008 and this document recommended changing the monitoring frequency from quarterly to an annual event.

In February 2009, preliminary comments were received from the EPA that indicated that monitoring of Reeder Creek was required per terms of the OB Grounds ROD, and questioning why the results of such inspections had not been reported. The EPA also indicated that they did not concur with the Army's recommended change in monitoring frequency, and requesting that monitoring be conducted twice a year, once in the spring and again in the fall. NYSDEC provided additional comments on the draft report in March 2009, indicating that they also believed that inspection of Reeder Creek was required, but indicating that they had no objection to the decrease in monitoring frequency from quarterly to annual.

The Army authorized performance of a Reeder Creek inspection as a result of these comments, but this work was delayed until April 2009 when safe access could be gained into that portion of Reeder Creek that is adjacent to the OB Grounds. The observations and conclusions of this inspection were then appended to subsequent versions of the OB Grounds Report (i.e., draft final, final). However, resolution of the approved monitoring frequency was not finalized until February 2010, once the final OB Grounds Report was approved by the EPA and NYSDEC and all parties agreed to an annual monitoring event frequency. LTM of the OB Grounds was also disrupted due to the expiration of the Army's ordering period under the contracting vehicle used to perform the original work. Due to the uncertainty associated with the requirements and frequency of the monitoring, the Army could not program necessary funding and contract authorizations until an agreement was reached between all parties. The new contract vehicle and funding were awarded for the continuation of the work in May 2010, and LTM for the OB Grounds was performed in August 2010 Inspection of Reeder Creek was also conducted during this event. The results of the fifth monitoring event are presented and discussed in the 2010 annual monitoring report (Parsons, 2011c).

Based on the results of fifth round of LTM at the OB Grounds, the following conclusions have been reached:

- Residual lead and copper concentrations remaining in the soils have not impacted groundwater at, or in the immediate vicinity of, the site above the action levels;
- The integrity of the vegetated soil cover overlying interred contaminated soils at the site was intact and there was no evidence that terrestrial wildlife are exposed to the contaminated soils below the 9-inch cover;
- The washout area noted during in Grid Cell L7 in (identified as L8 in 2008 Report) during the February and May 2008 inspections is again evident in the August 2010 inspection. Information provided in Section 4.2 indicates that this is outside of areas where contaminated soils were interred beneath clean soil, so this area will not be repaired at this time by the Army. If the next inspection suggests that this area is enlarging, the Army will evaluate a more permanent repair;
- The Army will continue to monitor cover erosion, and note any instance of cover erosion or exposed native soil;
- Based on the groundwater data and the cover inspection, there is no evidence to suggest that the OB Grounds may be contributing to the degradation of sediment quality in Reeder Creek.
- Sediment deposition in Reeder Creek adjacent to the OB Grounds was not noted during the August 2010 inspection; and,
- The Army will continue to inspect Reeder Creek for evidence of sediment deposition and if it is observed, a sediment sampling and analysis program plan will be prepared, submitted for approval, and implemented for Reeder Creek at locations adjacent to the OB Grounds.

Based on the result of the LTM events conducted at the OB Grounds, the Army recommended continuing the monitoring frequency of once per year. As presented and summarized above, available monitoring data shows no evidence of lead or copper in the groundwater above the cleanup goals subsequent to the completion of the remedial action for the site. These findings are consistent with the groundwater sample results obtained during the remedial investigation stage (1990s) of work at the site, indicating that there is no evidence of groundwater quality deterioration over the past 15 years. Further, the annual inspections of the soil cover have shown minimal evidence of erosion or animal breaching of the protective soil cover. Additionally, the examination of spillways connecting the OB Grounds to Reeder Creek indicate that measures performed to eliminate overland surface water flow the OB Grounds to Reeder Creek continue to exist and have been effective, as there is no indication that soil or debris from the OB Grounds is located in the spillways downgradient of the control measures. Finally, the inspections of Reeder Creek indicate that the bedrock that underlies the watercourse adjacent to the OB Grounds continues to be scoured by the perennial flow within the creek. There is no current indication that sediment is being redeposited at locations from which it was previously excavated. Therefore, due to the absence of any evidence that suggests contaminants of concern have been mobilized from the OB Grounds either via the groundwater or overland flow of storm-event waters, and due to the continued scouring of the creek bed by the perennial flow of water, there is no reason to develop or implement a sediment monitoring plan for Reeder Creek at this time.

The next LTM sampling, soil cover inspection, and Reeder Creek inspection events are scheduled to occur in August 2011. Results of the next year's monitoring efforts at the OB Grounds will be evaluated, and recommendations of necessary changes to the frequency or extent of monitoring will be made at that time. Subsequent rounds of LTM for the OB Grounds are expected to continue at yearly intervals thereafter, unless altered by mutual agreement of all parties.

3.1.3.6 Site Inspections

As a detailed site inspection was conducted at the Open Burning Grounds in August 2010, a survey was conducted on April 7, 2011 as part of the Five-Year Review. A site visit photo log is contained in Appendix A and completed Five-Year Review site inspection checklist is contained in Appendix B.

The following observations were made during the site inspection:

- Several ponded areas were noted at the site, which is consistent with the site hydrology noted in the 2010 annual monitoring report (Parsons, 2011c), "Little of the current storm event runoff impacting the former OB Grounds reaches the creek via overland flow because it is captured in one of the numerous, localized topographic lows that are scattered throughout the former AOC. The topographic lows result from the soil removal and interment action performed at the AOC. The captured storm water subsequently infiltrates into the soil or evaporates."
- The washout area noted in Grid Cell L7 in the 2010 annual monitoring report was observed during the Five-Year inspection.
- The vegetated soil cover overlying interred contaminated soils at the site appeared to be intact and there was no evidence that terrestrial wildlife is exposed to the contaminated soils below the 9-inch cover.

- There were no signs of erosion or undermining at the culvert and the roadway reconstructed in September, 2010.

The remedy appears to be effective and functioning as designed.

3.1.3.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Remedial Actions required by the ROD for the Open Burning Ground have been completed and documented (Weston, 2005b). No continuing active remediation is required Open Burning Ground.

Based on a review of the remediation completion report, Long Term Monitoring Reports, and a site visit conducted on April 7, th2011 the remedy is functioning as intended by the decisions documents.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site since implementation of the remedy that would affect the protectiveness of the remedy.

The results of the baseline risk assessment completed as part of the RI concluded that site conditions do not pose a threat to human health. The highest risk was to a theoretical on-site resident; however, this risk was still within the EPA target range. Therefore, if risk-based health criteria are applied to the OB Ground, remedial objectives would have been met with no further action. However, one facet of the risk assessment that was not considered was the risk posed to receptors from exposure to lead. Lead was determined to be present in numerous areas at the site and was recognized as a constituent of concern. Lead was not considered in the baseline risk assessment because EPA had withdrawn the Reference Dose (RfD) for lead and therefore lead was not carried through the entire risk assessment.

As a result, consideration was given to reducing lead concentrations to a predetermined level that would be considered protective of human health. EPA provided guidance for protection of human health from lead by application of the UBK model. The model calculated blood lead levels in children. The allowable lead level in blood had been established at 10 µg/dL. Using standard exposure default values for soil, under residential conditions, EPA guidance suggested that concentrations of lead in soil of approximately 400 mg/Kg would provide reasonable levels for protection. While this guideline is not site-specific it provided a basis for establishing the OB Ground clean-up value. The 400 mg/Kg value of lead in soil was considered conservative, since it was considered protective to child receptors from a residential exposure scenario. This exposure scenario was considered unrealistic, since the Army initially intended to continue to use this site as a munitions destruction area, not as a residential area. A value of 500 mg/Kg was established as the clean-up goal for the OB Grounds, based upon the future land use, which was industrial, i.e. munitions destruction. With the inclusion of SEDA on the BRAC95 list, future land use changed from industrial to a wildlife conservation/recreation area. Since the future land use did not involve residential exposures the 500 mg/Kg value of lead in soil was deemed appropriate and remained.

The ecological risk analysis was based upon a comparison with available state and federal guidelines and supplemented with literature derived guidelines. This comparison suggested that there might exist a potential risk from the presence of heavy metals, specifically lead and copper. As a result of this comparison, it was determined that a remedial action would be appropriate for copper and lead, in order to assure the protection of the aquatic life and wildlife consumers of aquatic life. The remedial action objective for protection of ecological receptors was established as those presented in the NYSDEC guidance document "*Technical Guidance for Screening Contaminated Sediments*, November, 1993". For lead and copper, the values adopted by NYSDEC and referenced in the guidance were the Lowest Effect Level (LEL) presented by Persaud et al. (1992).

The selected remedy was protective of human health and the environment through the use of a combination of treatment and disposal. It reduced human health risks by eliminating the highest levels of lead found in soils. It also provided long-term protection to ecological receptors by reducing the potential of exposure by wildlife to lead in surface soils by using a vegetative soil cap and by removing sediments in Reeder Creek with concentrations of lead and copper above NYSDEC criteria. The action also reduced the potential for these constituents to migrate to groundwater, even though their migration potential is considered very low in both the short-term and long-term. It reduced the carcinogenic risk to 9×10^{-6} and the non-carcinogenic risk HI to 0.11 for current and future intended land use.

The underlying assumptions support the selected remedy in remaining protective for the following reasons:

- The future intended land use, as presented by the Local Redevelopment Authority (LRA), is as a conservation/recreational area. The LRA has not identified housing/residential as the future land use for the OB Grounds and there are no plans to utilize this site for residential purposes. As a result, an on-site residential exposure scenario was not used as a basis for establishing remedial action goals even though this exposure scenario was considered in the baseline risk assessment. The OB Ground was remediated to meet ecological standards, which are more stringent than residential requirements.; and
- Soil, groundwater, and sediment investigations used protective criteria including NYS Soil Clean-up Objectives contained in TAGM #4046 (NYSDEC, 1996), NYSDEC Ambient Water Quality Standards and Guidance Values (NYSDEC, 1998), EPA MCL, and NYSDEC Sediment Screening Criteria (NYSEDC, 1993).

The NYS Clean-up Objectives contained in TAGM 4046 that were used were compared to 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives. TAGM 4046 soil cleanup objectives are found to be lower than the restricted commercial clean-up objectives contained in Table 375-6.8(b) and for many contaminants lower than unrestricted clean-up objectives contained in Table 375-6.8(a).

The most recent NYSDEC Ambient Water quality standard and guidance values are utilized for long term monitoring of copper and the most recent EPA MCL is used for long term monitoring of copper.

The NYSDEC Sediment Screening Criteria have been revised twice since 1993. In March 1998, new tables were added for screening marine and estuarine sediments only and in January 1999, additional sediment screening values were added to Table 1 for benzene, toluene, ethylbenzene, xylene, and nine polycyclic aromatic hydrocarbon compounds.

As a result, the clean-up levels and Remedial Action objectives for the open Burning Ground are considered still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no new information of significance that would affect the protectiveness of the remedy.

3.1.3.8 Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD for SEAD-23. On-going remedial monitoring activities include periodic evaluations of the effectiveness of the remedy. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs cited in the RODs remain protective of human health and the environment.

3.1.3.9 Recommendations

Based on this Five-Year Review, the Army recommends continuing the annual frequency of periodic reviews.

3.1.3.10 Protectiveness Summary

The remedy for SEAD-23 is protective of the environment and will protect human health when it is completed. Currently, there is no unacceptable exposure to human or environmental receptors from source area contaminants and none expected over the next five years.

3.1.4 SEAD-41 - Building 718 Boiler Blowdown Leaching Pit

3.1.4.1 History of Contamination, Initial Response and Basis for Taking Action

<u>History of Contamination and Initial Response</u>

SEAD-41 is the blowdown leaching area suspected to have existed in the drainage ditch located approximately 40 ft. west of Building 718, an abandoned boiler plant located in the northern end of the Depot (see **Figure 3-1**), on property currently occupied by the Hillside Children's Center. In 2000, a TCRA was conducted at SEAD-41, and approximately five cy of petroleum contaminated soils were removed.

Prior to connecting the boiler blowdown points to the sewer in 1979-1980, blowdown was reportedly released three times a day, and the discharged liquid was allowed to flow onto the ground at the blowdown point where it either infiltrated into the ground or flowed into the nearby drainage ditch. Each boiler is reported to have discharged between 400 and 800 gallons of blowdown liquids per day. The boiler blowdown is suspected to have contained water, tannins, caustic soda (sodium hydroxide), and sodium phosphate.

Thirty feet to the north of Building 718 an unnamed road runs from east to west. The drainage ditch is relatively steep near the building and primarily drains to the north, where it joins a roadside drainage ditch. Some runoff in the ditch flows to the southwest, where the drainage ditch is cut off by a crushed gravel road leading southwest away from Building 718.

Work performed at SEAD-41 included a LSP conducted in 1993/1994, followed by a TCRA conducted in 2000. The results of these activities are summarized below.

Limited Sampling Program – 1993/1994

One soil boring was advanced in the drainage ditch immediately to the west of the location where blowdown liquids were suspected to have been discharged from Building 718. The boring was terminated in weathered bedrock at 6.3 ft. bgs, the depth at which the boring could not be advanced further (i.e., refusal). The water table was encountered 4.0 ft. bgs. No VOCs were detected with the field screening instrument, and no stained soil was observed. The sample collected from immediately above the water table (2-4 ft. bgs) was submitted to the lab for chemical analysis. A second soil sample collected from the 0-2 ft. bgs interval at the same location was also submitted for analyses. Three additional shallow soil samples were also collected from the interval of 0 to 2 ft. bgs at other locations along the base of the drainage ditch. The samples were analyzed for pH by SW-846 Method 9045 and Total Recoverable Petroleum Hydrocarbons (TRPH) by EPA Method 418.1.

Petroleum hydrocarbons were detected in all of the soil samples collected from SEAD-41. TRPH detected in the surface soil samples ranged from 40 to 300 ppm. The subsurface soil sample contained 66 ppm TRPH. The pH of the soil samples ranged from 8.19 to 8.74.

The detection of petroleum hydrocarbons in all of the samples indicated that a release did occur. The surface samples collected nearest the point where the blowdown liquids were suspected of being discharged contained the greatest concentration of petroleum hydrocarbons. The sampling program delineated the extent of petroleum-impacted soil to an area approximately 40 ft. long by 3 ft. wide.

Time Critical Removal Action - 2000

A TCRA was conducted at SEAD-41 in 2000 to remove the petroleum-contaminated soils identified during the LSP. Approximately 5 cy of soil were removed as part of the TCRA. Soil samples were collected along the extent of the excavation area and analyzed for VOCs by EPA Method SW-846 8021 and SVOCs by EPA Method SW-846 8270 to confirm that site cleanup goals were achieved, and the area was refilled with clean fill.

<u>Basis for Taking Action</u>

Contamination

SVOCs were found in the soil samples collected at SEAD-41, with concentrations of benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, chrysene, and dibenzo(a,h)anthracene exceeding their NYSDEC TAGM #4046 cleanup objective level values. Table 6-8 in the ROD (Parsons, 2007a) summarizes the TCRA soil analytical results. The excavated soil was transported to another location within the Depot for use in a low temperature thermal desorption study at the SEDA.

Human Health Risk Assessment

At SEAD 41, a risk assessment was conducted to estimate the risks associated with current and future uses of this AOC. A risk assessment is a conservative, screening risk assessment tool. Because the mini risk assessment is a conservative tool, it is likely that a more traditional risk assessment would estimate even lower risks. The risk assessment estimated the human health and ecological risk that could be present at an AOC if no remedial action were taken.

Maximum concentrations of analytes found at the AOC were used as the EPCs for the area evaluated under the risk approach. The risk assessment approach was used for SWMUs (such as SEAD 41) where only limited sampling and analysis data was available, or when the identified maximum chemical concentrations indicated that the level of possible risk at the SWMU was within the EPA's acceptable range.

The risk assessment evaluated risk to receptors under the institutional future land use scenario (i.e., construction worker, adult resident, child resident, and lifetime resident). Table 7-5 in the ROD (Parsons, 2007a) summarizes the calculated cancer and non-cancer risks for all receptors and exposure routes considered in the risk assessment. The total cancer risk from all exposure routes is within or below the EPA target range (10^{-4} - 10^{-6}) for all four receptors. Likewise, the total non-cancer HI from all exposure routes is less than 1 for all receptors.

3.1.4.2 Remedy Selection

The LUC selected for SEAD-41 was already in place at the time the ROD was issued, and had been documented in the deed used to transfer the North End Barracks areas of the Depot. Part of the purpose of the ROD was to formalize and document the Army's intention to impose the existing LUC on the North End Barracks Area – SEAD-41 under CERCLA.

A deed was used to document the transfer of the land currently used for the Hillside Children's Center (i.e., former "North End Barracks" Area, see **Figure 3-1**) at the north end of the former Depot to the SCIDA. In the deed, the Army notified SCIDA that groundwater contamination had been identified in the vicinity of the former Building 718. This determination was made based on the results of historic groundwater sampling data that was collected during the investigation of SEAD-41, which indicated that total petroleum hydrocarbons (TPH, 690 ppb) were present in the upper aquifer of the groundwater. The Army applied the deed notification, based on the water quality from sampling, to all property located within the "North End Barracks" parcel. A public water supply services the entire area. This includes the area of the former SWMU SEAD-41, Building 718 Boiler Blowdown Pit.

The reported level of TPH exceeds the New York State Public Water System standards for unspecified organic contamination of 100 ppb. The deed further states "The Grantee, its successors and assigns, agree that in the event they use the groundwater as a public water supply source at the Property, they will comply with all applicable laws and regulations." Under New York regulations, future owners or occupants of the area would need to confirm the quality and acceptability of the groundwater as a source of potable water before it could be used for such a purpose. The Army recommends that the LUC documented in the existing deed for the "North End Barracks" parcel continue until the concentration of hazardous substances in groundwater beneath have been reduced to levels that allow for unrestricted use.

3.1.4.3 Remedy Implementation and Remedial Systems

LUC Objectives and Land Use Restrictions

A Record of Decision ("ROD") titled "Seventeen SWMU Requiring Land Use Controls (SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E) " signed on July 3, 2007 required the establishment of institutional controls ("ICs") at the site (SEAD-41) comprising the area formerly known as the North Barracks Area.

For SEAD-41 the Record of Decision signed on July 3, 2007 required the establishment of institutional controls that:

- Notifies future land owners of contaminated groundwater and requirement to meet all applicable laws and regulations should the owner decide to access and use the groundwater.

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") dated December 2006 implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 2 expanded the LUC RD from the PID area to include sites that are in the area formerly known as the North Barracks Area.

The existing deed provisions ensure the property is used in a manner consistent with the above LUC Objectives.

Implementation Actions

The following LUC Implementation Actions were achieved and implemented to prevent future violation of the LUC Objectives and Land Use Restrictions:

1. Lease restrictions – N/A for the North Barracks Area.
2. Environmental Easement - The Army transferred the North Barracks Area to the SCIDA prior to the issuance of the ROD signed on July 3, 2007 and an Environmental Easement was not required.
3. Deed restrictions –
    a. The North Barracks Area property was transferred prior to the issuance of the ROD dated July 3, 2007 with deed provisions that state "Groundwater sampling data of the Grantor indicates total petroleum hydrocarbon contamination of 690 parts per billion in the upper aquifer in the vicinity of Building 718 on the Property. The New York State Public Water System standards for unspecified organic contamination in groundwater of 100 parts per billion. The Property is currently served by a public water supply system that uses Seneca Lake as the source of drinking water. The Grantee, its successors and assigns, agree that in the event they use the groundwater as a public water supply source at the Property, they will comply with all applicable laws and regulations."

b. CERCLA Notice and Covenant. The deed included a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

c. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

4. Annual Certification – There is no requirement for an annual certification in the Record of Decision.

5. Five-Year Review - The Army will review the LUC remedy as part of the Five-Year Review and Report. The report will address the effectiveness of the LUC remedy and whether any LUC Objective, Land Use Restriction, or Implementation Actions should be modified.

Enforcement

Addendum 2 applied the SEAD LUC RD enforcement provisions to SEAD-41

Modification

Addendum 2 applied the SEAD LUC RD modification provisions to SEAD-41.

Termination

Addendum 2 applied the SEAD LUC RD termination provisions to SEAD-41.

3.1.4.4 Systems Operations/Operation & Maintenance

Not applicable; no active remedy.

3.1.4.5 Data Review

3.1.4.5.1 Institutional Control Review

The Land Use Control Remedial Design For SEAD 27, 66, and 64A (“SEAD LUC RD”) dated December 2006 implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area (“PID/Warehouse Area”). Addendum 2 expanded the LUC RD from the PID area to include sites that are in the area formerly known as the North Barracks Area. SEAD-41 is located on property known as the North End Barracks Area.

Environmental Easement

The Army transferred the North Depot, also known as the "North End Barracks" Area to the SCIDA, prior to the issuance of the ROD signed on July 3, 2007 and an Environmental Easement was not required.

Deed Restrictions

1. A deed was used to document the transfer of the land currently used for the Hillside Children's Center (i.e., former "North End Barracks" Area) at the north end of the former Depot to the SCIDA. In the deed, the Army notified SCIDA that groundwater contamination had been identified in the vicinity of the former Building 718. This determination was made based on the results of historic groundwater sampling data that was collected during the investigation of SEAD-41, which indicated that total petroleum hydrocarbons (TPH, 690 parts per billion [ppb]) were present in the upper aquifer of the groundwater. The Army applied the deed notification, based on the water quality from sampling, to all property located within the "North End Barracks" parcel. A public water supply services the entire area.

   This includes the area of the former SWMU SEAD-41, Building 718 Boiler Blowdown Pit. The reported level of TPH at SEAD-41 exceeds the New York State Public Water System standards for unspecified organic contamination of 100 ppb. The deed further states "The Grantee, its successors and assigns, agree that in the event they use the groundwater as a public water supply source at the Property, they will comply with all applicable laws and regulations."

2. CERCLA Notice and Covenant. The deed included a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

3. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

3.1.4.5.2 Long Term Monitoring Review

There are no long-term monitoring requirements for SEAD-41.

3.1.4.6 Site Inspection

The Army inspected the site to determine that the LUCs are being maintained on April 7, 2011. A survey was conducted throughout SEDA with site-specific inspections being conducted at SEAD-41. The Five-Year Review - site visit photo log is contained in Appendix A and completed Five-Year Review site inspection checklist is contained in Appendix B. During the site inspection, the Hillside Children's Center maintenance manager confirmed that the facility was using the public water supply.

The site inspection confirmed that no access to or use of groundwater was evident.

3.1.4.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

No active Remedial Action was required by the completed ROD for SEAD-41 and no continuing active remediation is required for SEAD-41.

Based on a review of the Land Use Control Remedial Design Addendum 2 and a site visit conducted on April 7, 2011 the remedy is functioning as intended by the decision documents.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site since implementation of Land Use Controls that would affect the protectiveness of the remedy.

The risk assessment indicated that the total cancer risk from all exposure routes is within or below the EPA target range (10^{-4} - 10^{-6}) for all four receptors. Likewise, the total non-cancer HI from all exposure routes is less than 1 for all receptors.

The Selected Remedy for SEAD-41 was based on the results of historic groundwater sampling data that was collected during the investigation of SEAD-41, which indicated that total petroleum hydrocarbons (TPH, 690 ppb) were present in the upper aquifer of the groundwater. The selected remedy is protective of human health and the environment through implementation of a groundwater use restriction until groundwater cleanup standards are achieved. The land use controls implemented under the Selected Remedy ensured that risks to all recreational and residential receptors were eliminated by preventing access to site groundwater.

The underlying assumptions support the selected remedy in remaining protective for the following reasons:

- The current/future LUC/IC restrictions minimize potential exposure pathways and eliminate groundwater ingestion.

As a result, the clean-up levels and Remedial Action objectives for SEAD-41 are considered still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no new information of significance that would affect the protectiveness of the remedy.

3.1.4.8 Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD for SEAD-41. On-going remedial monitoring activities include periodic evaluations of the effectiveness of the remedy. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

3.1.4.9 Recommendations

Based on this Five-Year Review, the Army recommends continuing the five year reviews.

3.1.4.10 Protectiveness Summary

The remedy for SEAD-41 is protective of the environment and will protect human health when it is completed. Currently, there are no unacceptable exposures to human or environmental receptors from source area contaminants and none are expected over the next five years.

3.1.5 Prison Area

3.1.5.1 History of Contamination, Initial Response and Basis for Taking Action

SEAD-43 - Old Missile Propellant Test Lab/SEAD-56- Herbicide and Pesticide Storage/SEAD-69- Building 606 Disposal Area

History of Contamination and Initial Response

SEADs 43, 56, and 69 are located in the southeastern corner of the Depot (**Figure 3-1**) on property that is currently associated with the New York State Department of Correctional Services' Five Points Correctional Facility. These areas are discussed as one AOC because SEAD-43 and SEAD-56 both represent historic uses of Building 606; SEAD-69 is a disposal area situated close to Building 606, which was previously suspected of receiving wastes from the two other SWMUs. The entire area encompassing the three SWMUs measures roughly 900 ft. long (east-west) and 600 ft. wide (north-south), shown in **Figure 3-1**.

In the 1960s, Building 606 was used as a missile propellant test laboratory; this use is designated as SEAD-43, the Old Missile Propellant Test Laboratory, which was used for quality assurance (QA) surveillance testing of military ordnance items. Operations performed reportedly involved the operational or functional testing of explosive devices. The Final SWMU Classification Report (Parsons, 1994a) indicates that IRFNA was used in, and stored at and near Building 606 prior to its disposal at SEAD-13. Much of the IRFNA storage occurred in a corrugated metal shed, which was exterior to and northwest of Building 606. The concrete pad was also used to aerate spill residues; thus IRFNA and/or liquid propellants from the QA laboratory may also have been released or disposed in this area.

After 1976, Building 606 was used as a pesticide and herbicide storage and mixing facility; this historic use is designated as SEAD-56, Herbicide/Pesticide Storage. Storage of pesticides and herbicides occurred at a now-demolished building formerly located west of Building 606. A historic concrete underground tank was also used for the intermittent storage of wastewater generated during the rinsing of the portable truck-mounted tank that was used for mobile spraying operations at the Depot. The truck-mounted tank was rinsed between dissimilar successive pesticide and herbicide applications, and the recovered wastewater was used as a diluent in successive mixing applications. In 1989, the pesticide/herbicide storage area was upgraded when a new rinseate building was constructed to the east of

Building 606, and the historic underground rinseate storage tank was replaced with a new vaulted tank that complied with the then-prevailing environmental regulations.

SEAD-69 is a disposal area in an open field that is located southeast of Building 606. It is suspected that waste from the IRFNA storage and pesticide/herbicide mixing was disposed at SEAD-69. SEAD-69 measures approximately 100 ft. by 100 ft. in size, and contained various types of construction debris, including bricks and concrete blocks, visible at the surface.

Basis for Taking Action

Contamination

Field investigations were conducted at SEADs 43, 56, and 69 in February of 1994 as part of the "ESI for Eight Moderately Low Priority AOCs" (Parsons, 1995a).

Test Pits

Three test pits were excavated at SEAD-69 in areas with distinct geophysical anomalies and in areas where debris was noted on the ground. The test pits revealed the presence of buried bricks, concrete blocks, construction debris, and piping. No impacted soil or obvious contamination was observed in the three test pits investigated. Soil samples from the investigated test pits were not submitted for analysis.

Surface/Subsurface Soil

Ten soil borings were drilled at SEADs 43, 56, and 69; three at SEAD-56, three at SEAD-69, and four at SEAD-43. Thirty (30) samples were collected from these ten borings and were submitted for chemical analysis. A summary of soil results is presented in Table 6-9 of the ROD (Parsons, 2007a).

Five VOCs were detected in 10 of the 30 soil samples collected at SEADs 43, 56, and 69. All VOCs were found at concentrations below their respective TAGM cleanup objective level values.

Twenty-one SVOCs were detected at varying concentrations in the soil samples collected at SEAD-43, 56, and 69. Six carcinogenic PAHs [benzo(a)anthracene, chrysene, benzo(a)pyrene, dibenz(a,h)anthracene, benzo(b)fluoranthene, and benzo(k)fluoranthene] were detected at concentrations that exceeded their respective TAGM cleanup objective level values. All of the TAGM exceedances for these compounds were limited to three soil samples: SB43-3-00, SB43-4.01 and SB43-4.02. The highest concentrations of the PAHs found above TAGM values, as well as the highest concentrations for 12 of the 15 remaining SVOCs detected at SEADs 43, 56, and 69, were found in soil sample SB43-4.02.

Two pesticides (endosulfan I and alpha-chlordane) were detected in two of the soil samples collected at SEADs 43, 56 and 69 at levels below their respective TAGM values.

Eleven metals were detected in one or more samples at concentrations that exceeded their respective TAGM cleanup objective level values (aluminum, antimony, beryllium, calcium, chromium, iron, lead, magnesium, nickel, potassium, and zinc). The occurrences of TAGM exceedances were distributed throughout the 30 soil samples collected at SEADs 43, 56, and 69. Zinc exceeded its TAGM value of 110 mg/Kg in ten samples, with a maximum detection of 338 mg/Kg. All other metals that exceeded their respective TAGM cleanup objective level values were detected at concentrations nominally greater than their TAGM values.

Cyanide was detected in one sample. A trace amount of cyanide (1.7 mg/Kg) was found in soil sample SB56-3-04.

Nitrate/nitrite-nitrogen was detected in 83% of the soil samples collected at SEADs 43, 56, and 69. Concentrations ranged from a low of 0.02 mg/Kg in sample SB56-3-00 to a high of 9.7 mg/Kg in sample SB69-1-00.

Groundwater

Four groundwater monitoring wells were installed in the vicinity of SEADs 43, 56, and 69. One monitoring well (MW43-1) was installed upgradient, along the eastern boundary of SEADs-43, 56, and 69 to obtain background water quality data. The remaining three monitoring wells were installed downgradient of the individual SEADs, in a linear fashion along the southwestern side of each area of concern being investigated.

One herbicide, 2,4,5-TP (Silvex), was detected at a concentration of 0.44 μg/L in the groundwater sample collected from monitoring well MW43-3. This concentration is slightly above the NYSDEC Class GA groundwater criteria of 0.26 μg/L.

Twenty metals were detected in the groundwater at SEADs 43, 56, and 69, as shown in Table 6-10 of the ROD (Parsons, 2007a). Aluminum, iron, and manganese were detected in four samples at concentrations greater than their comparative standards (i.e., NYSDEC GA AWQS) or guidance levels (i.e., Federal MCLs or Secondary Drinking Water Criteria). Thallium was detected once at a concentration (2.2 J μg/L) above its MCL value of 2 μg/L.

The groundwater samples were analyzed for nitrate/nitrite-nitrogen. Concentrations of 0.06 mg/L, 0.03 mg/L, and 0.02 mg/L were reported in samples MW43-1, MW43-1 and MW43-4, respectively. No indicator compounds were detected in groundwater sample MW43-2.

Surface Water

Five surface water and sediment samples were collected from drainage swales located within SEADs43, 56, and 69. Of these samples, one was collected from the drainage swale located upgradient (i.e., east) of the SEAD-69, two samples were collected downgradient of SEAD-43 and SEAD-56 following both possible drainage directions (northwest and southwest). The final sample was collected downgradient of SEAD-69, the suspected disposal area for Building 606. A duplicate sample was also collected from this location. All surface water and sediment samples were submitted for chemical analysis.

Two SVOCs were found in the surface water collected at SEADs 43, 56, and 69, and one SVOC, bis(2-ethylhexyl)phthalate, was detected at a concentration of 150 μg/L, which is greater than its NYSDEC AWQSs for Class C surface water standard of 0.6 μg/L (Table 6-11 of the ROD).

A total of 17 metals were detected in the surface water samples collected at SEADs43, 56, and 69. Four metals (aluminum, iron, nickel, and zinc) exceeded their NYSDEC AWQS Class C standards in one or more of the five surface water samples collected. The highest concentrations of aluminum (1,190 μg/L) and iron (1,750 µg/L) were detected in sample SW43-1. The highest concentrations of nickel (277 µg/L) and zinc (1,040 µg/L) were found in surface water sample SW43-4. All other detected metals were below their respective criteria values.

Nitrate/nitrite-nitrogen was detected in all five of the surface water samples analyzed from SEADs43, 56, and 69. The reported concentrations of nitrate/nitrite-nitrogen ranged from a low of 0.01 mg/L in sample SW43-1 to a high of 1.42 mg/L in SW43-3.

<u>Sediment</u>

Five sediment samples were collected as part of the investigation at SEADs43, 56, and 69. Acetone and 2-butanone (methyl ethyl ketone) were the only VOCs detected in the five sediment samples collected at SEADs 43, 56, and 69. These VOCs are common laboratory contaminants.

Three herbicides were detected in the sediment samples collected at SEADs 43, 56, and 69. Three herbicides, 2,4,5-T, 2,4-DB, and MCPP, were all found in sample SD43-2 at concentrations of 18 µg/Kg, 110 µg/Kg, and 17,000 µg/Kg, respectively (Table 6-12 of the ROD). These were the highest concentrations of 2,4-DB and MCPP detected in the sediments at SEADs 43, 56, and 69. The highest concentration of 2,4,5-T, 23 µg/Kg, was detected in sample SD43-3.

Twenty-two (22) metals were detected in the sediment samples collected as part of the SEADs 43, 56, and 69 investigations. Arsenic, cadmium, chromium, copper, iron, manganese, nickel, and zinc were detected at concentrations exceeding their respective sediment criteria values. Except for zinc, the highest concentrations for the eight metals found above criteria values occurred in sample SD43-1. The highest reported concentration of zinc (178 µg/Kg) was detected in sediment sample SD43-5.

The analysis for explosives by EPA Method 8330 detected HMX in two of the five sediment samples collected at SEADs 43, 56, and 69. The concentrations of HMX in sediment samples SD43-2 and SD43-4 were 110 µg/Kg and 72 µg/Kg, respectively. Nitrate/nitrite-nitrogen was detected in four of the five sediment samples. Concentrations ranged from 0.03 µg/Kg to 0.15 µg/Kg. The maximum concentration was found in sample SD43-3.

<u>Human Health Risk Assessment</u>

A risk assessment evaluated risk to receptors under the Prison land use scenario (i.e., prison worker, prison inmate, construction worker, worker at on-site day care, and child at on-site day care center). It should be noted that the described property is being used and maintained for a correctional facility in perpetuity. Table 7-6 of the ROD (Parsons, 2007a) summarizes the calculated cancer and non-cancer risks for all receptors and exposure routes considered in the risk assessment presented in "Decision Document – Mini Risk Assessment" (Parsons, 2002a). The total cancer risk from all exposure routes is within or below the EPA target range for all five receptors. Likewise, the total non-cancer HI from all exposure routes is less than 1 for all five receptors.

<u>Ecological Risk Assessment</u>

An ecological risk assessment was completed and no COCs were identified.

SEAD-44A- Quality Assurance Test Lab

History of Contamination and Initial Response

SEAD-44A is located in the southeastern portion of the Depot, approximately 1,000 ft. east of Brady Road and 1,500 ft. north of South Patrol Road (**Figure 3-1**) on property that is currently associated with the New York State Department of Correctional Services' Five Points Correctional Facility.

An ordnance and explosives (OE) and unexploded ordnance (UXO) removal was completed during 2001 and 2002. Once the removal was completed, soil stockpiles, which were previously screened for OE debris, were graded to allow for drainage by mounding the stockpiles. The surrounding 25-acre area was seeded.

Prior to the performance of any remedial actions or investigations at SEAD-44A, Building 416 was located at the AOC and a number of earthen berms that ran parallel to an unnamed dirt road at the AOC were present. The earthen berms were historically used for QA testing of ordnance items, including various pyrotechnics, firing devices, and 40-millimeter practice and chemical smoke grenades. The above-ground testing of landmines also reportedly occurred in SEAD-44A in a separate bermed area. During the period of its use, it is suspected that the area contained high levels of metals, cyanide, and other contaminants associated with ordnance testing. A drainage swale runs east to west along the middle of the AOC; this feature drains surface water runoff to the west towards Silver Creek.

Site investigations at SEAD-44A included a LSP in 1993 and 1994, followed by a TCRA in 2000 and 2002. A brief summary of the site investigations performed is presented below.

<u>Limited Sampling Program – 1993/1994</u>

Potential evidence of a release at SEAD-44A was evaluated with a LSP in 1993 and 1994. Nine excavations were performed at the three earthen berms, with three samples collected from each berm. Two surface soil samples were collected at various points around each of the three berms from a depth of 0-2 in. Three groundwater monitoring wells were installed; one upgradient of the site and the other two downgradient of the berms. Four surface water and sediment samples were collected from the drainage swale that runs east-west across this AOC. All samples were submitted for chemical analysis of TCL VOC, SVOC, pesticides/PCBs, TAL metals, and cyanide according to the NYSDEC Contract Laboratory Protocol (CLP) Statement of Work (SOW), explosives by EPA Method 8330, and nitrates by Method 353.2.

<u>Time Critical Removal Action – 2000/2002</u>

Between 2000 and 2002 a UXO and OE clearance and removal and soil remediation was performed at SEAD-44A. This UXO removal action was performed using heavy equipment to remove the top 2 ft. of soil from the entire 25-acre site, followed by sifting it to remove all pieces greater than 1-inch in size. The goal of this effort was to separate the UXO and OE related items from the surface soil and berm soil. The total volume of soil removed from the ground surface and bermed areas equaled 27,000 cy of material. This soil was processed through a vibratory screen that separated the oversized material that was greater than 1-inch from the surrounding soil.

After the OE-contaminated soil was removed from the area and stockpiled on-site, Parsons performed a geophysical survey across 55% of the 25-acre AOC to locate and investigate any subsurface anomalies that remained after the soil removal effort. The geophysical survey was used to assess whether all of the UXO and OE related items had been recovered during the initial soil removal effort. This geophysical mapping effort resulted in 1,588 geophysical anomalies being investigated and five UXO items being recovered from the area surveyed. The soil removal and screening effort was continued the following year and resulted in the entire 18,750 yards of material EODT removed being re-processed down to >1-inch. An additional 8,250 yards of material were then removed from a 1-foot soil removal outside the bermed area. This recovery effort removed an additional 12 OE items from the top 1-foot of material and 10 OE items from the remaining mapped area of 1-foot removal. Documentation of the work performed can be found in the document “UXO and Soil Remediation Area 44-A Final Report” (Weston, 2003).

<u>Basis for Taking Action</u>

Contamination

Complete analytical results for the samples collected during the LSP can be found in the “Expanded Site Investigation – Eight moderately Low Priority AOCs - SEADs 5,9,12 (A and B), (43, 56, 69), 44 (A and B), 50, 58, and 59” (Parsons, 1995a).

<u>Surface/Subsurface Soil</u>

The analytical results for the 15 soil samples collected as part of the SEAD-44A investigation are presented in Table 6-13 of the ROD (-Parsons, 2007a). The following is a summary of the nature and extent of the soil contamination SEAD-44A.

Detected analytes did not exceed their TAGMs in surface soil and were generally low in concentration. The subsurface samples from the berm showed TAGM exceedances for benzo(a)anthracene, chrysene, benzo(a)pyrene, and dibenz(a,h)anthracene. Benzo(a)pyrene was detected in all nine berm excavation samples, with a maximum detection of 1,100 μg/Kg. Benz(a)anthracene, chrysene, and dibenz(a,h)anthracene were found at concentrations that were 2 to 11 times the TAGM value.

Nine pesticide compounds were detected in the 15 soil samples collected during the LSP at concentrations below their respective TAGM values.

Twenty-one metal compounds were detected in the 15 soil samples submitted as part of the LSP. Of the 21 metals reported, 15 were found in one or more of the samples and six of the metals found were found at concentrations in excess of TAGMs Antimony and mercury were found most frequently to exceed their TAGM values and this occurred in two samples each.

One nitroaromatic compound, 2,4,6-(TNT), was detected in one soil sample at a concentration of 110 J μg/Kg. There is no TAGM value for 2,4,6-TNT.

<u>Groundwater</u>

Two VOCs, acetone and 1,1,2,2-tetrachloroethane, were detected in groundwater at concentrations below the GA standard.

Nineteen metals were detected in the groundwater, and three metals (aluminum, iron, and manganese) exceeded their groundwater standards. Iron was detected in MW44A-2 at a concentration of 4,810 µg/L; this elevated concentration of iron has been associated with the elevated turbidity in the sample (693 NTUs). Groundwater samples results are presented in Table 6-14 of the ROD (Parsons, 2007a).

<u>Surface Water / Sediments</u>

Surface water results indicate that the unnamed drainage swale within SEAD-44A has not been significantly impacted by contaminants. Only aluminum, iron, nickel, and zinc were detected at concentrations above the designated NYSDEC AWQS Class C surface water criteria value. Surface water results are presented in Table 6-15 of the ROD (Parsons, 2007a).

Two SVOCs were detected in the sediment at concentrations below their NYSDEC sediment criteria (Table 6-16 of the ROD). Twenty-one metals were detected in the sediment at SEAD-44A; of the metals detected, copper, iron, manganese, and nickel were detected at concentrations that exceeded the NYSDEC Sediment Criteria.

<u>Human Health Risk Assessment</u>

The risk assessment completed for SEAD-44A indicated that total cancer risks below or within the EPA target ranges for all receptors under the Prison land use scenario (i.e., prison worker, prison inmate, construction worker, worker at on-site day care, and child at on-site day care center). Likewise the total non-cancer risk and total non-cancer HIs from all exposure routes are less than 1 for all receptors. The described property is to be used and maintained for a correctional facility in perpetuity.

The results of total cancer risk and total non-cancer HI are summarized in Table 7-7 of the ROD (Parsons, 2007a) and in the “Decision Document – Mini Risk Assessment” (Parsons, 2002a).

<u>Ecological Risk Assessment</u>

An ecological risk assessment was completed and no COCs were identified.

SEAD-44B: Quality Assurance Test Laboratory

<u>History of Contamination and Initial Response</u>

SEAD-44B runs along the west side of Brady Road and occupies an area that is approximately 350 ft. by 200 ft. (**Figure 3-1**) on property that is currently associated with the New York State Department of Correctional Services’ Five Points Correctional Facility. Two buildings were originally associated with SEAD-44B. The buildings were part of a QA test area for pyrotechnics, chemical smoke grenades, and other fire devices. When it was designated as a SWMU in the FFA, the Army indicated that the site might contain high levels of metals and possible UXO debris. Subsequent inspections of the AOC by the Army as part of the DoD’s BRAC Ordnance and Explosives Archive Search Report (Parsons, 2007a) indicate that ordnance was not found at SEAD-44B or in the vicinity of the two berms that were observed near the buildings.

There is a drainage ditch on the eastern border of SEAD-44B between the AOC and Brady Road. During a visit to this AOC in 1994, no stressed vegetation was observed and the terrain of SEAD-44B was relatively flat with the exception of two distinct earthen berms 1 to 2 ft. high.

The investigative work at SEAD-44B included an ESI in 1993 and 1994. The results of the investigation are summarized and presented below.

During the ESI, three surface soil samples were collected from a depth of 0-2 inches. One sample was collected to the west (downgradient) of the concrete pad and flagpole. A second sample was collected in the southwestern portion of SEAD-44B, immediately downgradient of several small piles observed on the ground surface. The last soil sample was collected to the west (downgradient) of the metal building located on the property. Three groundwater monitoring wells were installed at SEAD-44B. One monitoring well (MW44B-1) was installed on the other side of East Brady Road, upgradient of the concrete slab and metal building associated with SEAD-44B to obtain background groundwater quality data. The two remaining monitoring wells were installed downgradient of the concrete slab and the metal building along the western boundary of SEAD-44B. One groundwater sample was collected from each of the three monitoring wells and submitted for chemical analysis. Two surface water and sediment samples were collected from SEAD-44B for chemical analysis. Each of the two samples was located within the drainage ditch that runs parallel to Brady Road along the eastern boundary of SEAD-44B. All of the samples were analyzed for TCL VOCs, SVOCs, pesticide/PCBs, TAL metals, and cyanide according to NYSDEC CLP SOW, and explosives by EPA Method 353.2.

<u>Basis for Taking Action</u>

Contamination

A summary of the surface soil, groundwater, surface water, and sediment data from the ESI are presented in Tables 6-17 to 6-20 of the ROD (Parsons, 2007a), respectively. Complete analytical results for the samples collected can be found in "Decision Document – Mini Risk Assessment SEAD 9, 27, 28, 32, 33, 34, 43, 44A, 44B, 52, 56, 58, 62, 64A, 64B, 64C, 64D, 66, 68, 69, 70, and 120B," Final (Parsons, 2002a).

<u>Surface/Subsurface Soil</u>

Two VOCs, acetone and 2-butanone, were detected in the soil samples collected at SEAD-44B. Acetone and 2-butanone are common laboratory contaminants (Table 6-17). Both contaminants were detected at concentrations below the respective TAGM cleanup objective level values.

Thirteen SVOCs were detected at varying concentrations in two of the three surface soil samples. Of the 13 SVOCs detected, two carcinogenic PAHs, benzo(a)pyrene and dibenz(a,h)anthracene, exceeded their respective TAGM values. The maximum detections of benzo(a)pyrene and dibenz(a,h)anthracene were both found in surface soil sample SS44B-3 at concentrations of 98 J µg/Kg and 28 J µg/Kg, respectively.

Five pesticides were detected in one soil sample each; four were collocated in a single sample, while the fifth pesticide was found in a second sample. One pesticide, dieldrin, exceeded its TAGM value of 44 µg/Kg with a concentration of 57 µg/Kg.

Twenty metals were detected in the surface soils, and three metals (arsenic, lead, and zinc) were found at concentrations above their associated TAGM values at SEAD-44B. Arsenic was detected at a maximum concentration of 13.1 mg/Kg, which is above its TAGM value of 8.2 mg/Kg. Lead was detected in a single soil sample SS44B-1 at a concentration of 39.5 mg/Kg, exceeding its TAGM value. Zinc was detected in sample SS44B-1 at a concentration of 145 mg/Kg, slightly above the TAGM value of 110 mg/Kg.

Nitrate/nitrite-nitrogen was detected in all three surface soil samples collected. Concentrations ranged from a low 0.04 mg/Kg to a maximum of 0.47 mg/Kg in sample SS44B-1.

Groundwater

Sixteen metals were detected in the groundwater samples collected and submitted for analysis at SEAD-44B (Table 6-18). Aluminum, iron, manganese, and thallium were detected at concentrations above their respective groundwater standards. Aluminum was detected in all three samples collected at concentrations exceeding its Secondary Drinking Water Regulation level (50 µg/L). Manganese was found in two of the wells at concentrations exceeding its Secondary Drinking Water criteria level. Iron was found at concentrations above the NYSDEC AWQS Class GA criteria value of 300 µg/L in two of the samples collected. Thallium was found at a level of 4.7 J µg//L in the sample collected from well MW44B-3, which is roughly twice its MCL criteria or 2 µg/L.

Surface Water

No VOCs, SVOCs, pesticides/PCBs, or cyanide were detected in the surface water. Thirteen metals were detected in the surface water samples analyzed from SEAD-44B (Table 6-19). All reported concentrations of aluminum, arsenic, copper, iron, mercury, nickel, and zinc were below the NYSDEC AWQS Class C surface water values. No criteria exist for the remaining six metals (barium, calcium, magnesium, manganese, potassium, and sodium) detected in surface water at SEAD-44B.

Nitrate/nitrite nitrogen compounds were detected in one of the two samples at a concentration of 0.01 mg/L. Currently, no criteria exist for nitrate/nitrite-nitrogen in NYSDEC AWQS Class C surface water.

Sediment

Two sediment samples were collected as part of the SEAD-44B investigation; the results are presented in Table 6-20. The only VOC detected in the sediment samples collected at SEAD-44B was 2-butanone.

One SVOC, di-n-butylphthalate, was detected in both sediment samples collected at SEAD-44B, with a maximum concentration of 110 µg/Kg. Currently no sediment criteria exist for di-n-butylphthalate.

Twenty metals were detected in the sediment samples collected at SEAD-44B. Five metals (arsenic, copper, iron, manganese, and nickel) were detected at concentrations that exceeded the NYSDEC Sediment criteria. The maximum concentration of arsenic was 58.3 mg/Kg, which was over nine times the sediment criteria value of 6 mg/Kg. The remaining metals, copper, iron, manganese and nickel, were detected in excess of the NYSDEC Sediment Criteria Value for Aquatic Life. The concentrations of the remaining metals detected above their criteria were only slightly above their associated sediment criteria established by NYSDEC.

Nitrate/nitrite-nitrogen compounds were detected in the both sediment samples at concentrations of 0.03 mg/Kg and 0.06 mg/Kg.

Human Health Risk Assessment

The risk assessment evaluated risk to receptors under the Prison land use scenario (i.e., prison worker, prison inmate, construction worker, worker at on-site day care, and child at on-site day care center). The described property is to be used and maintained for a correctional facility in perpetuity.

Table 7-8 in the ROD (Parsons, 2007a) summarizes the calculated cancer and non-cancer risks for all receptors and exposure routes considered in the risk assessment presentation “Decision Document – Mini Risk Assessment” (Parsons, 2002a). The total cancer risk from all exposure routes is within or below the EPA target range for all five receptors. Likewise, the total non-cancer HI from all exposure routes is less than 1 for all five receptors.

SEAD-52: Buildings 608 and 612 – Ammunition Breakdown Area

History of Contamination and Initial Response

SEAD-52 is located in the southeastern portion of SEDA (**Figure 3-1**), on land currently occupied by the Five Points Correctional Facility. The area is characterized by developed and undeveloped land. East and west of the SWMU are grassy fields with some sparse brush. Brady Road bisects the area running from north to south.

SEAD-52 was active from the mid-1950s to the late 1990s. The area consists of four buildings: Buildings 608, 610, 611, and 612. Building 608 was previously used for the storage of ammunition magazines; Building 610 was used for ammunition powder collection; Building 611 was used for storage of equipment, paints, and solvents; and Building 612 was used for the breakdown and maintenance of ammunition. None of these buildings are currently active or used for storage of materials. Railroad tracks enter the area from the northwest and divide into two spurs that provide access to the western side of Building 609 and the northern side of Building 612. There are paved access routes to Buildings 608, 610, and 611 and paved access routes on all sides of Building 612.

The topography of SEAD-52 is relatively flat with the area to the west of Brady Road sloping gently to the west from a topographic high that is located at Building 612. Numerous drainage ditches are located to the west, north, and south of Building 612. Four ditches are located west of the building. One ditch directs runoff flow to the north where it intersects an east-west trending drainage ditch. Another ditch directs flow southwest, and two ditches direct flow to the west. A fifth ditch is located south of Building 612 and it channels runoff flow to the south where it parallels Brady Road. The area to the east of Brady Road also slopes gently to the west. A north-south trending drainage ditch is located east of Buildings 608, 610, and 611. Another drainage ditch parallels the east side of Brady Road and flows south.

The field investigation at SEAD-52 included a LSP that focused on soil sampling that was performed in 1993. Complete analytical results from the LSP investigations are presented in “Decision Document – Mini Risk Assessment SEAD 9, 27, 28, 32, 33, 34, 43, 44A, 44B, 52, 56, 58, 62, 64A, 64B, 64C, 64D, 66, 68, 69, 70, and 120B,” Final (Parsons, 2002a).

A LSP was performed in 1993 to evaluate the presence of explosives in the soil at SEAD-52. Eighteen surface soil samples (plus one duplicate sample) were collected from a depth of 0 to 2 in. bgs, and the samples were chemically analyzed for explosives by EPA Method 8330.

Basis for Taking Action

Contamination

Results of the soil samples collected during the LSP are summarized in Table 6-21 of the ROD (Parsons, 2007a). The results of the investigation indicated that three explosive compounds were detected in one or more of the collected soil samples. The compound 2,4-dinitrotoluene was detected in ten of the surface soil samples. Surface soil samples collected from the buildings on the east side of Brady Road were generally free of all explosive compounds, with the exception of two samples with detections of 2,4-dinitrotoluene.

All but two of the surface soil samples collected around Building 612 contained explosive compounds. The compound 2,4-dinitrotoluene was most frequently detected (found in 10 of the 18 samples), and concentrations measured for 2,4-dinitrotoluene ranged from estimated levels of 91 J μg/Kg to 2,100 J μg/Kg. The other two explosives found (tetryl and 2,4,6-trinitrotoluene) were detected in one or two soil samples around Building 612. No TAGM soil cleanup objective values exist for the explosive compounds detected.

Human Health Risk Assessment

The risk assessment evaluated risk to receptors under the Prison land use scenario (i.e., prison worker, prison inmate, construction worker, worker at on-site day care, and child at on-site day care center). The described property is to be used and maintained for a correctional facility in perpetuity. The total cancer risk from all exposure routes was calculated to be within or below the EPA acceptable limits for all five receptors. In addition, the total non-cancer HI from all exposure routes was less than 1, the EPA acceptable limit for non-cancer risks, for all five receptors. A summary of the risk assessment results is presented in Table 7-9 of the ROD (Parsons, 2007a), and a full discussion is presented in the "Decision Document – Mini Risk Assessment" (Parsons, 2002a).

Ecological Risk Assessment

An ecological risk assessment was completed and no COCs were identified.

SEAD-62: Nicotine Sulfate Disposal Area near Buildings 606 and 612

History of Contamination and Initial Response

The Nicotine Sulfate Disposal Area (SEAD-62) is located in the southeastern portion of SEDA (**Figure 3-1**). It measures approximately one-half mile by one-quarter mile in size and is characterized by mostly undeveloped land with the exception of bunkers and buildings along the western perimeter. The undeveloped areas are predominantly low grassland in the western portion of the AOC that become more vegetated with low brush and sparse trees in the eastern portion. The developed area along the western perimeter is SEAD-52, which includes Buildings 609 and 612 and two grass covered bunkers with paved access. Brady Road separates the buildings and bunkers. SEAD-62 is bounded on all sides by mostly undeveloped land. An unnamed paved road that runs between Brady Road and Building 606 near SEAD-62's eastern boundary defines the northern boundary of this AOC. The fence separating the ammunition storage area from the unrestricted portion generally forms the eastern boundary SEAD-62. The ammunition storage area fence restricts access to most of the site.

The regional topography slopes gently to the west toward Brady Road. A ditch drains several wet areas in the central and south-central portions this AOC; the ditch drains west through a culvert under Brady Road.

The field investigation at SEAD-62 included an ESI that was performed in 1994. Complete analytical results from the ESI are presented in "Decision Document – Mini Risk Assessment SEAD 9, 27, 28, 32, 33, 34, 43, 44A, 44B, 52, 56, 58, 62, 64A, 64B, 64C, 64D, 66, 68, 69, 70, and 120B," Final (Parsons, 2002a).

Three soil samples and three groundwater samples were collected from SEAD-62 and submitted for chemical analysis. All the samples were analyzed for the following: TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, and cyanide according to the NYSDEC CLP SOW, and herbicides by EPA Method 8150.

Basis for Taking Action

Contamination

Summaries of the soil and groundwater results are presented in Table 6-22 and 6-23 of the ROD (Parsons, 2007a), respectively.

Soil

Two SVOCs, fluoranthene and pyrene, were detected in one soil sample at concentrations below their respective TAGM cleanup objective level values. Two herbicides, 2,4,5-T and dicamba, were detected in the soil; however, neither compound exceeded its respective TAGM value.

The soil samples collected at SEAD-62 were found to contain various metals at concentrations that exceeded their associated TAGM cleanup objective values (ROD Table 6-22). Of the 20 metals detected in SEAD-62 soils, four metals (arsenic, mercury, potassium, and zinc) were found in one or more samples at concentrations above their associated TAGM value; however, the exceedances were within the same order of magnitude as their respective TAGM value.

Groundwater

One VOC, benzene, was detected in the groundwater samples collected at SEAD-62 (ROD Table 6-23). Benzene was detected in two samples at concentrations of 2 J μg/L, exceeding its GA standard of 1 μg/L.

Sixteen metals were detected in the groundwater samples collected at SEAD-62, and four metals exceeded their respective groundwater standards. Aluminum, iron, and manganese were detected in each of the three sampled wells at concentrations exceeding their respective comparative groundwater criteria. Thallium was detected in one sample at a concentration of 2.4 μg/L, which is greater than its MCL of 2 μg/L.

Human Health Risk Assessment

The risk assessment evaluated risk to receptors under the Prison land use scenario (i.e., prison worker, prison inmate, construction worker, worker at on-site day care, and child at on-site day care center). The described property shall be used and maintained for a correctional facility in perpetuity. The total cancer risk from all exposure routes was below the EPA acceptable level for all five receptors.

The total non-cancer HI from all exposure routes was less than 1 for all five receptors. A summary of the risk assessment results is presented in Table 7-10 of the ROD (Parsons, 2007a), and a full discussion is presented in the "Decision Document – Mini Risk Assessment" (Parsons, 2002a).

Ecological Risk Assessment

An ecological risk assessment was completed and no COCs were identified.

SEAD-64C: Garbage Disposal Area

History of Contamination and Initial Response

SEAD-64C was the rumored location of a historic solid waste landfill; no information or evidence has been found or collected through the Army's studies of this area to indicate that solid wastes were ever disposed at this location. The location of the rumored SEAD-64C Garbage Disposal Area at SEAD-64C is near the intersection of East Patrol Road and South Patrol Road in the southeastern corner of SEDA (**Figure 3-1**). This former SWMU is located within the bounds of the New York State Department of Correctional Service's Five Points Correctional Facility. The area is vegetated with grass and low brush; the vegetation is denser in the southern and western portions of the site.

Two small concrete pads are located in the southeastern portion of SEAD-64C and can be accessed via a 75- foot long crushed shale road. One pad (25 ft. long by 15 ft. wide) is slightly elevated above the ground and shows little evidence of deterioration. The second pad (15 ft. square), covered with gravel and cracked in several places, is located near the southern edge of the first and is oriented approximately 25 degrees counterclockwise to it. A north-south trending chain-link fence divides SEAD-64C into eastern and western portions. A small west-flowing intermittent stream bounds SEAD-64C on the north, and paved roadways define its eastern and southern boundaries. Topography at SEAD-64C is generally flat, sloping gently to the southwest.

The field investigation at SEAD-64C included an ESI that was performed in 1994. Complete analytical results from the ESI are presented in "Decision Document – Mini Risk Assessment SEAD 9, 27, 28, 32, 33, 34, 43, 44A, 44B, 52, 56, 58, 62, 64A, 64B, 64C, 64D, 66, 68, 69, 70, and 120B," Final (Parsons, 2002a).

Surface soil samples, subsurface soil samples, and groundwater samples were collected at SEAD-64C and submitted for chemical analysis. All of the samples were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, and cyanide according to the NYSDEC CLP SOW.

Basis for Taking Action

Contamination

Summaries of the soil and groundwater results obtained during the ESI are presented in Table 6-28 and 6-29 of the ROD (Parsons, 2007a), respectively.

Soil

Ten soil samples were collected at SEAD-64C, and a summary of the analytical results are presented in ROD Table 6-28. Four metals (calcium, magnesium, manganese, and potassium) exceeded their respective TAGM cleanup objective values.

Groundwater

Five groundwater samples were collected from wells at SEAD-64C and the analytical results are summarized in ROD Table 6-29. Phenol was detected in two wells at a concentration of 2 J µg/L, exceeding its GA standard of 1 µg/L. Five metals (aluminum, iron, manganese, sodium, and thallium) exceeded their respective groundwater standards. Iron was detected in four of the samples at concentrations that exceeded its GA standard, with a maximum detection of 2,640 µg/L. Aluminum and manganese were detected in three samples at concentrations that exceeded their respective Secondary Drinking Water Regulation levels (i.e., 50 µg/L, each), in three samples each. The reported manganese levels were all below NYSDEC's GA AWQSs. The Secondary Drinking Water Regulations are non-enforceable guidance values only. Sodium was detected at a concentration of 30,400 µg/L in one sample, which exceeded its GA standard. Similarly, thallium was detected at a concentration of 2.1 J µg/L in the same sample, which is greater than its MCL criteria value of 2 µg/L.

Human Health Risk Assessment

The cancer and non-cancer risks for all future potential receptors under the Prison land use scenario (prison inmate, prison worker, on-site construction worker, day care center – child, and day care center - worker) and exposure routes (inhalation of dust and groundwater, ingestion of soil and groundwater, and dermal contact to soil and groundwater) for SEAD-64C were evaluated during the risk assessment conducted in 2001 and 2002. The described property is to be used and maintained for a correctional facility in perpetuity. The total cancer risk from all exposure routes was below the EPA acceptable level for all five receptors. The total non-cancer HI from all exposure routes was less than 1 for all five receptors. A summary of the risk assessment results is presented in Table 7-12 of the ROD (Parsons, 2007a), and a full discussion is included in the "Decision Document – Mini Risk Assessment" (Parsons, 2002a).

Ecological Risk Assessment

An ecological risk assessment was completed and no COCs were identified.

3.1.5.2 Remedy Selection

The Army had previously documented and imposed LUCs within a portion of the former Depot: in the southeastern corner of the Depot where the Five Points Correctional Facility ("Prison Area") currently is located. The AOCs defined above (i.e., SEADs 43/56/69, 44A, 44B, 52, 62, and 64C) are located within land covered by the existing LUCs imposed on land within the Prison Area parcel.

Within the ROD (Parsons, 2007a), the Army formalized and documented its intention to impose the existing LUCs on the AOCs located within the Prison Area parcel under CERCLA.

Existing Deed with Reversionary Clause

The "Prison Area" property was transferred under a public benefit conveyance. The United States used a deed with a reversionary clause, as is required under Federal implementing regulations[12], to convey land in the southeastern part of the former Depot (i.e., Prison Area, **see Figure 3-1** to the people of the State of New York for the construction of the Five Points Correctional Facility. It includes language that requires that the "property shall be used and maintained for a correction facility in perpetuity"[13] and that "the property shall not be sold, leased, mortgaged, assigned or otherwise disposed of"[14] without the prior consent of the Federal Government. In the event that any condition of the deed is breached "as to all or any portion or portions of the described property by New York or its successors or assigns,"[15] the "title and interest to such portion or portions of the property, in its existing condition, including all improvements thereon, shall revert to, and become property of, the Government at the option of and upon demand made in writing by the General Services Administration, or its successor in function."[16]

Provisions of the deed apply to the following SWMUs, which were transferred prior to a ROD being prepared and which are currently located within the bounds of New York's Five Points Correctional Facility Parcel:

- SEAD-43: Building 606 – Old Missile Propellant Test Laboratory;
- SEAD-44A: Quality Assurance Test Laboratory;
- SEAD-44B: Quality Assurance Test Laboratory;
- SEAD-52: Buildings 608 and 612 – Ammunition Breakdown Area;
- SEAD-56: Building 606 – Herbicide and Pesticide Storage;
- SEAD-62: Nicotine Sulfate Disposal Area near Buildings 606 and 612;
- SEAD-64C: Garbage Disposal Area; and,
- SEAD-69: Building 606 – Disposal Area.

---

[12] Title 41 Code of Federal Regulations, Part 101-47 Federal Property Management Regulations, Utilization and Disposal of Real Property, Section Sec. 101-47.308-9 Property for correctional facility use.

[13] Seneca County Clerk, Waterloo, New York, Deed, United States of America to People of the State of New York, September 26, 2000, Liber 612, Page 019.

[14] Ibid.

[15] Ibid.

[16] Ibid.

Hazardous substances may be present at one or more of the listed historic SWMUs at concentrations that do not allow for unlimited exposure and unrestricted use. However, based on the results of previous investigations, risk assessments, and/or removal actions, these sites do not pose or represent a risk or threat to human health and the environment, given consideration of the area's continuing restricted use as a state maximum security correctional facility. The deed with the reversionary clause was recorded by the Seneca County Clerk on 26 September 2000 (see Seneca County Liber 612 Page 014 through page 031). Pursuant to the terms of the deed, the prison use restriction remains in effect for these AOCs in perpetuity, or the property ownership reverts to the United States.

3.1.5.3 Remedy Implementation and Remedial Systems

LUC Objectives and Land Use Restrictions

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") (USACE, 2006) implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 2 (USACE, 2008a) expanded the LUC RD from the PID area to include sites that are in the area formerly known as the Conservation Area and the Airfield parcels.

SEADs 43/56/69, 44A, 44B, 52, 62, and 64C are located on property that was transferred to the State of New York for use as a correction facility. The existing deed provisions require the State of New York to use the property for the purpose of adult incarceration and if the State chooses to stop that activity, the property reverts back to the United States of America. Should the property revert to the Federal Government, the LUC will terminate and a remedy substitution will be agreed to.

The existing deed provisions ensure the property is used in a manner consistent with the above LUC Objectives.

Implementation Actions

The following LUC Implementation Actions were achieved and implemented to prevent future violation of the LUC Objectives and Land Use Restrictions:

1. Lease restrictions – N/A for the Prison Area.
2. Environmental Easement – N/A for the Prison Area. The Army transferred the Prison Area to the State of New York, prior to the issuance of the ROD (Parsons, 2007a) and there was no requirement for an Environmental Easement.
3. Deed restrictions –
    a. The Prison Area property was transferred prior to the issuance of the ROD (Parsons, 2007a) with deed provisions that require the State of New York to use the property for the purpose of adult incarceration and if the State chooses to stop that activity, the property reverts back to the United States of America. Should the property revert to the Federal Government, the LUC will terminate and a remedy substitution will be agreed to.
    b. CERCLA Notice and Covenant. The deed included a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual

contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

c. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

4. Five-Year Review - The Army will review the LUC remedy as part of the Five-Year Review and Report. The report will address the effectiveness of the LUC remedy and whether any LUC Objective, Land Use Restriction, or Implementation Actions should be modified.

Enforcement

Addendum 2 applied the SEAD LUC RD enforcement provisions to SEADs 43/56/69, 44A, 44B, 52, 62, and 64C.

Modification

Addendum 2 applied the SEAD LUC RD modification provisions to SEADs 43/56/69, 44A, 44B, 52, 62, and 64C.

Termination

Addendum 2 applied the SEAD LUC RD termination provisions to SEADs 43/56/69, 44A, 44B, 52, 62, and 64C.

3.1.5.4 Systems Operations/Operation & Maintenance

Not applicable; no active remedy.

3.1.5.5 Data Review

3.1.5.5.1 Institutional Control Review

The Land Use Control Remedial Design (LUC RD) For SEAD 27, 66, and 64A ("SEAD LUC RD") (USACE, 2006) implemented land use controls for the entire SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 2 (USACE, 2008a) to the SEAD LUC RD covered the eight sites (SEADs 43/56/69, 44A, 44B, 52, 62, and 64C) comprising the area known as the Prison Area.

Environmental Easement

The Army transferred the Prison Area to the State of New York, prior to the issuance of the ROD signed on July 3, 2007 and there was no requirement for an environmental easement.

Deed Restrictions

1. The “Prison Area” property was transferred under a public benefit conveyance. The United States used a deed with a reversionary clause, as is required under Federal implementing regulations, to convey the Prison Area to the people of the State of New York for the construction of the Five Points Correctional Facility. It includes language that requires that the “property shall be used and maintained for a correction facility in perpetuity” and that “the property shall not be sold, leased, mortgaged, assigned or otherwise disposed of” without the prior consent of the Federal Government. In the event that any condition of the deed is breached “as to all or any portion or portions of the described property by New York or its successors or assigns,” the “title and interest to such portion or portions of the property, in its existing condition, including all improvements thereon, shall revert to, and become property of, the Government at the option of and upon demand made in writing by the General Services Administration, or its successor in function.”

   Provisions of the deed apply to the following SEADs, which were transferred prior to a ROD being prepared and which are currently located within the bounds of New York’s Five Points Correctional Facility Parcel:

   - SEAD-43: Building 606 – Old Missile Propellant Test Laboratory;
   - SEAD-44A: Quality Assurance Test Laboratory;
   - SEAD-44B: Quality Assurance Test Laboratory;
   - SEAD-52: Buildings 608 and 612 – Ammunition Breakdown Area;
   - SEAD-56: Building 606 – Herbicide and Pesticide Storage;
   - SEAD-62: Nicotine Sulfate Disposal Area near Buildings 606 and 612;
   - SEAD-64C: Garbage Disposal Area; and,
   - SEAD-69: Building 606 – Disposal Area.

   Hazardous substances may be present at one or more of the listed historic SWMUs at concentrations that do not allow for unlimited exposure and unrestricted use. However, based on the results of previous investigations, risk assessments, and/or removal actions, these sites do not pose or represent a risk or threat to human health and the environment, given consideration of the area’s continuing restricted use as a state maximum security correctional facility. The deed with the reversionary clause was recorded by the Seneca County Clerk on 26 September 2000 (see Seneca County Liber 612 Page 014 through page 031). Pursuant to the terms of the deed, the prison use restriction remains in effect for these AOCs in perpetuity, or the property ownership reverts to the United States.

2. CERCLA Notice and Covenant. The deed included a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all

remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

3. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

3.1.5.5.2 Long Term Monitoring Review

There are no long-term monitoring requirements for the Prison Area.

3.1.5.6 Site Inspections

The Army inspected the site to determine that the LUCs are being maintained on April 7, 2011. A survey was conducted of the Five Points Correctional Facility. Photography is not allowed either in the Facility or of the Facility. The Five-Year Review - site visit photo log in contained in Appendix A contains the only allowable photograph of the Entrance sign. A completed Five-Year Review site inspection checklist is contained in Appendix B. during the site inspection, Officer G. Perry provided confirmation that the facility is still operating as a NY State correctional Facility and is in fact expanding.

The site inspection confirmed that the facility is still operating as a state prison.

3.1.5.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

No active Remedial Action was required by the completed ROD for the eight sites (SEADs 43/56/69, 44A, 44B, 52, 62, and 64C) comprising the area known as the Prison Area and no continuing active remediation is required for the Prison Area.

Based on a review of the Land Use Control Remedial Design Addendum 2 and a site visit conducted on April 7, th2011, remedy is functioning as intended by the decision documents.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site since implementation of Land Use Controls that would affect the protectiveness of the remedy.

The Selected Remedy for eight sites (SEADs 43/56/69, 44A, 44B, 52, 62, and 64C) comprising the area known as the Prison Area are based on the results of risk assessments that evaluated risk to receptors under the Prison land use scenario (i.e., prison worker, prison inmate, construction worker, worker at on-site day care, and child at on-site day care center). The results of these risk assessments indicated that the total cancer risk from all exposure routes is within or below the EPA target range for all five receptors. Likewise, the total non-cancer HI from all exposure routes is less than 1 for all five receptors.

The underlying assumptions support the selected remedy in remaining protective for the following reasons:

- These sites are located on property that was transferred to the State of New York for use as a correction facility. The existing deed provisions that requires the State of New York to use the property for the purpose of adult incarceration and if the State chooses to stop that activity, the property reverts back to the United States of America. Should the property revert to the Federal Government, the LUC will terminate and a remedy substitution will be agreed to.
- The existing deed provisions ensure the property is used in a manner consistent with the LUC Objectives.

As a result, the clean-up levels and Remedial Action objectives for eight sites (SEADs 43/56/69, 44A, 44B, 52, 62, and 64C) comprising the area known as the Prison Area are considered still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no new information of significance that would affect the protectiveness of the remedy.

3.1.5.8 Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD for the eight sites (SEADs 43/56/69, 44A, 44B, 52, 62, and 64C) comprising the area known as the Prison Area. On-going remedial monitoring activities include periodic evaluations of the effectiveness of the remedy.

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

3.1.5.9 Recommendations

Based on this Five-Year Review, the Army recommends continuing the Five-Year Reviews.

3.1.5.10 Protectiveness Summary

The remedy for the eight sites (SEADs 43/56/69, 44A, 44B, 52, 62, and 64C) comprising the area known as the Prison Area is protective of the environment and will protect human health when it is completed. Currently, there is no unacceptable exposure to human or environmental receptors from source area contaminants and none expected over the next five years.

3.1.6 SEAD-64B - Garbage Disposal Area

3.1.6.1 History of Contamination, Initial Response and Basis for Taking Action

History of Contamination and Initial Response

The Garbage Disposal Area at SEAD-64B is located immediately north of Ovid Road near Building 2086 in the southern end of SEDA (**Figure 3-1**). Previously, the location was characterized by undeveloped land that was bounded by Ovid Road on the south, an unnamed paved road on the west, an intermittent stream and several railroad tracks to the north, and undeveloped land with dense vegetation and deciduous trees to the east. Two large piles were observed located along the northern boundary of SEAD-64B.

SEAD-64B was used for garbage disposal from 1974 to 1979, which corresponds to a period when the Depot's solid waste incinerator was not in operation. It appears that one or two truckloads of household waste were disposed at SEAD-64B based on the size of the fill area and amount of debris observed.

The local topography of SEAD-64B is somewhat uneven, but generally slopes to the south-southwest. The intermittent stream flows west along the west-sloping regional features.

SEAD-64B is a historic solid waste management units (historic landfills) that are subject to regulation under the State of New York's Solid Waste Management Regulations (see 6 NYCRR Part 360). The Army ceased use of this unit in the late 1970s. As a historic solid waste landfill, the site was subject to final closure in accordance with requirements of 6 NYCRR Part 360 in effect as of August 28, 1977. The pertinent Part 360 regulations [i.e., Part 360.1(c)(8)] include a requirement for a final cover. "Final cover" is defined in the New York State regulations as a compacted layer of at least 24 in. of cover material, the uppermost 6 in. of which is soil of a composition suitable to sustain plant growth that is placed on all surfaces of a landfill where no additional refuse will be deposited within one year.

Once solid waste disposal ceased at SEAD-64B in the late 1970s, the Army applied a permanent soil cover over the disposed waste and allowed the area to revegetate naturally. The former landfill continues to be covered and has an established vegetative covering. The Army requested formal closure of this historic landfill from the NYSDEC in letters dated May 24, 2005 and August 14, 2006. In a letter dated September 11, 2006, the NYSDEC agreed that SEAD-64B and SEAD-64D are closed under the New York Solid Waste Regulations.

The field investigation at SEAD-64B included an ESI performed in 1994.

<u>Basis for Taking Action</u>

Contamination

Complete analytical results from the ESI investigation are presented in "Decision Document – Mini Risk Assessment SEAD 9, 27, 28, 32, 33, 34, 43, 44A, 44B, 52, 56, 58, 62, 64A, 64B, 64C, 64D, 66, 68, 69, 70, and 120B," Final (Parsons, 2002a).

<u>Soil</u>

Three soil borings were installed at SEAD-64B during the ESI. Locations were based on geophysical surveys that were performed to delineate the boundary of the disposal area. Soil samples were collected at three depths at each boring location, as well as at one monitoring well, and they were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, and cyanide according to the NYSDEC CLP SOW.

The results of the soil samples are summarized in Table 6-24 of the ROD (Parsons, 2007a). VOCs, SVOCs, pesticides, and metals were detected in the soils. One metal, magnesium, exceeded its TAGM cleanup value in one sample. All other parameters were detected below their respective TAGM values.

Groundwater

Three groundwater monitoring wells, including one upgradient (i.e., background) well, were installed and sampled at SEAD-64B. Aluminum and manganese exceeded their respective criteria levels in every sample with maximum concentrations of 1,530 μg/L and 559 μg/L, respectively. Iron exceeded the GA standard twice, with a maximum concentration of 5,090 μg/L. The higher concentration measured for each of these metals was found in the sample collected from MW64B-3, located furthest to the north and closest to the railroad tracks. The results of the groundwater samples are summarized in Table 6-25 of the ROD (Parsons, 2007a).

Surface Water/Sediment

Three surface water and three sediment samples were collected from SEAD-64B. All three sample sets were collected from the drainage ditch that flows to the west along the northern perimeter of this AOC.

Aluminum and iron exceeded their NYSDEC AWQS Class C surface water criteria in one sample at concentrations barely above their respective criteria values, as shown on Table 6-26 of the ROD (Parsons, 2008a).

Three pesticides (4,4'-DDE, endosulfan I, and heptachlor) exceeded their sediment criteria in one sample.

Arsenic, copper, iron, manganese, mercury, and nickel were detected at concentrations exceeding criteria in one or more of the sediment samples. The analytical results for sediment are summarized in Table 6-27 of the ROD (Parsons, 2007a).

Human Health Risk Assessment

The cancer and non-cancer risks for all future potential receptors under the Conservation/Recreation land use scenario (park worker, recreational visitor – child, and construction worker) and exposure routes (inhalation of dust, ingestion of soil, and dermal contact to soil, surface water, and sediment) for SEAD-64B were evaluated during the risk assessment. The total cancer risk from all exposure routes were below the EPA acceptable level for all three receptors. The total non-cancer HI from all exposure routes were less than 1 for all three receptors. A summary of the risk assessment results is presented in Table 7-11 of the ROD (Parsons, 2007a), and a full discussion is included in the "Decision Document – Mini Risk Assessment" (Parsons, 2002a).

Ecological Risk Assessment

An ecological risk assessment was completed and no COCs were identified.

3.1.6.2 Remedy Selection

The remedy selected in the ROD (Parsons, 2007a) was a LUC that prohibits unauthorized digging and excavations within the bounds of the SWMU to be imposed for SEAD-64B: Garbage Disposal Area.

SEAD-64B is a former solid waste disposal area that was closed by the Army prior to 1979. As a historic solid waste landfill, this SWMU is subject to requirements of the New York State's Solid Waste Regulations (6 NYCRR Part 360), in effect at the date of closure. Under New York's Solid Waste Regulations effective in 1979, a soil and vegetative cover was required to be placed on and maintained above the closed landfill. The proposed LUC would prohibit digging within the bounds of the former solid waste site. The LUC will continue at the AOC until solid wastes are removed from the site, and concentrations of hazardous substances allow for unlimited exposure and unrestricted use.

3.1.6.3 Remedy Implementation and Remedial Systems

LUC Objectives and Land Use Restrictions

A Record of Decision ("ROD") titled "Seventeen SWMU Requiring Land Use Controls (SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and122E) " signed on July 3, 2007 requires the establishment of institutional controls ("ICs") at the following sites:

For SEADs 13 and 64 D

- Prevent access or use of the groundwater until cleanup levels are met; and
- Maintain the integrity of any current or future remedial or monitoring system.

For SEADs 64B and 64D

- No unauthorized excavation
- Maintenance of the existing soil cover

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") dated December 2006 implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 2 expanded the LUC RD from the PID area to include sites that are in the area formerly known as the Conservation Area and the Airfield parcels.

SEADs 13, 64B and 64D are located on the property known as the Conservation Area Parcel and are still under the control of the Army. The designated reuse of land within the Depot was revised in 2005 by SCIDA and is reflected in **Figure 1-2**. The new future land uses for three SWMUs that were previously in the Conservation/Recreation area (SEADs 13, 64B, and 64D) are Residential/Resort for SEAD-13 and Training Area for SEADs 64B and 64D. The Training Area classification suggests that the areas will be used in a manner consistent with light industrial areas.

Implementation Actions

The following LUC Implementation Actions specified in the SEAD LUC RD (USACE, 2006) and Addendum 2 (USACE, 2008a) were achieved and implemented to prevent future violation of the LUC Objectives and Land Use Restrictions:

1. Lease restrictions – N/A for the Conservation Area.
2. Environmental Easement - The Army prepared an environmental easement consistent with N.Y. Code Env. Section 27-1318(b) that provides for NYSDEC monitoring of the LUCs set forth in the RD, which was recorded prior to the transfer of SEAD-64B from the federal government. The environmental easement will ensure the ability of NYSDEC to enforce the LUCs in the future. A notification about the existence of the environmental easement was identified in the deed associated with the parcel transfer. The Easement does not negate or transfer the Army's ultimate

responsibility under CERCLA Section 120(h)(3) and the Seneca Army Depot Federal Facilities Agreement ("FFA").

3. Deed restrictions –

   a. SEAD-64B was transferred with the land use restrictions, consistent with the LUC Objectives defined above. This deed for the SEAD-64B incorporates by reference the land use restrictions set forth in the Environmental Easement. The deed was recorded in the Seneca County Clerk's Office on June 10, 2011. The Army provided a copy of the executed PID/Warehouse Area deed(s) to EPA Region II and NYSDEC.

   b. CERCLA Notice and Covenant. The deed includes a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

   c. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

4. Annual Certification – The Army and/or future property owner shall annually, or within such time as NYSDEC may allow (with the consent of EPA Region II and the Army), submit to NYSDEC, with a copy to EPA Region II (and to the Army, if the certification is submitted by a future property owner), a written statement in accordance with N.Y. Code Env. Section 27-1318(c). The statement will prepared by an expert NYSDEC may find acceptable certifying under penalty of perjury that the controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls employed at the Controlled Property were approved by NYSDEC, and that nothing has occurred that would impair the ability of such control to protect the public health and environment or constitute a violation or failure to comply with this Remedial Design for such controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.

5. Five-Year Review - The Army will review the LUC remedy as part of the Five-Year Review and Report. The report will address the effectiveness of the LUC remedy and whether any LUC Objective, Land Use Restriction, or Implementation Actions should be modified.

Enforcement

Addendum 2 (USACE, 2008a) applied the SEAD LUC RD enforcement provisions to SEAD-64B.

Modification

Addendum 2 (USACE, 2008a) applied the SEAD LUC RD modification provisions to SEAD-64B.

Termination

Addendum 2 (USACE, 2008a) applied the SEAD LUC RD termination provisions to SEAD-64B.

3.1.6.4 Systems Operations/Operation & Maintenance

Not applicable; no active remedy.

3.1.6.5 Data Review

3.1.6.5.1 Institutional Control Review

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") dated December 2006 implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 2 expanded the LUC RD from the PID area to include sites that are in the area formerly known as the Conservation Area and the Airfield parcels. SEAD 64B is located on property formerly known as the Conservation Area Parcel.

Environmental Easement

An Environmental Easement that includes SEAD-64B was executed on February 14, 2011 and recorded in the Seneca County Clerk's Office on June 10, 2011. This Environmental Easement was reviewed during the preparation of this report with the following findings:

1. The environmental easement was granted by the United States of America (the Grantor) by an instrument that complies with the requirements of section 5-703 of the general obligations law.
2. As evidenced by the Department's acceptance of the Easement, the Grantor furnished to the Department abstracts of title and other documents sufficient to enable the Department to determine that the easements shall be enforceable. The environmental easement is in a form prescribed by the Department. The environmental easement describes the property encumbered by the easement by adequate legal description (Exhibit A to the easement). The environmental easement:
    a. names the state, acting through the department, as grantee;
    b. contains a complete description of the use restrictions and engineering control to which the property is subject;
    c. runs with the land, binding the owner of the land and the owner's successors and assigns;
    d. includes an acknowledgment by the Commissioner of acceptance of the easement by the Department; and
    e. includes an agreement to incorporate, either in full or by reference, the environmental easement in any leases, licenses, or other instruments granting a right to use the property that may be affected by such easement.

3. Contains a requirement that until such time as the environmental easement is extinguished, the property deed and all subsequent instruments of conveyance relating to the subject property shall state in at least fifteen-point bold-faced type: "This property is subject to an environmental easement held by the New York State Department Of Environmental Conservation pursuant to title 36 of article 71 of the environmental conservation law."
4. Contains a requirement that each instrument transferring an interest in the area affected by the easement shall include a specific reference to the recorded easement.
5. Contains requirements that the environmental easement may be extinguished or amended only by a release or amendment of the easement executed by the commissioner and filed with the office of the recording officer for the county or counties where the land is situated in the manner prescribed by article nine of the real property law.
6. The environmental easement was duly recorded and indexed as such in the office of the recording officer for Seneca County in the manner prescribed by article nine of the real property law.
7. The environmental easement is enforceable in law or equity by the grantor, by the state, or any affected local government as defined in ECL Section 71-3603, against the owner of the burdened property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. No general law of the state which operates to defeat the enforcement of any interest in real property shall operate to defeat the enforcement of any environmental easement unless such general law expressly states the intent to defeat the enforcement of such easement or provides for the exercise of the power of eminent domain. It is not a defense in any action to enforce the environmental easement that:
   a. it is not appurtenant to an interest in real property;
   b. it is not of a character that has been recognized traditionally at common law;
   c. it imposes a negative burden;
   d. it imposes affirmative obligations upon the owner of any interest in the burdened property;
   e. the benefit does not touch or concern real property;
   f. there is no privity of estate or of contract; or
   g. it imposes an unreasonable restraint on alienation.
8. Agents, employees, or other representatives of the state may enter and inspect the property burdened by the environmental easement in a reasonable manner and at reasonable times to assure compliance with the restrictions.

<u>Deed Restrictions</u>

SEAD-64B was transferred to the Seneca County Industrial Development Agency with a Quitclaim Deed recorded on May 27, 2011. This deed was reviewed during the preparation of this report with the following findings:

1. SEAD-64B was transferred with the land use restrictions, consistent with the LUC Objectives as defined in the LUC RD. This deed for the PID/Warehouse Area incorporates by reference the land use restrictions set forth in the Environmental Easement. The property deed states in at least fifteen-point bold-faced type:

   "This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant to title 36 of article 71 of the Environmental Conservation Law."

   The deed was recorded in the Seneca County Clerk's Office on June 10, 2011. The Army provided a copy of the executed deed to EPA Region II and NYSDEC.

2. CERCLA Notice and Covenant. The deed included a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

3. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

3.1.6.5.2 Long Term Monitoring Review

There are no long-term monitoring requirements for SEAD-64B other than periodic verification that no unauthorized excavation has occurred and to provide maintenance of the existing soil cover.

3.1.6.6 Site Inspections

The Army inspected the site to determine that the LUCs are being maintained on April 6, 2011. A survey was conducted throughout the SEDA area with a site specific inspection being conducted at SEAD-64B. Five-Year Review - site visit photo logs are contained in Appendix A and completed Five-Year Review site inspection checklists are contained in Appendix B.

The following observations were made during the site inspection:

- Cover is vegetated with no signs of erosion evident.
- Some ponding was observed but did not appear to reduce the effectiveness of the remedy. SEDA had received heavy rainfall on the day before the site visit.

The site inspection confirmed that no prohibited excavation has taken place and the vegetative cover is being maintained.

3.1.6.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

No active Remedial Action was required by the completed ROD for SEAD-64B and no continuing active remediation is required for SEAD-64B.

Based on a review of the Land Use Control Remedial Design Addendum 2 environmental easements and transfer deeds and a site visit conducted on April 6, 2011, remedy is functioning as intended by the decision documents.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site since implementation of Land Use Controls that would affect the protectiveness of the remedy.

The underlying assumptions support the selected remedy in remaining protective for the following reasons:

- The current/future LUC/IC restrictions minimize potential exposure pathways; and
- The intended future use of the site is at least as restrictive as the future use anticipated for the risk assessment.

As a result, the Remedial Action objectives for 64B are considered still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no new information of significance that would affect the protectiveness of the remedy.

3.1.6.8 Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD for SEAD-64B. On-going remedial monitoring activities include periodic evaluations of the effectiveness of the remedy. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs cited in the RODs remain protective of human health and the environment.

3.1.6.9 Recommendations

Based on this Five-Year Review, the Army makes the following recommendations;

- Continuing the implementation of Land Use Controls and the annual frequency of periodic reviews.

3.1.6.10 Protectiveness Summary

The remedy for SEAD-64B is protective of the environment and will protect human health when it is completed. Currently, there is no unacceptable exposure to human or environmental receptors from source area contaminants and none expected over the next five years.

3.1.7 SEAD-64D - Garbage Disposal Area

3.1.7.1 History of Contamination, Initial Response and Basis for Taking Action

History of Contamination and Initial Response

SEAD-64D covers an area located between West Patrol Road and the railroad tracks located to the west along North-South Baseline Road in the southwestern portion of SEDA (**Figure 3-1**). The SWMU stretches for approximately 2,700 ft. along the straight portion of West Patrol Road and is approximately 1,200 ft. wide extending east from West Patrol Road. Firebreaks are cut into the dense vegetation in the area and trend east-west and north-south.

Portions of SEAD-64D were used for garbage disposal from 1974 to 1979 when the SEDA solid waste incinerator was not in operation. The type of waste disposed at SEAD-64D was primarily household waste, although according to information contained in the “SWMU Classification Report, Final” (Parsons, 1994a) and conditions observed during test pitting, construction debris was also disposed of at SEAD-64D. The size of the disposal area and the volume of waste estimated to be present confirms that this area was used intermittently for disposal during the referenced period (i.e., 1974 – 1979).

Several discrete disposal areas were developed at SEAD-64D, and today these areas can be identified by the surface expression of metal objects and other forms of debris. The majority of the identified disposal areas were located in the southern, south-central, and east-central portions of SEAD-64D. An elongated east-west trending mound (approximately 75 ft. long) that is located in the southern portion of the SWMU is reported to contain trash and assorted debris. Immediately to the north and east of this elongated mound are three 25-foot to 30-foot diameter depressions that are 2 to 4 ft. in depth, which were areas excavated to provide adequate cover material.

The topography of SEAD-64D slopes to the west. The regular west-sloping topography is interrupted in the south-central portion of this AOC by an eroded stream bed that traverses the south-central portion of the area. The intermittent stream flows west toward low areas that are located to the east of West Patrol Road. These low areas parallel to West Patrol Road are believed to collect much of the surface water runoff from the SWMU.

SEAD-64D is a historic solid waste management unit (historic landfill) that is subject to regulation under the State of New York’s Solid Waste Management Regulations (see 6 NYCRR Part 360). The Army ceased use of this unit in the late 1970s. As a historic solid waste landfill, the site was subject to final closure in accordance with requirements of 6 NYCRR Part 360 in effect as of August 28, 1977. The pertinent Part 360 regulations [i.e., Part 360.1(c)(8)] include a requirement for a final cover. "Final cover" is defined in the New York State regulations as a compacted layer of at least 24 in. of cover material, the uppermost 6 in. of which is soil of a composition suitable to sustain plant growth that is placed on all surfaces of a landfill where no additional refuse will be deposited within one year.

Once solid waste disposal ceased at SEAD-64D in the late 1970s, the Army applied a permanent soil cover over the disposed waste and allowed the area to revegetate naturally. The former landfill continues to be covered and has an established vegetative covering. The Army requested formal closure of the historic landfill from the NYSDEC in letters dated May 24, 2005 and August 14, 2006. In a letter dated

September 11, 2006, the NYSDEC agreed that SEAD-64B and SEAD-64D are closed under the New York Solid Waste Regulations.

The field investigation at SEAD-64D included an ESI that was performed in 1994. During the ESI, 16 surface soil (0-0.2 ft.), 20 subsurface soil, and five groundwater samples were collected at SEAD-64D and submitted for chemical analysis. All samples were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, and cyanide according to the NYSDEC CLP SOW.

<u>Basis for Taking Action</u>

Contamination

Complete analytical results from the ESI are presented in "Decision Document – Mini Risk Assessment SEAD 9, 27, 28, 32, 33, 34, 43, 44A, 44B, 52, 56, 58, 62, 64A, 64B, 64C, 64D, 66, 68, 69, 70, and 120B," Final (Parsons, 2002a). Summaries of the soil and groundwater results are presented in Table 6-30 and 6-31 of the ROD (parsons, 2007a), respectively.

<u>Soil</u>

Thirty-six soil samples were collected at SEAD-64D. Three SVOCs, [Benzo(a)pyrene, dibenz(a,h)anthracene, and phenol] exceeded their respective TAGM cleanup objective values at least once. Nine metals (aluminum, calcium, iron, lead, manganese, potassium, sodium, thallium, and zinc) were detected in one to five samples at levels exceeding their respective TAGM cleanup objective values.

In addition to soil samples, three test pits were excavated at SEAD-64D. No metallic objects were discovered in the test pits. One field measurement recorded at Test Pit 1 indicated that a VOC level of 3 ppm was present in the headspace of the test pit immediately above buried waste material found at 2 – 4 feet bgs. Subsequently, two soil borings were located in very close proximity to the test pit and surface and subsurface soil samples were collected and analyzed for volatile and semivolatile organic compounds.

The analytical results for these samples showed trace concentrations (i.e., less than or equal to 3 J μg/Kg) of methylene chloride in the surface soils at both locations and in the subsurface samples collected from one of the borings (SB64D-1). Numerous SVOCs were detected in the surface samples collected at both soil boring locations, but only bis(2-ethylhexyl)phthalate was detected in deeper portions of the soil borings. In Test Pit 2 a 4-inch outside diameter red clay pipe oriented east-west was found at a depth of 2 ft. 3 in. The interior of the pipe was dry and free of deposits.

The excavated material for all three pits was continuously screened for organic vapors and radioactivity with an OVM-580B and a Victoreen-190, respectively. Excluding the 3 ppm OVM reading from the 2-4 foot interval of TP64D-1, no readings above background levels (0 ppm of organic vapors and 10 to 15 microRems per hour of radiation) were observed during the excavations.

<u>Groundwater</u>

Six metals (aluminum, iron, lead, manganese, nickel, and thallium) exceeded their respective groundwater standards in at least one of the five groundwater samples collected, as shown in Table 6-31 of the ROD (Parsons, 2007a). Aluminum, iron, and manganese exceeded their GA standard or Secondary Drinking Water Regulation values in all five samples. Lead exceeded its GA standard of 25 μg/L in one sample with a concentration of 71.6 μg/L. The turbidity level recorded at that sample was greater than 200 NTUs. Thallium was detected at concentrations greater than its MCL value of 2 μg/L three times, with estimated concentrations ranging from 2.1 J μg/L to 3.2 J μg/L.

Low-flow sampling techniques were not used to collect the groundwater samples at SEAD-64D. Four of the five samples collected and analyzed exhibited turbidity levels greater than 100 NTUs. It is presumed that the elevated concentrations of aluminum, iron, lead, and manganese are associated with the high turbidity in the samples. Groundwater concentrations of iron increased from 440 μg/L to 65,800 μg/L as turbidity increased from 1.5 NTUs to greater than 200 NTUs. Manganese groundwater concentrations increased from 223 μg/L to 8,250 μg/L, as turbidity increased from 1.5 NTUs to more than 200 NTUs.

<u>Human Health Risk Assessment</u>

Table 7-13 in the ROD (Parsons, 2007a) summarizes the calculated cancer and non-cancer risks for all future potential receptors under the Conservation/Recreation land use scenario (park worker, recreational visitor – child, and construction worker) and exposure routes (inhalation of dust and groundwater, ingestion of soil and groundwater, and dermal contact to soil and groundwater) considered in the risk assessment conducted at SEAD-64D in 2001 and 2002. The total cancer risk from all exposure routes was below the EPA acceptable level for all three receptors. The total non-cancer HI from all exposure routes were less than 1 for the construction worker, but equal to or greater than 1 for the park worker (HI=3) and the recreational child visitor (HI=1). The elevated HI for both receptors is due solely to ingestion of groundwater. The elevated HIs for the park worker and the child visitor were due to elevated concentrations of metals in the groundwater samples, which were associated with the observed elevated turbidity levels. If the groundwater pathway were eliminated, the non-cancer risk would be reduced to within acceptable levels.

A full discussion is included in the "Decision Document – Mini Risk Assessment" (Parsons, 2002a).

<u>Ecological Risk Assessment</u>

An ecological risk assessment was completed and no COCs were identified.

3.1.7.2 Remedy Selection

The ROD (Parsons, 2007a) selected LUCs that restrict unauthorized excavation and access to and use of groundwater as the remedy to be imposed for SEAD-64D: Garbage Disposal Area.

Results of the risk assessment for this AOC indicate that ingestion of groundwater could pose a risk to future receptors. Furthermore, as a historic solid waste landfill, this SWMU is subject to requirements of the New York State's Solid Waste Regulations (6 NYCRR Part 360), as were in effect in 1979 when it was closed. Under New York's 1979 Solid Waste Regulations, a soil and vegetative cover must be placed on and maintained above the closed landfill.

The proposed groundwater use/access restriction will be implemented over the geographic area of SEAD-64D to prohibit access to or use of the groundwater until the levels of hazardous substances are reduced to levels that allow for unlimited exposure and unrestricted use. The restriction to prohibit unauthorized excavation at the SWMU will remain in effect as long as solid waste remains at the SWMU. The reduction of groundwater contamination to levels that allow for unlimited exposure and unrestricted use, and the removal of solid waste must be completed before unlimited exposure and unrestricted use can be allowed at this SWMU.

3.1.7.3 Remedy Implementation and Remedial Systems

<u>LUC Objectives and Land Use Restrictions</u>

A Record of Decision ("ROD") titled "Seventeen SWMU Requiring Land Use Controls (SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and122E) " signed on July 3, 2007 requires the establishment of institutional controls ("ICs") at the following sites:

For SEADs 13 and 64 D

- Prevent access or use of the groundwater until cleanup levels are met; and
- Maintain the integrity of any current or future remedial or monitoring system.

For SEADs 64B and 64D

- No unauthorized excavation
- Maintenance of the existing soil cover

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") dated December 2006 implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 2 expanded the LUC RD from the PID area to include sites that are in the area formerly known as the Conservation Area and the Airfield parcels.

SEADs 13, 64B and 64D are located on the property known as the Conservation Area Parcel and are still under the control of the Army. The designated reuse of land within the Depot was revised in 2005 by SCIDA and is reflected in **Figure 1-2**. The new future land uses for three SWMUs that were previously in the Conservation/Recreation area (SEADs 13, 64B, and 64D) are Residential/Resort for SEAD-13 and Training Area for SEADs 64B and 64D. The Training Area classification suggests that the areas will be used in a manner consistent with light industrial areas.

<u>Implementation Actions</u>

The following LUC Implementation Actions specified in the SEAD LUC RD (USACE, 2006) and Addendum 2 (USACE, 2008a) were achieved and implemented to prevent violation of the LUC Objectives and Land Use Restrictions:

1. Lease restrictions – N/A for the Conservation Area.
2. Environmental Easement - The Army prepared an environmental easement consistent with N.Y. Code Env. Section 27-1318(b) that provides for NYSDEC monitoring of the LUCs set forth in the RD, which was recorded prior to the transfer of SEAD-64D from the federal government. The environmental easement will ensure the ability of NYSDEC to enforce the LUCs in the future. A notification about the existence of the environmental easement was identified in the deed associated with the parcel transfer. The Easement does not negate or transfer the Army's ultimate

responsibility under CERCLA Section 120(h)(3) and the Seneca Army Depot Federal Facilities Agreement ("FFA").

3. Deed restrictions –

    a. SEAD-64D was transferred with the land use restrictions, consistent with the LUC Objectives defined above. This deed for SEAD-64D incorporates by reference the land use restrictions set forth in the Environmental Easement. The deed was recorded in the Seneca County Clerk's Office on June 10, 2011. The Army provided a copy of the executed PID/Warehouse Area deed(s) to EPA Region II and NYSDEC.

    b. CERCLA Notice and Covenant. The deed includes a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

    c. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

4. Annual Certification – The Army and/or future property owner shall annually, or within such time as NYSDEC may allow (with the consent of EPA Region II and the Army), submit to NYSDEC, with a copy to EPA Region II (and to the Army, if the certification is submitted by a future property owner), a written statement in accordance with N.Y. Code Env. Section 27-1318(c). The statement will prepared by an expert NYSDEC may find acceptable certifying under penalty of perjury that the controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls employed at the Controlled Property were approved by NYSDEC, and that nothing has occurred that would impair the ability of such control to protect the public health and environment or constitute a violation or failure to comply with this Remedial Design for such controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.

5. Five-Year Review - The Army will review the LUC remedy as part of the Five-Year Review and Report. The report will address the effectiveness of the LUC remedy and whether any LUC Objective, Land Use Restriction, or Implementation Actions should be modified.

<u>Enforcement</u>

Addendum 2 (USACE, 2008a) applied the SEAD LUC RD enforcement provisions to SEAD-64D.

Modification

Addendum 2 (USACE, 2008a) applied the SEAD LUC RD modification provisions to SEAD-64D.

Termination

Addendum 2 (USACE, 2008a) applied the SEAD LUC RD termination provisions to SEAD-64D.

3.1.7.4 Systems Operations/Operation & Maintenance

Not applicable; no active remedy.

3.1.7.5 Data Review

3.1.7.5.1 Institutional Control Review

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") dated December 2006 implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 2 expanded the LUC RD from the PID area to include sites that are in the area formerly known as the Conservation Area and the Airfield parcels. SEAD 64D is located on property known as the Conservation Area.

Environmental Easement

An Environmental Easement that included SEAD-64D was executed on February 14, 2011 and recorded in the Seneca County Clerk's Office on June 10, 2011. This Environmental Easement was reviewed during the preparation of this report with the following findings:

1. The environmental easement was granted by the United States of America (the Grantor) by an instrument that complies with the requirements of section 5-703 of the general obligations law.
2. As evidenced by the Department's acceptance of the Easement, the Grantor furnished to the Department abstracts of title and other documents sufficient to enable the Department to determine that the easements shall be enforceable. The environmental easement is in a form prescribed by the Department. The environmental easement describes the property encumbered by the easement by adequate legal description (Exhibit A to the easement). The environmental easement:
    a. names the state, acting through the department, as grantee;
    b. contains a complete description of the use restrictions and engineering control to which the property is subject;
    c. runs with the land, binding the owner of the land and the owner's successors and assigns;
    d. includes an acknowledgment by the Commissioner of acceptance of the easement by the Department; and
    e. includes an agreement to incorporate, either in full or by reference, the environmental easement in any leases, licenses, or other instruments granting a right to use the property that may be affected by such easement.

3. Contains a requirement that until such time as the environmental easement is extinguished, the property deed and all subsequent instruments of conveyance relating to the subject property shall state in at least fifteen-point bold-faced type: "This property is subject to an environmental easement held by the New York State Department Of Environmental Conservation pursuant to title 36 of article 71 of the environmental conservation law."
4. Contains a requirement that each instrument transferring an interest in the area affected by the easement shall include a specific reference to the recorded easement.
5. Contains requirements that the environmental easement may be extinguished or amended only by a release or amendment of the easement executed by the commissioner and filed with the office of the recording officer for the county or counties where the land is situated in the manner prescribed by article nine of the real property law.
6. The environmental easement was duly recorded and indexed as such in the office of the recording officer for Seneca County in the manner prescribed by article nine of the real property law.
7. The environmental easement is enforceable in law or equity by the grantor, by the state, or any affected local government as defined in ECL Section 71-3603, against the owner of the burdened property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. No general law of the state which operates to defeat the enforcement of any interest in real property shall operate to defeat the enforcement of any environmental easement unless such general law expressly states the intent to defeat the enforcement of such easement or provides for the exercise of the power of eminent domain. It is not a defense in any action to enforce the environmental easement that:
    a. it is not appurtenant to an interest in real property;
    b. it is not of a character that has been recognized traditionally at common law;
    c. it imposes a negative burden;
    d. it imposes affirmative obligations upon the owner of any interest in the burdened property;
    e. the benefit does not touch or concern real property;
    f. there is no privity of estate or of contract; or
    g. it imposes an unreasonable restraint on alienation.
8. Agents, employees, or other representatives of the state may enter and inspect the property burdened by the environmental easement in a reasonable manner and at reasonable times to assure compliance with the restrictions.

Deed Restrictions

SEAD-64D was transferred to the Seneca County Industrial Development Agency with a Quitclaim Deed executed on May 27, 2011.

This deed was reviewed during the preparation of this report with the following findings:

1. SEAD-64D was transferred with the land use restrictions, consistent with the LUC Objectives as defined in the LUC RD. This deed for the PID/Warehouse Area incorporates by reference the land use restrictions set forth in the Environmental Easement. The property deed states in at least fifteen-point bold-faced type:

   "This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant to title 36 of article 71 of the Environmental Conservation Law."

   The deed was recorded in the Seneca County Clerk's Office on June 10, 2011. The Army provided a copy of the executed deed to EPA Region II and NYSDEC.

2. CERCLA Notice and Covenant. The deed included a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

3. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

3.1.7.5.2 Long Term Monitoring Review

There are no long term monitoring requirements for SEAD-64D other than periodic verification that no unauthorized excavation has occurred, no unauthorized use of Groundwater is evident, and to provide maintenance of the existing soil cover.

3.1.7.6 Site Inspections

The Army inspected the site to determine that the LUCs are being maintained on April 6, 2011. A survey was conducted throughout the SEDA area with a site specific inspection being conducted at SEAD-64D. Five-Year Review - site visit photo logs are contained in Appendix A and completed Five-Year Review site inspection checklists are contained in Appendix B.

The following observations were made during the site inspection:

- Cover is vegetated with no signs of erosion evident.
- Some ponding was observed but did not appear to reduce the effectiveness of the remedy. SEDA had received heavy rainfall on day before the site visit.
- No evidence of groundwater use.

The site inspection confirmed that no prohibited activities have taken place and the vegetative cover is being maintained.

3.1.7.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

No active Remedial Action was required by the completed ROD for SEAD-64D and no continuing active remediation is required for SEAD-64D.

Based on a review of the Land Use Control Remedial Design Addendum 2 and a site visit conducted on April 6, 2011, remedy is functioning as intended by the decision documents.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site since implementation of Land Use Controls that would affect the protectiveness of the remedy.

The underlying assumptions support the selected remedy in remaining protective for the following reasons:

- The current/future LUC/IC restrictions minimize potential exposure pathways; and
- The intended future use of the site is at least as restrictive as the future use anticipated for the risk assessment.

As a result, the Remedial Action objectives for 64D are considered still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no new information of significance that would affect the protectiveness of the remedy.

3.1.7.8 Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD for SEAD-64d. On-going remedial monitoring activities include periodic evaluations of the effectiveness of the remedy. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs cited in the RODs remain protective of human health and the environment.

3.1.7.9 Recommendations

Based on this Five-Year Review, the Army makes the following recommendations;

- Continuing the implementation of Land Use Controls and the annual frequency of periodic reviews.

3.1.7.10 Protectiveness Summary

The remedy for SEAD-64D is protective of the environment and will protect human health when it is completed. Currently, there is no unacceptable exposure to human or environmental receptors from source area contaminants and none expected over the next five years.

3.1.8 Airfield Parcel (SEAD-122B – Airfield Small Arms Range and SEAD-122E Plane Deicing Area)

3.1.8.1 History of Contamination, Initial Response and Basis for Taking Action

SEAD-122B- Airfield Small Arms Range

History of Contamination and Initial Response

The Small Arms Range (SAR, SEAD-122B) located on the Airfield Parcel along Route 96A was previously used by the Air Force, Navy, and Army as a small arms qualification ground. The Airfield SAR is located in the southwest corner of SEDA adjacent to the SEDA Airfield (**Figure 3-1**). The SAR consists of two contiguous bermed small arms ranges: one previously used for small arms training, and the second previously used for machine gun targeting.

As part of a treatability study conducted in 2004, approximately 500 cy of soil were excavated from SEAD-122B. The excavations included removing of soil: from the floor of the range to a depth of 3 in.; from the western face of the backstop berm to a depth of 2 ft. to 3 ft. bgs; and from a drainage swale to a depth of 6 in.

Since construction by the Air Force in the early 1950s, the size and shape of the firing lanes and berms have been modified. The configuration of the firing lanes and berms observed during the investigations consisted of a 20-lane SAR with protective wooden baffles and a two-lane machine gun range. Each of the firing line areas were surrounded on three sides (north, east, and south) by earthen berms that measure up to 28 ft. in height. The firing line areas were suspected to contain UXO, high lead concentrations, and possibly other high metal concentrations. Underlying the firing lines within each range area was a network of footer drains that captured surface water runoff from within the firing lines and conveyed it to the open area located west of the SAR where it was discharged. The surface water and groundwater flow is anticipated to follow the general trend of the land and flow towards the west and Seneca Lake.

Basis for Taking Action

Contamination

The investigative work at the SAR included an EBS in 1998, an initial site investigation in 2002, and a treatability study in 2004.

Environmental Baseline Survey – 1998

Surface soil samples were collected at five different locations within the SAR. The samples were collected at locations immediately downrange and in locations that were believed to be impact points or the small arms fire. The samples were analyzed for TAL metals. A summary of the EBS soil samples is presented in Table 6-41 of the ROD (Parsons 2007a).

Seven metals exceeded their respective TAGMs. Two metals, copper and lead, exceeded their TAGM values in all six samples. The maximum concentrations of these metals exceeded their TAGMs by 15 times and 1,962 times, respectively. Less prevalent metals included antimony, arsenic, and silver, which were found to exceed their TAGMs in two to three samples. Three metals (chromium, magnesium, and zinc) and cyanide exceeded their TAGMs in one sample, and the exceedances were between 1 time and 3 times their TAGM values.

Initial Site Investigation – 2002

Surface Soil

Surface soil samples were collected at 25 different locations within the SAR. Two samples were collected at each location with the exception of one location where a single sample was collected. The samples were analyzed for TAL metals, Synthetic Precipitation Leaching Procedure (SPLP) metals, and Toxicity Characteristic Leaching Procedure (TCLP) metals. Each sample was screened for visible bullets and bullet fragments before being sent to the laboratory for analysis. A summary of the soil results is presented in Table 6-39 of the ROD (Parsons, 2007a).

Subsurface soil samples were collected from seven borings located in the two berms and from three monitoring wells located exterior to the bermed area. Each boring advanced within the berms had three to seven associated subsurface samples, while one sample was collected from each monitoring well. The 32 collected samples (including one duplicate) ranged in depth from surface to 30 ft. bgs. The samples were analyzed for TAL metals, TCLP metals, and SPLP metals.

Lead, the main constituent of concern, was primarily found in the surface soil samples with a maximum concentration of 88,700 ppm detected along the southeast perimeter of the berm (impact area). Additional metal results, including antimony, arsenic, copper, silver, sodium, thallium, and zinc, were found primarily in the surface soil samples at concentrations slightly over the soil cleanup objective. These concentrations were all collocated in areas where high levels of lead were detected. One TCLP lead concentration was above the RCRA limit of 5,000 μg/L.

The SPLP metals results indicated that there were levels of antimony, iron, and thallium above the NYSDEC Class GA standards. The maximum detected concentrations of iron and thallium were consistent with SEDA background levels. Four of the antimony SPLP concentrations that exceeded the GA limit were within the proposed excavation area for the treatability study. The remaining four detections were in an area where the antimony concentrations in soil were below the maximum SEDA background concentration. A comprehensive table of results can be found in "The Characterization Report – Small Arms Range – Airfield (SEAD-122B)" Revised Final (Parsons, 2004e).

Groundwater

Three monitoring wells were installed and sampled in 2002. The groundwater samples were collected using low-flow sampling procedures with a peristaltic pump and dedicated tubing, and the samples were analyzed for TAL metals. Metal concentrations detected in the groundwater were below NYSDEC Class GA standards with the exception of antimony and iron. The elevated antimony and iron concentrations were likely due to the elevated turbidities of the samples. The antimony and iron concentrations detected in the downgradient wells were generally consistent with the concentrations in the upgradient well. In addition, lead, the primary COC at small arms ranges, was not detected in any of the groundwater samples. Therefore, it is concluded that groundwater is not impacted by contact with or contaminant migration from the SAR soil. Groundwater data is summarized in Table 6-40 of the ROD (Parsons, 2007a).

<u>Treatability Study – 2004</u>

In 2004, a treatability study was conducted, and approximately 500 cy of soil was excavated from locations where high concentrations of total lead were found during the 2002 investigation in the larger of the two SARs. Other metals detected at levels above their respective NYSDEC cleanup objective levels were collocated within the areas where high lead concentrations were found. Elevated lead concentrations included any value above 400 ppm. The excavation area was delineated by lead concentrations greater than 400 ppm and included the western face of the backstop berm and a drainage swale that carried surface water runoff away from the firing range area. The top three inches of soil on the surface of the firing range's floor was also excavated.

Confirmatory soil samples were collected and analyzed for total lead to ensure that all soil with total lead concentrations in excess of 400 ppm were removed during the treatability study. If lead concentrations exceeded 400 ppm in the confirmation sample, excavation continued in that area and an additional confirmation sample was collected. The final results reported confirm that all excavated locations exhibited lead concentrations at levels less than 400 ppm. The maximum detection of lead in the final confirmation samples was 299 ppm detected at CS012, which was collected in the area where soil was formerly stockpiled. A summary of lead data that characterizes current conditions at this AOC is presented in Table 6-38 of the ROD (Parsons, 2007a); samples that were removed during excavation and preliminary confirmation samples that were subsequently dug out are not part of the final data set and are not included in the summary presented in Table 6-38, since they are no longer representative of current soil conditions at the range. Confirmatory soil analytical results are presented in "The Characterization Report – Small Arms Range – Airfield (SEAD-122B)," Revised Final (Parsons, 2004e).

<u>Human Health Risk Assessment</u>

A risk assessment was not performed for SEAD-122B, where the results of the treatability study indicated that the cleanup objectives established for the treatability study had been achieved and all lead concentrations remaining at the AOC were below the EPA's guidance value for residential soils.

SEAD-122E: Plane Deicing Area

<u>History of Contamination and Initial Response</u>

History of Contamination and Initial Response SEAD-122E is associated with the deicing of planes at three separate aircraft refueling areas at the former SEDA Airfield (**Figure 3-1**). The property where the airfield currently sits was once part of the Sampson Naval Training Station which was open from 1942 to 1946, and which was used for basic training of naval personnel. In 1946 the naval training station was closed and the turned over to the War Assets Administration as surplus property. The Air Force obtained custody of the former training station in 1950, and used the property for training air force personnel during the Korean War period. During the Air Force's tenancy at the location, the airfield was constructed (1952 or 1953). The Air Force closed the airfield in 1956 and it reverted to caretaker status. Somewhere between 1958 and 1962, the Army acquired control over the 629 acre airfield, and used the facility to operate flights in support of the depot activities and security. The airfield was officially closed in 2000, and is no longer an active airfield, but is currently utilized by the New York State Police for training and special events.

All three of the historic deicing/refueling pads that comprise SEAD-122E are located along the western side of the northwest-southeast runway. Two of the deicing/refueling pads are located near either end of the runway, while the third is located at the end of a short taxiway, west of the central portion of the runway. The central pad is the largest of the three pads measuring approximately 350 ft by 250 ft in size. The two other pads are smaller, each measuring about 150 ft by 250 ft in size. Both the central and southern most pad can be accessed by vehicles along paved roadways, while the third pad (i.e., northern end pad) can only access from the runway or via dirt road.

Basis for Taking Action

Contamination

The investigative work at SEAD-122E included an EBS that was performed in 1998 and 1999. The Final EBS Report was issued to EPA and NYSDEC in May 1999 (Parsons, 1999b).

Environmental Baseline Survey – 1998/1999

The purpose of the EBS was to determine if soil or groundwater on the perimeter of three pads were impacted by the deicing fluids used on the planes. The constituents of concern are SVOCs and principal components of deicing fluids (alcohols/glycols, i.e., ethylene glycol, propylene glycol, total unknown alkanes) in soil and groundwater.

The investigation included drilling and sampling one soil boring at each identified deicing location. Each of the soil borings was located in a low spot immediately adjacent to one of the asphalt pads. Two soil samples were collected from each boring, one from the top two inches of soil, with the second being collected at depths of either 2 to 2.5 ft. bgs (at two locations) or 6 to 7.5 ft. below grade (one location). A temporary well was installed in each of the three soil borings subsequent to the completion of soil sampling, and a groundwater sample was recovered from the well after purging using a peristaltic pump.

Summaries of the soil and groundwater results are presented in Table 6-42 and 6-43 of the ROD (Parsons, 2007a), respectively.

Twenty SVOCs, comprised mainly of PAHs and phthalates, were found in the six soil samples collected from the three soil borings (ROD Table 6-42). The maximum detections of PAHs were collocated in one surface soil sample collected from the edge of the pavement next to the central deicing station. No phthalates were detected in this sample. The PAH concentrations at the other five locations were at least an order of magnitude lower than the maximum concentration. No deicing chemicals (e.g., glycols) were detected in any of the six soil samples characterized during this event.

Five contaminants were found in the four groundwater samples collected (ROD Table 6-43). Bis(2-ethylhexyl)phthalate was detected in all four groundwater samples collected, as well as in the field blank, and is believed to be an artifact of the sampling process and the use of the temporary wells. Four other SVOCs (fluoranthene, hexachlorobutadiene, phenanthrene, and pyrene) were detected in the sample collected from the boring where the majority of the PAHs were detected in the surface soil. None of the compounds detected in the four groundwater samples exceeded groundwater standards.

Human Health Risk Assessment

In response to a request by EPA, the Army presented the results of a risk assessment in a memo submitted in March 2005. The cancer and non-cancer risks for all future potential receptors (industrial worker, construction worker, day care center – worker, and day care center – child) and exposure routes (inhalation of dust in air, ingestion of soil or groundwater, or dermal contact to soil) for SEAD-122E were evaluated. The total non-cancer HIs for all exposure routes were less than 1 for all four receptors. The total cancer risk from all exposure routes was within EPA acceptable level for the industrial worker and the construction worker. The cancer risk values for the day care center worker and day care center child, 2×10^{-4} and 1×10^{-4}, respectively, were above or at the acceptable level. The unacceptable cancer risk is due to dermal contact to soil and ingestion of soil. The contributing COCs are carcinogenic PAHs in soils. A summary of the risk assessment results is presented in Table 7-15 of the ROD (Parsons, 2007a).

For comparison purposes, risk to residential receptors was evaluated. The non-cancer HIs were less than 1. Cancer risk values were above EPA acceptable limits due to the presence of cPAHs in the soil.

3.1.8.2 Remedy Selection

For SEADs 122B and 122E the Record of Decision signed on July 3, 2007 (parsons, 2007a) required the establishment of institutional controls that:

- Prevent residential housing, elementary and secondary schools, childcare facilities and playground activities.

The proposed residential activities LUC will be implemented over the entire Airfield Parcel, which extends beyond the bounds of SEAD-122B and SEAD-122E. This LUC will be applied to all areas within the former Airfield, and will continue until such time as the concentrations of hazardous substances are reduced to levels that allow for unlimited exposure and unrestricted use. Future owners or users of land within the Airfield may request a waiver from the LUC on a location-by-location basis. At the time of the waiver request, the applicant must develop and submit sufficient data and information, subject to review and approval by the Army and the EPA, to substantiate its request that the identified location is suitable for unlimited exposure and unrestricted use.

3.1.8.3 Remedy Implementation and Remedial Systems

LUC Objectives and Land Use Restrictions

A Record of Decision ("ROD") titled "Seventeen SWMU Requiring Land Use Controls (SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and122E) " signed on July 3, 2007 required the establishment of institutional controls ("ICs") at the two sites (SEADs 122B and 122E) comprising the area known as the Airfield Parcel.

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") dated December 2006 implements land use controls for the SEAD Planned Industrial/Office Development and

Warehousing Area ("PID/Warehouse Area"). Addendum 2 expanded the LUC RD from the PID area to include sites that are in the area formerly known as the Conservation Area and the Airfield parcels.

The residual contamination at the Airfield Parcel will not pose an unacceptable threat to human health and the environment provided the following Land Use Restrictions are employed:

1. Commercial/Industrial Use Restriction.

The Controlled Property shall be used solely for commercial and industrial purposes and not for residential purposes, such real property having been remediated only for commercial and industrial uses. Commercial and industrial uses include, but are not limited to, administrative/office space, manufacturing, warehousing, restaurants, hotels/motels, and retail activities. Residential use includes, but is not limited to, housing; day childcare facilities; schools (excluding education and training programs for persons over 18 years of age); assisted living facilities; and outdoor recreational activities (excluding recreational activities by employees and their families incidental to authorized commercial and industrial uses on the Controlled Property).

The boundary of the Airfield Area is defined as the boundary of the Airfield Special Events, Institutional, and Training area highlighted on **Figure 3-1**.

The following LUC Implementation Actions were achieved and implemented to prevent future violation of the LUC Objectives and Land Use Restrictions:

1. Lease restrictions – N/A for the Airfield Parcel.

2. Environmental Easement - The Army prepared an environmental easement consistent with N.Y. Code Env. Section 27-1318(b) that provides for NYSDEC monitoring of the LUCs set forth in the RD, which was recorded immediately prior to the transfer of the Airfield Parcel from the federal government. The environmental easement will ensure the ability of NYSDEC to enforce the LUCs in the future. A notification about the existence of the environmental easement was identified in the deed associated with the parcel transfer. The Easement does not negate or transfer the Army's ultimate responsibility under CERCLA Section 120(h)(3) and the Seneca Army Depot Federal Facilities Agreement ("FFA").

3. Deed restrictions –

    a. The Airfield Parcel was transferred with the land use restrictions, consistent with the above LUC Objectives as defined in Section 3.4.1, above. This deed for the Airfield Parcel incorporates by reference the land use restrictions set forth in the Environmental Easement. The deed was recorded in the Seneca County Clerk's Office on July 9, 2009. The Army provided a copy of the executed Airfield Parcel deed to EPA Region II and NYSDEC.

    b. CERCLA Notice and Covenant. The deed included a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

c. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

4. Annual Certification – The Army and/or future property owner shall annually, or within such time as NYSDEC may allow (with the consent of EPA Region II and the Army), submit to NYSDEC, with a copy to EPA Region II (and to the Army, if the certification is submitted by a future property owner), a written statement in accordance with N.Y. Code Env. Section 27-1318(c). The statement will prepared by an expert NYSDEC may find acceptable certifying under penalty of perjury that the controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls employed at the Controlled Property were approved by NYSDEC, and that nothing has occurred that would impair the ability of such control to protect the public health and environment or constitute a violation or failure to comply with this Remedial Design for such controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.

5. Five-Year Review - The Army will review the LUC remedy as part of the Five-Year Review and Report. The report will address the effectiveness of the LUC remedy and whether any LUC Objective, Land Use Restriction, or Implementation Actions should be modified.

Enforcement

Addendum 2 applied the SEAD LUC RD enforcement provisions to SEADs 122B and 122E

Modification

Addendum 2 applied the SEAD LUC RD modification provisions to SEADs 122B and 122E.

Termination

Addendum 2 applied the SEAD LUC RD termination provisions to SEADs 122B and 122E.

3.1.8.4 Systems Operations/Operation & Maintenance

Not applicable; no active remedy.

3.1.8.5 Data Review

3.1.8.5.1 Institutional Control Review

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") (USACE, 2006) implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 2 (USACE, 2008a) expanded the LUC RD from the PID area to include sites that are in the area formerly known as the Conservation/Recreational Area and the Airfield parcels. SEADs 122B and 122E are located on property known as the Airfield Parcel.

Environmental Easement

An Environmental Easement for the Warehouse/Planned Industrial Development Area was executed on June 8, 2009 and recorded in the Seneca County Clerk's Office on July 9, 2009. This Environmental Easement was reviewed during the preparation of this report with the following findings:

1. The environmental easement was granted by the United States of America through the Deputy Assistant Secretary of the Army (Installations and Housing) (the Grantor) by an instrument that complies with the requirements of section 5-703 of the general obligations law.
2. As evidenced by the Department's acceptance of the Easement, the Grantor furnished to the Department abstracts of title and other documents sufficient to enable the Department to determine that the easements shall be enforceable. The environmental easement is in a form prescribed by the Department. The environmental easement describes the property encumbered by the easement by adequate legal description (Schedule A to the easement) and by reference to a recorded map showing its boundaries and bearing the seal and signature of a licensed land surveyor. The environmental easement:
   a. names the state, acting through the department, as grantee;
   b. contains a complete description of the use restrictions and engineering control to which the property is subject;
   c. runs with the land, binding the owner of the land and the owner's successors and assigns;
   d. includes an acknowledgment by the Commissioner of acceptance of the easement by the Department; and
   e. includes an agreement to incorporate, either in full or by reference, the environmental easement in any leases, licenses, or other instruments granting a right to use the property that may be affected by such easement.
3. Contains a requirement that until such time as the environmental easement is extinguished, the property deed and all subsequent instruments of conveyance relating to the subject property shall state in at least fifteen-point bold-faced type: "This property is subject to an environmental easement held by the New York State Department Of Environmental Conservation pursuant to title 36 of article 71 of the environmental conservation law."
4. Contains a requirement that each instrument transferring an interest in the area affected by the easement shall include a specific reference to the recorded easement.
5. Contains requirements that the environmental easement may be extinguished or amended only by a release or amendment of the easement executed by the commissioner and filed with the office of the recording officer for the county or counties where the land is situated in the manner prescribed by article nine of the real property law.
6. The environmental easement was duly recorded and indexed as such in the office of the recording officer for Seneca County in the manner prescribed by article nine of the real property law.

7. The environmental easement is enforceable in law or equity by the grantor, by the state, or any affected local government as defined in ECL Section 71-3603, against the owner of the burdened property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. No general law of the state which operates to defeat the enforcement of any interest in real property shall operate to defeat the enforcement of any environmental easement unless such general law expressly states the intent to defeat the enforcement of such easement or provides for the exercise of the power of eminent domain. It is not a defense in any action to enforce the environmental easement that:

   a. it is not appurtenant to an interest in real property;

   b. it is not of a character that has been recognized traditionally at common law;

   c. it imposes a negative burden;

   d. it imposes affirmative obligations upon the owner of any interest in the burdened property;

   e. the benefit does not touch or concern real property;

   f. there is no privity of estate or of contract; or

   g. it imposes an unreasonable restraint on alienation.

8. Agents, employees, or other representatives of the state may enter and inspect the property burdened by the environmental easement in a reasonable manner and at reasonable times to assure compliance with the restrictions.

Deed Restrictions

The Airfield Parcel property was transferred to the Seneca County Industrial Development Agency with a Quitclaim Deed dated June 8, 2009. This Deed was reviewed during the preparation of this report with the following findings:

1. The Airfield Parcel property was transferred with the land use restrictions, consistent with the LUC Objectives as defined in the LUC RD. This deed for the Airfield Parcel incorporates by reference the land use restrictions set forth in the Environmental Easement. The property deed states in at least fifteen-point bold-faced type:

   "This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant to title 36 of article 71 of the Environmental Conservation Law."

   The deed was recorded in the Seneca County Clerk’s Office on July 9, 2009. The Army provided a copy of the executed Airfield Parcel deed(s) to EPA Region II and NYSDEC.

2. CERCLA Notice and Covenant. The deed included a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any

hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

3. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

3.1.8.5.2 Long Term Monitoring Control Review

There are no long-term monitoring requirements for the Airfield Parcel (SEAD-122B and SEAD-122E).

3.1.8.6 Site Inspections

The Army inspected the site to determine that the LUCs are being maintained on April 7, 2011. A survey was conducted throughout SEDA with site specific inspections being conducted at SEADs 122B and 122E. Five-Year Review - site visit photo logs are contained in Appendix A and completed Five-Year Review site inspection checklists are contained in Appendix B.

The site inspection confirmed that no prohibited facilities have been constructed.

3.1.8.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

No active Remedial Action was required by the completed ROD for the Airfield Parcel and no continuing active remediation is required for the Airfield Parcel.

Based on a review of the Land Use Control Remedial Design Addendum 2 and a site visit conducted on April 7, 2011, remedy is functioning as intended by the decision documents.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site since implementation of Land Use Controls that would affect the protectiveness of the remedy.

A risk assessment was not performed for SEAD-122B, where the results of the treatability study indicated that the cleanup objectives established for the treatability study had been achieved and all lead concentrations remaining at the AOC were below the EPA's guidance value for residential soils.

The cancer risk values for the day care center worker and day care center child, 2×10^{-4} and 1×10^{-4}, respectively, were above or at the acceptable level. The unacceptable cancer risk is due to dermal contact to soil and ingestion of soil. The contributing COCs are carcinogenic PAHs in soils. The Record of Decision signed on July 3, 2007 (parsons, 2007a) required the establishment of institutional controls for the Airfield Parcel that prevent residential housing, elementary and secondary schools, childcare facilities and playground activities.

The airfield was officially closed in 2000, and is no longer an active airfield, but is currently utilized by the New York State Police for training and special events.

The underlying assumptions support the selected remedy in remaining protective for the following reasons:

- The current/future LUC/IC restrictions minimize potential exposure pathways; and
- The current and intended future use of the site is consistent with the residential LUC specified by the remedy.

As a result, the Remedial Action objectives for SEADs 122B AND 122E are considered still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no new information of significance that would affect the protectiveness of the remedy.

3.1.8.8 Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD for SEADs 122B and 122E. On-going remedial monitoring activities include periodic evaluations of the effectiveness of the remedy. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs cited in the RODs remain protective of human health and the environment.

3.1.8.9 Recommendations

Based on this Five-Year Review, the Army makes the following recommendations;

- Continuing the implementation of Land Use Controls and the annual frequency of periodic reviews.

3.1.8.10 Protectiveness Summary

The remedy for SEADs 122B and 122E is protective of the environment and will protect human health when it is completed. Currently, there is no unacceptable exposure to human or environmental receptors from source area contaminants and none expected over the next five years.

3.1.9 Ash Landfill Operable Unit (SEAD 3, 6, 8, 15, and 15)

3.1.9.1 History of Contamination, Initial Response and Basis for Taking Action

<u>History of Contamination and Initial Response</u>

The Ash Landfill site is located along the western boundary of SEDA (**Figure 3-1)**. The site is bounded on the north by Cemetery Road, on the east by a SEDA railroad line, on the south by open grassland and brush, and on the west by the Depot's boundary. Beyond the Depot's western boundary are farmland and residences on Smith Farm Road and along Route 96A. Sampson State Park, which is on the shore of Seneca Lake, is located immediately to the west of Route 96A.

The Ash Landfill site was initially estimated to encompass an area of approximately 130 acres. This larger area was investigated to ensure that no previously unknown waste disposal areas were overlooked. Following the remedial investigation, the area of the Ash Landfill site was refocused to an area of approximately 23 acres. This area is comprised of five SWMUs including: Incinerator Cooling Water Pond (SEAD-3), the Ash Landfill (SEAD-6), the Non-Combustible Fill Landfill (NCFL) (SEAD-8), the Refuse Burning Pits (SEAD-14), and the Abandoned Solid Waste Incinerator Building (SEAD-15) (**Figure 3-2**). The Debris Piles are located near SEAD-14. The Ash Landfill (SEAD-6) also includes a groundwater plume that emanates from the northern western side of the landfill area.

The Incinerator Cooling Water Pond is a circular-bermed area approximately 50 feet in diameter. The Ash Landfill (SEAD-6) is a kidney-shaped landfill approximately 550 feet by 300 feet (3.8 acres) in area. The groundwater plume associated with the Ash Landfill is approximately 18 acres. The NCFL is an area approximately 400 feet by 400 feet (3.4 acres) in area. The Refuse Burning Pits were approximately 15 feet in diameter and was where trash was open burned. The debris piles were discovered near this side of the Ash Landfill area and contamination was found in the debris piles**.** The Abandoned Incinerator Building is approximately 25 feet by 40 feet. The area that comprises the remainder of the 44.7 acres of the Ash Landfill site is a grassy shrub-covered area.

The stratigraphy of the Ash Landfill site generally consists of between 6 and 10 feet of till, below which is a thin zone (1 to 3 feet) of weathered shale, which grades into competent shale at depth. Generally, the depth to groundwater in the till/weathered shale aquifer varies seasonally between approximately 2 and 6 feet below the ground surface; the depth to groundwater is similar in the competent shale aquifer. Infiltration of precipitation is the sole source of groundwater for the overburden aquifer, and run-off on the site is controlled by a network of engineered drainage ditches.

The direction of groundwater flow in the till/weathered shale aquifer is generally to the west toward Seneca Lake; the flow direction in the competent shale aquifer is also to the west. No significant vertical gradients exist between the overburden and bedrock aquifers, and no substantial vertical connection exists between these two aquifers.

The site groundwater is classified as Class GA groundwater by NYSDEC. Seneca Lake is a source of drinking water for SEDA and many surrounding communities. A more comprehensive description of the site is presented in the RI Report (Parsons ES, 1994c).

From 1941 to 1974, household trash and depot refuse was burned in a series of Refuse Burning Pits near the Abandoned Incinerator Building (Building 2207). According to a U.S. Army Environmental Hygiene Agency's Interim Final Report, Groundwater Contamination Survey No. 38-26-0868-88 (USAEHA, 1987), during approximately this same period (1941 until the late 1950s or early 1960s) the ash from the Refuse Burning Pits was buried in the Ash Landfill.

The Incinerator Building was built in 1974. Between 1974 and 1979, materials intended for disposal were transported to the incinerator. The incinerator was a multiple chamber, batch-fed 2,000 pound per hour capacity unit, which burned rubbish and garbage. The incinerator unit contained an automatic ram-type feeder, a refractory-lined furnace with secondary combustion and settling chamber, a reciprocating stoker, a residue conveyor for ash removal, combustion air fans, a wet gas scrubber, an induced draft fan, and a refractory-lined stack (USAEHA, 1979). Nearly all of the approximately 18 tons of refuse generated per week on the Depot were incinerated. The source for the refuse was domestic waste from Depot activities and family housing. Large items that could not be burned were disposed of at the NCFL. The NCFL is located southeast of the Incinerator Building (immediately south of the SEDA railroad line). The NCFL was used as a disposal site for non-combustible materials, including construction debris, from 1969 until 1977.

Ash and other residues from the incinerator were temporarily disposed of in the Incinerator Cooling Water Pond immediately north of the Incinerator Building. The Incinerator Cooling Water Pond consisted of an unlined depression approximately 50 feet in diameter and approximately 6 to 8 feet deep. When the pond filled (approximately every 18 months), the fly ash and residues were removed, transported, and buried in the adjacent Ash Landfill, east of the Cooling Pond. The refuse was dumped in piles and occasionally spread and compacted. No daily or final cover was applied during operation. The active area of the Ash Landfill extended at least 500 feet north of the Incinerator Building, near a bend in a dirt road ("Bend in the Road"), based on an undated aerial photograph of the incinerator during operation. A fire destroyed the incinerator in May 1979, and the landfill was subsequently closed. A vegetative cover, comprised of native soils and grasses, was observed over the Ash Landfill during the RI.

A grease pit disposal area near the eastern boundary of the site was used for disposal of cooking grease.

Investigations that pertain to the environmental history of the Ash Landfill site were completed between 1979 and 1989 by various Army agencies. These investigations were performed primarily to investigate the release of chlorinated VOCs to soil and groundwater at the Ash Landfill site.

At the time of the ROD (Parsons, 2004c) two removal actions had been performed at the Ash Landfill. The first action was the removal of a former 1000-gallon underground storage tank (UST) that was used to store heating oil and was located on the east side of the abandoned Incinerator Building. The UST was investigated and removed in April 1994 in accordance with the protocols outlined in the NYSDEC STARS memo (August 1992). According to the UST closure report that documented this tank removal, the tank was intact and there was no visual or olfactory evidence of tank leakage in the soil surrounding the UST.

The second action, a non-time critical removal action, also known as an Interim Remedial Measure (IRM), was conducted by the Army between August 1994 and June 1995, under the requirements of the CERCLA. The IRM consisted of excavation and thermal treatment of VOC impacted soils using the Low Temperature Thermal Desorption (LTTD) process. The objectives of the IRM were to thermally treat VOCs and polycyclic aromatic hydrocarbons (PAHs) in soils at two source areas near the "Bend in the Road" where sampling identified elevated concentrations of VOCs and PAHs. The non-time critical removal action reduced risk due to future exposure to these soils and prevented continued leaching of VOCs to groundwater associated with this operable unit. Cleanup requirements for soils were adopted from the NYSDEC TAGM #4046 soil cleanup objectives. The scope of the removal action is described in the "Action Memorandum, Ash Landfill Removal Action" (Parsons ES, 1994d). In July 1995, the final report for the Ash Landfill Immediate Response was prepared by IT Corporation. The treatment of soils involved two distinct source areas at the “Bend in the Road” area. Approximately 35,000 tons of soil were excavated from the two source areas and heated to 800-900°F in the LTTD system. After the soil was heated and cooled, soil was tested prior to backfilling into the excavation area. Following backfilling and proper grading for drainage control, a vegetative cover was established to prevent erosion. Sampling and analysis of the excavated and treated soil material indicated that these soils were successfully treated and met the VOC cleanup criteria (NYSDEC TAGM values) for the project. Also, concentrations of VOCs in soils after the IRM were below NYSDEC TAGM values. In the several years that have passed since the IRM, the positive benefits of the IRM have been observed as the concentrations of VOCs in groundwater in the removal area have decreased by more than 95%.

Basis for Taking Action

Contamination

The primary media investigated at the Ash Landfill site included soil (from soil borings and test pits), groundwater, and surface water and sediment (from Kendaia Creek and on-site wetlands and drainage swales). Based on these investigations, soil and groundwater were found to be the media that were the most significantly impacted by a release of chemicals on-site.

The primary COCs at the Ash Landfill site are VOCs, including chlorinated and aromatic compounds, SVOCs (mainly PAHs), and, to a lesser degree, metals. The COCs are believed to have been released to the environment during former activities conducted at the Ash Landfill Operable Unit (OU). The source of the VOCs was most likely the three alleged solvent dump areas located at the “Bend in the Road” area northwest of the Ash Landfill site. The source of the VOCs that were allegedly disposed in this area is unknown.

Soil

Guidelines for soil cleanup are presented in the NYSDEC TAGM #4046. This guidance was used to compare site soil concentrations in order to provide an initial indication of site conditions. Details of this comparison are presented in Chapter 4 of the RI (Parsons, 1994c). Concentrations above these guidance values imply that conditions at the site may pose a threat to human health and the environment. Tables 6-1a, 6-1b, 6-1c, and 6-1d in the ROD (Parsons, 2004c) present a summary of all the soil data collected during the RI.

The primary chlorinated VOCs in soils at the Ash Landfill site were 1,2-dichloroethene (1,2-DCE, maximum = 79 mg/Kg), TCE (maximum = 540 mg/Kg), and vinyl chloride (VC, maximum = 14.5 mg/Kg). The highest concentrations of these compounds were measured in a two-acre area, located in the northwestern corner of the Ash Landfill, at the “Bend in the Road”. The primary aromatic VOCs were xylene (maximum = 17 mg/Kg) and toluene (maximum = 5.7 mg/Kg). The SVOCs of principal concern were PAHs. PAHs were measured at concentrations above the NYSDEC TAGM #4046 cleanup guidelines. The metals that were detected at elevated concentrations in soils were copper (maximum = 836 mg/Kg), lead (maximum = 2,890 mg/Kg), mercury (maximum = 1.2 mg/Kg) and zinc (maximum = 55,700 mg/Kg). The highest concentrations of metals were detected in the surface soils of the Debris Piles. The extent of the aromatic VOCs in the horizontal direction was smaller than that for the chlorinated VOCs (approximately one-half acre). The vertical impacts extended from the land surface to 4 feet below the surface (above the water table).

As part of the Ash Landfill RI, a soil-boring program was conducted in the area around the abandoned Incinerator Building, including the adjacent Incinerator Cooling Water Pond during November 1991. Results from this investigation indicated that concentrations of 29 of the 30 SVOCs were below TAGM criteria. One compound was detected at concentrations exceeding the TAGM criteria. Benzo(a)pyrene was detected at concentrations of 760 J μg/Kg and 120 μg/Kg in two surface soil samples collected adjacent to the cooling pond. The TAGM value for benzo(a)pyrene is 61 μg/Kg. Benzo(a)pyrene was not detected in samples collected below these two surface soil samples indicating that these concentrations were limited to the surface. Benzo(a)pyrene concentrations in surface and subsurface soils were below the TAGM in several other borings in the immediate vicinity of the Cooling Pond. No pesticides or PCBs were detected in the soil borings, and measured metal concentrations were consistent with background values developed as part of USAEHA Waste Study 37-26-0479-85.

Groundwater

The primary impact to the groundwater is a plume containing dissolved concentrations of TCE, 1,2-DCE, and VC that originated in the "Bend in the Road". Quarterly monitoring in 1996, 1997 and 1998 detected 1,2-DCE between 1 μg/L and 2 μg/L at monitoring well MW-56, which is 225 feet past the Depot boundary. Sampling of MW-56 in January 2000 did not detect 1,2-DCE above the detection limit of 1 μg/L. The NYSDEC GA groundwater quality standard for 1,2-DCE is 5 μg/L. It is likely that the boundary of the plume extends westward to slightly beyond the Depot boundary. Exceedances over the NYSDEC GA groundwater standard, beyond the Depot boundary, have not been observed. Table 6-2 of the ROD (Parsons, 2004c) lists the total chlorinated ethene concentrations for five sampling rounds in the site wells.

The maximum VOC concentration was detected in monitoring well MW-44, located within the source area prior to the soil removal action. In November 1993, the concentrations of TCE, 1,2-DCE, and VC were 51,000, 130,000, and 23,000 μg/L, respectively, for a total chlorinated ethene concentration of 204,000 μg/L in MW-44. The nearest exposure points for groundwater are the three nearby farmhouse wells, located approximately 1,250 feet from the leading edge of the plume. At least one of the farmhouse wells draws water from the till/weathered shale aquifer and the remaining two wells derive water from the bedrock aquifer. Vertically, the plume is believed to be restricted to the upper till/weathered shale aquifer and is not present in the deeper competent shale aquifer.

Although exceedances of the NYSDEC Class GA groundwater standards for the metals chromium, lead, nickel, zinc, antimony, barium, beryllium, and copper were observed in several wells during the RI , the data appears to be related to the elevated turbidity of the sample. It was noted that wells with high turbidity have high metals concentrations. Subsequent improvements to the sampling techniques provided less turbid samples with a corresponding decrease in the concentration of metals. For example, lead in MW-44, with a turbidity of 100 NTUs, was detected during the second round of the RI at a level of 147 μg/L, which was above both the EPA criteria of 15 μg/L and the NYSDEC GA standard of 25 μg/L. During the quarterly sampling conducted following the RI, the concentration of lead in MW-44 was non-detectable at less than 2 μg/L. This same trend was observed for other wells. During these post-RI sampling events, the EPA Region II Low Stress (low flow) Purging and Sampling Method was used to reduce the turbidity in the groundwater samples. As a result, the turbidity of the samples was less than 10 NTUs. Furthermore, the locations of the exceedances did not correlate to form a continuous plume; rather, they were random and were not related to a source. This supports the contention that the exceedances were related to sample turbidity rather than a release from a point source. Based on this data, concern over exceedances of metals in groundwater was resolved and attributed to turbidity.

The non-time critical removal action successfully removed VOCs and SVOCs from soil, and positive effects have been observed in the groundwater concentration in the area of the removal action. For example, prior to the removal action, the concentration of total chlorinated ethenes in MW-44 was 204,000 μg/L. In October 1999 and January 2000, the concentrations in MW-44a, the replacement well for MW-44, were 1,104 μg/L and 399 μg/L, 99.5% and 99.8% reductions in concentrations, respectively. Figure 6-1 in the ROD (Parsons, 2004c) depicted the groundwater VOC plume based on the results of the January 2000 groundwater sampling and analysis.

In December 1998, a 650-foot long permeable reactive iron wall was installed approximately 100 feet east of the railroad tracks near the property line. The wall was installed as a demonstration project to show that the reactive iron wall could be effective in reducing the concentrations of chlorinated ethenes through reductive dechlorination. The wall was constructed by placing a mixture of 50% zero valent reactive iron granules and 50% sand in a trench with a width of 14 inches and a depth ranging from 7 to 12 feet. Eleven monitoring wells were installed upgradient, downgradient and within the wall to monitor its effectiveness. Groundwater sampling has been performed at these wells since the wall installation.

The first four rounds of groundwater sampling in the vicinity of the wall were evaluated to determine if the reactive iron wall technology was effective in destroying TCE in groundwater and whether a reactive iron wall would be appropriate for full-scale remediation (Draft Feasibility Memorandum for Groundwater Remediation Alternatives Using Zero Valent Iron Reactive Wall at the Ash Landfill, Parsons, August 2000). The report concluded that the technology was viable, however, future applications would require longer reactive iron residence times in order to meet the targeted groundwater standards.

Column and batch testing was performed in August 2001 using site groundwater and reactive iron to determine if the retention time in the existing wall was sufficient to allow for complete destruction of the TCE. As detailed in the Bench-Scale Treatability Report for the Ash Landfill, Seneca Army Seneca Army Depot Activity (ETI, 2001), the reactive iron wall would degrade chlorinated ethenes below NYSDEC Class GA standards if sufficient reaction time is allowed. If iron is selected as the reactive media for the walls, future walls would be designed to allow sufficient reaction time within the wall. The Army will select the reactive material for the walls during remedial design. If a wall material other than iron is selected, the Army will conduct a review of the remedy's effectiveness one year after the walls are installed. Subsequent annual reviews will be performed until the first Five-Year Review. The typical Five-Year Review schedule will be followed thereafter.

Three additional rounds of sampling had been conducted on the Ash Landfill wells prior to the ROD. The results were generally consistent with the previous two rounds.

Surface Water

The NYS AWQS were considered as an appropriate screening criteria for surface water. Surface water data was collected from on-site surface water and from Kendaia Creek, which has been classified by NYSDEC as a Class C stream.

The on-site drainage ditches and wetlands have not been classified by NYSDEC, since the on-site wetlands and drainage ditches do not contain surface water throughout the entire year.

No VOCs or SVOCs were detected in any of the on-site surface waters or in Kendaia Creek. Metals concentrations were also low in surface water with only iron exceeding NYSAWQCS in three of the six on-site locations. The concentrations of iron in these three samples ranged from 2.08 mg/L to 8.75 mg/L. The NYS AWQS for iron in a Class C surface water body is 0.3 mg/L.

Sediment

The NYSDEC Sediment Criteria were used to compare sediment data collected from Kendaia Creek and on-site sediment found in the drainage ditches and wetlands. Since background for sediment at Kendaia Creek was not determined, comparisons to background could not be performed and the NYSDEC Sediment Guidelines were used instead. Concentrations of chemicals above the NYSDEC Sediment Guidelines were used to determine if impacts to sediment were likely to have occurred. The list of COCs was then refined during the data evaluation portion of the risk assessment.

The sediments found in the wetland adjacent to the "Bend in the Road" contained elevated concentrations of 1,2-DCE (640 μg/Kg). No other on-site sediment samples contained concentrations of VOCs or SVOCs. Metals (arsenic, chromium, copper, iron, lead, manganese, mercury, nickel, and zinc) concentrations in several sediment samples exceeded the NYSDEC Sediment Criteria guidelines.

This area was removed during the non-time critical source removal action in 1994-1995.

Human Health Risk Assessment

The results of the baseline risk assessment indicated that none of the receptors are in danger of exceeding the EPA target risk range under the current and expected receptor scenarios. The current receptors include site workers, occasional hunters, and off-site residents. Future receptors include construction workers and on-site residents. The cancer risks for the on-site hunter and the on-site construction worker scenarios were $9.5x10^{-6}$ and $3.8x10^{-7}$, respectively, which are also within the EPA target ranges. The HIs for these receptors were 0.0075 and 0.06, respectively, which are less than the EPA defined non-carcinogenic HI target risk value of 1.0

The carcinogenic risk for current off-site receptors is 1.5×10^{-5} and the HI is 0.15. The carcinogenic risks for the off-site receptor ingesting groundwater were found to be 6×10^{-6}, which is within the EPA's target risk range. Additionally, the HI of 0.14 is less than the EPA defined non-carcinogenic HI target risk value of 1.0. Groundwater sampling performed as part of this investigation, in addition to several years of quarterly groundwater monitoring, has confirmed that the current off-site residents do not exhibit an increased risk of cancer in excess of the target risk range or adverse non-carcinogenic health threats. The off-site residences obtain water from a bedrock well, and the well has been tested for several years and chlorinated ethenes have never been detected.

Currently, there is no evidence of concentrations of VOCs exceeding the New York State GA groundwater quality standards at the leading edge of the plume. The edge of the plume is located at the western boundary of the Ash Landfill OU. The nearest off-site exposure points for groundwater are the three farmhouse wells, located approximately 1,250 feet from the leading edge of the plume. Groundwater monitoring of these three farmhouse wells had been ongoing for approximately eight to ten years at the time of the ROD, and the results have not indicated any VOC contamination in the water supply. The land located off-site and adjacent to the Ash Landfill is currently used as farmland. The till/weathered shale aquifer is unlikely to yield sufficient quantities of water for residential use.

There are no on-site residences and there is no intended future use of the site for residential purposes.

The on-site residential scenario was considered as a worst-case condition. Currently, there are no drinking water wells at the Ash Landfill OU. Site workers and hunters obtain drinking water from other sources, including water from the Depot water supply, which is distributed by the Varick Water District, which ultimately obtains water from Seneca Lake.

The carcinogenic risks for potential future residents using groundwater for drinking at SEDA is $1.4x10^{-3}$, and the HI is 3.2. Although risks exist for potential future residents using groundwater for drinking at SEDA, the LRA does not intend to use this land for residential purposes. The future intended use for the site has been determined by the LRA as a conservation/recreation area. As part of the BRAC process, the future land use has been determined by the LRA in conjunction with the Army. As of July 1996, the LRA recommended to the Army specific reuse alternatives for several areas at SEDA. Accordingly, it was determined to be unreasonable to establish remedial action objectives and to remediate to conditions inconsistent with such land use. Decisions pertaining to implementing a remedial action were based upon the then current and intended future land use. This included the risk to the receptor groups: the current off-site residents, the current on-site hunters, the future on-site residents, and the future on-site construction workers.

Ecological Risk Assessment

The evaluation of on-site soils, surface water, and sediment suggested a slightly elevated ecological risk due to the presence of heavy metals. However, the criteria for these media are not considered ARARs since none of the criteria are promulgated standards. NYSDEC and federal AWQSs, which are promulgated standards for Kendaia Creek, are considered ARARs. No exceedances of the AWQSs were observed for downstream samples from Kendaia Creek, which is classified by NYSDEC as a Class C stream.

Metal exceedances were identified for ecological guidelines and reported literature values for on-site soil, sediment, and surface water. The actual ecological risk caused by these exceedances is not readily observable. Phase I and Phase II field evaluations for the RI included fish trapping and counting, benthic macroinvertibrate sampling and counting, and small mammal species sampling and counting. Trapping of small mammals was performed within a 0.5-mile radius to evaluate the diversity and abundance of species within an area closer to the actual site. In addition, a vegetation survey was performed, identifying major vegetation and understory types. Site ecological characterization activities included a site reconnaissance by field biologists in 1992, terrestrial trapping, fish captures, qualitative evaluation of plant communities, quantitative sorting of the macroinvertibrate data, and identification and descriptions of visible evidence of environmental stresses. Sampling of sediments and macroinvertibrate identification and counting was used to identify the macroinvertibrate biological community. The conclusions determined from these field efforts indicated a diverse and healthy aquatic and terrestrial environment. The results of the Phase I data collection did not indicate stressed biological or plant communities. Furthermore, the use of the on-site wetlands and surface waters by aquatic species is unlikely since these wetlands are small and dry during a large portion of the year.

3.1.9.2 Remedy Selection

Based on an evaluation of the various options, the selected remedy was Excavation of Debris Piles/Disposal in an Off-Site, Subtitle D Landfill/Vegetative Cover over Ash Landfill and NCFL (Alternative SC-5) for source control and In-Situ Treatment using Zero Valence Iron (Alternative MC-3a) for migration control. The elements that compose the selected remedy include the following:

- Excavation and off-site disposal of debris piles and establishment and maintenance of a vegetative soil cover for the Ash Landfill and the Non-Combustion Fill Landfill (NCFL) for source control;
- Installation of three in-situ permeable reactive barrier walls, and maintenance of the proposed walls and the existing wall for migration control of the groundwater plume;
- A Contingency Plan would be developed to include one of the following options;
  - provision of an alternative water supply for potential downgradient receptors (farmhouse) or
  - air sparging of the plume in the event that groundwater conditions downgradient of the recommended remedial action described above exceed trigger values;
- Land Use Controls (LUCs) to attain the remedial action objectives; and,
- Completion of a review of the selected remedy every five-years (at minimum), in accordance with Section 121(c) of the CERCLA. If a wall material other than iron is selected, the Army would conduct a review of the remedy's effectiveness one year after the walls are installed. Subsequent annual reviews will be performed until the first Five-Year Review. The typical Five-Year Review schedule will be followed thereafter.

The LUC performance objectives for the Ash Landfill are to:

- Prevent access or use of the groundwater until cleanup levels are met.
- Maintain the integrity of any current or future remedial or monitoring system such as monitoring wells and impermeable reactive barriers.

- Prohibit excavation of the soil or construction of inhabitable structures (temporary or permanent) above the area of the existing groundwater plume.
- Maintain the vegetative soil layer over the ash fill areas and the NCFL to limit ecological contact.

The groundwater LUCs will be continued until such time that the concentration of hazardous substances in the groundwater have been reduced to levels that allow for unlimited exposure and unrestricted use. Intrusive restrictions for those areas requiring a vegetative soil cover will continue indefinitely. These land use controls will be implemented over the area of the groundwater plume, NCFL, and the Ash Landfill, as shown on Figure 1-1 of the ROD (Parsons, 2004c).

3.1.9.3 Remedy Implementation and Remedial Systems

A Remedial Action was completed in October and November 2006 in accordance with the Record of Decision (ROD) for the Ash Landfill OU (Parsons, 2004c), the Remedial Design Work Plan (Parsons, 2006b), and the RDR (Parsons, 2006c), The RA involved the following:

- Installation of three dual biowall systems, A1/A2, B1/B2, and C1/C2, to address VOCs in groundwater that exceed NYSDEC's Class GA groundwater standards;
- Construction and establishment of a 12-inch vegetative cover over the Ash Landfill and the NCFL to prevent ecological receptors from coming into direct contact with the underlying soils that are contaminated with metals and polycyclic aromatic hydrocarbons (PAHs);
- Excavation and disposal of Debris Piles A, B, and C; and
- Re-grading of the Incinerator Cooling Water Pond to promote positive drainage.

RA Summary

Biowalls

Three biowall pairs were installed to address groundwater contamination on-site, as documented in the Construction Completion Report (Parsons, 2006c). The biowalls were constructed by excavating a linear trench to competent bedrock then backfilling the trench to the ground surface with a mixture of mulch and sand.

Biowalls A1/A2, B1/B2, and C1/C2 were constructed perpendicular to the chlorinated solvent plume at the locations prescribed in the RDR (Parsons, 2006c). The entire length of Biowalls A1/A2 and the northern portion of B1/B2 were combined into a single double-width trench (minimum of 6 feet in width) due to unstable soil conditions that caused trench widening. Approximately 2,840 linear feet (lf) of biowalls were constructed in the areas downgradient of the Ash Landfill at depths ranging from 7 feet below ground surface (bgs) to 18.5 feet bgs.

A 12-inch soil cover was placed over the entire length of the biowalls to impede surface water from preferentially flowing into the biowall trenches. Trench spoils were used as the cover material and were compacted with a backhoe. A site visit in December 2009 confirmed that the mulch backfill in the trenches has settled to ground surface.

Incinerator Cooling Water Pond

As specified in the RDR, the Incinerator Cooling Water Pond (ICWP) was re-graded to meet the surrounding grade to prevent the accumulation of water in this inactive pond. Prior to re-grading, the vegetation on the berms surrounding the ICWP was removed with an excavator. The soil berm was then regraded with a dozer to match the surrounding grade. The ICWP was seeded with a standard meadow mix to promote vegetation and to prevent erosion.

Ash Landfill and NCFL Vegetative Cover

A soil cover comprised of mulch, biowall trench spoils that met the site cleanup criteria, and off-site topsoil was placed over the 2.2 acres of the Ash Landfill. The Ash Landfill was covered with 4,380 cy of fill to achieve a minimum cover thickness of 12 inches. Biowall trench spoils that met the site cleanup criteria and off-site topsoil were placed over the 3.4 acre NCFL. The NCFL was covered with 6,015 cy of fill to achieve a minimum cover thickness of 12 inches. The purpose of the covers is to prevent terrestrial wildlife from directly contacting or incidentally ingesting metal impacted soils.

Debris Pile Removal

During the RA, approximately 200 cy of debris was removed from Debris Piles B and C. Approximately 1,000 cy of debris was removed from within and beyond the staked limits of Debris Pile A. The total volume of debris removed was approximately 1,200 cy (1,548 tons).

Description of Technology Used in Biowalls

Reductive dechlorination is the most important process for natural biodegradation of highly chlorinated solvents (EPA, 1998). Complete dechlorination of TCE and other chlorinated solvents is the goal of anaerobic biodegradation via mulch biowall technology. Biodegradation causes measurable changes in groundwater geochemistry that can be used to evaluate the effectiveness of substrate addition in stimulating biodegradation For anaerobic reductive dechlorination to be an effective process, generally groundwater must be sulfate-reducing or methanogenic. Thus, groundwater in which anaerobic reductive dechlorination is occurring should have the following geochemical signature:

- Depleted concentrations of dissolved oxygen (DO), nitrate, and sulfate;
- Elevated concentrations of methane, carbon dioxide, chloride, and alkalinity; and
- Reduced oxidation reduction potential (ORP).

Treatment of chlorinated ethenes in groundwater using a biowall relies on the flow of groundwater under a natural hydraulic gradient through the biowall to promote contact with slowly-soluble organic matter. As the groundwater flows through the organic matter in the biowall, an anaerobic treatment zone is established in the biowall. The treatment zone may also extend downgradient of the biowall as soluble organic matter migrates with groundwater and stimulates microbial processes.

Solid-phase organic substrates used to stimulate anaerobic biodegradation of chlorinated ethenes include plant mulch and compost. To enhance microbial activity, the mulch may be composted prior to emplacement to more readily degraded material, or mulch may be mixed with an outside source of compost. Mulch is primarily composed of cellulose and lignin, and contains “green” plant material that provides nitrogen and nutrients for microbial growth. These substrates are mixed with coarse sand and placed in a trench or excavation in a permeable reactive biowall configuration.

Biodegradable vegetable oil may be added to the mulch mixture to increase the availability of soluble Degradation of the organic substrate by microbial processes in the subsurface provides a number of breakdown products, including metabolic acids (e.g., butyric and acetic acids). The breakdown products and acids produced by degradation of mulch in a saturated subsurface environment provide secondary fermentable substrates for the generation of molecular hydrogen, which is the primary electron donor utilized in anaerobic reductive dechlorination of chlorinated ethenes. Thus, a mulch biowall has the potential to stimulate reductive dechlorination of chlorinated ethenes for many years. If necessary, mulch biowalls can be periodically recharged with liquid substrates (e.g., vegetable oils) to extend the life of the biowall. Vegetable oil is a substrate that is readily available to microorganisms as a carbon source that helps establish and continually develop the microbial population. Used in combination with mulch, vegetable oil has the potential to extend the duration of organic carbon release.

The Land Use Control Remedial Design For SEAD 27, 66, and 64A ("SEAD LUC RD") dated December 2006 implements land use controls for the SEAD Planned Industrial/Office Development and Warehousing Area ("PID/Warehouse Area"). Addendum 3 expanded the LUC RD from the PID area to include sites that are in the area known as the Ash Landfill (SEADs-3, 6, 8, 14, and 15). The Ash Landfill is located on the property formerly known as the Conservation Area Parcel.

The following LUC Implementation Actions specified in the SEAD LUC RD (USACE, 2006) and Addendum 3 (USACE, 2008b) were achieve and implemented to prevent future violation of the LUC Objectives and Land Use Restrictions:

1. Lease restrictions – N/A for the Conservation Area.
2. Environmental Easement - The Army prepared an environmental easement consistent with N.Y. Code Env. Section 27-1318(b) that provides for NYSDEC monitoring of the LUCs set forth in the RD, which was recorded prior to the transfer of the Ash Landfill property from the federal government. The environmental easement will ensure the ability of NYSDEC to enforce the LUCs in the future. A notification about the existence of the environmental easement was identified in the deed associated with the parcel transfer. The Easement does not negate or transfer the Army's ultimate responsibility under CERCLA Section 120(h)(3) and the Seneca Army Depot Federal Facilities Agreement ("FFA").
3. Deed restrictions –
    a. The Ash Landfill property was transferred with the land use restrictions, consistent with the LUC Objectives defined above. This deed for the Ash Landfill incorporates by reference the land use restrictions set forth in the Environmental Easement. The deed was recorded in the Seneca County Clerk's Office on June 10, 2011. The Army provided a copy of the executed PID/Warehouse Area deed(s) to EPA Region II and NYSDEC.
    b. CERCLA Notice and Covenant. The deed includes a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual

contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

c. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

4. Annual Certification – The Army and/or future property owner shall annually, or within such time as NYSDEC may allow (with the consent of EPA Region II and the Army), submit to NYSDEC, with a copy to EPA Region II (and to the Army, if the certification is submitted by a future property owner), a written statement in accordance with N.Y. Code Env. Section 27-1318(c). The statement will prepared by an expert NYSDEC may find acceptable certifying under penalty of perjury that the controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls employed at the Controlled Property were approved by NYSDEC, and that nothing has occurred that would impair the ability of such control to protect the public health and environment or constitute a violation or failure to comply with this Remedial Design for such controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.

5. Five-Year Review - The Army will review the LUC remedy as part of the Five-Year Review and Report. The report will address the effectiveness of the LUC remedy and whether any LUC Objective, Land Use Restriction, or Implementation Actions should be modified.

Enforcement

Addendum 3 applied the SEAD LUC RD enforcement provisions to SEADs 3, 6, 8, 14, and 15 (Ash Landfill).

Modification

Addendum 3 applied the SEAD LUC RD modification provisions to SEADs 3, 6, 8, 14, and 15 (Ash Landfill).

Termination

Addendum 3 applied the SEAD LUC RD termination provisions to SEADs 3, 6, 8, 14, and 15 (Ash Landfill).

3.1.9.4 Systems Operations/Operation & Maintenance

Long Term Monitoring is being performed as part of the post-closure operations. Groundwater monitoring is required as part of the remedial design, which was formulated to comply with the ROD. There have been ten rounds of groundwater monitoring conducted at the Ash Landfill which have been documented in four Long Term Monitoring reports, (Parsons, 2008b, Parsons, 2009b, Parsons 2010b, Parsons 2011e).

These Annual Reports review the results of the LTM program as part of the ongoing evaluation of the remedy and provide conclusions and recommendations about the effectiveness of the remedial action, including the groundwater remedy and the vegetative landfill covers.

Three types of long-term groundwater monitoring are being performed: 1) plume performance monitoring, 2) biowall process monitoring, and 3) off-site compliance monitoring. On-site performance monitoring is being conducted to measure groundwater contaminant concentrations and to evaluate the effectiveness of the biowall remedy for the Ash Landfill OU. The objectives of performance and compliance monitoring are as follows:

- Confirm that there are no exceedances of groundwater standards for COC at the off-site compliance monitoring well MW-56;
- Document the effectiveness of the biowalls to remediate and attenuate the chlorinated ethane plume; and
- Confirm that groundwater concentrations throughout the plume are decreasing to eventually meet NYSDEC Class GA groundwater standards.

Biowall process monitoring is being conducted at two locations to determine if, and when, any biowall maintenance activities should be performed. The first location is within Biowalls B1/B2 in the segment that runs along the pilot-scale biowalls that were installed in July 2005. The second location is within Biowall C2, the furthest downgradient biowall. The objectives of biowall process monitoring for operations and maintenance (O&M) activities are as follows:

- Monitor the long-term performance and sustainability of the biowalls;
- Monitor substrate depletion and geochemical conditions under which the effectiveness of the biowalls may decline; and
- Determine if, and when, the biowalls need maintenance (i.e., need to be recharged with additional organic substrate).

3.1.9.5 Data Review

3.1.9.5.1 Institutional Control Review

The initial LUC RD (USACE, 2006) was issued by the Army to address areas of concern SEAD 27, 66 and 64A, the SEAD Planned Industrial/Office Development and Warehousing Area. Addendum 3 to the LUC RD (USACE, 2008b) was issued by the Army to further supplement the LUC RD and to address SEAD 3, 6, 8, 14 and 15, collectively known as the Ash Landfill OU.

Environmental Easement

An Environmental Easement that included the Ash Landfill property was executed on February 14, 2011 and recorded in the Seneca County Clerk's Office on June 10, 2011. This Environmental Easement was reviewed during the preparation of this report with the following findings:

1. The environmental easement was granted by the United States of America (the Grantor) by an instrument that complies with the requirements of Section 5-703 of the general obligations law.
2. As evidenced by the Department's acceptance of the Easement, the Grantor furnished to the Department abstracts of title and other documents sufficient to enable the Department to determine that the easements shall be enforceable. The environmental easement is in a form prescribed by the Department. The environmental easement describes the property encumbered by the easement by adequate legal description (Exhibit A to the easement). The environmental easement:
   a. names the state, acting through the department, as grantee;
   b. contains a complete description of the use restrictions and engineering control to which the property is subject;
   c. runs with the land, binding the owner of the land and the owner's successors and assigns;
   d. includes an acknowledgment by the Commissioner of acceptance of the easement by the Department; and
   e. includes an agreement to incorporate, either in full or by reference, the environmental easement in any leases, licenses, or other instruments granting a right to use the property that may be affected by such easement.
3. Contains a requirement that until such time as the environmental easement is extinguished, the property deed and all subsequent instruments of conveyance relating to the subject property shall state in at least fifteen-point bold-faced type: "This property is subject to an environmental easement held by the New York State Department Of Environmental Conservation pursuant to title 36 of article 71 of the environmental conservation law."
4. Contains a requirement that each instrument transferring an interest in the area affected by the easement shall include a specific reference to the recorded easement.
5. Contains requirements that the environmental easement may be extinguished or amended only by a release or amendment of the easement executed by the commissioner and filed with the office of the recording officer for the county or counties where the land is situated in the manner prescribed by article nine of the real property law.
6. The environmental easement was duly recorded and indexed as such in the office of the recording officer for Seneca County in the manner prescribed by article nine of the real property law.
7. The environmental easement is enforceable in law or equity by the grantor, by the state, or any affected local government as defined in ECL Section 71-3603, against the owner of the burdened

property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. No general law of the state which operates to defeat the enforcement of any interest in real property shall operate to defeat the enforcement of any environmental easement unless such general law expressly states the intent to defeat the enforcement of such easement or provides for the exercise of the power of eminent domain. It is not a defense in any action to enforce the environmental easement that:

a. it is not appurtenant to an interest in real property;

b. it is not of a character that has been recognized traditionally at common law;

c. it imposes a negative burden;

d. it imposes affirmative obligations upon the owner of any interest in the burdened property;

e. the benefit does not touch or concern real property;

f. there is no privity of estate or of contract; or

g. it imposes an unreasonable restraint on alienation.

8. Agents, employees, or other representatives of the state may enter and inspect the property burdened by the environmental easement in a reasonable manner and at reasonable times to assure compliance with the restrictions.

Deed Restrictions

The Ash Landfill was transferred to the Seneca County Industrial Development Agency with a Quitclaim Deed executed on May 27, 2011.

This deed was reviewed during the preparation of this report with the following findings:

1. The Ash Landfill was transferred with the land use restrictions, consistent with the LUC Objectives as defined in the LUC RD. This deed for the PID/Warehouse Area incorporates by reference the land use restrictions set forth in the Environmental Easement. The property deed states in at least fifteen-point bold-faced type:

   "This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant to title 36 of article 71 of the Environmental Conservation Law."

   The deed was recorded in the Seneca County Clerk's Office on June 10, 2011. The Army provided a copy of the executed deed to EPA Region II and NYSDEC.

2. CERCLA Notice and Covenant. The deed included a CERCLA Section 120(h)(3) notice and covenant. The CERCLA Section 120(h)(3) notice has a description of the residual contamination on the subject property. The CERCLA Section 120(h)(3) warrants that the Army has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property and any additional remedial action found to be necessary after the date of transfer shall be conducted by the Army.

3. Reservation of Access. The deed also contains a reservation of access to the property for the Army, EPA Region II, and NYSDEC, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the FFA. The deed contains appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable.

3.1.9.5.2 Long Term Monitoring Review

There have been ten rounds of groundwater monitoring conducted at the Ash Landfill which have been documented in three Long Term Monitoring reports, (Parsons, 2008b, Parsons, 2009b, Parsons 2010b, Parsons 2011e).

These Annual Reports review the results of the LTM program as part of the ongoing evaluation of the remedy and provide conclusions and recommendations about the effectiveness of the remedial action, including the groundwater remedy and the vegetative landfill covers.

Based on these LTM Reports, the Army has made the following conclusions:

- TCE within the biowalls remains below or close to detection limits;
- TCE, cis-DCE, and VC are present in the groundwater at the site at concentrations above respective Class GA groundwater standards;
- Chemical results indicate that the concentrations of chlorinated ethenes are decreasing as they pass through the biowall systems;
- Geochemical parameters indicate that redox conditions are highly conducive for reductive chlorination to occur within the biowall systems;;
- Concentrations of chlorinated ethenes at off-site well MW-56 are below Class GA groundwater standards;
- Continued monitoring is required to determine trends in concentrations of COCs at PT-18A, PT-17, and MWT-7;
- Recharge of the biowalls is not necessary at this time;
- The remedial action continues to meet the requirements of the EPA's "operating properly and successfully" designation; and
- The Army will continue to monitor the performance of the biowall system, including semi-annual periodic evaluations of the potential need to recharge the biowalls.

Recommendations

Based on the first three years of long-term monitoring at the Ash Landfill OU, the Army recommends continuing the semi-annual frequency of monitoring based on the process shown in Figure 7-3 of the RDR (Parsons, 2006c). The recommendations for LTM during year three of monitoring are as follows:

- Biowall process monitoring wells (MWT-26, MWT-27, MWT-28, MWT-29, and MWT-23) will be monitored on a semi-annual basis. Each year a recharge evaluation will be completed. As stated in the RDR (Parsons, 2006b), if a recharge is conducted, MWT-26, MWT-27, and MWT-29 would be excluded from the LTM program, as detailed in Figure 12 (Parsons, 2011e) . MWT-28 and MWT-23 will continue to be monitored as part of the performance monitoring wells to supplement data that will be used to determine whether additional biowall recharge is required. The recharge evaluation(s) conducted each year after the first biowall recharge would review the chemical and geochemical data at MWT-28 and MWT-23, and determine if the contaminant increase is a result of poor biowall performance or due to other issues such as seasonal variations in groundwater levels, unusual precipitation events, or desorption and back diffusion.

- Performance monitoring wells (PT-17, PT-18A, PT-22, PT-24, MWT-7, MWT-22, MWT-24, and MWT-25) will continue to be monitored on a semi-annual basis in a manner consistent with the Year 3 LTM program. In the three years of LTM events at the Ash Landfill OU, the concentrations of COCs, specifically TCE, in the wells downgradient of the source area (near PT-18A) have decreased.

- The off-site performance monitoring well (MW-56) will continue to be monitored on a semiannual basis.

- The vegetative covers at the Ash Landfill and the NCFL will be inspected annually to ensure that they remain intact and protective of ecological receptors.

- The frequency of monitoring and the need to recharge the biowalls will be reviewed in the annual report submitted after the completion of the fourth year of LTM, based on the process outlined in Figure 7-3 of the RDR (Parsons, 2006a).

3.1.9.6 Site Inspections

The Army inspected the site to determine that the LUCs are being maintained on April 7, 2011. A cursory windshield survey was conducted throughout SEDA with site-specific inspections being conducted at the Ash Landfill and NCLF. Five-Year Review - site visit photo logs are contained in Appendix A and completed Five-Year Review site inspection checklists are contained in Appendix B.

The following observations were made during the site inspection:

- What appears to be small animal burrows were noted at SEAD-8 (the NCLF) (Figure A-26), but it did not appear to reduce the effectiveness of the remedy.

- Some erosion was evident at the northwest corner of SEAD-8 and appeared to be coincident to deer paths (Figure A-26). The erosion did not appear to be deep enough to reduce the effectiveness of the remedy.

- At the Ash Landfill, monitoring well PT-18A used for LTM was unlocked, but within the fenced portion of SEDA and not accessible to the public.

- What appear to be relatively large animal burrows were observed near the original ZVI wall (Figure A-25). These burrows are outside the areas where vegetative covers are required for the Ash Landfill and the NCLF and were not observed or reported during prior inspections of the Ash Landfill OU. They do not appear to reduce the effectiveness of the remedy.
- The protective cover of one flush mount monitoring well in the vicinity of the ZVI wall was observed to be broken as was the inner cover. The top of the well casing also had a crack in it (Figure A-26). There was no identification visible on the well, but based on location, it is suspected to be PT-17. This finding was reported to the Army and maintenance will be scheduled for this location.
- Ponding was observed in the area of the biowalls but did not appear to reduce the effectiveness of the remedy. SEDA had received heavy rainfall on day before the site visit.

The site inspection confirmed that no prohibited excavation has occurred, no prohibited facilities have been constructed, and no access to or use of groundwater was evident. Maintenance of the vegetative soil layer over the ash fill areas and the NCFL appears to be adequate to limit ecological contact. The integrity of the impermeable reactive barriers appears to be adequate, however at least one monitoring well requires maintenance. This observation was reported to the Army, and necessary work will be scheduled.

3.1.9.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Remedial Actions required by completed RODs for SWMUs within the Ash Landfill OU have been completed and documented. Long Term Remedy Maintenance and Monitoring activities are being conducted as required in the Ash Landfill OU.

Based on a review of the RDR, Long Term Monitoring Reports, Land Use Control Remedial Designs, environmental easement, transfer deed, and a site visit conducted on April 7, th2011, all remedies are functioning as intended by the decisions documents.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site since implementation of LUCs that would affect the protectiveness of the remedy.

The selected remedy was deemed protective of human health and the environment using a combination of treatment/engineering controls and a contingency plan. The source control remedy uses engineering and treatment controls to further reduce acceptable human health and ecological risks by eliminating the highest levels of lead found in soils and by reducing the potential of exposure to low levels of selective metals and PAHs in soils using a vegetative soil cap. This action also reduces the potential for these contaminants to migrate to groundwater, even though their migration potential is considered very low in both the short-term and long-term. The migration control remedy protects human health and the environment through the use of treatment controls to reduce the concentrations of both TCE and 1,2-DCE in the groundwater to below 5 μg/L, the NYSDEC criteria for Class GA groundwater. The TCE and 1,2-DCE NYSDEC criteria (i.e., 5 μg/L, respectively) for Class GA groundwater are the trigger criteria for implementation of a contingency plan. A contingency plan will be developed to include additional monitoring and air sparging or implementation of an alternative water supply for the potential downgradient receptor (farmhouse), if required based on the exceedance of trigger criteria.

The underlying assumptions support the selected remedy in remaining protective for the following reasons:

- The current/future LUC/IC restrictions minimize potential exposure pathways; and
- Soil, surface water, groundwater, and sediment investigations used protective criteria including NYS Soil Clean-up Objectives contained in TAGM #4046 (NYSDEC, 1996), NYSDEC Ambient Water Quality Standards and Guidance Values (NYSDEC, 1998), and NYSDEC Sediment Screening Criteria (NYSEDC, 1993).

The NYS Clean-up Objectives contained in TAGM #4046 that were used were compared to 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives. TAGM 4046 soil cleanup objectives are found to be lower than the restricted commercial clean-up objectives contained in Table 375-6.8(b) and for many contaminants lower than unrestricted clean-up objectives contained in Table 375-6.8(a).

An Addendum to NYSDEC Ambient Water quality standard and guidance Values was issued by NYSDEC in 2004 and amended the standards for three contaminants, none of which are Chemicals of concern at SEDA.

The NYSDEC Sediment Screening Criteria have been revised twice since 1993. In March 1998, new tables were added for screening marine and estuarine sediments only and in January 1999, additional sediment screening values were added to Table 1 for benzene, toluene, ethylbenzene, xylene, and nine polycyclic aromatic hydrocarbon compounds.

Since the soil and groundwater cleanup standards for the remedy are equivalent to or more stringent than human-health-based promulgated standards and cleanup criteria, the cleanup standards are expected to remain protective of human health.

As a result, the Remedial Action objectives for the Ash Landfill and NCLF are considered still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no new information of significance that would affect the protectiveness of the remedy.

3.1.9.8 Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD for the Ash Landfill OU. On-going remedial monitoring activities include periodic evaluations of the effectiveness of the remedy. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs cited in the RODs remain protective of human health and the environment.

3.1.9.9 Recommendations

Based on this Five-Year Review, the Army makes the following recommendations;

- In addition to the recommendations made in the annual report – year 4, monitoring well PT-17 should be repaired and all monitoring wells used for LTM should be kept locked.

3.1.9.10 Protectiveness Summary

The remedy for the Ash Landfill OU is protective of the environment and will protect human health when it is completed. Currently, there is no unacceptable exposure to human or environmental receptors from source area contaminants and none expected over the next five years.

3.2 Pre-ROD Sites

3.2.1 SEAD-12 - Radioactive Waste Burial Sites

3.2.1.1 History of Contamination and Initial Response

The Radioactive Waste Burial Sites (SEAD-12) is located in the north, central portion of the former Seneca Army Depot Activity within the former Weapons Storage Area (WSA) facility, which is also known as the "Q Area". Investigation of SEAD-12 originally began as the investigation of two separate areas, formerly designated as SEAD-12A (Radioactive Waste Burial Site – northeast corner of the Q) and SEAD-12B (Radioactive Waste Burial Site – northeast of Buildings 803, 804, and 805). Locations of these two historic SEADs are shown in **Figure 3-1**. SEAD-12A encompassed an area measuring approximately 1,500 feet long by 900 feet wide that was suspected to have included up to five separate small burial pits. SEAD-12B encompassed an area measuring 300 feet long by 300 feet wide, and it was suspected to have included a 5,000 gallon storage tank and a small dry waste pit.

After the completion of the ESIs of SEAD-12A and SEAD-12B in 1995, the bounds of SEAD-12 were expanded based on the similarity of the chemicals found at the two historic SEADs and the general history of the overall Q Area, which suggested that similar constituents were likely to exist throughout the larger area. Building 715 and the portion of Reeder Creek that is adjacent to SEAD-12 were also included in the RI at SEAD-12. Building 715 is a wastewater treatment plant that received wastewater from the buildings within the Q Area during the period of their Army use. This facility currently receives wastewater from the Hillside Adolescent Center. Reeder Creek receives the surface water runoff from SEAD-12, and other locations within the former Depot, as well as the wastewater discharge from Building 715.

The expanded SEAD-12 includes approximately 350+ acres of land, much of which has not been impacted. In order to conservatively bias the evaluation of the AOC, nine potential release areas within the redefined boundary of SEAD-12 were identified and individually investigated during subsequent environmental and radiological investigations and surveys that were conducted. These areas were identified during the RI based on historical use of the AOC, the results of electromagnetic (EM) surveys conducted to identify buried objects below ground, the radiological classification, and geographical location.

SEAD-12 excludes the area of SEAD-63, the Miscellaneous Components Burial Site, which is also located within the Q Area along its western boundary. A non-time critical removal action (NTCRA) was performed at SEAD-63 in 2004, resulting in the removal of 5,100 tons of soil and debris. A NFA ROD for SEAD-63 was signed by the Army and the EPA, with concurrence from the NYSDEC, in September 2006 and this former AOC has been closed under CERCLA.

An ESI was conducted for SEAD-12A and SEAD-12B in 1994, and included the sampling and analyses of surface and subsurface soil, groundwater, surface water, and sediment. A RI was started at SEAD-12 in 1997, and the final RI Report was issued in 2002. The RI consisted of geophysical investigations; radiological investigations, including building surveys; a soil gas survey; test pitting; sampling and analysis of surface and subsurface soil, groundwater, surface water, and sediment; a baseline human health risk assessment; an ecological investigation; and a screening-level ecological risk assessment. As part of the geophysical survey completed at SEAD-12, four surface and 44 subsurface anomalies were identified and marked as locations that had a potential to contain buried metallic objects.

Site investigations conducted during the ESI and RI focused on the assessment of nine primary potential release areas listed as follows:

- Building 819 and EM-27;
- Building 815, Building 816, and EM-28;
- Disposal Pits A/B;
- Disposal Pit C;
- Dry Waste Disposal Pit;
- EM-5;
- EM-6;
- Class III Areas; and
- Wastewater Treatment Plant.

3.2.1.2 Site Investigation Results

Analytical data collected during the ESI and RI are presented, summarized, and discussed for each potential release area in the SEAD-12 RI Report (Parsons, 2002d). Based on the investigation data and available documentation of activity associated with the former WSA operations, three potential release areas (i.e., the Former Dry Waste Disposal Pit, Disposal Pit A/B, and Disposal Pit C) were considered impacted to the greatest extent by former activities performed in the WSA. At two of these areas (i.e., Disposal Pit A/B and Disposal Pit C) military-related items associated with the areas historic weapons storage mission were discovered during test pitting operations within the historic burial pit locations during site investigations. Analytical data for conventional chemical and radiological contaminants identified in soil from each of the three Disposal Pit areas were combined separately with equivalent AOC-wide analytical results for conventional chemical and radiological contaminants in surface water, sediment, and groundwater and used as the basis of human health and ecological risk assessments conducted. Potential risks and health hazards to seven potential human receptors (i.e., current site worker, future outdoor park worker, future construction worker, future recreational visitor, off-site child wader, and future adult and child resident) were evaluated. Of these receptors, only the future lifetime resident exhibited potential risks of cancer above the EPA targeted risk range (i.e., 1 x 10^{-4} to 1 x 10^{-6}) at each of the three release areas evaluated. Similarly, only the child resident showed potential health hazards in excess of the EPA recommended threshold level of 1. Based on Risk Management and Uncertainty Analysis considerations, which are allowed under the risk assessment process, the elevated cancer and non-carcinogenic estimates were assessed as over estimates of likely effects likely to be encountered.

The results of the screening level ecological risk assessment (SLERA) indicated that all of the identified COCs were inorganic compounds, which are naturally occurring. Each of the COCs were compared to background levels, and with the exception of zinc concentrations in soil reported in specific portions of Disposal Pit C, no further action was warranted. The single COPC identified was zinc, due to the discovery of elevated levels in subsurface soils.

Despite the determinations of the risk assessments, groundwater sampling results obtained during the RI did indicate that TCE was detected at an elevated concentration (1,600 µg/L) in former monitoring well MW12-37, previously located to the north of Buildings 813 and 814, between the buildings and the adjacent man-made drainage ditch. In addition, elevated levels of Lead 210 (^{210}Pb), a radioactive decay product of radium, were detected in the soil at suspected release area EM-5. To further investigate the extent of TCE found in groundwater in the Buildings 813/814 area and the level of ^{210}Pb that was present in the area of EM-5, a Supplemental Remedial Investigation (SRI) was conducted to further characterize and assess possible contributing factors associated with these two anomalous RI findings during 2004 and 2005.

During the SRI, the Army expanded the extent of its investigation of TCE contaminated groundwater in the vicinity of monitoring well MW12-37 by installing temporary wells, which were then sampled and the collected samples were analyzed. The results of these analyses indicated that the elevated groundwater concentrations of TCE were limited to the immediate area of well MW12-37, and that no contiguous or continuous plume was apparent around, or beyond, the two buildings and the historic well. Once this was determined, the Army conducted soil excavations immediately around the affected well in an attempt to determine if it could identify the source of TCE causing the noted problem, and during this process they identified subsurface soil near a buried pipe that contained up to 65,000 µg/Kg of TCE. This soil was excavated and isolated, and the Army expanded the lateral and vertical extent of the soil excavation site until it was able to confirm that residual soil concentrations of TCE fell below the State of New York's TAGM #4046 soil cleanup objective level of 700 µg/Kg, or until the contaminated soil was limited to an area immediately beneath Building 813 where its removal would have compromised the structural integrity of the building. As a result of this action, more than 230 cubic yards of TCE contaminated soil were excavated from locations surrounding the former well MW12-37, between the northern edge of Building 813 and the surrounding man-made drainage ditch to the north and east of the building. The excavation in this area extended to bedrock, and to points on the west, north, east, and southeast where residual soil concentrations of TCE were found to be less than the cleanup level of 700 µg/Kg. As is indicated, excavations in the southwest portion of the work area terminated at the exterior edge of Building 813 due to concerns about undermining the building's structural integrity. Residual concentrations of TCE recorded below the northern face of Building 813 were measured at 1,000 and

4,800 µg/Kg. Once all soil exterior of Building 813's footprint was removed and the extent of excavation was confirmed, the excavation was backfilled with clean fill with the concurrence and approval of the NYSDEC and EPA.

The Army also reassessed the RI determination that soil in the area of suspected historic release location EM-5 contained ^{210}Pb at levels above background plus worker derived concentrations guideline levels (DCGLs) during the 2004/2005 SRI. Ten soil locations were resampled during the SRI and analyzed for Ra-226 (^{226}Ra) and its daughter products (e.g., ^{210}Pb). ^{226}Ra is the parent of ^{210}Pb, which was the only radiological COC identified at EM-5 based on statistical analysis of data collected during the RI. The RI analysis used a Wilcoxon Rank Sum (WRS) Test to compare Depot-wide background radiological concentrations with the concentrations detected at EM-5. Prior to the background to EM-5 release area comparison, DCGLs were developed for each isotope and added to each background data point. The DCGLs were developed according to procedures outlined in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM, Department of Defense et al., 2000) using RESRAD version 5.82 and the NYSDEC TAGM-4003 total effective dose equivalent of 10 millirems per year. Using the WRS, ^{210}Pb was the only isotope detected that exceeded the background value adjusted using the DCGL calculated for a worker at EM-5. The ^{210}Pb DCGL for a worker at EM-5 was calculated to be 33.05 pico-curies/gram (pCi/g). ^{210}Pb was not detected in any of the samples collected or analyzed during the SRI, and the uncertainties and detection limits associated with the SRI analyses were much lower than those reported for the RI analyses. Therefore, there is no longer any reason to believe that ^{210}Pb concentrations exceed background values at EM-5.

After the conclusion of the SRI, the Army conducted a Feasibility Study (FS) to assess and evaluate remedial alternatives that could be used to address the military-related items that were likely buried in two of the historic burial pits (i.e., Disposal Pit A/B and C) and potential vapor intrusion and groundwater re-contamination concerns that remained in the vicinity of Buildings 813 and 814. Immediately after completion and submittal of the FS, the Army moved forward and began the preparation of the Proposed Plan for SEAD-12 and SEAD-72. In the preliminary version of the Proposed Plan, the Army proposed that the remedial alternative for SEAD-12 would include the excavation of the historic Disposal Pit A/B and C during which any military-related item identified would be recovered and secured pending its subsequent demilitarization and final disposition in accordance with national security and environmental regulations and statutes. In addition, during the excavation and recovery of military-related items, other debris and fill would be inspected, characterized as warranted, and either returned to the burial pit location or treated as required, and transported off site for disposal at a licensed landfill. In addition, the TCE contamination remaining in the vicinity of Buildings 813 would be addressed by imposing a land use restriction that prohibited access to, or use of, the existing buildings, or construction and use of any new structures in the immediate vicinity of the existing buildings until a vapor intrusion study was conducted and showed that the area and buildings would not be affected by vapor intrusion. Finally, for SEAD-72, the Army would conduct and verify the successful completion of RCRA Closure operations required at the former SWMU.

Shortly after the preparation and submittal of the Draft Proposed Plan for SEAD-12 and SEAD-72, the SCIDA identified a tenant for transferred property within SEAD-12. During ensuing discussions with the

SCIDA, the tenant expressed interest in expanding its holdings in SEAD-12, and as a result of this interest, the Army decided to perform a removal action to address the military-related items suspected to be buried in Disposal Pits A/B and C. In April of 2009, the Army submitted a work plan for the performance of the removal action for military related items, and implemented the work plan between July and November of 2009. During this effort, the Army excavated approximately 5,400 cubic yards of soil, debris, and fill from four excavations placed within the footprints of former burial pits A, B, and C. Of the total quantity of material excavated, approximately 5,400 tons of waste and debris was transported to an offsite landfill for disposal as cover material or as mixed debris, 120 tons of assorted scrap metals were recycled at a metal recycling facility, and roughly 13.25 tons of military-related items were secured pending demilitarization and final disposal determinations. As part of the removal action, conventional chemical contaminant concentrations in soil located at the excavation sites were characterized by the collection and analysis of excavation confirmation samples, and these new data were compared to State of New York Unrestricted Use SCOs, and used as the basis of a revised human health risk assessment for these locations at SEAD-12.

The results of the direct comparison of soil data to New York Unrestricted Use SCOs indicated that while individual sample concentrations of particular contaminants may exceed State SCO levels, the appropriate 95th UCL of the soil dataset was generally consistent with or below State limits or statistically equivalent to background concentrations for metals. Furthermore, the results of the revised risk assessment indicated that soils remaining at the Disposal Pit excavation sites do not pose any unacceptable risk to any of the evaluated potential users or occupants of the site, including future adult, child, and lifetime residents once Risk Management and Uncertainty Analyses were completed.

3.2.2 SEAD-72 - Mixed Waste Storage Facility

3.2.2.1 History of Contamination and Initial Response

SEAD-72, the former Mixed Waste Storage Facility (Building 803) is located in the northern portion of SEAD-12, between Service Road No. 1 and the Q Area's outer perimeter security fence line near the intersection of Service Road No. 1 and Patrol Road. The Atomic Energy Commission (AEC) originally constructed Building 803 in 1958 to secure items that required special storage. Because of its design, the Army designated Building 803 to store mixed chemical and radiological waste generated within neighboring buildings prior to off-site shipment and subsequent treatment or disposal.

As constructed, Building 803 meets requirements for conforming storage status for mixed waste storage facilities as defined in Title 6 NYCRR Part 373. This facility was designated as a RCRA unit in SEDA's New York State Part 373 Hazardous Waste Management Facility RCRA Permit Application and is a unit that remained regulated under RCRA interim status provisions (Facility Number NY0213820830) pending final decontamination, verification sampling and analysis, and closure. As constructed, the building is two stories tall, with the upper exposed level measuring approximately 35 feet by 25 feet in size. The upper level is built atop a mound of earth with the lower level being located within the earthen mound. The building consists of the exposed upper structure, four subsurface interior vaults, two subsurface interior hallways, a covered and walled hallway leading into the subterranean level of the building, and an exterior loading platform adjacent to a parking area north that is located north of Service

Road No. 1. The four subsurface storage vaults are each approximately 10 feet by 13 feet in size and are separated from one another and from the outside by concrete walls and ceilings that are 18 inches thick. The floors of the subsurface structures are not sloped, but there are plugged floor drains present in each of the vault chambers. The drains once allowed liquids to exit the building via an outflow pipe that discharged at the west end of the loading platform. The upper structure is a solid poured concrete building that is hidden behind a false exterior shell that features false windows and doors and a conventional roof.

Mixed wastes were stored within the subterranean storage vaults in new, removable head type, 55-gallon drums that conformed to appropriate Department of Transportation (DOT) specifications for containers holding hazardous waste during transport. The mixed waste consisted of solvent-wetted paper wipes (solvents used included isopropanol, Freon®, TCE, acetone, or toluene) that were used to clean low-level radioactive components. The wipes were segregated by solvent type, bagged, sealed with tape, double bagged, sealed with tape again, labeled for identification, and then placed in the drum until it was shipped off-site under manifest. At any one time, Building 803 could hold a maximum of 96, 55-gallon drums (24 per cell) if the drums were double stacked in each vault. According to data provided by the Army, none of the materials stored or handled in Building 803 contained or ever contacted equipment containing PCBs; therefore, there was no reason to suspect that PCBs were present in the building. Building 803 was cleared of drummed hazardous waste in 1996 and was left empty and vacant since that time.

The Seneca Army Depot was approved for Part A interim status as a hazardous waste TSDF in 1980. In 1986, Building 803, the former Mixed Waste Storage Facility, was identified in the Army's Part 373 RCRA Part B Permit Application as a greater than 90 day storage facility for mixed chemical and radiological wastes. SEDA's Part B permit application was never approved and all facilities identified in the Part B Permit Application operated under interim status until SEDA's mission terminated and the facility was closed. Under RCRA, all designated interim status units are subject to closure in accordance with RCRA requirements.

3.2.2.2 Site Investigation Results

Between 1998 and 2001, radiological surveys were conducted in buildings located in the former WSA, including Building 803 (SEAD-72), as part of the SEAD-12 RI. The radiological surveys were used for both characterization purposes and as the final status survey for the decommissioning of the facility in accordance with Nuclear Regulatory Commission (NRC), agreement state (New York), and EPA requirements. Based on the results of the radiological survey, Building 803 was found to have met unrestricted use release criteria.

A RCRA Closure Plan was prepared by the Army and submitted to the NYSDEC and EPA for approval in October of 2005. Under this plan, the Army defined decontamination and verification procedures that would be completed to confirm that hazardous wastes did not remain within the building at levels in excess of RCRA criteria. The RCRA Closure Plan was approved by the NYSDEC in August of 2006. Per agreement of all parties, closure of Building 803 in accordance with the approved plan was delayed until it could be completed along with the larger, SEAD-12 closure process.

RCRA Closure of SEAD-72 was performed during July of 2009, simultaneous to the performance of the removal action of military related items from historic burial pit locations in SEAD-12 (discussed above). During closure, the interior of Building 803 was decontaminated by sweeping, vacuuming, and high-pressure washing of the inner walls, floors and ceiling. Subsequent to the completion of decontamination, verification samples were collected, analyzed, and compared to cleanup objectives specified in the approved closure plan to document the successful completion of the decontamination process. The RCRA Closure Report was first submitted to all parties in November 2009, and final regulatory approval was received from all parties in June 2009.

3.2.3 SEAD-70 - Former Building T2110 – Filled Area

3.2.3.1 History of Contamination and Initial Response

SEAD-70 is a historic fill area encompassing approximately 4.5 acres that are adjacent to the former Building T2110 in the northwestern portion of the Depot (see **Figure 3.1**). SEAD-70 is south of East-West Baseline Road approximately 1,000 feet west of the intersection of North-South Baseline Road and East-West Baseline Road, and approximately 15,000 feet northwest of the former Depot's main gate on State Highway 96. Prior to 2006, a wooden barn (Building T2110) was located at this AOC but it was demolished due to safety concerns about the aged, dilapidated structure. Building T2110 was identified as a potential ordnance, ammunition, explosives and other warfare materials storage shed at the time of the 1998 Archives Search Report effort, but once site inspections and interviews were completed, this area was dismissed from further consideration for munitions response actions.

SEAD-70 is currently vacant and undeveloped. The most noticeable feature in the undeveloped portion of SEAD-70 is a kidney-shaped landfill that forms a flat topographic high area. The landfill appears to originate near the former barn and expand southeasterly. A mound is located near the southeastern corner of the former barn and an elongated vegetated mound is present along the southern perimeter of the landfill. Immediately east of the landfill is a wet area beyond which is a large stand of deciduous trees.

The topography over the extent of the landfill is relatively flat; however, the local and regional topography surrounding the landfill slopes west.

3.2.3.2 Site Investigation Results

Soil Investigations

Shallow soil samples and subsurface soil samples were collected at SEAD-70 during the 1994 ESI sampling event. Data from the soil that was removed as part of the Building T2110 removal action was eliminated from the SEAD-70 soil dataset. Analytical results from sample duplicate pairs of soil data were presented as discreet samples.

Groundwater Investigations

Four monitoring wells (MW70-1 to MW70-4) were installed at SEAD-70 during the ESI; the wells were sampled during the ESI sampling event on July 7 and July 8, 1994. Collected samples were analyzed for TAL inorganic compounds and TCL VOCs, SVOCs, and pesticides/PCBs. Results of the groundwater sampling and analysis indicated that one VOC (acetone) and 17 metals were detected in one of more of the four samples collected, but only iron and manganese were found at levels that exceeded NYSDEC GA or federal MCL levels. Iron and manganese were each found once, in separate samples at levels that exceeded identified standard levels. However, these samples were collected using bailers so it is likely that these exceedances result due to turbidity in the samples. The elevated concentrations found for iron and manganese in the SEAD-70 groundwater samples were within the range of comparable concentrations reported for iron and manganese in approved background wells.

Risk Assessment

The Army conducted a mini-risk assessment for SEAD-70 based on the results of the ESI sampling event, and determined that potential carcinogenic risks for conservation/recreational receptors evaluated (i.e., park worker, construction worker, recreational visitor) were within the EPA's recommended range (i.e., 10^{-4} to 10^{-6}). The cancer risk for the lifetime resident was estimated as 3 x 10^{-4} driven by arsenic.

The non-carcinogenic hazard indices (HIs) were the park worker and the recreational child were both estimated as lower than EPA's recommended threshold of 1, whereas the construction worker's HI was estimated at 2. The construction worker's estimated elevated HI is driven by the presence of arsenic in the soil. The risk also indicated that the child resident's non-carcinogenic HI was 4, again driven by arsenic in soil.

Removal Action (2008)

Based on the results of the risk assessment, during work associated with the demolition of Building T-2110, the Army excavated soil from the area at SEAD-70 where the highest concentrations of arsenic in soil were previously identified. The initial excavation encompassed an area measured approximately 50 feet wide by 100 feet long by six inches deep centered around the sample location where the single high value of arsenic (i.e., SB70- 02, 0 to 0.2 ft bgs, 88.5 mg/Kg) had been found. Once this area was excavated, excavation perimeter, sidewall, and base confirmatory samples were collected and analyzed for arsenic content in soil. Analytical results from the confirmatory samples were compared to New York's unrestricted use SCO for arsenic (i.e., 13 mg/Kg), which was established as the removal action's cleanup goal. Results of the initial confirmatory samples did not confirm that all locations achieved the site cleanup goals so additional excavations were advanced and additional confirmatory sampling and analyses were performed until cleanup goals were achieved. At the completion of the soil removal action, the SEAD-70 excavation expanded to encompass an area of approximately 19,250 square feet, with vertical depths varying from 1 to 6.5 feet below grade surface. In total, approximately, 720 cy were excavated from the site and disposed off site at a licensed landfill. Analytical results from the removal action were then added to the ESI dataset, and the risk assessment was rerun for the site. The results of the revised risk assessment for SEAD-70 are presented below.

Closure Sampling

Forty-six surface soil samples were collected from SEAD-70 during the 2006 Munitions Response actions. Four compounds exceed the guidance values: one VOC, and three metals.

Arsenic was detected in all soil samples at SEAD-70 at concentrations that exceed the EPA RSL for residential soil; however, arsenic concentrations in these samples are below approved background levels and the NYSDEC SCO value for arsenic.

Acetone was detected in one sample at a concentration that exceeds the NYSDEC SCO value. However, acetone is a byproduct of the sample preservation and extraction procedure, and it is believed that the acetone in these samples does not result from releases that have occurred at SEAD-70.

Nickel and zinc were found at concentrations that exceed their respective NYS SCOs; however, neither of these metals was found at concentrations that exceed EPA RSLs for residential soil.

Revised Risk Assessment

Projected HIs for all conservation/recreation receptors are below the EPA-recommended limit of 1; the projected HI for the residential adult is also below the limit whereas the projected HI for the residential child is above the limit. Projected cancer risk levels for all conservation/recreation and residential/resort receptors are within the EPA acceptable range (i.e., 1×10^{-4} to 1×10^{-6}).

Three exposure pathways, ingestion of soil, inhalation of dust in ambient air, and intake of groundwater account for 98% of the overall HI projected for the child receptor. The hazard quotients estimated due to exposure to groundwater via either ingestion or dermal contact are derived from a sample set that consists of four samples of groundwater. Each of these samples was collected during the ESI with a bailer. The iron EPC (2.14 mg/L) used for groundwater is the maximum concentration measured in the groundwater which was found in the sample that contained the highest level of turbidity (325 NTUs). Each of the other three samples contained lower levels of turbidity (less than 50 NTUs) and all of the other iron concentrations in groundwater were below the state's GA standard of 300 μg/L. Furthermore, as has been discussed previously, the shallow groundwater aquifer underlying the Seneca site is not productive enough to provide water for domestic purposes, so this exposure pathway is considered incomplete.

The ingestion of soil represents approximately 60% of the HI estimated for the child receptor, while the inhalation of dust accounts for approximately 22% of the estimated HI. As discussed in the Risk Assessment, five metal COPCs (aluminum, arsenic, cobalt, iron, and manganese) account for the ingestion hazard. As shown in the risk assessment, each of the EPCs, exclusive of the one for arsenic, were below the EPA RSLs for residential soil. The EPCs for arsenic and manganese are also below their respective NYS SCO values. Further, the EPCs for aluminum, cobalt, iron, and manganese are less than their approved 95th UCL background soil concentrations at the Depot.

Arsenic was found at an EPC that is slightly above its 95th UCL background soil level, but at a concentration that is within the range of concentrations that are in the Depot's background dataset. Furthermore, the estimated arsenic contribution to the child's HI is not at a level in excess of the EPA threshold of 1 at the target organ level.

3.2.4 SEAD-45 - Open Detonation (OD) Grounds

3.2.4.1 History of Contamination and Initial Response

The OD Grounds is located in the northwestern corner of the Depot in Seneca County, New York and is designated as SEAD-45 (See **Figure 3.1**). The OD Grounds encompass approximately 60 acres and, together with the Open Burning (OB) Grounds, comprise the 90-acre demolition area at SEDA. Access into the greater OD and OB Grounds demolition area is possible via a paved road that enters the area from the southeast and roughly parallels the path of Reeder Creek along its western bank. The unnamed access road branches off North-South Baseline Road near Building 2104, which is located in the southeastern corner of the greater OD/OB Grounds complex.

The OD Grounds was used to destroy munitions. Operations at the OD Grounds began circa 1941 when the Depot was first constructed and continued at regular intervals until circa 2000 when the military mission of the Depot ceased. Detonations have occurred intermittently since the Depot closed as part of continuing munitions response activities that have been performed.

During operations, waste munitions are placed in a hole created in the hill with additional demolition material, covered with a minimum of 8 feet of soil, and detonated remotely. After demolition was completed, explosively displaced portions of the mound were reconstructed by bulldozing displaced and native soils back into the central earthen mound.

3.2.4.2 Site Investigation Results

Topographic Survey

The intent of the topographic investigations was to develop an estimate of the amount of soil that comprises the Open Detonation Hill, which is a man-made earthen mound that was historically used to buffer the intensity of planned detonations.

Topographic information for the OD Grounds, including OD Hill, was last developed between 1992 and 1994. In March 2010, a topographic survey of the earthen mound was conducted using a global positioning system (Trimble Base Station and Rover). The purpose of the GPS survey was to determine the current location and shape of the OD Hill and to provide a means to estimate the volume of soil contained in the mound, which has been periodically modified by detonations and reconstruction since the last detailed survey effort in the early 1990s.

An initial estimate of the volume of soil contained in the aboveground portion of the OD Hill mound was developed using the combination of the 1992-1994 land and aerial topographic information and GPS survey results. The estimated volume of the earthen mound above ground surface is 38,000 cy. The estimated volume of soil in the OD Hill above bedrock surface is 75,000 cy. Figure 3 of the Draft Completion Report (Parsons, 2010e) shows the March 2010 position, shape, and elevation of the OD Hill mound superimposed over the 1990 survey data of the greater OD Grounds area.

Using depth-to-bedrock measurements made during historic soil and monitoring well installation borings at the OD and OB sites and OD Grounds test pitting operations, Parsons created a bedrock contour plan of the OD Grounds site. This information is presented in Figure 4 of the Completion Report (Parsons, 2010e). This figure shows that the thickness of soil overlying the competent bedrock surrounding the OD Hill varies from 10 to 20 feet thick; additionally, the height of the OD Hill above bedrock ranged between approximately 40 and 50 feet thick.

Three horizontal profiles of the earthen mound, shown in Figures 4A, 4B, and 4C of the Draft Completion Report (Parsons, 2010e), present the 1994 ground surface exterior of the mound and the March 2010 ground surface of the earthen mound. The profiles show that the ground surface at the outer edge of the existing earthen mound was 1 to 2 feet lower than the reported 1994 ground surface elevation. The difference was likely due to earth work conducted on the mound between 1994 and 2010.

Geophysical Survey

Historic geophysical data developed during prior munitions response surveys of the OD Grounds were used to select the test plots where Parsons conducted intrusive operations to investigate the vertical deposition of munitions debris[17] (MD), material potentially presenting an explosive hazard (MPPEH[18]), and other cultural debris[19] (CD) in soil surrounding OD Hill. As part of these intrusive operations, geophysical surveys were conducted after each 1-foot layer of soil was removed to provide further definition of the approximate number of anomalies that remained at the site. In addition, selected anomalies exhibiting electromagnetic responses in excess of 50 millivolts were investigated, recovered, and identified by UXO personnel to provide additional information pertinent to the nature of items that remained at the test plot locations, and which may be representative of other items present in soils at the OD Grounds.

The Army selected five test plots from numerous possible locations to provide a preliminary assessment of the vertical deposition of MPPEH, MD, and CD located at different distances and in different directions from the detonation point (i.e., OD Hill). The test plot locations surveyed were identified as Areas 1, 2, 3, 5, and 6, and the location of each is shown on Figure 5 of the Draft Completion Report (Parsons, 2010e) relative to the position of the OD Hill. Each of the selected test plots was placed at a location where historic geophysical surveys indicated that saturated response areas (i.e., geophysical anomaly density in excess of 600 items per acre) existed.

---

[17] Remnants of munitions (i.e., fragments, penetrators, projectiles, shell casings, links, fins) remaining after use, demilitarization, or disposal

[18] MPPEH includes munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; range-related debris; and equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production. Excluded from MPPEH are munitions established in the DOD's munitions management system and hazardous items that may present explosion hazards that are not munitions and are not intended for use as munitions (e.g., gasoline cans, compressed gas cylinders).

[19] Debris found on operational ranges or munitions response sites that may be removed to facilitate range clearance or munitions response, that is not related to munitions or range operations. Such debris includes, but is not limited to: rebar, household items, automobile parts, automobiles (not associated with range targets), fence posts, fence wire, and magnetic rocks.

Data summarizing the anomaly density at each test plot depth are presented in Table 2 of the Draft Completion Report (Parsons, 2010e). Review of the data in Table 2 indicated that anomaly densities generally decreased with depth of excavation, especially at distances greater than 100 to 200 feet from the detonation mound. At Area 3 and Area 6 anomaly densities one foot below grade were estimated to be zero, while the projected anomaly densities at Area 1 and Area 2) were below 50 items per acre at the same depth. Area 6 and Area 3 are located approximately 500 feet and 1,250 feet southeast of OD Hill, respectively, while Area 2 is located between 350 and 500 feet east, northeast of the OD Hill and Area 1 is located between approximately 750 and 1,000 feet northwest of the OD Hill.

Anomaly densities estimated at Area 5, which is within 200 feet of the OD Hill, dropped with depth less significantly than those discussed above, to a level of approximately 250 anomalies per acre at one foot depth below ground surface. The anomaly density estimated for the two foot depth rises to 280 per acre, which suggested that this area may have been affected by OD Hill reconstruction and repositioning efforts that have occurred over the life of the OD Grounds.

The overall assessment of the data suggested that there may be a directional component to the vertical deposition of anomalies, as is evidenced by the absence of anomalies to the southeast of the OD Hill and the presence of anomalies to the northeast and northwest at roughly comparable distances from the detonation site. Additionally, the finding of significantly more subsurface anomalies at test plot 5 would suggest that areas in close proximity to the OD Hill may have more subsurface anomalies due to the extensive amount of soil rework that was done at this site during operation.

Chemical Analysis of Soil Samples

Soil samples were collected at the OD Grounds between March 10, 2010 and April 1, 2010. Samples were submitted to a New York State NELAC-certified and DOD ELAP-certified laboratory. The list of soil samples collected, with sample IDs and performed analyses were provided in Table 3 of the Draft Completion Report (Parsons, 2010e).

Ninety-two samples, including quality assurance/quality control (QA/QC) samples, were collected at the OD Grounds. Samples were collected from:

1. the surface of OD Hill (20 locations);
2. surface locations at cardinal, ordinal and, intermediate locations, on a series of expanding concentric rings (“Doughnut Rings”) exterior to the OD Hill (37 locations), and
3. surface and subsurface locations (i.e., 0, 2.5, 5, 7.5 and 10 ft bgs) from four test pits excavated immediately adjacent to the toe of the OD Hill mound (19 locations).

Appropriate QC/QA samples, including matrix spike/matrix spike duplicate (MS/MSD), sample duplicate, and field blanks, were collected, as well.

All samples were analyzed for TAL metals via Methods SW846 6010B/7471A; 38 were analyzed for explosives by SW846 Method 8330B; and 26 were analyzed for TCL SVOCs (SW846 Method 8270C), pesticides/PCBs (SW846 Method 8081A/8082), and organochlorine herbicides (SW846 Method 8151). In addition, eight samples were analyzed to determine the degree to which metals in soil may leach via SW846 Method 1312 coupled with Method SW846 6010B/7471A.

Forty-seven analytes were detected in the soil samples collected from the OD Grounds. Of the total number of analytes found, four were semivolatile organics, eight were explosives compounds, 11 were organochlorine pesticides, one was a PCB, and 23 were metals. Summary results for all OD Grounds soil samples were provided in Table 4 of the Draft Completion Report (Parsons, 2010e).

Overall, the results of the data analysis indicated that 24 analytes were found in one or more of the samples characterized at levels that exceeded one or more of the applicable comparator values. Of these 24, 22 were metals (all TAL metals except thallium), one was aroclor-1254, and one was nitroglycerin. Further, the appropriate dataset's 95th UCL for 19 metals (all except antimony, calcium, magnesium, and thallium) exceeded one or more of applicable comparator levels. No other analyte of interest exhibited a 95th UCL value in excess of comparator guidance values.

Analytical results for cadmium, copper, mercury, silver, and vanadium, which are COPCs at the OD Grounds, were posted on site maps provided in Appendix A of the Draft Completion Report (Parsons, 2010e). Four maps are provided for each COPC, arranged in order of OD Hill, Test Pits, inner doughnut ring and outer doughnut rings. The following discussion presents a discussion of the distribution of these metals found in soil.

Cadmium

Cadmium levels measured at all surface locations at OD Hill exceeded the NYSDEC unrestricted use SCO and exceeded the maximum SEDA background concentration of cadmium. Further, 16 of the 21 samples collected from the surface of the OD Hill were detected above the EPA adjusted RSL for residential soil. The maximum concentration reported for cadmium (i.e., 1100 mg/Kg) was found on the eastern face of OD Hill. Analytical results for cadmium in test pits surrounding OD Hill indicated that 17 of the 20 samples contained concentrations exceeding the unrestricted use SCO for cadmium; further, each of the non-exceeding samples were located in deeper soil (i.e., S45-TP1-04 at 7.5 ft bgs, S45-TP4-03 at 5 ft bgs; and S45-TP4-04 at 7.5 ft bgs). Similarly, comparing cadmium concentrations to maximum SEDA background concentrations shows that only deeper samples (including S45-TP3-04) contain levels below 2.9 mg/Kg. Comparing test pit results for cadmium to adjusted EPA RSLs for residential soil showed varied results, but the data still indicated that soils at depth were of potential concern.

Samples containing cadmium above the NYSDEC unrestricted use SCO and the maximum SEDA background concentration were found at each of the inner ring sample locations; however, outside of the inner ring, (i.e., at the 1,000 and 1500 foot radius rings) cadmium was generally detected below comparator concentrations. Cadmium concentrations exceeding the EPA adjusted RSL for residential soil were limited to the three innermost rings (i.e., 100, 200, and 300 foot radii), with occasional exceedances out to the 500 foot ring.

Copper

The extent of copper was generally similar to the extent of cadmium. Concentrations of copper were highest in soil near OD Hill; with increasing distance from OD Hill, the concentration of copper decreased until reaching acceptable concentrations somewhere between 500 and 1000 feet away from OD Hill. However, there was evidence that several of the highest concentrations of copper, including the overall highest (i.e., 7,310 mg/Kg at S45-TP1-02 at 2.5 ft bgs), were found in underground test pit samples.

The distribution of the concentrations of copper at depth was generally similar across test pits, with the highest concentrations detected between 2.5 and 7.5 feet bgs. All samples from test pits 1, 2, 3, and 4 exceeded the NYSDEC SCO and SEDA maximum background for mercury except the deepest samples at test pits 1 and 4.

Mercury

Mercury concentrations at all surface locations at OD Hill exceeded the NYSDEC unrestricted use SCO and exceed the maximum SEDA background concentration of mercury. Further, 18 of the 21 samples collected from the surface of the OD Hill were detected above the EPA adjusted RSL for residential soil. Samples containing mercury above the NYSDEC unrestricted use SCO and the maximum SEDA background concentration were found at each of the inner ring sample locations and even further afield at the 1,000 foot radius; only one sample (i.e., the northernmost sample) on the 1,500-foot ring exceeded the NYSDEC SCO.

The distribution of the concentrations of mercury at depth was generally similar across test pits, with the highest concentrations detected at 5 feet bgs. Like the concentration of copper, all mercury samples from test pits 1, 2, 3, and 4 exceeded the NYSDEC SCO and SEDA maximum background except the deepest samples at test pits 1 and 4.

Silver

With one exception on the western edge of OD Hill, silver concentrations at all surface locations at OD Hill exceeded the NYSDEC unrestricted use SCO and exceeded the maximum SEDA background concentration of silver. Concentrations of silver that exceeded the NYSDEC unrestricted use SCO are generally limited to the innermost 200 feet of the OD Hill site; however, there were two notable exceedances at 300 and 500 feet to the east and northeast of the center of the OD Hill.

The distribution of the concentrations of silver at depth varied greatly across test pits with noted exceedances at all locations. At test pit 1, the three shallowest samples exceeded the NYSDEC unrestricted use SCO; at test pit 2, only the surface sample exceeded the SCO; at test pit 3, the samples at 0 feet, 2.5 feet, and 7.5 feet bgs exceeded the SCO; at test pit 4, both the surface sample and the sample 2.5 feet bgs exceeded the SCO. It appeared that the concentration of silver at depth was highly varied across the OD Hill site.

Vanadium

Vanadium concentrations at all surface locations at OD Hill exceeded the EPA RSL for residential soil; however, no samples exceeded the maximum SEDA background concentration of vanadium. There is no NYSDEC unrestricted use SCO for vanadium. The lateral extent of vanadium across the OD Hill site (i.e., from OD Hill and out to the 1500 foot radius) was generally consistent, ranging between 16.6 and 41.9 mg/Kg which was consistent with the SEDA background maximum (i.e., 32.7 mg/Kg).

The distribution of the concentrations of vanadium at depth was generally consistent across test pits with analytical results from all test pit samples being in line with the maximum SEDA background concentration yet exceeding the EPA RSL for residential soil. Analytical results for samples at depth ranged from 17.5 mg/Kg to 28.1 mg/Kg. It appeared that the concentration of vanadium at depth closely matched that of vanadium across the OD Hill site.

Overall Results

The above discussions indicate that metal concentrations tended to be highest in samples collected in close proximity to the OD Hill, and generally decreased as distance from the hill increased. Many of the highest metal concentrations were found in the surface soils collected from the OD Hill, but as is indicated by the discussion regarding copper, other elevated concentrations may have been present at depth in, and around, the OD Hill Area. However, at distances of greater than 500 feet from the OD Hill only sporadic exceedances of metals were noted.

The only other analytes detected at levels in excess of comparator guidance values in any samples were aroclor-1254 and nitroglycerin, and both of these compounds were detected in samples that were collected from the surface of the OD Hill. Other explosives, pesticides, and semivolatile organic compounds were found at lower concentrations in samples away from the OD Hill and were detected at lower concentrations.

Leachability Determinations

Once all total metal concentration results were received and evaluated, eight samples were selected for leachability determinations using the synthetic precipitation leaching procedure (SPLP) (EPA SW-846 Method 1312) in combination with EPA SW-846 Method 6010 and 7471, as appropriate for the RCRA eight metals (i.e., arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) and other metals of interest (e.g., antimony, cobalt, copper, vanadium, and zinc). It is noted that SPLP determinations for five of the samples were performed more than 28 days after the original total metal sample was collected and submitted to the laboratory. The extended holding time is not recommended for mercury analyses, but in this analysis do not appear to lessen mercury's potential to leach from soil.

The results of these analyses were summarized in Table 5 of the Draft Completion Report (Parsons, 2010e), where the results of the SPLP and total metal analysis for each of the eight samples were presented. Total metal analysis results presented were compared to EPA's RSLs for residential soils and New York's unrestricted use SCO values, while the SPLP results were compared to New York's GA Groundwater Effluent limitations.

Preliminary data review included attempts to plot and correlate leachate concentrations versus total soil concentrations to determine if it was possible anticipate total soil threshold concentrations that could be indicative of adverse leaching potential. This approach was recommended in several technical articles referenced in the available literature, but the collected data did not support this approach in this study.

A general review of the data indicated that all of the suspect metals, exclusive of selenium, which was not detected in total soil samples, exhibited some potential to leach to groundwater. Two metals, mercury and lead, exhibited the highest number of samples affected (i.e., six) at levels of potential concern, while cadmium and copper were also observed to be of potential concern when total soil concentrations move up to and above EPA's RSLs for residential soil. Barium and zinc also exhibited leaching potential, but it appeared that these may only reach levels of concern once residential and unrestricted use concentrations are surpassed. None of the reported leachate concentrations reported from the SPLP analyses approached toxicity characteristic leaching procedure regulatory levels reported in 40 CFR 261.24 which range from a low of 200 micrograms per liter for mercury to a high of 100 milligrams per liter for barium. The other six RCRA metals have levels set at either 1 milligram per liter (cadmium, selenium) or 5 milligrams per liter (arsenic, chromium, lead, or silver).

Conclusions

Based on the results of this investigation, the following conclusions were offered (Parsons, 2010e):

- The quantity of soil contained in the OD Hill above surrounding grade level was estimated to be 38,000 cubic yards.
- Bedrock underlying the area of the OD Hill mound was estimated to vary from 10 to 20 feet bgs.
- Geophysical anomaly densities generally decreased from saturated levels (i.e., 600 anomalies per acre) at surface elevations to lower densities at depth at each test plot; this was especially true for the test plots that were further from the initial point of detonation.
- Directional and point-of-detonation distance variations may have been related to the vertical distribution of geophysical anomalies in the soil surrounding the detonation site.
- Metals were the predominant contaminants that were identified at the OD Grounds, both in terms of the frequency of detection and with respect to the number of samples with concentrations that exceed applicable comparator guidance values. In addition, 95th UCL values calculated from the four assessed datasets (i.e., overall data, OD Hill only, test pit only, and radius samples only) indicated that metal contamination at levels above comparator values was distributed throughout surface and subsurface and soils at and beyond the OD Hill.
- Metal concentrations were generally greatest in soils closest to the OD Hill and decreased with distance from OD Hill. With the exception of isolated instances, at distances greater than 500 feet, metal concentrations decrease to levels that are consistent with background and comparable or lower than regulatory guidance values.
- Four metals, mercury, lead, copper, cadmium, and copper, exhibited potential to leach from soils at levels that exceeded State of New York GA Groundwater Effluent Limitation levels when exposed to synthetic precipitation solutions. Other metals also were observed to leach from soils found at the OD Grounds, but not to levels that indicated potential problems.

3.2.5 SEAD-46 - 3.5-inch Rocket Range

3.2.5.1 History of Contamination and Initial Response

SEAD-46, also known as the "3.5-inch Rocket Range", is a trapezoidal parcel of land that encompasses approximately 68 acres (see **Figure 3.1**). The southern east-west boundary of SEAD-46 is located approximately 6,000 feet north-northwest of the former Depot's main gate on State Highway 96. The area is comprised primarily of open grassland that is occasionally interrupted and bordered by areas of dense brush and trees. SEAD-46 is bisected by an unnamed dirt road that runs southeast to northwest. The predominant feature in the area is a man-made earthen berm that is situated near the northwest corner of the AOC; the most likely use of the berm was as a protective barrier during range operations. From the 1940s to the 1960s SEAD-46 was used for testing as a function test range for 3.5-inch rocket motors. The 1998 Archives Search Report (ASR) indicates that the berm is visible in a 1954 aerial photograph of the area. The OE EE/CA indicates that SEAD-46 was once used as a testing range for rocket motors. Review of historic files revealed at least one picture of a 3.5-inch motor fixed to a tripod in front of the berm at SEAD-46.

3.2.5.2 Site Investigation Results

Soil Investigations

<u>Remedial Investigation</u>

SEAD-46 soil was characterized as part of the remedial investigation (RI) field activities conducted during 1999 and 2000. During the RI, soil from test pits, soil borings, surface soil locations, surface water drainage channels, and swales (i.e., ditch soil) was collected and characterized for TAL and TCL hazardous substances. Based on the investigation, metals were identified as the principal COPCs at the AOC. The collected data indicates that detected metal concentrations are generally consistent with concentrations found in native soil. Based on the analytical data collected during the RI, the Army analyzed soil samples in locations where potential ordnance or explosive debris was found during the 2006 Munitions Response activities. (See section "Closure Sampling" for a discussion of sample analyses and detected compounds.)

<u>OE EE/CA and Geophysical Investigation</u>

As part of the OE EE/CA (Parsons, 2004f), geophysical surveys and intrusive investigations were conducted over roughly 17.5 acres of SEAD-46. During the OE EE/CA investigation, 1,155 geophysical anomalies[20] were identified and investigated; this work resulted in the identification of 478 MD items; of which 10 were identified as MPPEH. During the Geophysical Investigation conducted by Shaw in April 2005 (Shaw, 2005), approximately 24 acres of SEAD-46 were digitally mapped using electromagnetic inductance and magnetometry. The DGM survey identified one area in SEAD-46 where the anomaly

[20] A geophysical anomaly is a deviation from the background as determined by an instrument. In Munitions Response, geophysical measurements are used to identify residual metal components that may be associated with ordnance or munitions. Magnetometry and electromagnetic inductance are two of the primary detection methods used to find ferrous and non-ferrous metals.

density was greater than 600 anomalies per acre. Areas with more than 600 anomalies per acre are defined as "saturated response areas" (SRAs). In addition to the identification of the SRA, 98 anomalies were investigated by Shaw. The investigation found 32 pieces of aluminum MD, six ferrous MD pieces, and 60 cultural debris (CD) pieces. The majority of recovered M4071A 40mm practice grenades were located at the south boundary of the AOC, opposite the protective barrier berm.

<u>Munitions Response – Munitions Clearance</u>

The 2006 Munitions Response investigation of SEAD-46 detected 2,054 geophysical anomalies. Of the anomalies found, 16 were identified as suspected MPPEH. Upon further investigation however, all 16 MPPEH items were reclassified as MD and were assessed to pose no threat. No identifiable complete or partial 3.5-inch rockets or rocket motors were found during the 2006 investigation. Based on the results of this investigation and past investigations, SEAD-46 is considered clear of MPPEH and no further geophysical or munitions response action is needed.

<u>Munitions Response – Closure Sampling</u>

One foot of soil from the exterior surfaces of the berm at SEAD-46 was excavated and moved to a cleared location in SEAD-57. After the initial foot of soil was removed from the backstop berm, UXO personnel surveyed the berm and confirmed that only non-military items and cultural debris remained in the underlying soil. In addition, a test pit was excavated in the center of the berm structure, and the senior UXO supervisor (SUXOS) determined that no MPPEH was present in the remainder of the berm. The excavated soil from the SEAD-46 backstop berm was commingled with soil that was excavated from the SEAD-57 protective berm during the metal separation process, then laid out on the ground in a cleared area within SEAD-57 in a one-foot thick soil lift. This soil lift was surveyed and processed by UXO personnel to identify and remove MD and MPPEH. Samples of the remaining soil were collected and characterized to determine residual levels of metal contaminants. Please refer to the "SEAD-46 and SEAD-57 Stockpile Samples" section for further discussion of sample analyses and results for the processed lift soil.

<u>Groundwater Investigations</u>

Monitoring well installation and groundwater sampling at SEAD-46 took place as part of the RI. Investigations included the installation, development, testing, and sampling of six monitoring wells (MW46-1 to MW46-6). Monitoring well MW46-1 was installed as a background well; the remaining five wells were installed close to the earthen berm located at the northern end of the AOC. Two rounds of groundwater samples were collected in January and April of 2000 and analyzed for TCL VOCs, SVOCs, pesticides/ PCBs, TAL metals and cyanide, explosives, herbicides, total recovered petroleum hydrocarbons (TRPH), fluoride, and nitrate. The resulting groundwater data were compared to the lower permissible concentration promulgated in New York State Class GA groundwater standards and EPA MCLs.

Three metals were detected in SEAD-46 groundwater samples at concentrations above NYS GA Standards and/or EPA MCLs: antimony, iron, and thallium. Antimony and thallium were both found at concentrations above their respective MCLs once, in separate wells during the first RI sampling event.

As such, these measurements are viewed as suspect, and are not presumed to be indicative of a groundwater plume. It is more likely that these occurrences are artifacts that occur during first sampling of newly installed and developed monitoring wells.

With respect to iron, it was detected in all of the groundwater samples collected at SEAD-46, but only four times at concentrations above New York's GA groundwater standard. All of the exceedances occurred in different wells (MW46-1, 46-2, 46-3, and 46-6). Three of the noted exceedances, including the two highest concentrations, occurred in the first RI sampling event and one occurred during the second sampling event at the well. However, the concentration of iron found in the groundwater at SEAD-46 is consistent with the regional groundwater quality in Seneca County and therefore cannot be distinguished from background contributions.

Closure Sampling

The soil data set for SEAD-46 has been modified to reflect the removal of several shallow soil samples that were collected from the former backstop berm at SEAD-46 during the RI. During the Munitions Response action, the top foot of soil was removed from the backstop berm and transported to the SEAD-57 lay down area for MEC/MPPEH surveying and processing. Once all MEC/MPPEH was removed, residual soil was sampled and analyzed. Please refer to the "SEAD-46 and SEAD-57 Stockpile Samples" section for further discussion.

The thirty-one confirmatory soil samples collected during the SEAD-46 RI were analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL metals and cyanide, and nitroaromatic and nitroamine compounds. Nine compounds at SEAD-46 were detected at concentrations above guidance values: one VOC, one SVOC, three pesticides, and four metals.

Arsenic was detected in all soil samples at SEAD-46 at concentrations that exceed the EPA RSL for residential soil; however, arsenic concentrations in these samples are typical of the approved background levels and the NYSDEC SCO value for arsenic.

Acetone was detected in the majority of samples at concentrations that exceed the NYSDEC SCO value for acetone; however, this finding likely reflects the method of sample preservation and analysis rather than the presence of acetone at the site. Available technical literature[21] indicates that preserving soil samples with sodium bisulfate, which was done for SEAD-46 samples, generates acetone. Hence, the measured acetone in SEAD-46 samples is likely a result of the preservation protocol not an indication of acetone in site soil. Further, there is no historic information that indicates that acetone was ever used or

[21] See Nebelsick, John D., "USACE Sample Collection and Preparation strategies for Volatile Organic Compounds in Solids," http://www.environmental.usace.army.mil/pres_chem.htm. 1999. Also, see Clausen, Jay L., et al., "Acetone Production as a result of Sodium Bisulfate Preservation Using EPA Method 5035," The 17th Annual International Conference on Contaminated Soils, Sediments, and Water, University of Massachusetts, Amherst October 18 & 19, 2000. Additionally, see Uhlfelder, M., "Study of Acetone Production in SW-846 Method 5035 (Low Level) Associated with Various Preservation and Storage Conditions," 16th Annual Waste Testing and Quality Assurance Symposium, August 5th – 10th, 2000.

stored at the SEDA, and its ubiquitous presence in surface samples throughout the site makes its detection suspect.

Nickel was detected twelve times in soil samples at SEAD-46 at concentrations that exceed the NYSDEC SCO value for nickel; however, the 95th UCL is only slightly above the NYSDEC SCO value of 30 mg/Kg these samples are below typical approved background levels. Further, the 95th UCL is below the EPA RSL for residential soil.

The other compounds found at concentrations above comparator values were infrequently (i.e., 1 or 2 times) detected at elevated concentrations.

Risk Assessment

Projected non-carcinogenic HIs for the park worker and the recreational child visitor at SEAD-46 are below the EPA-recommended limit of 1; projected non-carcinogenic HIs for the construction worker, adult resident, and resident child are above 1. Projected carcinogenic risk for all receptors, with the exception of the lifetime resident, is within the EPA acceptable range (i.e., 1x10-4 to 1x10-6).

Non-carcinogenic HIs for the construction worker and the adult and child residential receptors are estimated to be above the EPA limit; however, for each receptor the elevated HI estimated is attributed to SEAD-46 EPCs that are consistent with, and often below, state and federal guidance limits and standards for residential or unrestricted use and approved background concentrations. Therefore in each case, the estimated hazard index is attributable to COPC concentrations that cannot be differentiated from levels that exist in native soils or that would be allowed under prevailing environmental laws and regulations as acceptable concentrations. Furthermore, for the construction worker and the adult resident, likely health effects to individual target organs or body systems are less than 1, and therefore allowable. Therefore, the Army believes that the reported HIs overestimate the likely noncarcinogenic health impacts present at SEAD-46.

Similarly, the carcinogenic risk estimated for the lifetime resident, which is above the EPA limit, results primarily (1.1×10^{-04} out of 1.2×10^{-04}) from the intake of arsenic in groundwater. However, the concentration of arsenic in groundwater at SEAD-46 is below the EPA MCL. As such, the cancer risk level for the SEAD-46 lifetime resident overestimates the actual risk that exists at the site. Further, since the shallow overburden aquifer that underlies SEAD-46 will not yield sufficient water to support potable usage, this exposure pathway is considered incomplete.

Therefore, the Army believes that environmental conditions at SEAD-46 do not pose an unacceptable level of risk to future receptors.

Three metals, antimony, iron, and thallium were detected in groundwater samples at concentrations that exceeded New York GA or federal MCL standard levels. Results of the SEAD-46 risk assessment indicate that neither antimony nor iron in groundwater contribute to the risk or hazards that are determined for potential receptors at the AOC, while thallium in groundwater does contribute roughly 10 to 11 percent to the noted HIs that are determined for the adult and child residents. At this level, thallium was not considered a significant component of the overall hazard measured.

3.2.6 SEAD-57 - Explosive Ordnance Detonation Range

3.2.6.1 History of Contamination and Initial Response

SEAD-57, the former Explosive Ordnance Disposal Area (formerly EOD-1), is a rectangular parcel of land that encompasses approximately 72 acres in the west-northwest portion of the former Depot (see **Figure 3.1**). SEAD-57 is adjacent to the southernmost area of the Open Burning/Open Detonation Grounds that occupy most of the land in the northwestern corner of the former Depot. SEAD-57 is comprised primarily of open grassland. A few man-made structures are located in the center of the AOC and along its northern edge exist at SEAD-57. An open, reverse "C"-shaped berm, measuring 80 feet by 100 feet, is located in the center of the AOC. Equipment shelters, remote control shelters, and an EOD storage structure are located along the north-central edge of the AOC. An east-west oriented, unnamed dirt road transects the northern edge of the AOC, and a second, perpendicular, unnamed dirt road intersects the northern road roughly halfway across the AOC's edge. This road provides vehicular access to the area surrounding the earthen containment berm.

For more than 20 years the 143rd Ordnance Detachment, a Department of the Army tenant organization at the Depot, performed ordnance and explosives (OE) disposal at SEAD-57. The disposal area was used by EOD personnel for the disposal of conventional ammunition or explosives weighing less than 5 pounds.

3.2.6.2 Site Investigation Results

Soil Investigations

<u>ESI and RI</u>

The soil at SEAD-57 was characterized during the 1999 and 2000 RI and the 1993 and 1994 ESI field activities. Soil sample types include: surface soils, subsurface soil from soil borings and test pits, and ditch soil from drainage gullies and swales. Metals were the principal hazardous substances detected at the AOC, but detected concentrations were generally consistent with the approved background soil concentration dataset values. See section "Closure Sampling" for a discussion of sample analyses and detected compounds.

<u>OE EE/CA and Geophysical Investigation</u>

Geophysical surveys and intrusive investigations were conducted at SEAD-57 as part of the OE EE/CA (Parsons, 2004f). Approximately 15 acres were mapped, and 1,700 anomalies were investigated. Over 950 recovered items were classified as MD; of the investigated items, three were determined to be MEC (i.e., an MK2 grenade and two 20mm projectiles). During a surface sweep, a 37mm armor piercing high explosive (APHE) item was found near the abandoned ammunition disassembly area across the unpaved road at the northern end of the AOC. At the end of the OE EE/CA all MD and MEC items were disposed in accordance with approved procedures.

During Shaw's geophysical investigations in April 2005, 22.5 acres of the AOC were digitally mapped. The results identified six SRAs spanning approximately 13 acres of SEAD-57. In addition, 75 other anomalies were investigated at the site. Four MPPEH items were identified including a 75mm, a 75mm AP, a 105mm, and an unknown bomb. Following venting[22], these items were classified as MD.

<u>Munitions Response – Munitions Clearance</u>

Of the 7,485 anomalies detected during the SEAD-57 Munitions Response investigation, 47 were classified as MPPEH items. Of these 47, all but two were classified as MD after venting the items during the disposal process. The two MPPEH items were a fused 37mm projectile and a MK2 grenade, and may have been EOD training items. This determination was supported by the fact that most ferrous MD items at SEAD-57 were found north of Building T011, a known EOD training area, and outside of the 400-foot high-density radius around the SEAD-57 berm.

Upon the completion of the 2006 Munitions Response action, SEAD-57 was considered to be free of MPPEH and no further geophysical investigation or munitions response action was required.

<u>Munitions Response – Closure Sampling</u>

During the Munitions Response action, soil samples from SEAD-57 were collected from two areas:

1. The walls and floor of an excavation that removed debris and residues found in a historic burn pit at the protective berm, and
2. The top foot of soil on the SEAD-57 protective berm.

The foot of soil removed from the top of the berm was combined with the foot of soil removed from the backstop berm at SEAD-46 for processing; the combined soil was laid out in a one-foot thick soil lift for further UXO processing and subsequent sampling. A post-excavation sweep of the berm was then performed by UXO personnel using metal detectors with evidence of Mk25 drift signals and an empty 155 mm projectile identified and recovered. These items were removed and secured, and then the protective berm was re-swept and cleared of MPPEH and residual debris by the SUXOS.

The soil and debris removed from the historic burn pit was separately processed by UXO personnel at another location in the SEAD-57 soil lay down area. See section “"SEAD-46 and SEAD-57 Stockpile Samples” for a discussion of the combined soil removed from SEAD-46 and SEAD-57; see section “SEAD-57 Berm Pit Excavation” for a discussion of sample analyses and detected compounds for the material removed from the historic burn pit.

<u>Groundwater Investigations</u>

Three monitoring wells (MW57-1 to MW57-3), including one background well and two down gradient wells, were installed at SEAD-57 during the 1994 ESI. Four additional monitoring wells (MW57-4 to MW57-7) were installed at SEAD-57 during the 2000 RI. Three sets of samples were collected from the wells at SEAD-57: the three ESI wells were sampled at various times between 1993 and 2000, all seven monitoring wells were sampled in January 2000 and April 2000; and MW57-1 was sampled two

[22] Exposing any internal cavities of MPPEH, to include training or practice munitions (e.g., concrete bombs), using DDESB- or DoD Component approved procedures, to confirm that an explosive hazard is not present.

additional times during the SEAD-12 RI in 2000. The discussion below summarizes the results found during the sampling events. The resulting groundwater data were compared to the lower permissible concentration promulgated in NYS GA Standards and EPA MCLs.

Five metals, antimony, iron, manganese, sodium, and thallium, were found in one or more of the groundwater samples at SEAD-57 at concentrations above NYS GA Standards and/or EPA MCLs. The two exceedances for antimony were detected in the ESI wells that were sampled prior to 2000; none of the groundwater samples from the RI exhibited any exceedances for antimony. TAL metals were analyzed at MW57-1 during the SEAD-12 RI sampling events. Iron was the only exceedance in the SEAD-12 RI data; and the detected iron concentrations are in line with accepted background concentrations. The single exceedance for manganese was detected in an ESI sampling event; all manganese concentrations from the RI were below the NYS GA standard. The highest iron concentration was detected in an ESI sampling event; lower exceeding iron concentrations were observed during the RI sampling event. Since these lower concentrations are similar to accepted background groundwater quality, no further groundwater investigations was considered necessary at SEAD-57.

Closure Sampling

Roughly 120 confirmatory soil samples were collected during the RI at SEAD-57 and were analyzed for TCL VOCs, SVOC, pesticides and PCBs, TAL metal and cyanide, and nitroaromatic and nitroamine compound content. Sixteen compounds were detected that exceeded one of the comparative guidance values: one VOC, one SVOC, four pesticides, and 10 metals.

Of all 87 samples, acetone has the most exceedances above the NYSDEC SCO value. Nevertheless, acetone was never found at a concentration above the EPA RSL for residential soil. As previously discussed, preserving soil samples with sodium bisulfate generates acetone that is not present in site soil. Therefore, it is believed that its presence in samples at elevated levels was an artifact of the preservation and analysis process used and not indicative of acetone in the SEDA soil.

Benzo(a)pyrene was detected in eight samples at levels above the EPA RSL for residential soil; the 95th UCL for benzo(a)pyrene was above the EPA residential soil RSL, as well. However, none of the sample concentrations were detected at levels above the NYS SCO of 1000 μg/Kg.

Arsenic had the most samples with concentrations above the EPA RSL for residential soil. Nevertheless, only one sample had a concentration above the NYSDEC SCO value. Also, the 95th UCL for arsenic at the site was less than the approved background for arsenic.

Nickel was detected 37 times in soil samples at SEAD-57 at concentrations that exceed the NYSDEC SCO value for nickel; however, the 95th UCL was below the NYSDEC SCO value. None of the nickel results exceeded the EPA RSL for residential soil; these samples were below typical regional background levels.

Zinc, cadmium, and manganese were found at concentrations that exceed their respective NYS SCOs, but the 95th UCL for each metal was lower than NYS SCOs. None of these metals was found at concentrations that exceeded EPA RSLs for residential soil.

SEAD-46 and SEAD-57 Stockpile Samples

One foot of soil from the exterior surfaces of the backstop berm at SEAD-46 and the protective enclosure berm at SEAD-57 was excavated and processed by UXO personnel to remove MD and MPPEH. The excavated soils were laid out in a one foot lift on a cleared portion of SEAD-57. Once the soil was cleared of munitions, it was collected and analyzed for TCL and TAL analytes. Six metals exceed the guidance values.

Arsenic was detected in all soil samples at the SEAD-46 and SEAD-57 stockpile area at concentrations that exceeded the EPA RSL for residential soil. However, all arsenic concentrations were consistent with or below approved background levels and below the NYSDEC SCO.

Nickel was detected in four samples at concentrations that exceeded the NYS SCO; however, nickel concentrations did not exceed the EPA RSL for residential soil, these samples were below typical approved background levels.

Each of the other metals that exceeded the NYSDEC SCO value did so only once; further, none of the metals exceeded its respective EPA RSL.

SEAD-57 Berm Pit Excavation

Six soil samples were collected from the walls and floor of the excavation required as part of the munitions response action that removed residue in a historic burn pit at SEAD-57. After sampling the soil from the burn pit, the soil was processed with the soil that was excavated from the SEAD-46 backstop berm and the SEAD-57 protective berm that was placed in the soil lay down area at SEAD-57.

Six samples were collected from the Burn Pit excavation at SEAD-57 and analyzed for TCL VOCs, SVOCs, pesticides, PCBs, TAL metals, and nitroaromatics and nitroamine. Four metals were detected in soil samples at concentrations that exceeded one of the comparative guidance values in one or more of the samples characterized.

Arsenic was detected in all soil samples at the SEAD-57 berm pit area at concentrations that exceeded the EPA RSL for residential soil. However, all arsenic concentrations were consistent with or below approved background levels and below the NYSDEC SCO value.

All six soil samples had concentrations of nickel that were above the NYSDEC SCO value but below the EPA RSL. Concentrations of nickel were consistent with the approved background values. Similarly, five of the six samples for zinc were above the NYSDEC SCO value but below the EPA RSL for residential soil.

Risk Assessment

A review of all available analytical data was conducted prior to the performance of the risk assessment for SEAD-57. During this data evaluation step, inconsistencies were noted between the analytical results obtained during the ESI and RI groundwater sampling events. Further assessment indicated that elevated concentrations of certain key COPCs were present only during the ESI sampling event and were absent or significantly lower during the two subsequent RI sampling events. ESI groundwater samples were collected using bailers, whereas RI groundwater samples were collected using low flow bladder pumps.

Since the repetitive raising and lowering of a bailer into a well during the sample collection sequence is a more invasive sampling technique than the one-time lowering of the bladder pump prior to sample collection, it is likely that the noted concentration discrepancies for several of the key COPCs result from their presence in the sediment and silt that exists at the bottom of monitoring wells prior to sampling. Based on this determination, inordinately high groundwater concentrations noted for bis(2-ethylhexyl)phthalate, antimony and cobalt during the ESI sampling events were eliminated from the data set prior to the performance of the final risk assessment.

Estimated cancer risk levels for the park worker, the construction worker, and the recreational child visitor were all within the EPA acceptable range (i.e., 1 x 10^{-4} to 1 x 10^{-6}). Estimated cancer risk levels for the adult, child, and lifetime residential receptors at SEAD-57 were also within the EPA acceptable range (i.e., 1 x 10^{-4} to 1 x 10^{-6}) for carcinogenic risk.

Estimated non-carcinogenic HIs at SEAD-57 for the park worker, construction worker, and the recreational child visitor receptors were below the EPA preferred limit (i.e., 1). Estimated non-carcinogenic hazard indices for the adult and child residential receptors at SEAD-57 were above the EPA preferred limit of 1.

The evaluation of the potential adult and child residents' target organ or body system impacts due to exposure to SEAD-57 COPCs indicated that none of the adult resident's target organs would be subjected to an HI in excess of 1; therefore, the estimated aggregate HI for the adult was considered a conservative estimate of the potential non-carcinogenic hazard that was likely to exist at the site. However, several of the child's organs or body systems continued to show potential effects at levels in excess of 1.

Intake of groundwater represented approximately 40% of the child resident's overall non-carcinogenic HI. Further examination of the estimated hazard quotients contributing to the hazard projected for the child due to exposure to groundwater showed that intake of arsenic represents 43%, antimony 31%, and thallium 26% of the child's groundwater intake HI. The estimated effects due to intake of arsenic and antimony were associated with EPCs (i.e. 3.1 μg/L and 3.0 μg/L, respectively) that are below federal MCLs for drinking water (i.e., 10 μg/L and 6 μg/L, respectively) for these two analytes. As such, these values were considered conservative and likely to overestimate the HI that existed for the child's consumption of groundwater at the SEAD-57 site. Further, the groundwater pathway did not represent a complete exposure pathway at SEAD-57 as the shallow aquifer that underlies the site, and most of the Depot, does not yield a sufficient quantity of water to support potable water needs for a full-time residential application. Further, an alternative source of potable water exists within the Depot that is derived from a non-groundwater source, making use of the shallow aquifer unnecessary. The HI for the child resident dropped to 3.4E00 when use of groundwater was eliminated as an exposure pathway.

After the elimination of the groundwater pathway, the estimated target organ/system HI for the child's neurodevelopment/central nervous system, heart, liver, and endocrine glands remained above 1 due to their exposure to soil or dusts containing certain metals (i.e., aluminum, cobalt, iron and manganese) found at SEAD-57. Table 12 of the Draft Final Proposed Plan (Parsons, 2010d) summarized and compared the applicable EPCs for these metals versus guidance values and background concentrations seen in the vicinity of the Depot.

In each case, the metal's EPC was below the metal's respective EPA RSL for residential soil. Further, in the case where New York has identified an unrestricted use SCO value for the metal (i.e., manganese), the SCO value identified was higher than the EPC identified in the SEAD-57 soil. Finally, three (i.e., cobalt, iron, and manganese) of the EPCs used as the basis of the risk calculation for metals were below their respective 95th UCL background concentration. Further for aluminum, the site EPC concentration was less than 1 percent higher than its comparable 95th UCL background soil concentration indicating that risks from AOC-specific soils and background soils are indistinguishable. This suggested that the concentrations observed at SEAD-57 were just as likely to be associated with natural soil, and not attributable to contamination that has occurred at the site during its historic use.

Therefore, the potential non-carcinogenic impact associated with exposure to these metals could not be separated from that which was likely to occur due to exposure to native soils.

3.2.7 SEAD-007-R-01 - Grenade Range

3.2.7.1 History of Contamination and Initial Response

The Grenade Range, which was constructed in the mid-1980s, encompasses approximately 28 acres of land in the northwestern portion of the former Depot, to the west and southwest of SEAD-57 (see **Figure 3-1**). During its lifetime, the Grenade Range area contained wooden and armored vehicle targets, distance and boundary markers, and a range control tower. The Grenade Range is comprised primarily of open grassland that is surrounded by woods. The ASR (USACE, 1998) states that 40mm M781 (40mm Low Velocity Practice Cartridge) and 35mm M73 sub-caliber practice rockets were used at the Grenade Range during security forces' training. There is no record (or indication at the targets) that high explosive (HE) rounds were used. Small arms (blanks) casings were reported to be present at the time of the ASR (USACE, 1998).

3.2.7.2 Site Investigation Results

Soil Investigations

OE EE/CA

A geophysical investigation was conducted at the Grenade Range as part of the OE EE/CA. Eight hundred and sixty-five geophysical anomalies were identified and 102 MPPEH items were recovered. Items classified as MPPEH were comprised of 101, 35mm sub-cal LAW M73s, and one M407A1 Rifle Grenade. All MPPEH, MD, and cultural debris (CD) were identified and disposed of appropriately.

Munitions Response – Munitions Clearance

During the 2006 Munitions Response, 218 potential MPPEH items were detected at SEAD-007-R-01. All potential MPPEH items were related to the M73 Practice LAW Rocket and 40mm practice grenade. Since none of the practice rockets found at SEAD-007-R-01 had its motor intact, the practice rockets were reclassified as MD. However, since the M73 Practice Rockets potentially contained small, smokeemitting, bursting charges, all items were disposed by detonation as part of the final inerting process[23]. Based on the munitions response survey results, findings, quality control and quality assurance procedures performed at the AOC, SEAD-007-R-01 was considered to be cleared of MPPEH and no further action was required.

Munitions Response – Closure Sampling

Surface soil samples were collected at SEAD-007-R-01 as part of the Munitions Response and CERCLA closure activities. Forty-two samples were analyzed for TCL VOCs, SVOCs, pesticides, PCBs, TAL metals, and nitroaromatic and nitroamine compounds. Seven compounds exceeded the guidance values: one VOC, and six metals.

Acetone and arsenic had the most exceedances of any compound at SEAD-007-R-01. None of the acetone concentrations at SEAD-007-R-01 exceeded the EPA RSL for residential soil, but 32 did exceed the NYS SCO. As previously discussed, acetone is a known byproduct of sample preservation and analysis and the validity of the detected acetone concentrations is dubious.

Arsenic was detected in all soil samples at SEAD-007-R-01 at a concentration that exceeds the EPA RSL; however, arsenic concentrations in these samples were below approved background levels and the NYSDEC SCO value for arsenic.

Although other chemicals at SEAD-007-R-01 exceeded state or federal comparator values, residual concentrations, as measured by the 95th UCL, are below established guidance concentrations.

Risk Assessment

Projected non-carcinogenic HIs for all receptors, with the exception of the resident child, at SEAD-007-R-01 were below the EPA-recommended limit of 1. Projected carcinogenic risk for all receptors was within the EPA acceptable range (i.e., 1×10^{-4} to 1×10^{-6}).

With reference to the child resident's elevated non-carcinogenic HI, the analysis of the potential impacts to target organs or body systems was summarized in the Draft Final Proposed Plan (Parsons, 2010d). There were estimated hazard indices in excess of 1 noted for the child's neuro-development/central nervous system and their heart.

The ingestion of soil (60%) and the inhalation of dust (39%) primarily drove the elevated HI estimated for the child receptor. Five metals (aluminum, arsenic, cobalt, iron, and manganese) accounted for the elevated hazard; however, each metal was found at the site at an EPC that was below its respective EPA RSL for residential soil. The EPCs for arsenic and manganese were also below their respective New York State SCO value for unrestricted use.

Further, the EPC concentrations used for four of the metals of concern were lower than comparable background soil 95th UCL levels, while the EPC concentration used for aluminum was roughly 10

[23] The process by which all energetic material (i.e., primers, fuses, explosive or incendiary fill) contained in munitions has been removed or rendered harmless (source: http://en.wikipedia.org/wiki/Inert).

percent above its 95th UCL background level in soil and within the range of the approved background data set. Therefore, as was found for other sites, the child's potential impacts due to exposure to soil at SEAD-007-R-01 (Grenade Range) could not be differentiated from those that would occur due to soils at residential sites or to other background areas in the vicinity of the Depot.

Considering the above discussion, environmental conditions at the Grenade Range did not pose an unacceptable level of hazard or risk to Conservation/Recreation or Residential/Resort receptors.

3.2.8 SEAD-002-R-01 - EOD-2 and EOD-3

3.2.8.1 History of Contamination and Initial Response

SEAD-002-R-01 is comprised of two separate areas; EOD-2 and EOD-3 that are located in the northeastern portion of the former Depot in the vicinity of the Duck Pond and SEAD-46 (see **Figure 3-1**).

EOD-2 encompasses approximately 3 acres of land on the southwestern shore of the Duck Pond. This area is west-northwest of SEAD-46 and southeast of the intersection of Fayette Road and East-West Baseline Road. EOD-2 is comprised primarily of open grassland with small areas of brush and tree cover. A portion of the eastern boundary of this site is defined by the shore of the Duck Pond. A portion of EOD-2 is collocated with the western portion of SEAD-13, the former Inhibited Red-fuming Nitric Acid disposal area. The ASR (USACE, 1998) states that explosive devices were used in EOD-2, and that non-explosive projectiles were disposed near the Duck Pond.

EOD-3 encompasses approximately 4 acres of land approximately 250 feet north of the earthen protective barrier berm in SEAD-46. EOD-3 is mostly flat with the exception of a 100 foot by 200 foot depression in the middle of the site. The area surrounding the depression is wooded. The ASR (USACE, 1998) describes the AOC as a former EOD disposal area, and indicates that in the 1950s and 1960s the area surrounding the depression was clear of brush and trees.

3.2.8.2 Site Investigation Results

Soil Investigations

A geophysical investigation was conducted at SEAD-002-R-01 as part of the OE EE/CA. Twenty-one items were recovered during the investigation; one item was classified as MEC. Any items that were classified as MD or CD were identified and disposed of appropriately.

<u>Munitions Response – Munitions Clearance</u>

Two MPPEH items were found during the investigation at EOD-2; these two items were classified as MD after they were vented. These two items were an expended electric squibb and the fuseless body of an M16 APERS[24]. No MPPEH items were found at EOD-3. SEAD-002-R-01 is considered to be clear of MPPEH.

---

[24] M16 anti-personnel landmine.

Munitions Response – Closure Sampling

Surface soil samples were collected at SEAD-002-R-01 as part of the Munitions Response.

EOD-2

Twelve surface soil samples were collected from EOD-2 during the 2006 Munitions Response actions. Eight compounds exceeded the guidance values: one VOC, four SVOCs, and three metals.

Arsenic was detected in all soil samples at EOD-2 at concentrations that exceeded the EPA RSL; however, arsenic concentrations in these samples were below approved background levels and the NYSDEC SCO value for arsenic.

Acetone was found in eight samples at concentrations above the NYS SCO; however, as previously discussed, acetone detected in these samples was likely a byproduct of sample preservation and analysis and not a contaminant of concern.

The remaining compounds exceeded their respective comparator concentrations in fewer than one-quarter of the samples. Further, the exceedances for these compounds were above the NYS SCO or the EPA RSL, not both.

EOD-3

Nine surface soil samples were collected from EOD-3 during the Munitions Response actions. Two compounds exceed the guidance values: one VOC and one metal.

Arsenic was detected in all soil samples at EOD-3 at concentrations that exceeded the EPA RSL; however, arsenic concentrations in these samples were below approved background levels and the NYSDEC SCO value for arsenic.

Acetone was detected in six samples at concentrations that exceeded the NYSDEC SCO. As previously discussed however, acetone is a byproduct of the sample preservation and extraction procedure, and it was believed that the acetone in these samples did not result from releases that have occurred at EOD-3.

Risk Assessment

EOD -2

Projected non-carcinogenic HIs for the park worker and the recreational child visitor at SEAD-002-R-01 (EOD Area 2) were below the EPA-recommended limit of 1; projected non-carcinogenic HIs for the construction worker, adult resident, and child resident were above the limit. Projected carcinogenic risk for all receptors was within the EPA acceptable range (i.e., 1 x 10^{-4} to 1 x 10^{-6}).

The construction worker's target organ distribution HI was summarized in the Draft Final Proposed Plan (Parsons, 2010d). As is noted, there was no target organ or body system that was likely to be affected at a level in excess of the EPA's recommended limit of 1.

The adult and child resident's target organ/body system HI distribution was summarized in the Draft Final Proposed Plan (Parsons, 2010d). This summary indicated that hazard indices in excess of the EPA's limit of 1 were possible for the adult's and child's central nervous systems, and the child's heart, liver, and endocrine glands.

The largest components of the elevated hazard quotients were associated with soil that contained aluminum, cobalt, iron, and manganese. The soil EPCs generating the elevated hazard indices were

Manganese is the COPC that was the largest contributor to both the adult's and child's elevated HI. Review of the EPC for manganese at EOD Area 2 suggested that the value used was elevated compared to soil concentrations found in approved background levels, but the EPC was still below the concentrations identified as acceptable by the EPA for residential soil and by the state for unrestricted use.

Inhalation of dusts containing manganese was also the largest individual hazard quotient estimated for both the adult and child resident's HI. The inhalation hazard quotient calculated for manganese was based on an Rfc that is derived from an industrial study of battery manufacturing workers that were exposed to manganese dioxide. While soil at EOD 2 may contain some amount of manganese dioxide, it is unlikely that all manganese found exists solely in the form of manganese dioxide. Furthermore, the Rfc derived from this study was 4,000 times more stringent than the ACGIH's recommended TLV for manganese in industrial applications which further highlighted the extremely conservative nature of this calculation.

With reference to two other major COPCs (i.e., cobalt and iron), each of these was found in the soil at EOD-2 at concentrations that were below EPA residential soil RSL guidance values, and at concentrations that were below approved background levels. The EPC used for aluminum at EOD-2 was approximately 12.5% above the 95th UCL background soil concentration and still within the range of the dataset. This corresponded to an increased HI of 0.015 for the adult and 0.005 for the child resident. Both of these values were insignificant when compared to the level of uncertainty (probable over-estimation) that was associated with the reference dose used for manganese. This suggested that the concentrations observed at EOD-2 were just as likely to be associated with natural soil, and not attributable to contamination that has occurred at the site due to its historic use.

Based on these findings, it was the Army's conclusion that the environmental conditions that remained at EOD-2 posed no unacceptable non-carcinogenic hazard or carcinogenic risk to Conservation/Recreational receptors or Residential receptors.

SEAD-002-R-01 (EOD Area 3)

Non-carcinogenic HIs for all receptors, with the exception of the resident child, were below the EPA limit of 1. Projected carcinogenic risk for Conservation/Recreation receptors (i.e., parker worker, construction worker, and recreation child visitor) and Residential/Resort receptors (adult, child and lifetime resident) were within the EPA acceptable range (i.e., 1 x 10^{-4} to 1 x 10^{-6}).

The summary of potential effects to the child's target organs or body systems suggested that hazard indices in excess of EPA's preferred limit of 1 were estimated for the child's central nervous systems and for the heart. The largest components of the identified hazard quotients were associated with soil that contains aluminum, cobalt, iron, and manganese.

The soil EPCs generating the elevated hazard indices were summarized in the Draft Final Proposed Plan (Parsons, 2010d).

The EPC for each of the identified metals was below its listed EPA RSL for residential soil. The EPC for manganese was also below its respective New York SCO value, and the EPC used for cobalt and iron agree were lower than approved 95th UCL background soil concentrations. The hazard quotient derived for manganese was overly conservative as it was based on inhalation of manganese dioxide, which is not the only form of manganese that is likely to be found at the site. Aluminum again was observed at an EPC that was about nine percent higher than its background soil 95th UCL concentration and again within the range of the dataset, but for the child resident this only amounted to a potential HI increase of 0.04, which was insignificant when compared to the uncertainty that was associated with the HI determined for manganese.

Therefore, the observed risk associated with metals at EOD-3 were due to approved background conditions and could not be distinguished from effects that may have been associated with the natural setting at the Depot.

Thus, it was likely that the elevated non-carcinogenic hazard for the resident child overestimated the hazards that actually existed at EOD-3. The observed risks associated with metals at EOD-3 were due to background conditions and were not associated with any site contamination.

4.0 FIVE-YEAR REVIEW CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Based on a review of LUC RD, environmental easements, property transfer deeds, closure reports, and long term monitoring reports, and a site inspection conducted on April 6, 2011 and April 7, 2011, the Army has made the following conclusions:

- Land Use Controls employed at the Controlled Property are unchanged from the time of implementation;
- Any changes to the Long Term Monitoring employed at the Site have been approved by NYSDEC and EPA (e.g. termination of groundwater monitoring at SEAD-26);
- Nothing has occurred that would impair the ability of the Land Use Controls to protect the public health and environment; and
- Nothing has occurred that would constitute a violation or failure to comply with the Remedial Design for the Land Use Controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.
- Engineering controls, including necessary treatment and/or mitigation systems and associated institutional controls are in place, are performing properly and remain effective;
- Long Term monitoring requirements are being implemented;
- Operation and maintenance activities are being conducted properly; and

Based on this review, the remedy continues to be protective of public health and the environment and is compliant with the decision documents.

4.2 Recommendations

Based on this review, the Army recommends continuing the implementation of Land Use Controls and the periodic reviews.

The Army recommends that the groundwater monitoring frequency and schedule at SEAD-25 be changed from a semi-annual to an annual requirement and that the annual sampling be conducted at the same time each year when there is sufficient groundwater available in all wells to support the necessary sampling requirements. Additionally, monitoring of the downgradient wells at SEAD-25, MW25-8, MW25-13, MW25-15 and MW25-19 should be terminated as no COCs have been found at these wells during any of the post-RA sampling events. This would mean that the annual monitoring would be conducted only at wells MW25-2, MW25-3, MW25-9, MW 25-10 and MW25-17 where historic information indicates that COCs of interest have been found.

The Army also recommends that the annual groundwater monitoring requirement for SEAD-16 and SEAD-17 be terminated. This recommendation is based on the determination that groundwater has not been adversely impacted by the remedial action and that the Land Use Control (LUC) is in place and prevents access to, and use of the groundwater at these sites. The LUC is sufficient to protect human health and the environment by restricting the use of the groundwater. Since the groundwater use restriction is area-wide and not AOC-specific, and the post-RA groundwater monitoring shows no additional impacts, there is no requirement for continued monitoring.

4.3 Protectiveness Statement

Based upon the review of the CERCLA sites at the former Seneca Army Depot conducted by the Army, it has been determined that the remedies selected for the LUC/IC and LTM sites at the former SEDA remain protective of human health and the environment. Remedies have not been selected for SEAD-12, SEAD-72, SEAD-70, SEAD-45, SEAD-46, SEAD-57, SEAD-007-R-01, and SEAD-002-R-01. Evaluation of the remedies will be included in the next Five-Year Review.

4.4 Next Review

The next Five-Year Review for the FAA Technical Center should be completed before by 30 September 2016.

5.0 REFERENCES

ETI, 2001 - Bench-Scale Treatability Report in Support of a Granular Iron Permeable Reactive Barrier Installation at the Ash Landfill, Seneca Army Depot Activity, Romulus, New York, EnviroMetal Technologies Inc, September 2001

EPA, Army, and NYSDEC, 1993 - Federal Facility Agreement under CERCLA Section 120, Docket Number: II-CERCLA-FFA-00202, January 1993

EPA, 2002 - Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites, EPA 540-R-003, OSWER 9285.7-41, September 2002.

International Technology Corporation, 1995 - Building 360 Closure, Seneca Army Depot Activity, Final - Volume I, July 1995.

NYSDEC, 1996 - Technical and Administrative Guidance Memorandum #4046 Determination of Soil Cleanup Objectives and Cleanup Levels, January 1994.

NYSDEC, 2000 - NYSDEC, 2000 - Division of Water Technical and Operational Guidance Series 1.1.1 (TOGS 1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998 as amended January 1999 and April 2000.

NYSDEC, 2006 - 6 NYCRR Part 375 Environmental Remediation Programs Subparts 375-1 to 375- 4 & 375-6, December 2006.

Parsons 1994d – Action Memorandum Report, Ash Landfill, Seneca Army Depot, Romulus, New York, May 1994

Parsons ES, 1994a - Final SWMU Classification Report, Seneca Army Depot Activity, September 1994.

Parsons ES, 1994b - Remedial Investigation Report at the Open Burning Grounds, Final, October 1993

Parsons ES, 1994c - Remedial Investigation Report Ash Landfill Seneca Army Depot Romulus, New York, July 1994.

Parsons, 1995a - Expanded Site Investigation – Eight moderately Low Priority AOCs SEADs 5,9,12 (A and B), (43, 56, 69), 44 (A and B), 50, 58, and 59 Seneca Army Depot Activity, December 1995

Parsons ES, 1998 - Remedial Investigation Report at the Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26), Final, May, 1998.

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

Parsons ES, 1999b - Final Investigation of Environmental Baseline Survey Non-Evaluated Sites [SEAD 119A, SEAD 122 (A, B, C, D, E), SEAD 123 (A, B, C, D, E, F), SEAD 46, SEAD 68, SEAD 120 (A, B, C, D, E, F, G, H, I, J), and SEAD 121 (A, B, C, D, E, F, G, H, I)], May 1999.

Parsons ES, 1999c - Final Record of Decision (ROD) Former Open Burning (OB) Grounds Site, June 1999.

Parsons, 2001 - Phase I Remedial Investigation (RI) at the Fill Area West of Building 135 (SEAD-59), and the Alleged Paint Disposal Area (SEAD-71), Seneca Arm Depot Activity (FINAL), November 2001.

Parsons, 2002a - Decision Document, Mini Risk Assessment SEAD 9, 27, 28, 32, 33, 34, 43, 44A, 44B, 52, 56, 58, 62, 64A, 64B, 64C, 64D, 66, 68, 69, 70, and 120B, Seneca Army Depot Activity, Final, May 2002.Parsons, 2004a. Record of Decision (Rod) for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas, Final, September 2004.

Parsons, 2002b - Action Memorandum and Decision Document, Time-Critical Removal Actions, Three VOC Sites (SEADs 38, 39, & 40), Seneca Army Depot Activity, Final, August 2002.

Parsons, 2002c - Action Memorandum and Decision Document, Time-Critical Removal Actions, Four Metal Sites (SEADs 24, 50/54, & 67), Seneca Army Depot Activity, Final, August 2002.

Parsons, 2002d - Revised Final Remedial Investigation (RI) Report at the Radioactive Waste Burial Sites (SEAD-12), August 2002.

Parsons, 2003 – Record of Decision (ROD) Twenty No-Action SWMUs (SEADs 7, 9,10,18,19, 20, 21, 22, 33, 35, 36, 37, 42, 47, 49, 51, 53, 55, 65, and 68) and Eight No-Further-Action SWMUs (SEADs 28, 29,30,31, 32, 34, 60 and 61), Final, September 2003.

Parsons, 2004a - Record of Decision (ROD) for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas, Final, September 2004.

Parsons, 2004b - Record of Decision for the Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26), Final, July 2004.

Parsons, 2004c - Record of Decision for the Ash Landfill Operable Unit, Final, July 2004.

Parsons, 2004d –Decision Document – Mini Risk Assessment SEAD-13 Inhibited Red Fuming Nitric Acid (IRFNA) Disposal Site, Final, July 2004.

Parsons, 2004e - Characterization Report, Small Arms Range – Airfield (SEAD-122B), Revised Final, October 2004.

Parsons, 2004f - Ordnance and Explosives Engineering Evaluation Cost Analysis Report (OE EE/CA), Final, January 2004.

Parsons, 2005a - Remedial Design Work Plan and Design Report for the Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26), Final, June 2005.

Parsons, 2005b - Record of Decision for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Final, July 2005.

Parsons, 2006a - Construction Completion Report for the Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26), Final, November 2006.

Parsons, 2006b - Remedial Design Work Plan for the Ash Landfill Site at Seneca Army Depot Activity, July 2006.

Parsons, 2006c - Remedial Design Report for the Ash Landfill Operable Unit, August 2006.

Parsons, 2006d - Phase II Remedial Investigation Report for the Fill Area West of Building 135 (SEAD-59) and the Alleged Paint Disposal Area (SEAD-71), Draft Final April 2006.

Parsons, 2006e - Remedial Investigation Report for Two EBS Sites in the Planned Industrial Development Area (SEAD 121C and SEAD-121I), Final, April 2006.

Parsons, 2007a - Record of Decision for 17 No Action/No Further Action SWMUs Requiring Land Use Controls (SEADs 13,39,40,41,43/56/69,44A,44B.,52,62,64B, 64C, 64D, 67, 122B and l22E, Final, March 2007.

Parsons, 2007b - SEAD-25 & SEAD-26 Annual Report, February 2007.

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

Parsons, 2007d –Long-Term Monitoring Plan for the Open Burning (OB) Grounds, Final, January 2007.

Parsons, 2008a - Year 2 SEAD-25 Annual Report, June, 2008.

Parsons, 2008b - Annual Report and One Year Review for the Ash Landfill Operable Unit, May 2008.

Parsons, 2008c - Draft Final Completion Report for Building Cleaning and Building Demolition Seneca Army Depot Activity, Romulus, New York, November 2008.

Parsons, 2008d - Record of Decision the Defense Reutilization and Marketing Office Yard (SEAD-121C) and the Rumored Cosmoline Oil Disposal Area (SEAD-121I) Seneca Army Depot Activity, Final, June 2008.

Parsons, 2008e – Final Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) Seneca Army Depot Activity, Romulus, NY, September 2008.

Parsons 2009a - Record Of Decision for Five Former Solid Waste Management Units (SWMUs) SEAD-1, Hazardous Waste Container Storage Facility; SEAD-2, PCB Transformer Storage Facility; SEAD-5, Sewage Sludge Waste Piles; SEAD-24, Abandoned Powder Burn Pit; and, SEAD-48, Row E0800 Pitchblende Storage Igloos, Final, April 2009

Parsons, 2009b - Annual Report and Year Two Review for the Ash Landfill Operable Unit, June 2009.

Parsons, 2009c - Record of Decision for the Fill Area West of Building 135 (SEAD-59) and the Alleged Paint Disposal Area (SEAD-71) Seneca Army Depot Activity, March 2009.

Parsons, 2009d - Annual Report – Year 2 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Final, September 2009.

Parsons, 2009e - Remedial Action Operations Plan, Former Sludge Waste Piles (SEAD-5), Seneca Army Depot Activity, Final, October 2009.

Parsons, 2010a - Annual Report – Year 3 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Draft Final, December 2010.

Parsons, 2010b - Annual Report and Year Three Review for the Ash Landfill Operable Unit, Draft, April 2010.

Parsons, 2010c - Construction Completion Report for the Former Sewage Sludge Waste Piles (SEAD-5), Final, July 2010.

Parsons, 2010d - Proposed Plan for No Further Action at Munitions Response Sites SEAD-46, SEAD-57, SEAD-007-R-01, SEAD-002-R-01, and SEAD-70, Draft Final, May 2010.

Parsons, 2010e - Completion Report Additional Munitions Response Site Investigations, Draft, May 2010.

Parsons, 2011a - Long-Term Monitoring Report for the Fire Training and Demonstration Pad (SEAD-25), Final, January 2011.

Parsons, 2011b - Annual Report 2010 – Year 4 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Draft, April 2011.

Parsons, 2011c - Long-Term Monitoring Annual Report 2010 Open Burning Grounds Draft Final, March 2011

Parsons, 2011d - Long-Term Monitoring and Site Assessment Report for the Fire Training and Demonstration Pad (SEAD-25), Draft, May 2011

Parsons, 2011e – Annual Report and Year 4 Review, Ash Landfill Operable Unit, Seneca Army Depot Activity, Draft, May 2011.

RKG Associates, Inc., 1996 - Reuse Plan and Implementation Strategy for the Seneca Army Depot Activity, December 1996.

Shaw, 2005 – Geophysical Investigation Munitions Destruction Areas SEADs 46 & 57, Seneca Army Depot Activity, Romulus, New York, Shaw Environmental Inc., April 2005.

USACE, 1998 - Archives Search Report (ASR), Conclusions and Recommendations, Seneca Army Depot, Final (USACE, 1998).

USACE, 2006 - Land Use Control Remedial Design for SEAD-27, 66, and 64A, Final, December 2006.

USACE, 2007 - Addendum 1 - SEAD 25 and SEAD 26, Land Use Control Remedial Design for SEAD 27, 66, and 64A, Final, May 2007.

USACE, 2008a - Addendum 2 - SEAD 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and122E, Land Use Control Remedial Design for SEAD 27, 66, and 64A, Final, March 2008.

USACE, 2008b - Addendum # 3 to Land Use Control Remedial Design for Seneca Army Depot Activity Romulus, New York, Addressing SEADs 3, 6, 8, 14, and 15 (Ash Landfill), November 2008.

USACE, 2009 - Addendum #4 to Land Use Control Remedial Design for Seneca Army Depot Activity Romulus, New York, Addressing SEADs 1, 2, 5, 16, 17, 59, 71, 121C, and 121I, July 2009.

USAEHA, 1979 – Army Pollution Abatement Program Study, No. D-1031-W, Landfill Leachate Study Seneca Army Depot, Romulus, New York 23 July – 3 August 1979.

USAEHA, 1987 - Interim Final Report, Groundwater Contamination Survey No. 38-26-0868-88, U.S. Army Environmental Hygiene Agency, July 1987

Weston, 2003 – Seneca Army Depot Activity UXO and Soil Remediation AREA-44A Seneca County, Romulus, New York, May 2003.

Weston, 2004 - Seneca Army Depot VOC Sites – SEADs 39 and 40, Time-Critical Removal Action, Seneca County, Romulus, New York, October 2004.

Weston, 2005a - Seneca Army Depot Activity Time-Critical Removal Action Metal Sites – SEAD 67, Seneca County, Romulus, New York, February, 2005.

Weston, 2005b - Soil and Sediment Remediation Open Burning Grounds Completion Report, June 2005.

TABLES

Table 1

Land Use Control Remedial Design

Site Description / Title

SITE DESCRIPTION	**DOCUMENT**
SEAD 27- STEAM JENNY PIT	REMEDIAL DESIGN
SEAD 64A- GARBAGE DISPOSAL AREA	REMEDIAL DESIGN
SEAD 66- PESTICIDE STORAGE AREA	REMEDIAL DESIGN
SEAD 25- FIRE DEMONSTRATION PAD	ADDENDUM 1
SEAD 26- FIRE TRAINING AREA	ADDENDUM 1
SEAD 39 - BUILDING 121 BOILER BLOW DOWN PIT	ADDENDUM 2
SEAD 40 - BUILDING 319 BOILER BLOW DOWN PIT	ADDENDUM 2
SEAD 41- BUILDING 718 BOILER BLOW DOWN PIT	ADDENDUM 2
SEAD 67 - DUMPSITE EAST OF STP 4	ADDENDUM 2
SEAD 13 - INHIBITED RED FUMING NITRIC ACID (IRFNA)	ADDENDUM 2
SEAD 64B- GARBAGE DISPOSAL AREA	ADDENDUM 2
SEAD 64C- RUMORED GARBAGE DISPOSAL AREA	ADDENDUM 2
SEAD 64D- GARBAGE DISPOSAL AREA	ADDENDUM 2
SEAD 122B- AIRFIELD SMALL ARMS RANGE	ADDENDUM 2
SEAD 122E- DEICING LOCATIONS	ADDENDUM 2
SEAD 44A- QUALITY ASSURANCE TEST LAB WEST	ADDENDUM 2
SEAD 44B- QUALITY ASSURANCE TEST LAB	ADDENDUM 2
SEAD 43- OLD MISSILE PROPELLANT TEST LAB	ADDENDUM 2
SEAD 56- HERBICIDE AND PESTICIDE STORAGE	ADDENDUM 2
SEAD 69- BUILDING 606 DISPOSAL AREA	ADDENDUM 2
SEAD 62- NICOTINE SULFATE DISPOSAL AREA	ADDENDUM 2
SEAD 52- AMMUNTION BREAKDOWN AREA	ADDENDUM 2
ASH LANDFILL OPERABLE UNIT (SEAD 3, 6, 8, 14, and 15)	ADDENDUM 3

Table 2 - Summary of Historic Areas of Concern at Seneca Army Depot and Current Deposition

Site Status	Site Number	Site Name	LUC Requirement									
			Prohibit Residential, Schools, Childcare Facilities, & Playgrounds	GW Use Restriction	GW LTM Required	GW Use Deed Restriction	Maintain Remedial & Monitoring Wells System	No Digging Permitted	Soil Cap Vegetative Cover Inspection	Soil Cap Erosion Inspection	Army Retained Property	Prison Parcel Reversionary Deed
LUC/IC	SEAD 1	Hazardous Waste Container Storage Facility (Building 307)	X	X								
	SEAD 2	PCB Transformer Storage Facility (Building 301)	X	X								
	SEAD 5	Sewage Sludge Storage Piles	X	X				X		X		
	SEAD 13	Inhibited Red Fuming Nitric Acid (IRFNA) Disposal Site		X			X					
	SEAD 16	Building S311, Abandoned Deactivation Furnace	X	X	X							
	SEAD 17	Building 367, Active Deactivation Furnace	X	X	X							
	SEAD 23	Open Burning Ground			X			X		X		
	SEAD 25	Fire Training and Demonstration Pad	X	X	X		X					
	SEAD 26	Fire Training Pit	X	X								
	SEAD 27	Steam Cleaning Waste Tank (Building 360 - Steam Jenny Pit)	X	X								
	SEAD 39	Building 121 Boiler Plant Blowdown Leach Pit	X	X								
	SEAD 40	Building 319 Boiler Plant Blowdown Leach Pit	X	X								
	SEAD 41	Building 718 Boiler Plant Blowdown Leach Pit				X						
	SEAD 43/56/69	• SEAD-43 Building 606 Old Missile Propellant Test Laboratory • SEAD-56 Building 606 Herbicide and Pesticide Storage • SEAD-69 Building 606 Disposal Area										X
	SEAD 44A	Quality Assurance Test Laboratory, West of Building 616										X
	SEAD 44B	Quality Assurance Test laboratory, Brady Road										X
	SEAD 52	Building 608 and 612 Ammunition Breakdown Area										X
	SEAD 59	Fill Area West of Building 135	X	X								
	SEAD 62	Nicotine Sulfate Disposal Area near Building 606 and 612										X
	SEAD 64A	Garbage Disposal Area, Debris Landfill south of Storage Pad	X	X				X				
	SEAD 64B	Garbage Disposal Area, Disposal Area South of Classification Area						X				
	SEAD 64C	Garbage Disposal Area, Proposed Landfill Site										X
	SEAD 64D	Garbage Disposal Area, Disposal Area West of Building 2203		X			X	X				
	SEAD 66	Pesticide Storage Area near Buildings 5 and 6	X	X								
	SEAD 67	Dump Site east of S\ewage Treatment Plant No. 4	X	X								

X* - Indicate that the site is located with the PID Area and subject to the PID Land Use restrictions. The PID/Warehouse Area also includes No Action/No Further Action ("NA/NFA") sites. NA/NFA sites may be suitable for uses other than industrial. Upon request by a future property owner, the Army, USEPA Region II, and NYSDEC will evaluate any requested variances to the Land Use Restrictions regarding a NA/NFA site on a site-by-site basis.

Table 2 - Summary of Historic Areas of Concern at Seneca Army Depot and Current Deposition (cont)

Site Status	Site Number	Site Name	LUC Requirement									
			Prohibit Residential, Schools, Childcare Facilities & Playgrounds	GW Use Restriction	GW LTM Required	GW Use Deed Restriction	Maintain Remedial & Monitoring Wells System	No Digging Permitted	Soil Cap Vegetative Cover Inspection	Soil Cap Erosion Inspection	Army Retained Property	Prison Parcel Reversionary Deed
LUC/IC	SEAD 71	Alleged Paint Disposal Area	X	X								
	SEAD 121C	Defense Reutilization and Marketing Office (DRMO) Yard	X	X								
	SEAD 121I	Rumored Cosmoline Disposal Area	X	X								
	SEAD 122B	Small Arms Range, Airfield	X									
	SEAD 122E	Plane Deicing Area	X									
LTMM	Ash Landfill Operable Unit including SEADs 3, 6, 8, 14, & 15	Ash Landfill Operable Unit • SEAD-3 Incinerator Cooling Water Pond • SEAD-6 Abandoned Ash Landfill • SEAD-8 Non-Combustible Fill Area • SEAD-14 Refuse Burning Pits (2 units) • SEAD-15 Abandoned Solid Waste Incinerator (Building 2207)		X			X	X	X	X		
	SEAD 5	Sewage Sludge Waste Piles	X	X				X		X		
	SEAD 16	Building S311, Abandoned Deactivation Furnace	X	X	X							
	SEAD 17	Building 367, Active Deactivation Furnace	X	X	X							
	SEAD 23	Open Burning Ground										
	SEAD 25	Fire Training and Demonstration Pad	X	X	X		X					
	SEAD 26	Fire Training Pit	X	X								
	SEAD 64B	Garbage Disposal Area, Disposal Area South of Classification Area						X				
	SEAD 64D	Garbage Disposal Area, Disposal Area West of Building 2203		X			X	X				
Ongoing Remedial Action	SEAD 12	Radiological Waste Burial Sites									X	
	SEAD 72	Building 803, Mixed Waste Storage Area									X	
	SEAD 45	Open Detonation Area									X	
	SEAD 46	Small Arms Range (aka 3.5-inch Rocket Range)									X	
	SEAD 57	Explosive Ordnance Disposal Area (#1)									X	
	SEAD 007-R-01	Grenade Range									X	
	SEAD-002-R-01	Explosive Ordnance Disposal Areas #2 and #3									X	
	SEAD 70	Building 2110, Fill Area									X	

X* - Indicate that the site is located with the PID Area and subject to the PID Land Use restrictions. The PID/Warehouse Area also includes No Action/No Further Action ("NA/NFA") sites. NA/NFA sites may be suitable for uses other than industrial. Upon request by a future property owner, the Army, USEPA Region II, and NYSDEC will evaluate any requested variances to the Land Use Restrictions regarding a NA/NFA site on a site-by-site basis.

Table 2 - Summary of Historic Areas of Concern at Seneca Army Depot and Current Deposition (cont'd)

Site Status	Site Number	Site Name	LUC Requirement									
			Prohibit Residential, Schools, Childcare Facilities & Playgrounds	GW Use Restriction	GW LTM Required	GW Use Deed Restriction	Maintain Remedial & Monitoring Wells System	No Digging Permitted	Soil Cap Vegetative Cover Inspection	Soil Cap Erosion Inspection	Army Retained Property	Prison Parcel Reversionary Deed
Pre-ROD	SEAD 12	Radioactive Waste Burial Sites									X	
	SEAD 72	Building 803, Mixed Waste Storage Facility									X	
	SEAD 70	Building 2110, Fill Area									X	
	SEAD 45	Open Detonation Area									X	
	SEAD 46	Small Arms Range (aka 3.5-inch Rocket Range)									X	
	SEAD 57	Explosive Ordnance Disposal Area (#1)									X	
	SEAD 007-R-01	Grenade Range									X	
	SEAD-002-R-01	Explosive Ordnance Disposal Areas #2 and #3									X	
NFA	SEAD 4	Munitions Washout Facility Leach Field										
NA	SEAD 7	Shale Pit										
NA	SEAD 9	Old Scrap Wood Site	X*	X*								
NA	SEAD 10	Present Scrap Wood Site	X*	X*								
NFA	SEAD 11	Old Construction Debris Landfill										
NA	SEAD 18	Building 709, Classified Document Incinerator										
NA	SEAD 19	Building 801, Classified Document Incinerator										
NA	SEAD 20	Sewage Treatment Plant No. 4	X*	X*								
NA	SEAD 21	Sewage Treatment Plant No. 715										
NA	SEAD 22	Sewage Treatment Plant No. 314	X*	X*								
NFA	SEAD 24	Abandoned Powder Burning Pit	X	X								
NFA	SEAD 28	Building 360, Underground Waste Oil Tanks (2)	X*	X*								
NFA	SEAD 29	Building 732, Underground Waste Oil Tank										
NFA	SEAD 30	Building 118, Underground Waste Oil Tank	X*	X*								
NFA	SEAD 31	Building 117, Underground Waste Oil Tank	X*	X*								
NFA	SEAD 32	Building 718, Underground Waste Oil Tanks (2)										
NA	SEAD 33	Building 121, Underground Waste Oil Tank	X*	X*								
NFA	SEAD 34	Building 319, Underground Waste Oil Tank	X*	X*								

X* - Indicate that the site is located with the PID Area and subject to the PID Land Use restrictions. The PID/Warehouse Area also includes No Action/No Further Action ("NA/NFA") sites. NA/NFA sites may be suitable for uses other than industrial. Upon request by a future property owner, the Army, USEPA Region II, and NYSDEC will evaluate any requested variances to the Land Use Restrictions regarding a NA/NFA site on a site-by-site basis.

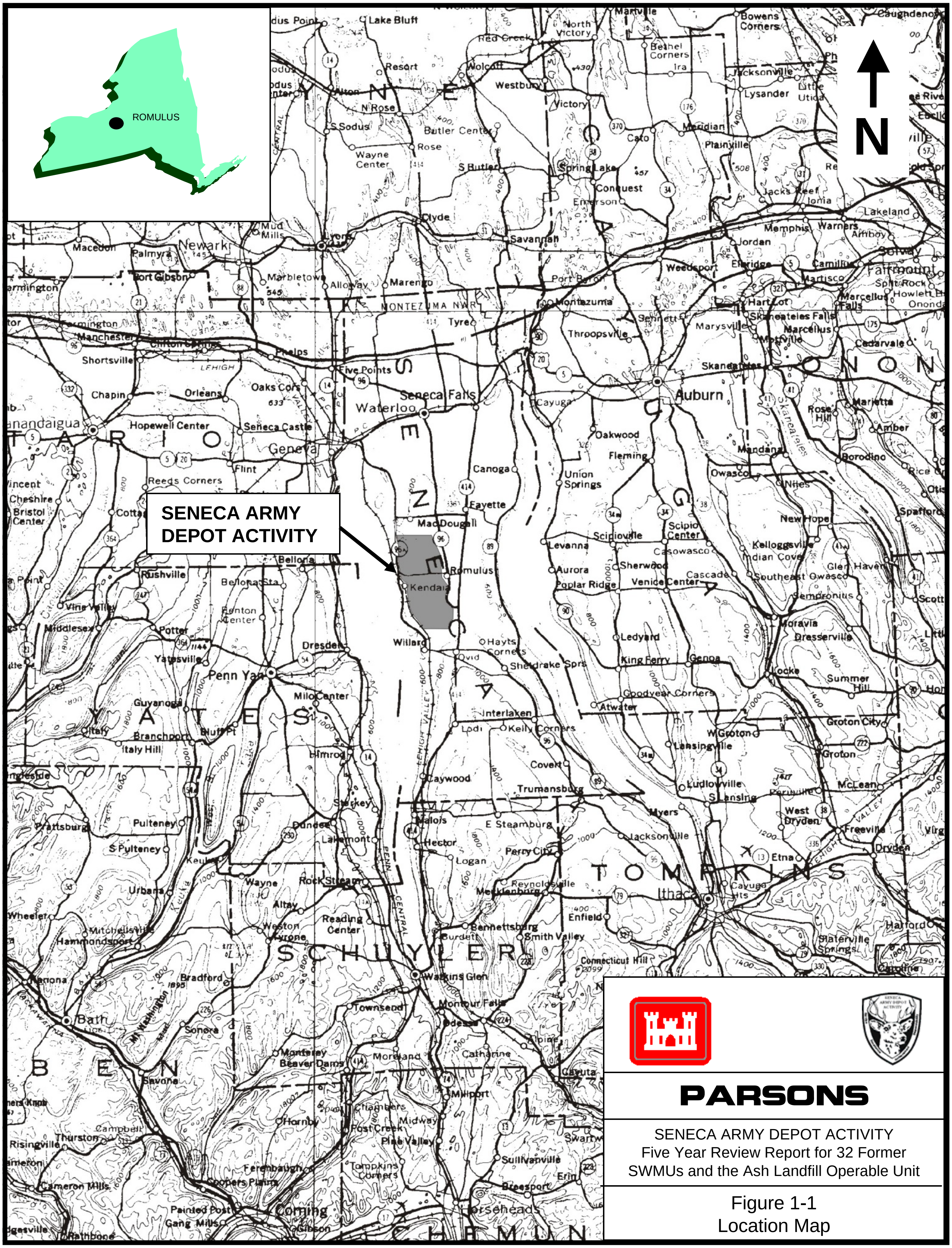
Table 2 - Summary of Historic Areas of Concern at Seneca Army Depot and Current Deposition (cont'd)

Site Status	Site Number	Site Name	LUC Requirement									
			Prohibit Residential, Schools, Childcare Facilities, & Playgrounds	GW Use Restriction	GW LTM Required	GW Use Deed Restriction	Maintain Remedial & Monitoring Wells System	No Digging Permitted	Soil Cap Vegetative Cover Inspection	Soil Cap Erosion Inspection	Army Retained Property	Prison Parcel Reversionary Deed
NA	SEAD 35	Building 718, Waste Oil Burning Boilers (3 units)										
NA	SEAD 36	Building 121, Waste Oil Burning Boilers (2 units)	X*	X*								
NA	SEAD 37	Building 319, Waste Oil Burning Boilers (2 units)	X*	X*								
NFA	SEAD 38	Building 2079, Boiler Plant Blowdown Leach Pit										
NA	SEAD 42	Building 106, Preventive Medicine Laboratory	X*	X*								
NA	SEAD 47	Building 321 and 806, Radiation Calibration Source Storage	X*	X*								
NFA	SEAD 48	Pichblende Ore Storage Igloos										
NA	SEAD 49	Building 356, Columbite Ore Storage	X*	X*								
NFA	SEAD 50	Tank Farm	X*	X*								
NA	SEAD 51	Herbicide Usage, Perimeter of High Security Area										
NA	SEAD 53	Munitions Storage Igloos										
NFA	SEAD 54	Asbestos Storage	X*	X*								
NA	SEAD 55	Building 357, Tannin Storage	X*	X*								
NA	SEAD 58	Debris Area near Booster Station 2131										
NFA	SEAD 60	Oil Discharge adjacent to Building 609										#
NFA	SEAD 61	Building 718, Underground Waste Oil Tank										
NFA	SEAD 63	Miscellaneous Components Burial Area										
NA	SEAD 65	Acid Storage Area										
NA	SEAD 68	Building S-355, Old Pest Control Shop	X*	X*								

- SEAD-60 was not included in the ROD associated with the Prison Parcel Reversionary Deed.

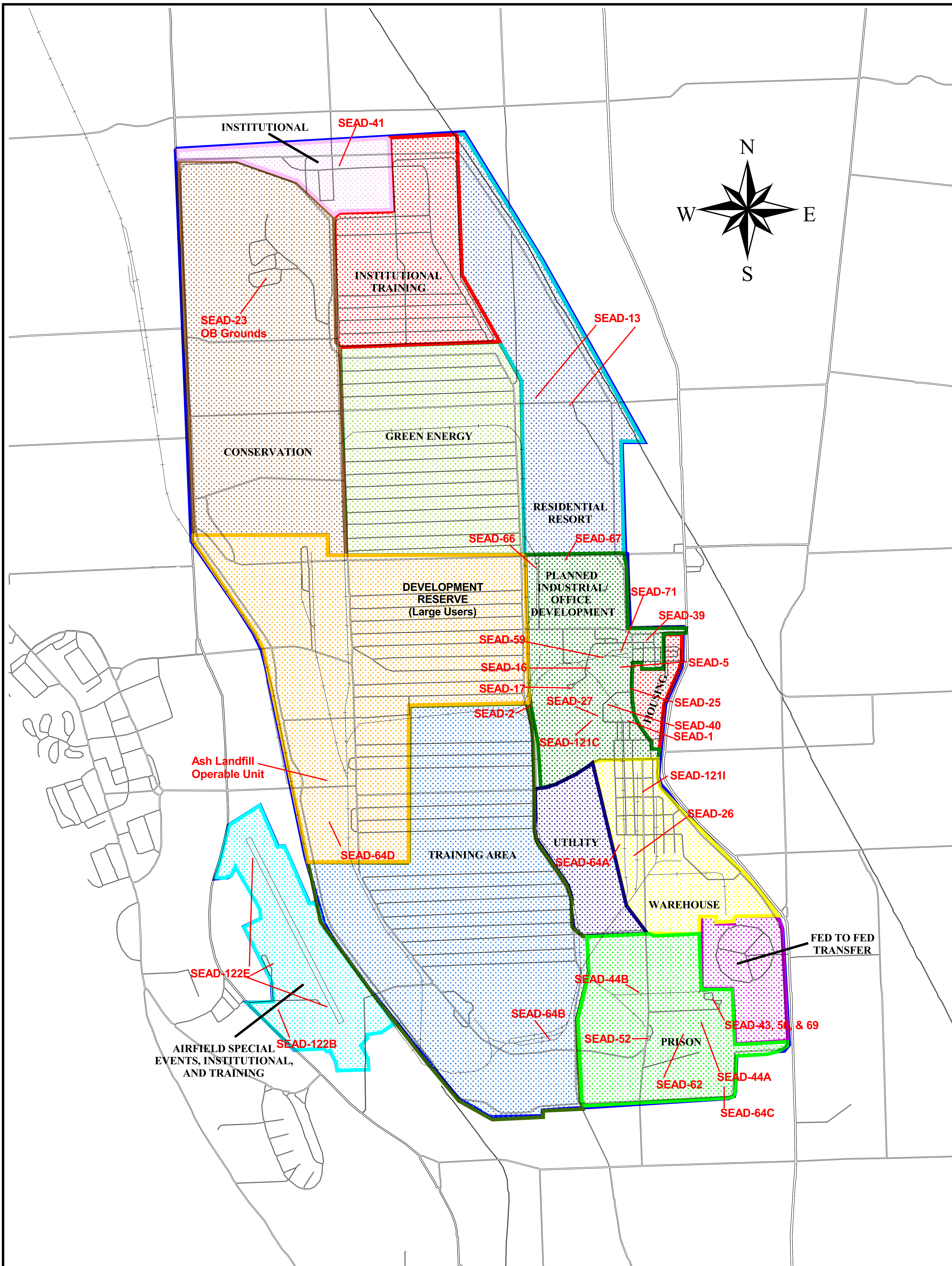
X* - Indicate that the site is located with the PID Area and subject to the PID Land Use restrictions. The PID/Warehouse Area also includes No Action/No Further Action ("NA/NFA") sites. NA/NFA sites may be suitable for uses other than industrial. Upon request by a future property owner, the Army, USEPA Region II, and NYSDEC will evaluate any requested variances to the Land Use Restrictions regarding a NA/NFA site on a site-by-site basis.

FIGURES



SENECA ARMY DEPOT ACTIVITY
Five Year Review Report for 32 Former
SWMUs and the Ash Landfill Operable Unit

Figure 1-1
Location Map



LEGEND

5000 0 5000 10000 Feet

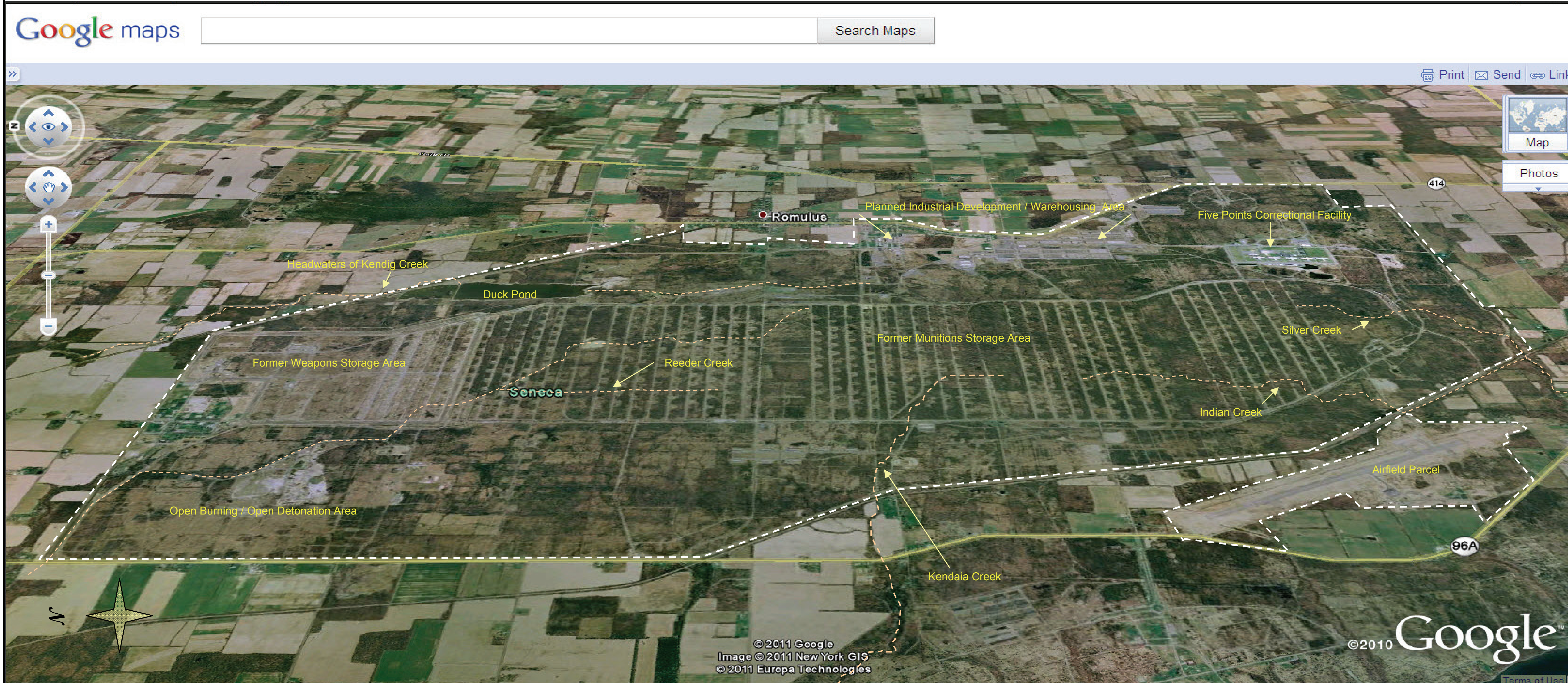
PARSONS

SENECA ARMY DEPOT ACTIVITY
Five Year Review Report for 32 Former SWMUs and the Ash Landfill Operable Unit

Figure 1-2
Future Land Use and Location of Institutional Control Sites

September 2011

O:\Seneca\Noact\prap-rod-NFA newlanduses.apr\Five Year Review Sites



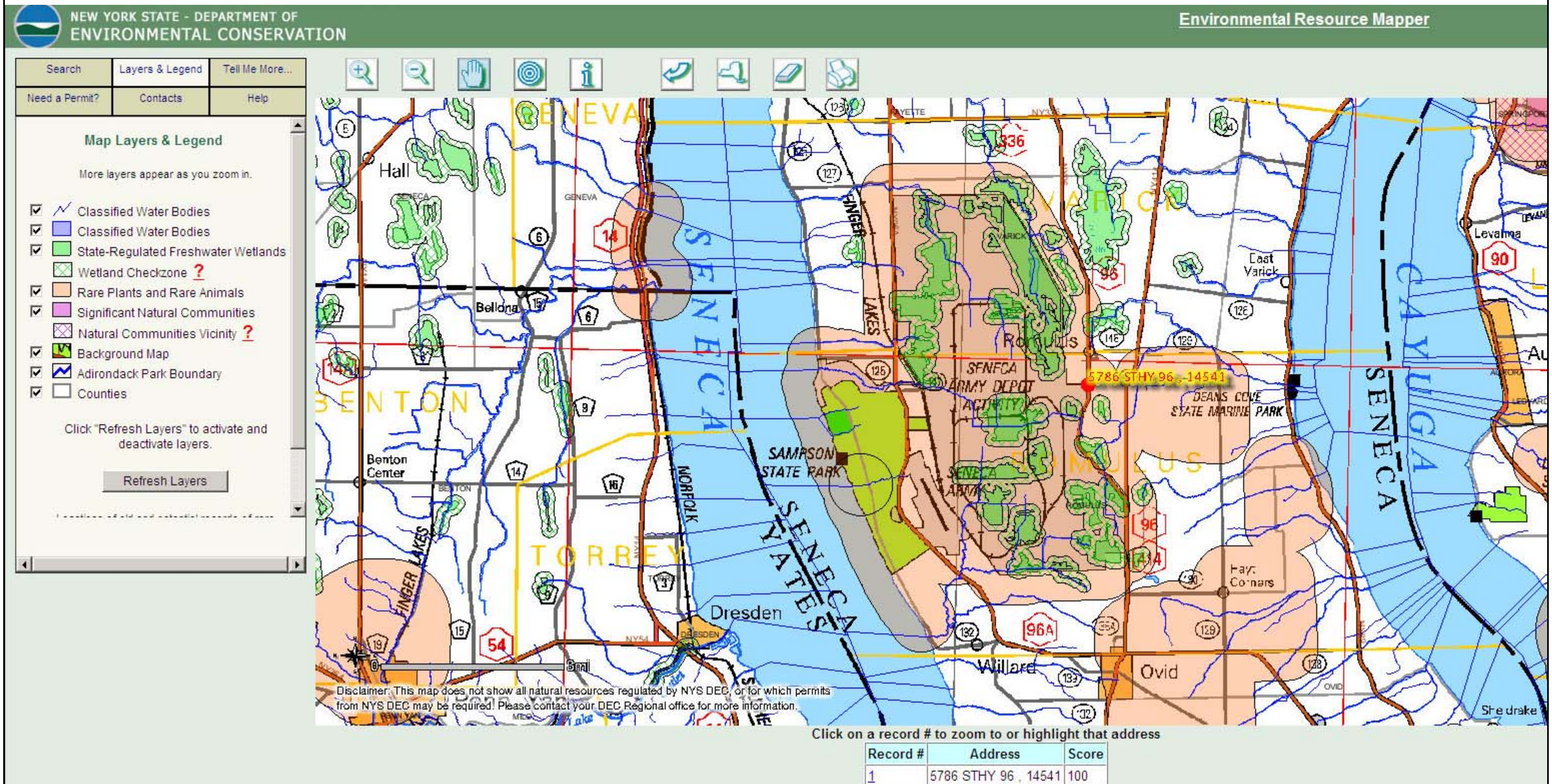
Approximate Creek Path

Approximate Depot Boundary

PARSONS

SENECA ARMY DEPOT ACTIVITY
Five Year Review Report for 32 Former SWMUs and the Ash Landfill Operable Unit

Figure 2-1
Aerial View of Former Depot



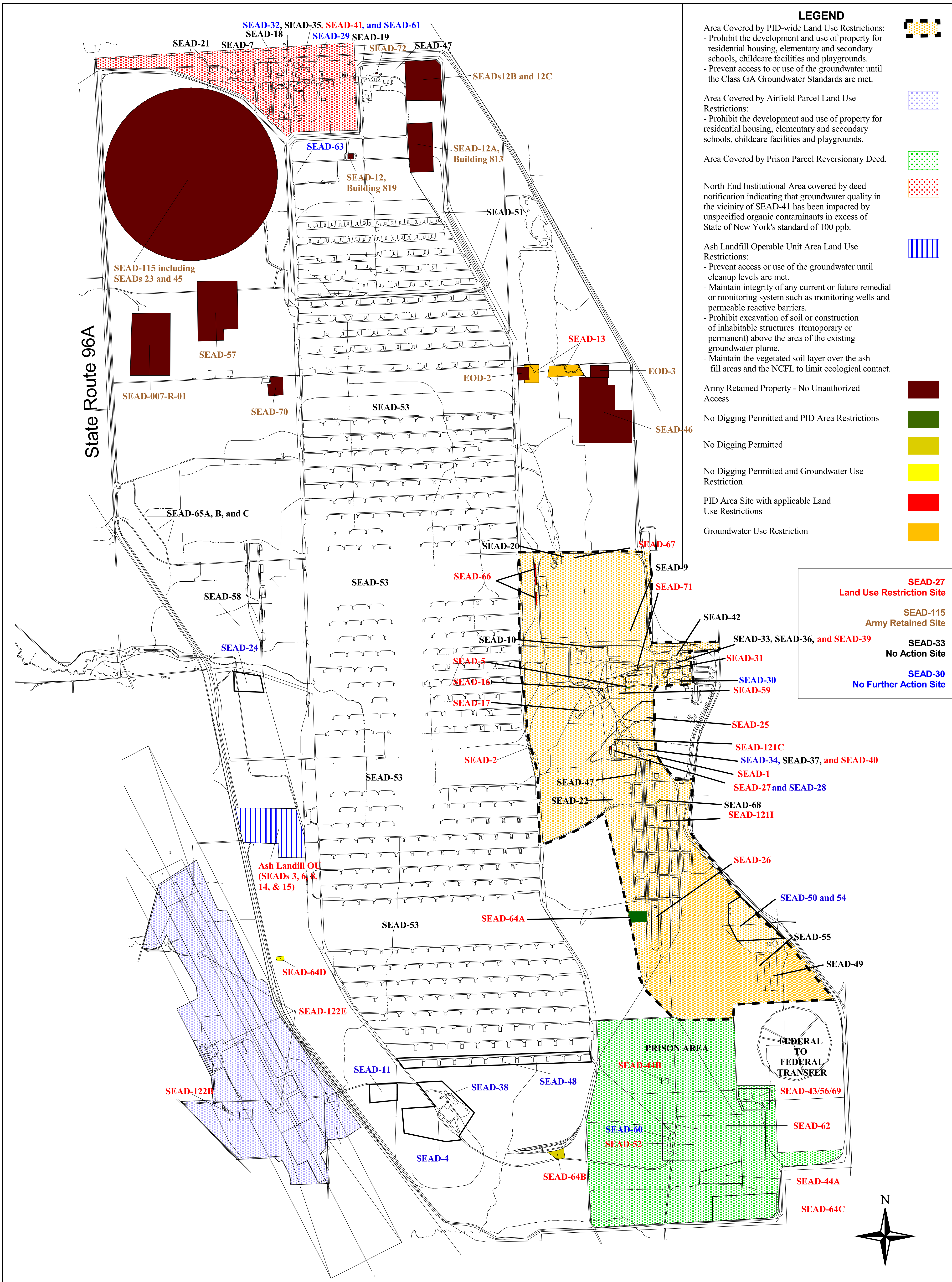
Source: New York State Department of Environmental Conservation, http://www.dec.ny.gov/imsmaps/ERM/viewer.htm,

5786 State Highway 96, Romulus, New York 14541

PARSONS

SENECA ARMY DEPOT ACTIVITY
Five Year Review Report for 32 Former SWMUs and the Ash Landfill Operable Unit

Figure 2-2
Environmental Resources at SEDA



Land Use Control, Remedial Design, Version

2500 0 2500 5000 Feet

PID Area LUC Sites, SEADs 27, 64A, and 66

LUC Addendum #1, SEADs 25 and 26

LUC Addendum #2, SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E

LUC Addendum #3, Ash Landfill Operable Unit SEADs 3, 6, 8, 14 and 15

LUC Addendum #4, SEADs 1, 2, 5, 16, 17, 59, 71, 121C, and 121I

o:\seneca\pid luc\seneca lur amend 4 april 2009.apr\SEDA 5 Yr Review

PARSONS

SENECA ARMY DEPOT ACTIVITY
FIVE YEAR REVIEW REPORT

FIGURE 3-1
EXTENT OF SEDA
LAND USE RESTRICTION

June 2011

LEGEND:

- PAVED ROAD
- DIRT ROAD
- GROUND CONTOUR AND ELEVATION
- TREE
- WETLAND & DESIGNATION
- BRUSH
- CHAIN LINK FENCE
- UTILITY POLE
- APPROXIMATE LOCATION OF FIRE HYDRANT
- FUEL OR UNDERGROUND STORAGE TANK
- SURVEY MONUMENT (SEAD-1 EL.630.90')
- MONITORING WELL AND DESIGNATION (PT-22)
- RAILROAD TRACKS
- WATER MAIN
- APPROXIMATE EXTENT OF IRM SOIL TREATMENT AND EXCAVATION
- APPROXIMATE AREA REQUIRING LAND USE CONTROLS
- SEDA PROPERTY BOUNDARY
- OU BOUNDARY

NOTE:
FIGURE SHOWS PRE-CONSTRUCTION CONDITIONS

100 0 100 200
(feet)

PARSONS

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY

FIVE-YEAR REVIEW REPORT

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 3-2

ASH LANDFILL HISTORIC SITE MAP

SCALE | DATE APRIL 2011 | REV

APPENDICES

APPENDIX A

PHOTO LOG

Figure A-1
5 Year Review - Site Visit Photo Log
SEAD-1 Hazardous Waste Container Storage Facility (Building 307)

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

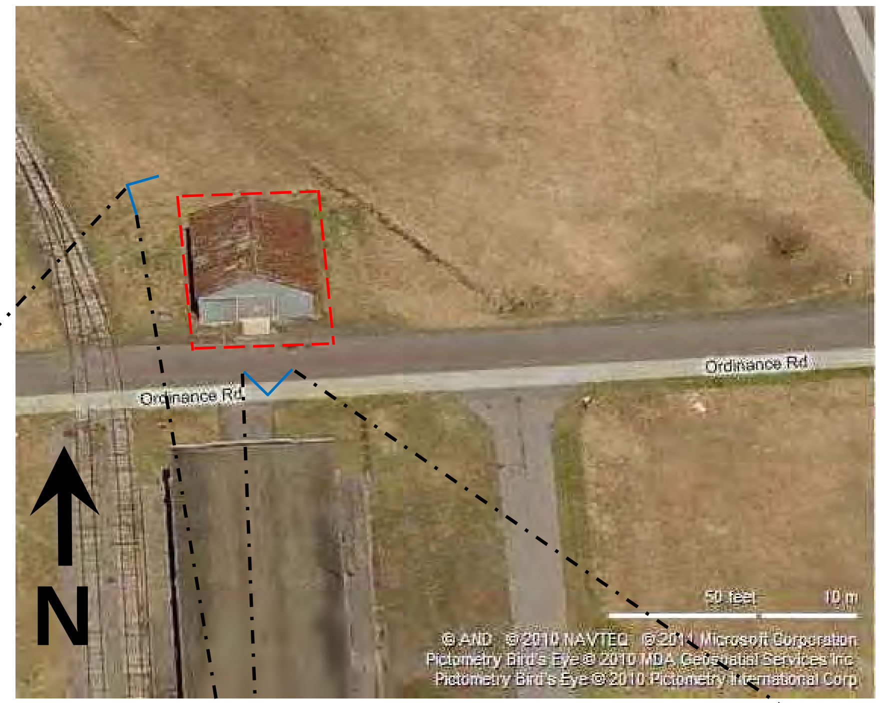
LOCATION: SEAD-1, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

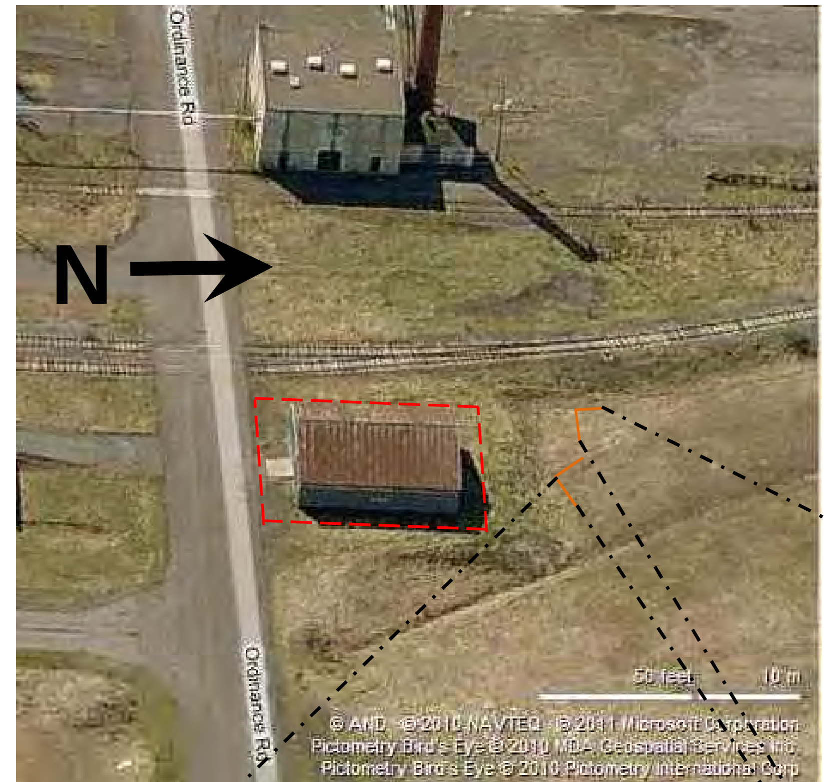
P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\SEAD-1_Aerial_n_Ground_Photos.ppt

Approximate Site Boundary

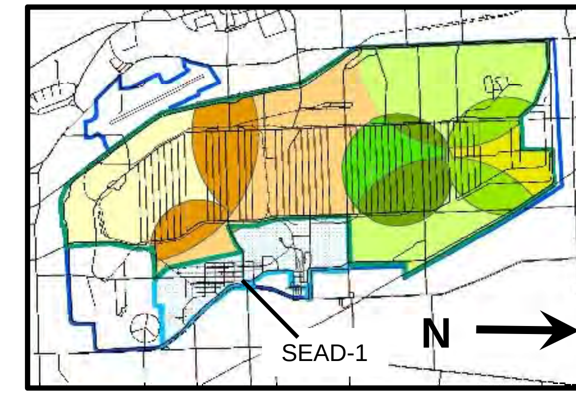
Photo Viewing Direction

Bing.com (Microsoft) Birds Eye Aerial of SEAD-1; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.





SEDA Overall Map (no scale)



SEAD-1 is located within the PID/ Warehouse Area Parcel.

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 14

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 13

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 16

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 15

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\SEAD-2_Aerial_n_Ground_Photos.ppt

Figure A-2
5 Year Review - Site Visit Photo Log
SEAD-2 PCB Transformer Storage Facility (Building 301)

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-2, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

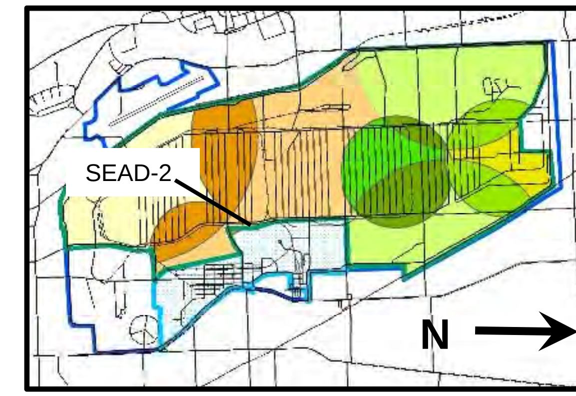
SEAD-2 is located within the PID/ Warehouse Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

Bing.com (Microsoft) Birds Eye Aerial of SEAD-2; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.

SEDA Overall Map (no scale)



2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 57

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 58

Figure A-3
5 Year Review - Site Visit Photo Log
SEAD-5 Sewage Sludge Waste Piles

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-5, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

2011 Site Visit Photo

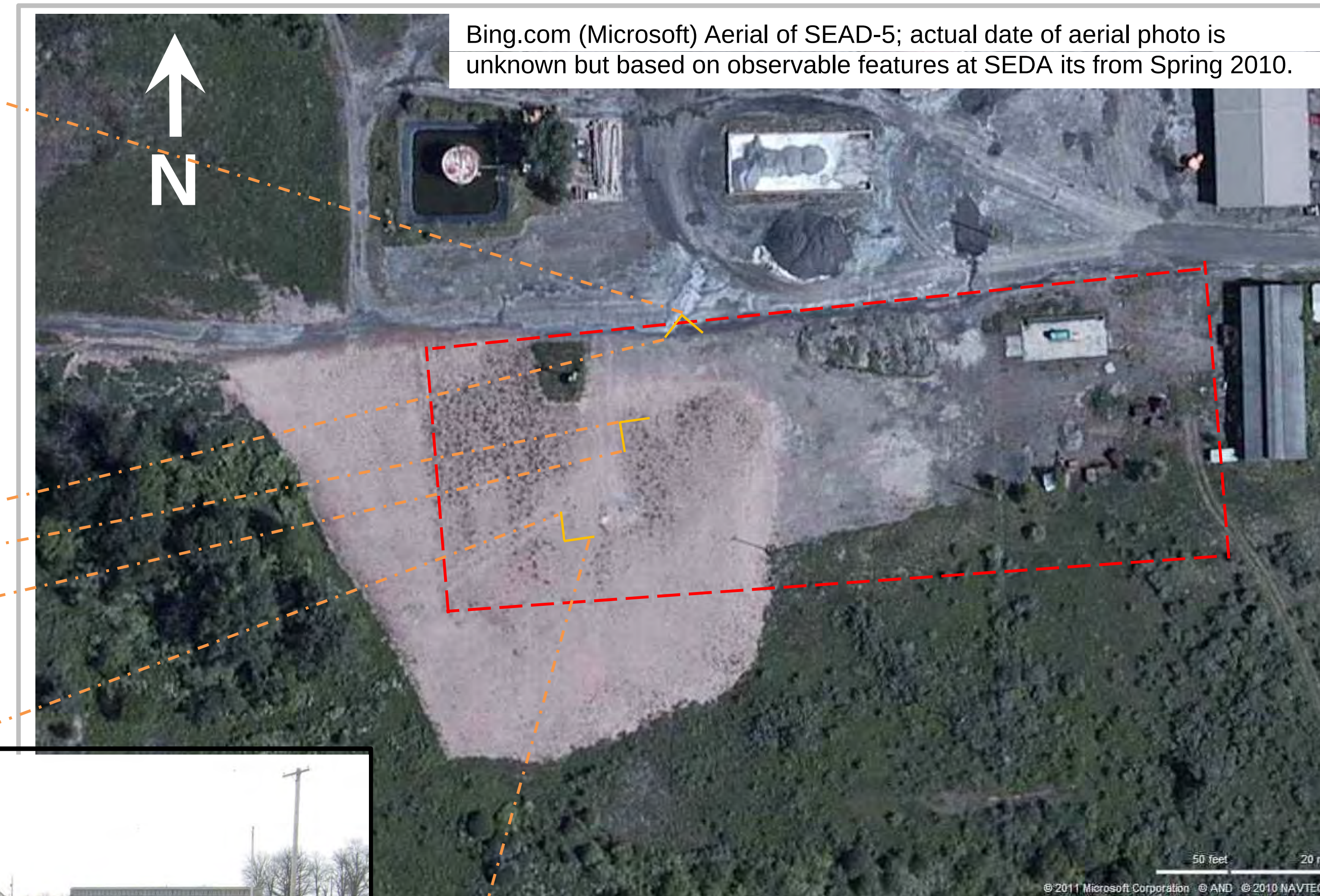
Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 27

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 25

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 26

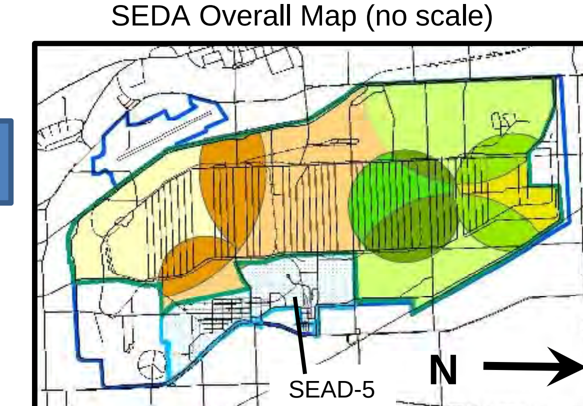


SEAD-5 is located within the PID/Warehouse Area Parcel.

Photo Viewing Direction

Approximate Site Boundary

SEDA Overall Map (no scale)



P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures SEAD-5_Aerial_n_Ground_Photos.ppt

Figure A-4
5 Year Review - Site Visit Photo Log
SEAD-16 Building S311, Abandoned Deactivation Furnace

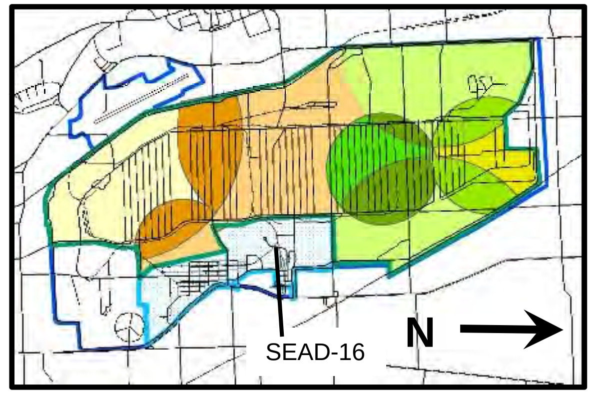
PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-16, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 41

SEDA Overall Map (no scale)

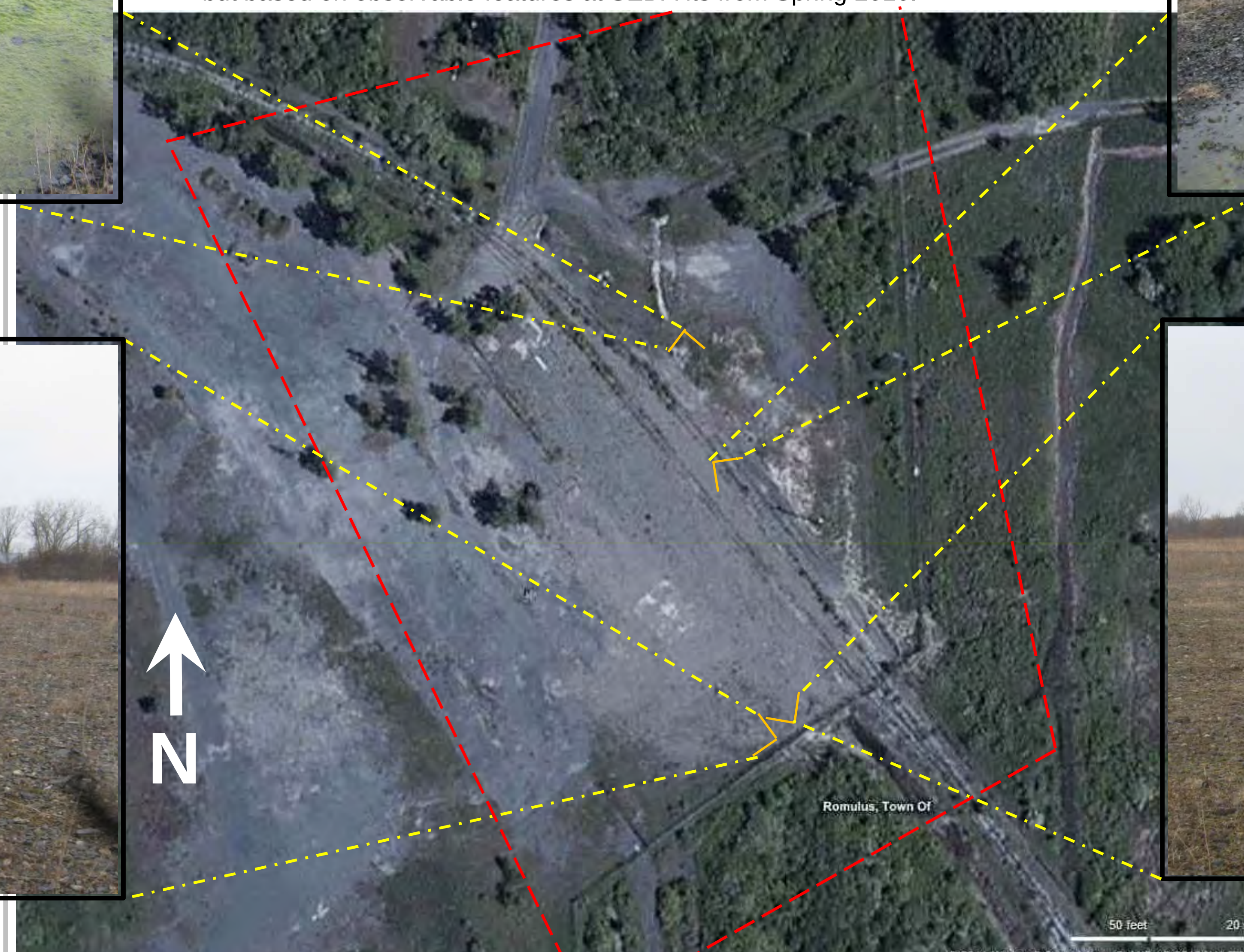


SEAD-16 is located within the PID/Warehouse Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

Bing.com (Microsoft) Aerial of SEAD-16; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.



2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 40

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 39

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 38

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures \ SEAD-16_Aerial_n_Ground_Photos.ppt

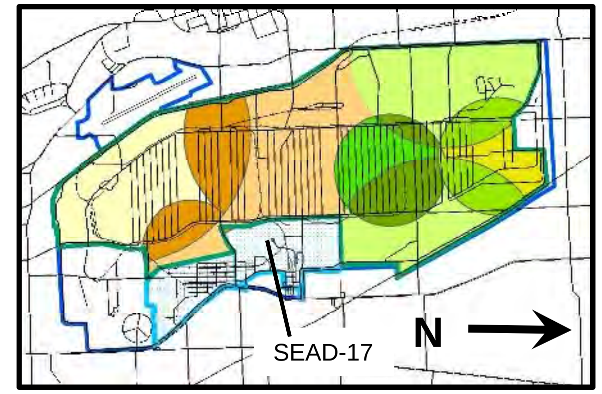
Figure A-5
5 Year Review - Site Visit Photo Log
SEAD-17 Building 367, Active Deactivation Furnace

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-17, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

Approximate Site Boundary

Photo Viewing Direction



SEDA Overall Map
(no scale)

SEAD-17 is located within the PID/Warehouse Area Parcel.

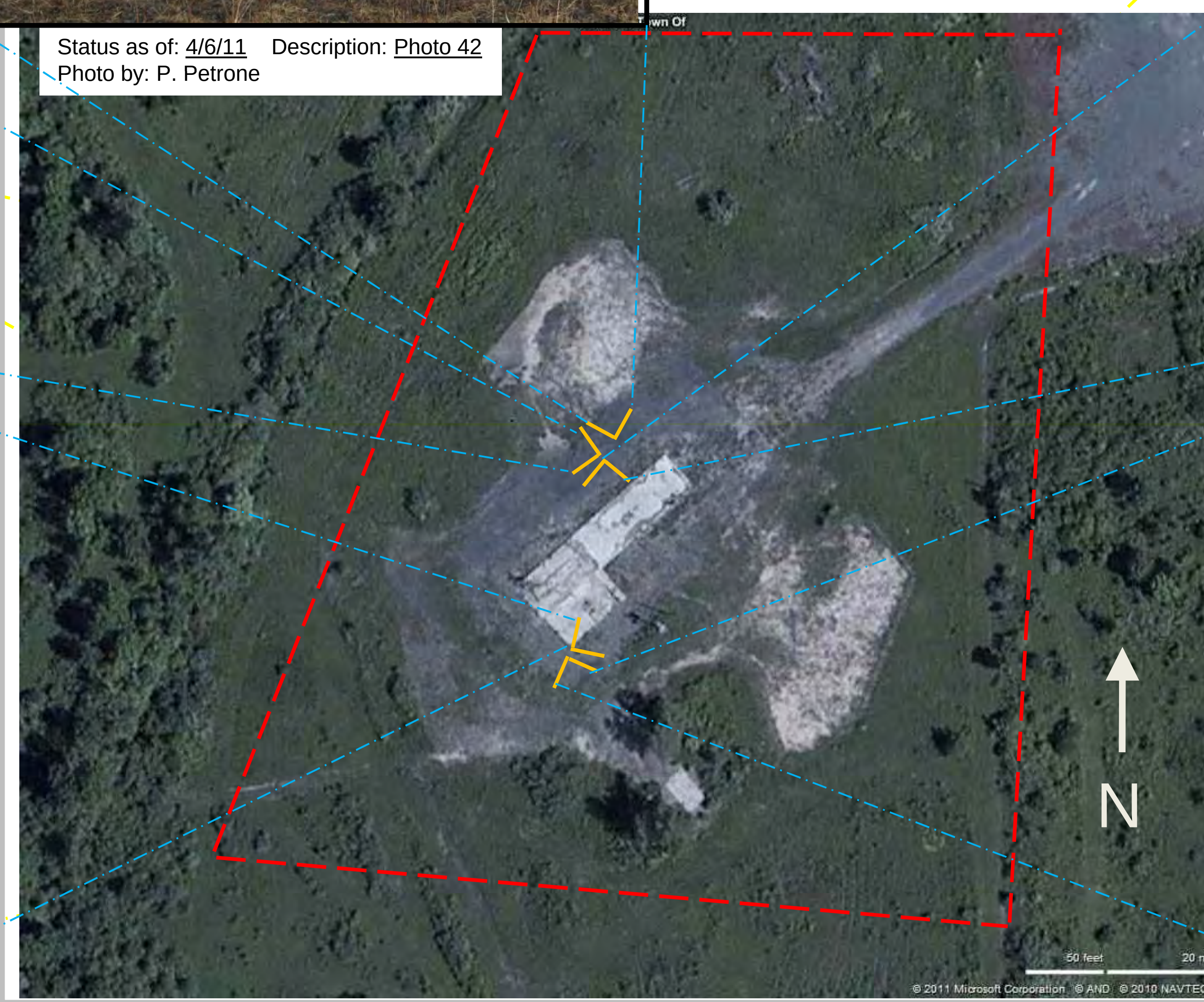
2011 Site Visit Photo

Status as of: 4/6/11 Description: Photo 43
Photo by: P. Petrone

Status as of: 4/6/11 Description: Photo 46
Photo by: P. Petrone

Status as of: 4/6/11 Description: Photo 42
Photo by: P. Petrone

Bing.com (Microsoft) Aerial of SEAD-17; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.



2011 Site Visit Photo

Status as of: 4/6/11 Description: Photo 44
Photo by: P. Petrone

Status as of: 4/6/11 Description: Photo 45
Photo by: P. Petrone

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\LUC RD\Draft Report\Figures\ SEAD-17_Aerial_n_Ground_Photos.ppt

Figure A-6
5 Year Review - Site Visit Photo Log
SEAD-25 Fire Training and Demonstration Pad

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-25, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

2011 Site Visit Photo

Status as of: 4/6/11 Description: Photo 1
Photo by: P. Petrone

Status as of: 4/6/11 Description: Photo 2
Photo by: P. Petrone

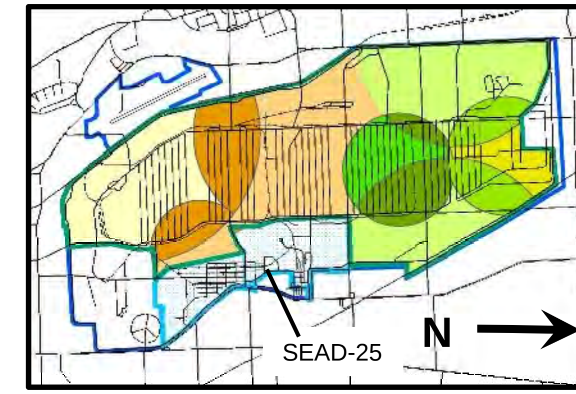
Status as of: 4/6/11 Description: Photo 7
Photo by: P. Petrone

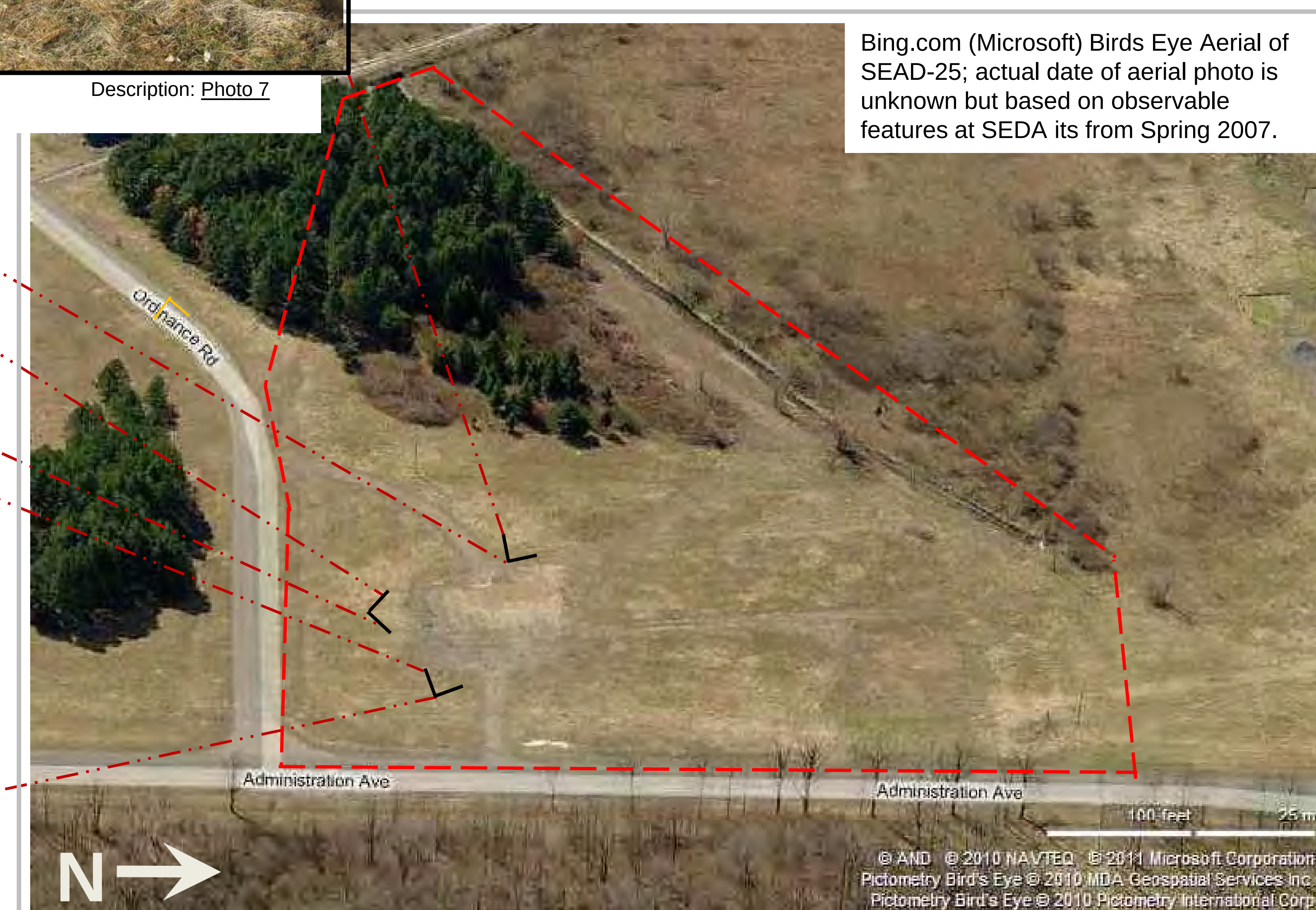
SEAD-25 is located within the PID/Warehouse Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

SEDA Overall Map (no scale)





Bing.com (Microsoft) Birds Eye Aerial of SEAD-25; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ SEAD-25_Aerial_n_Ground_Photos.ppt

Figure A-7
5 Year Review - Site Visit Photo Log
SEAD-26 Fire Training Pit

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

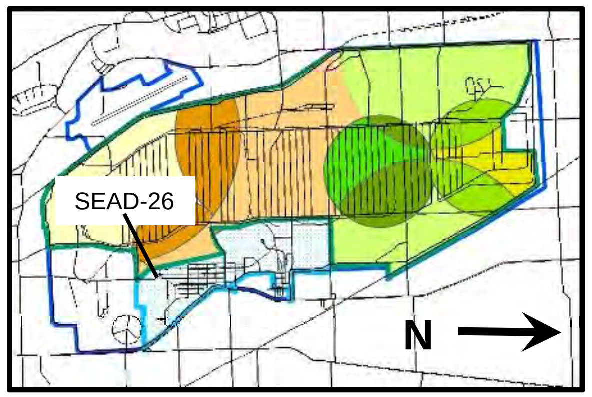
LOCATION: SEAD-26, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

SEAD-26 is located within the PID/Warehouse Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

SEDA Overall Map (no scale)



2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 22

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 21

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 18

Bing.com (Microsoft) Aerial of SEAD-26; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2006.

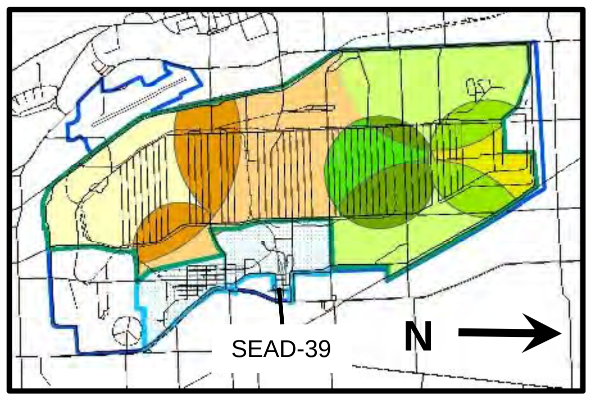
P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\LUC RD\Draft Report\Figures\ SEAD-26_Aerial_n_Ground_Photos.ppt

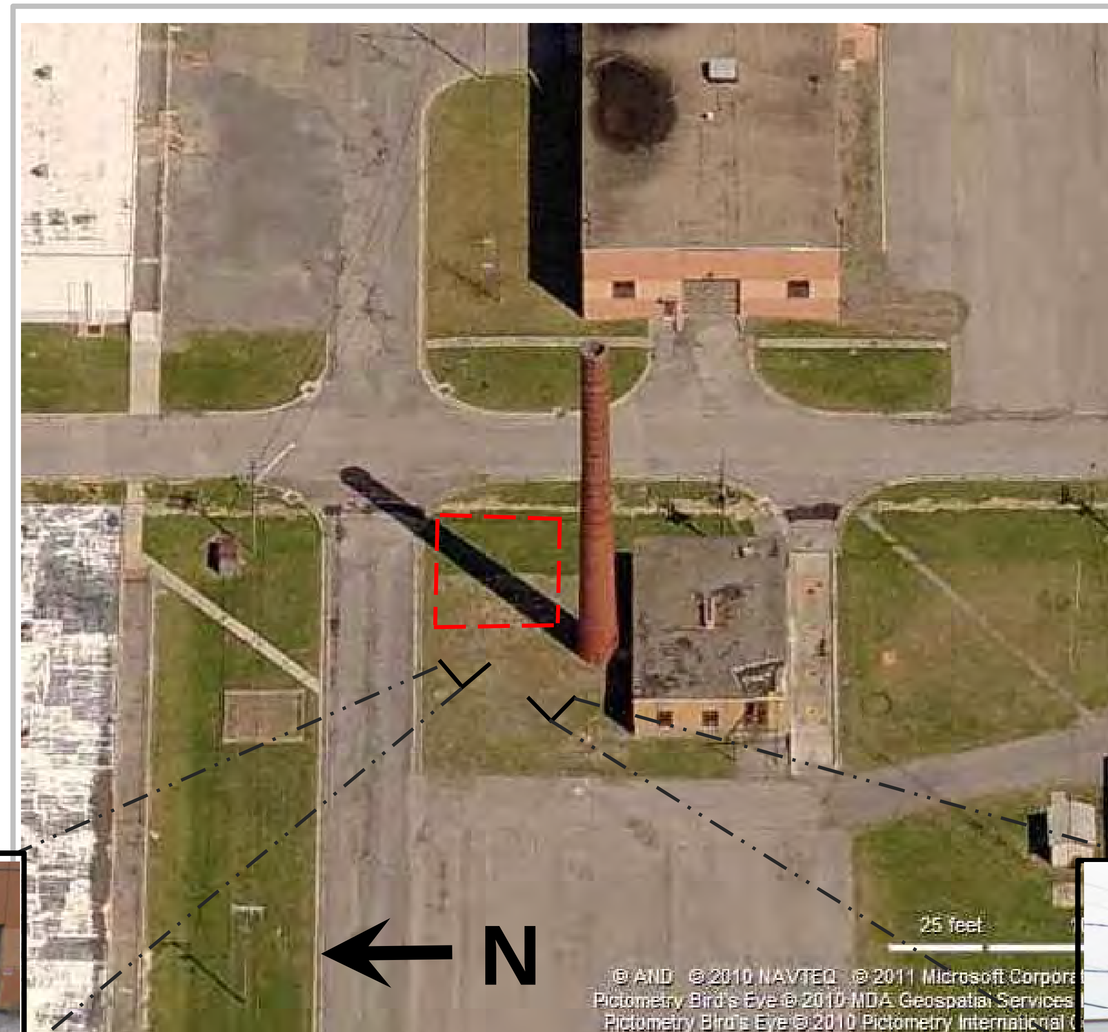
Figure A-8
5 Year Review - Site Visit Photo Log
SEAD-39 Building 121 Boiler Plant Blowdown Leach Pit

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-39, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

SEDA Overall Map (no scale)





Bing.com (Microsoft) Aerial of SEAD-26; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2006.

SEAD-39 is located within the PID/Warehouse Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 35

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 34

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\LUC RD\Draft Report\Figures\ SEAD-39_Aerial_n_Ground_Photos.ppt

Figure A-9
5 Year Review - Site Visit Photo Log
SEAD-40 Building 319 Boiler Plant Blowdown Leach Pit

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-40, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

SEAD-40 is located within the PID/Warehouse Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

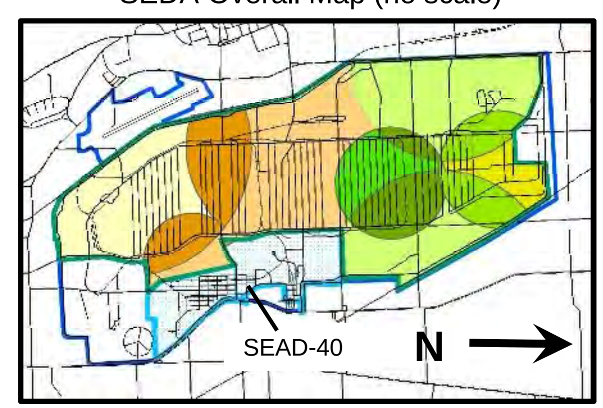
Bing.com (Microsoft) Birds Eye Aerial of SEAD-40; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2006.

2011 Site Visit Photo

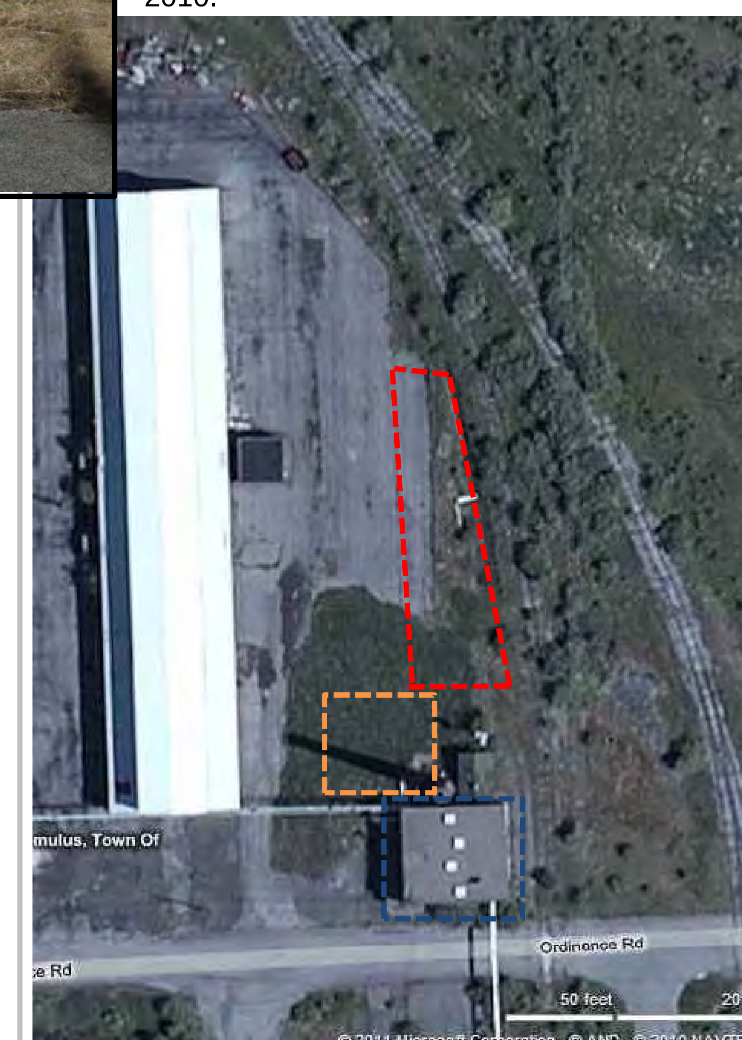
Status as of: 4/6/11
Photo by: P. Petrone

Description: Photo 34

SEDA Overall Map (no scale)



Bing.com (Microsoft) Aerial of SEAD-40; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.



P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\LUC RD\Draft Report\Figures\ SEAD-40_Aerial_n_Ground_Photos.ppt

Figure A-10
5 Year Review - Site Visit Photo Log
SEAD-59 Fill Area West of Building 135

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-59, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

2011 Site Visit Photo

Status as of: 4/7/11 Description: Photo 29
Photo by: P. Petrone

2011 Site Visit Photo

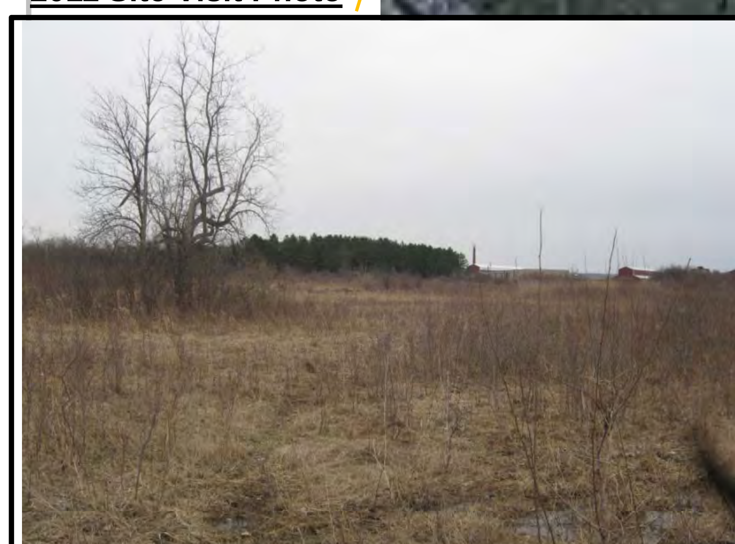
Status as of: 4/7/11 Description: Photo 28
Photo by: P. Petrone

SEAD-59 is located within the PID/Warehouse Area Parcel.

Photo Viewing Direction

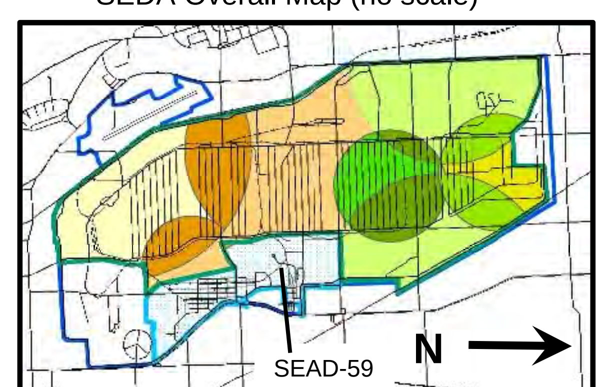
Bing.com (Microsoft) Aerial of SEAD-59; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.

2011 Site Visit Photo



Status as of: 4/7/11 Description: Photo 30
Photo by: P. Petrone

SEDA Overall Map (no scale)



2011 Site Visit Photo

Status as of: 4/7/11 Description: Photo 31
Photo by: P. Petrone

2011 Site Visit Photo

Status as of: 4/7/11 Description: Photo 32
Photo by: P. Petrone

Approximate Site Boundary

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ SEAD-59_Aerial_n_Ground_Photos.ppt

Figure A-11
5 Year Review - Site Visit Photo Log
SEAD-64A Garbage Disposal Area, Debris Landfill south of Storage Pad

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-64A, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

2011 Site Visit Photo

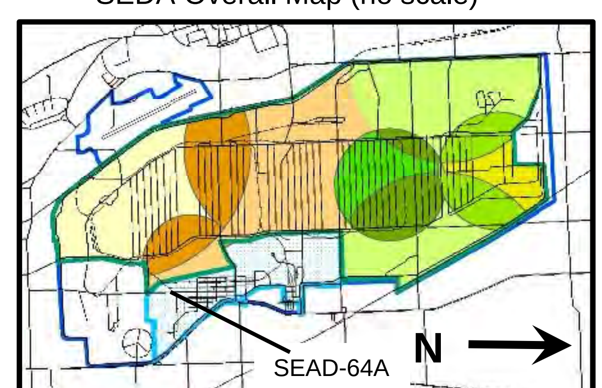
Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 24

Bing.com (Microsoft) Birds Eye Aerial of SEAD-64A; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 23

SEDA Overall Map (no scale)



SEAD-64A is located within the PID/Warehouse Area Parcel.

Photo Viewing Direction

Approximate Site Boundary

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ SEAD-64A_Aerial_n_Ground_Photos.ppt

Figure A-12
5 Year Review - Site Visit Photo Log
SEAD-66 Pesticide Storage Area near Buildings 5 and 6

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-66, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

2011 Site Visit Photo

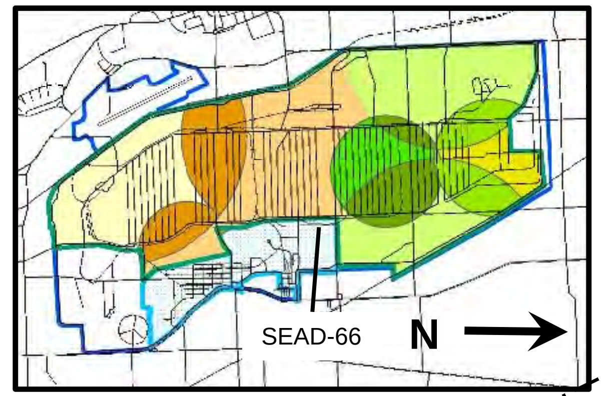
Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 47

SEAD-66 is located within the PID/Warehouse Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

SEDA Overall Map (no scale)



2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 48

Bing.com (Microsoft) Birds Eye Aerial of SEAD-66; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ SEAD-66_Aerial_n_Ground_Photos.ppt

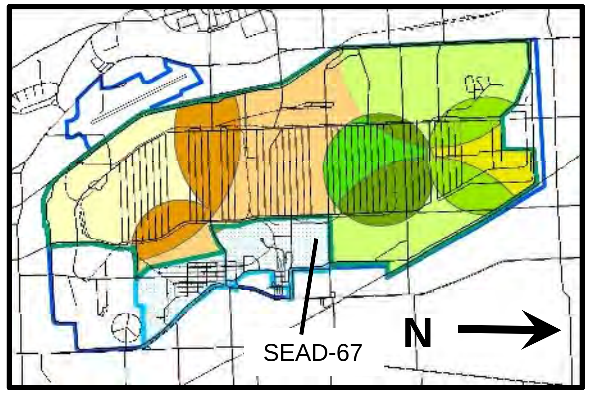
Figure A-13
5 Year Review - Site Visit Photo Log
SEAD-67 Dump Site east of Sewage Treatment Plant No. 4

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-67, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

SEAD-67 is located within the PID/Warehouse Area Parcel.

SEDA Overall Map (no scale)



Approximate Site Boundary

Photo Viewing Direction

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 56

Bing.com (Microsoft) Birds Eye Aerial of SEAD-67; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 55

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 54

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ SEAD-67_Aerial_n_Ground_Photos.ppt

Figure A-14
5 Year Review - Site Visit Photo Log
SEAD-71 Alleged Paint Disposal Area

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-71, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone

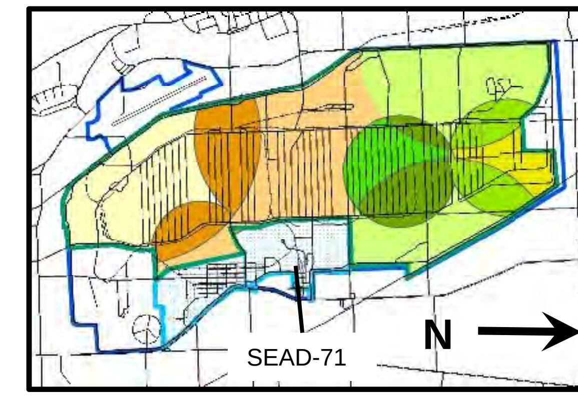
Description: Photo 33

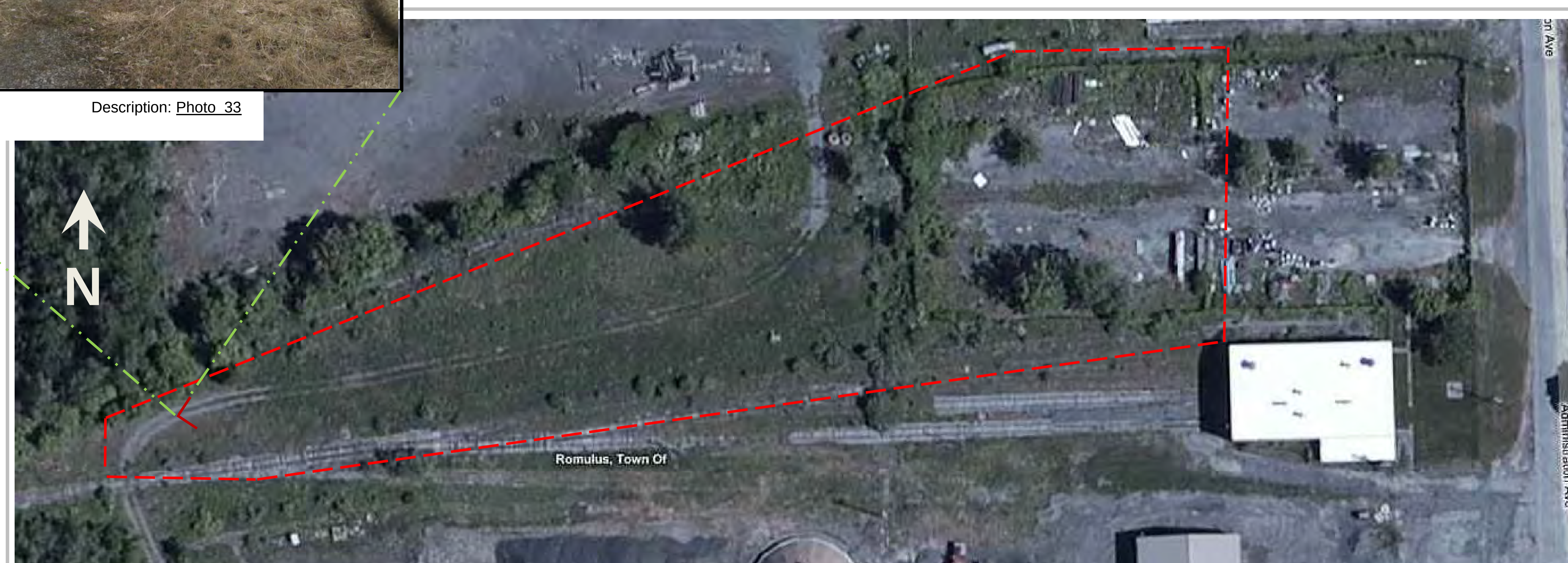
SEAD-71 is located within the PID/Warehouse Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

SEDA Overall Map (no scale)





Bing.com (Microsoft) Aerial of SEAD-71; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures \ SEAD-71_Aerial_n_Ground_Photos.ppt

Figure A-15
5 Year Review - Site Visit Photo Log
SEAD-121C Defense Reutilization and Marketing Office (DRMO) Yard

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-121C, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

SEAD-121C is located within the PID/ Warehouse Area Parcel.

2011 Site Visit Photo

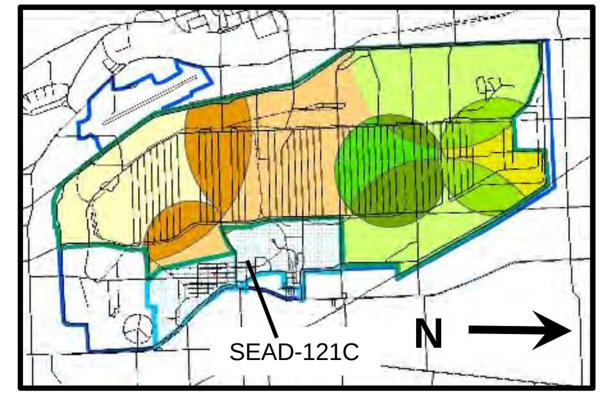
Status as of: 4/6/11 Description: Photo 8
Photo by: P. Petrone

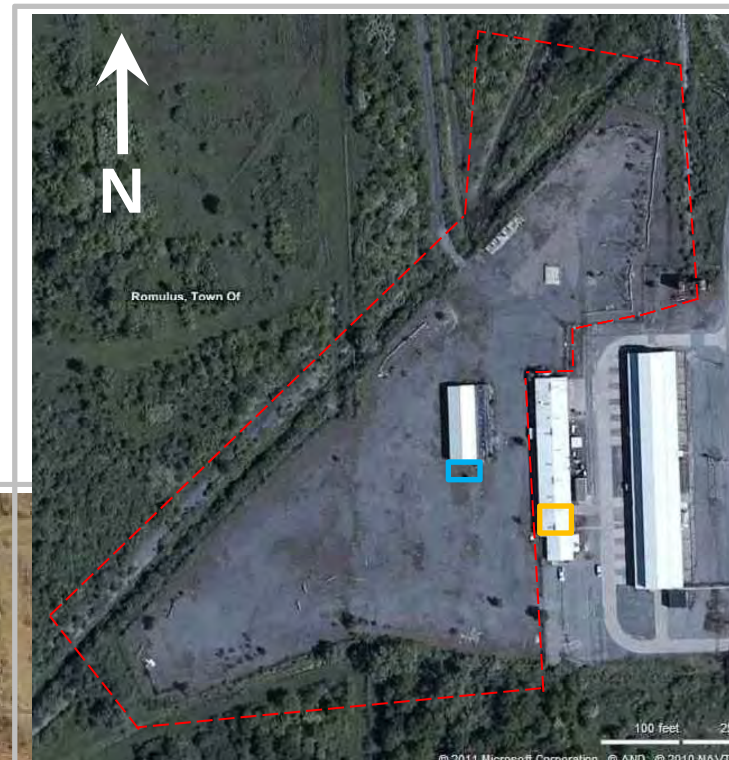
Status as of: 4/6/11 Description: Photo 9
Photo by: P. Petrone

2011 Site Visit Photo

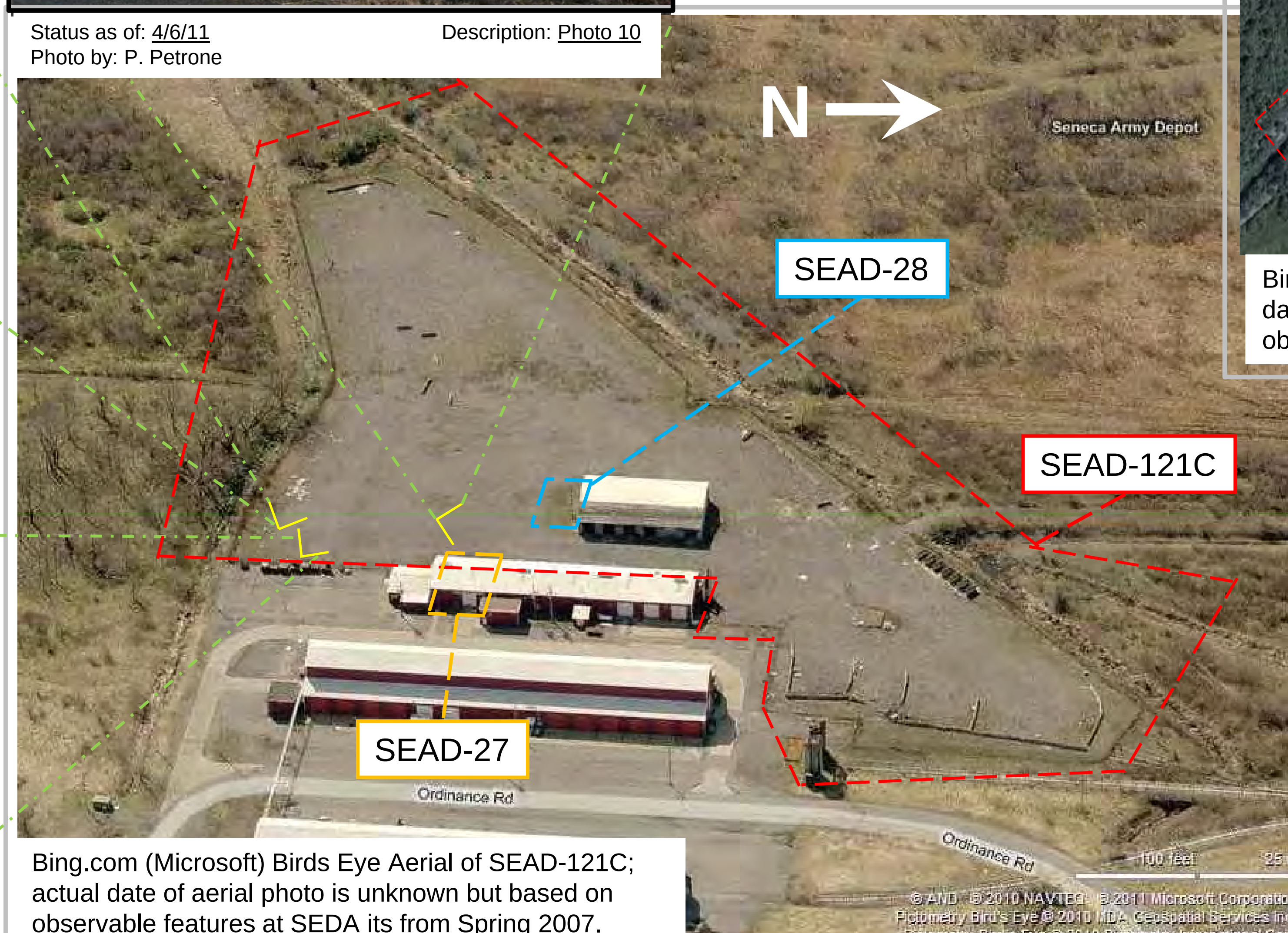
Status as of: 4/6/11 Description: Photo 10
Photo by: P. Petrone

SEDA Overall Map (no scale)





Bing.com (Microsoft) Aerial of SEAD-121C; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.



Bing.com (Microsoft) Birds Eye Aerial of SEAD-121C; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.

Approximate Site Boundary

Photo Viewing Direction

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures \ SEAD-121C_Aerial_n_Ground_Photos.ppt

Figure A-16
5 Year Review - Site Visit Photo Log
SEAD-121I Rumored Cosmoline Disposal Area

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-121I, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

Bing.com (Microsoft) Aerial of SEAD-121I; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone

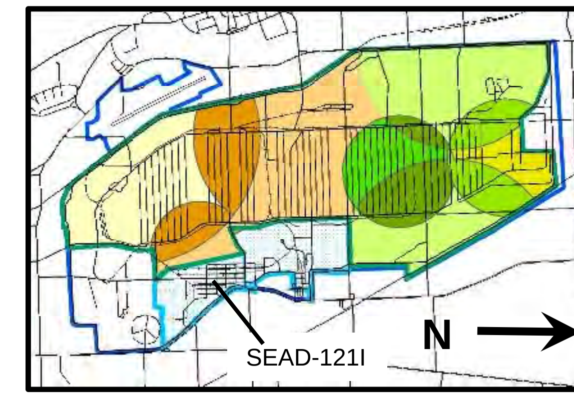
Description: Photo 17

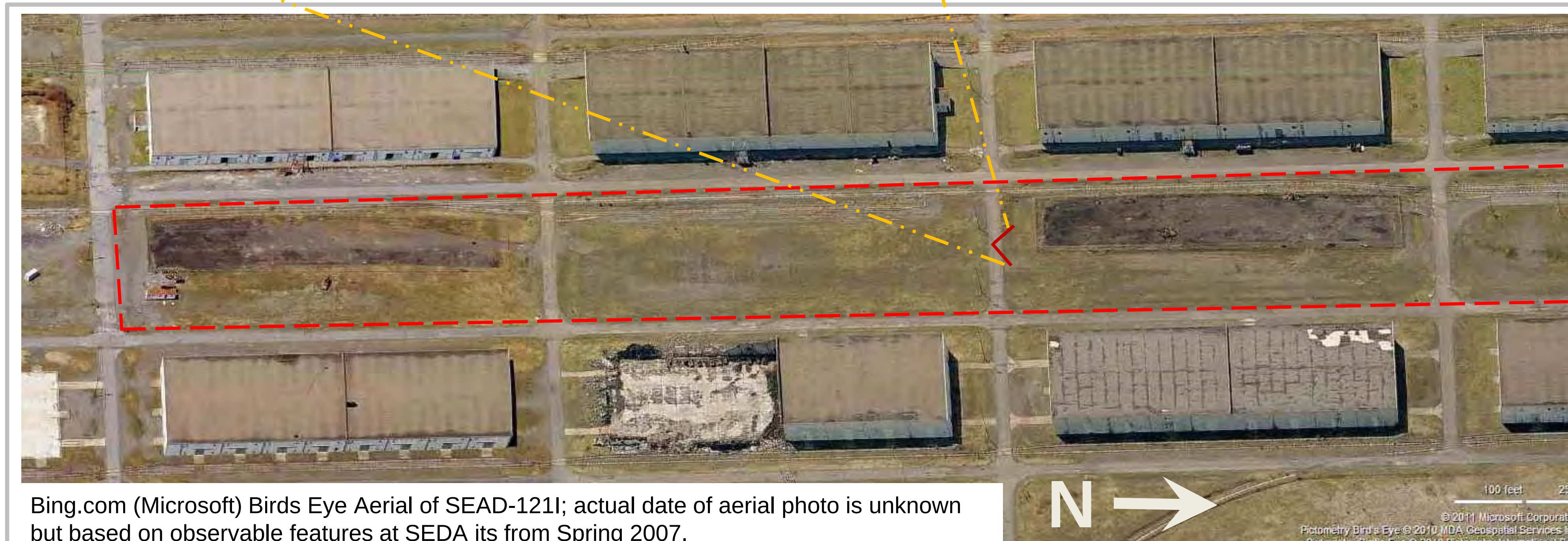
SEAD-121I is located within the PID/Warehouse Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

SEDA Overall Map (no scale)





Bing.com (Microsoft) Birds Eye Aerial of SEAD-121I; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures \ SEAD-121I_Aerial_n_Ground_Photos.ppt

Figure A-17A
5 Year Review - Site Visit Photo Log
SEAD-13 Inhibited Red Fuming Nitric Acid (IRFNA) Disposal Site

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-13, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

Bing.com (Microsoft) Aerial of SEAD-13 West; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.

SEAD-13 is located within the Conservation Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 51

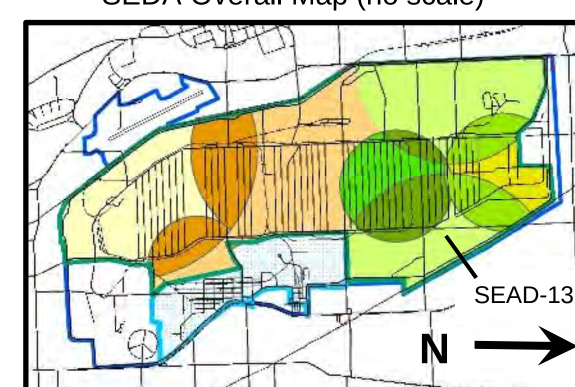
2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 50

2011 Site Visit Photo

Status as of: 4/6/11
Photo by: P. Petrone
Description: Photo 49

SEDA Overall Map (no scale)



P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\SEAD-13A_Aerial_n_Ground_Photos.ppt

Figure A-17B
5 Year Review - Site Visit Photo Log
SEAD-13 Inhibited Red Fuming Nitric Acid (IRFNA) Disposal Site

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-13, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ SEAD-13B_Aerial_n_Ground_Photos.ppt

2011 Site Visit Photo

Status as of: 4/6/11 Description: Photo 52
Photo by: P. Petrone

Bing.com (Microsoft) Birds Eye Aerial of SEAD-13 East; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.

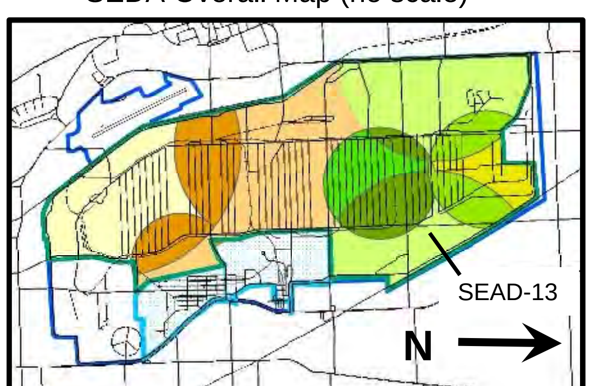
Photo Viewing Direction

Approximate Site Boundary

2011 Site Visit Photo

Status as of: 4/6/11 Description: Photo 53
Photo by: P. Petrone

SEDA Overall Map (no scale)



SEAD-13 is located within the Conservation Area Parcel.

Figure A-18
5 Year Review - Site Visit Photo Log
SEAD-23 Open Burning Ground

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

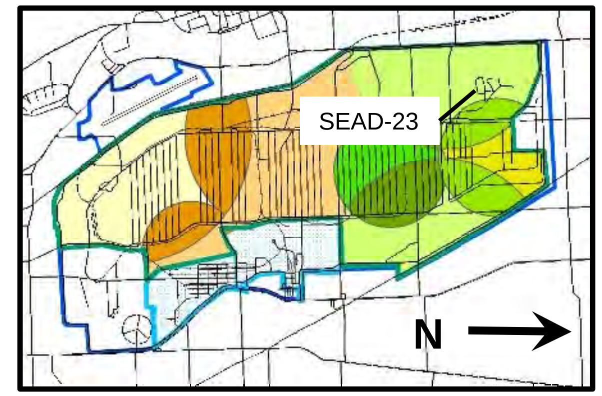
LOCATION: SEAD-23, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

Approximate Site Boundary

Photo Viewing Direction

Status as of: 4/7/11 Description: Photo 115
Photo by: P. Petrone

SEDA Overall Map (no scale)



SEAD-23 is located within the Conservation/Recreational Parcel.

2011 Site Visit Photo

Status as of: 4/7/11 Description: Photo 116
Photo by: P. Petrone

Status as of: 4/7/11 Description: Photo 117
Photo by: P. Petrone

Bing.com (Microsoft) Aerial of SEAD-23; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.

2011 Site Visit Photo

Status as of: 4/7/11 Description: Photo 124
Photo by: P. Petrone

Status as of: 4/7/11 Description: Photo 119
Photo by: P. Petrone

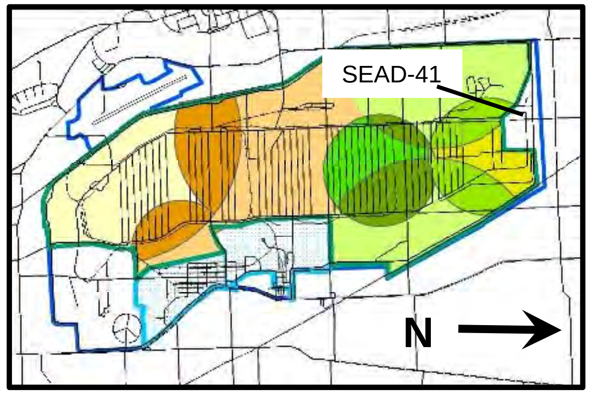
P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\LUC RD\Draft Report\Figures\ SEAD-23_Aerial_n_Ground_Photos.ppt

Figure A-19
5 Year Review - Site Visit Photo Log
SEAD-41 Building 718 Boiler Plant Blowdown Leach Pit

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-41, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

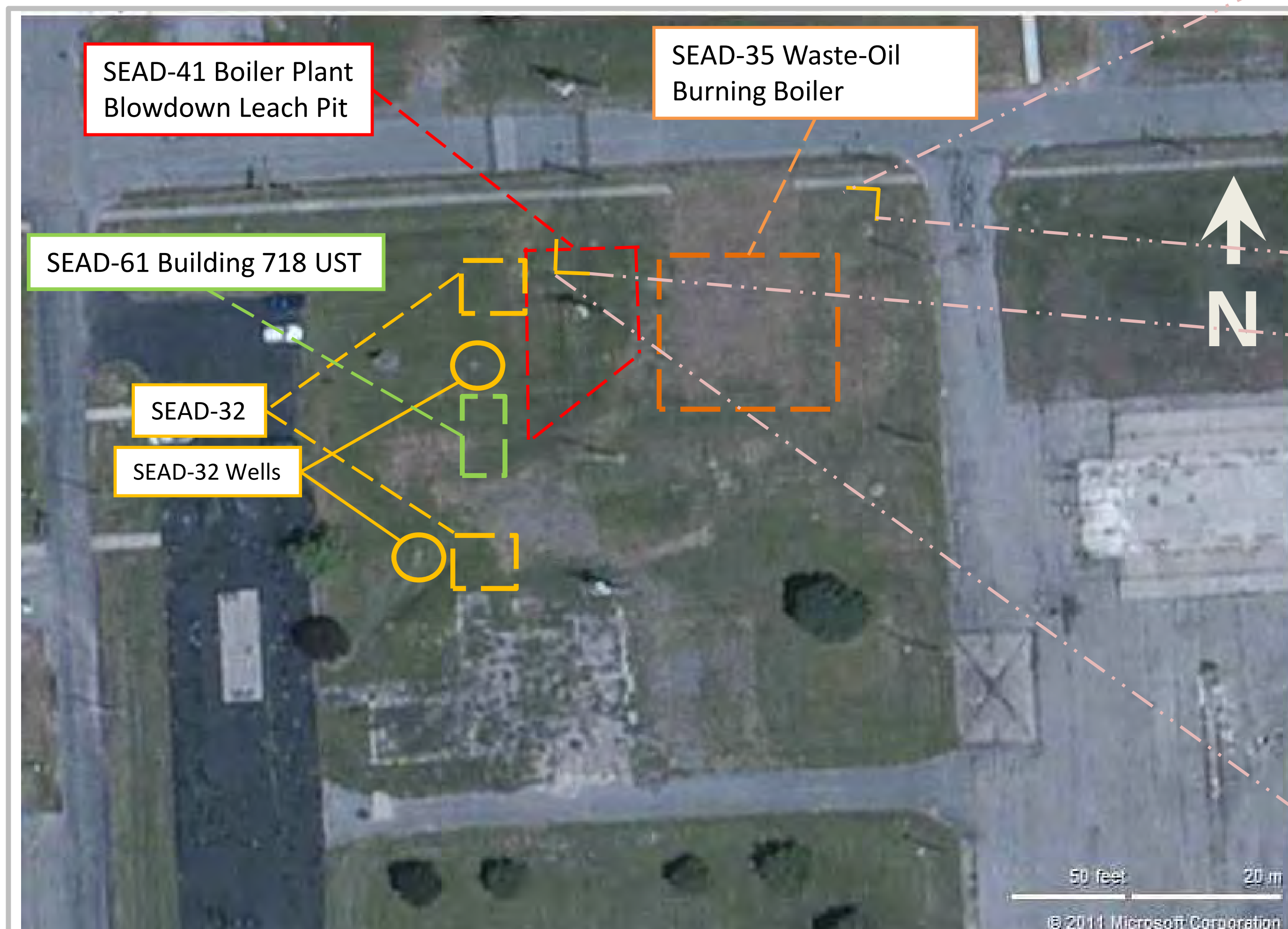
SEDA Overall Map (no scale)



SEAD-41 is located within the Institutional /Training Area Parcel.

Approximate Site Boundary

Photo Viewing Direction



Bing.com (Microsoft) Aerial of SEAD-41; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.

2011 Site Visit Photo

Status as of: 4/7/11
Photo by: P. Petrone
Description: Photo 66

2011 Site Visit Photo

Status as of: 4/7/11
Photo by: P. Petrone
Description: Photo 64

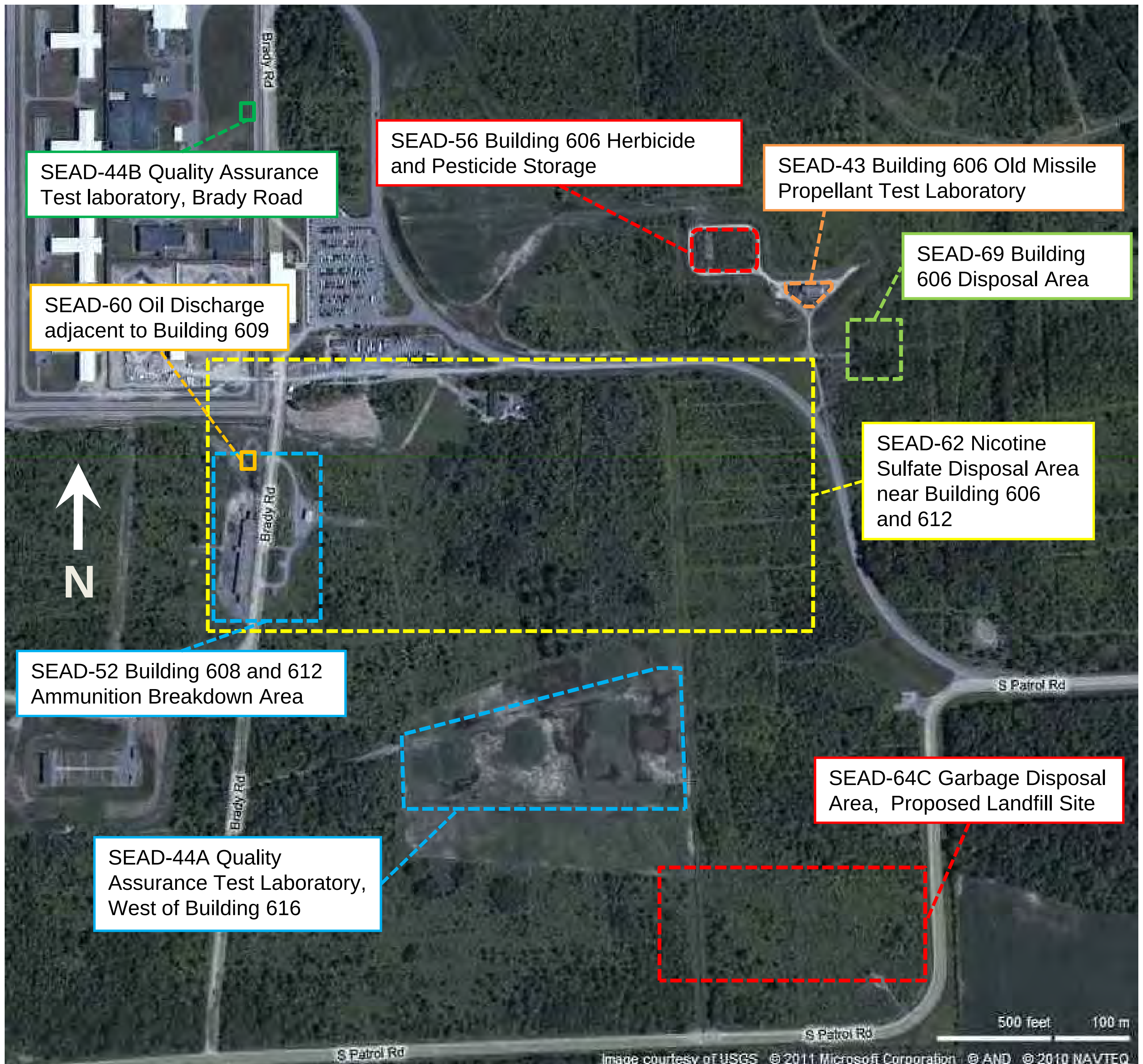
P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\LUC RD\Draft Report\Figures\ SEAD-41_Aerial_n_Ground_Photos.ppt

Figure A-20
5 Year Review - Site Visit Photo Log
Prison Area Parcel

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

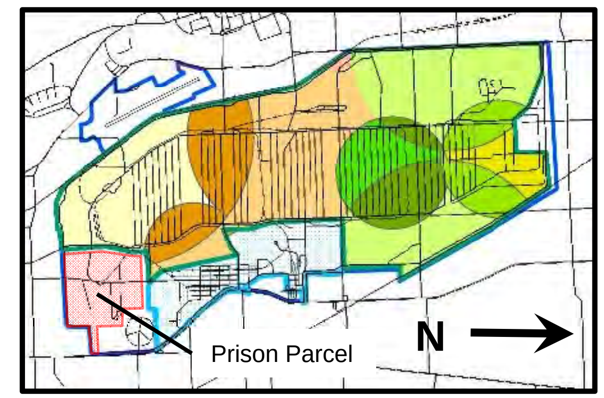
LOCATION: Prison Parcel, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

Bing.com (Microsoft) Aerial of Prison Parcel; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.



Prison Parcel contains the following:
- SEAD-43 Building 606 Old Missile Propellant Test Laboratory
- SEAD-44A Quality Assurance Test Laboratory, West of Building 616
- SEAD-44B Quality Assurance Test laboratory, Brady Road
- SEAD-52 Building 608 and 612 Ammunition Breakdown Area
- SEAD-56 Building 606 Herbicide and Pesticide Storage
- SEAD-60 Oil Discharge adjacent to Building 609
- SEAD-62 Nicotine Sulfate Disposal Area near Building 606 and 612
- SEAD-69 Building 606 Disposal Area

SEDA Overall Map (no scale)



Approximate Site Boundary

2011 Site Visit Photo

Status as of: 4/7/11
Photo by: P. Petrone
Description: Photo_79

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ Prison_Parcel_Aerial_n_Ground_Photos.ppt

Figure A-21
5 Year Review - Site Visit Photo Log
SEAD-64B Garbage Disposal Area, Disposal Area South of Classification Area

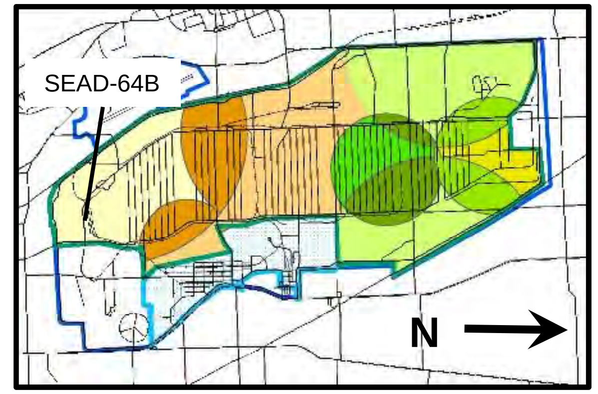
PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-64B, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

Approximate Site Boundary

Photo Viewing Direction

Status as of: 4/6/11 Description: Photo 62
Photo by: P. Petrone



SEDA Overall Map
(no scale)

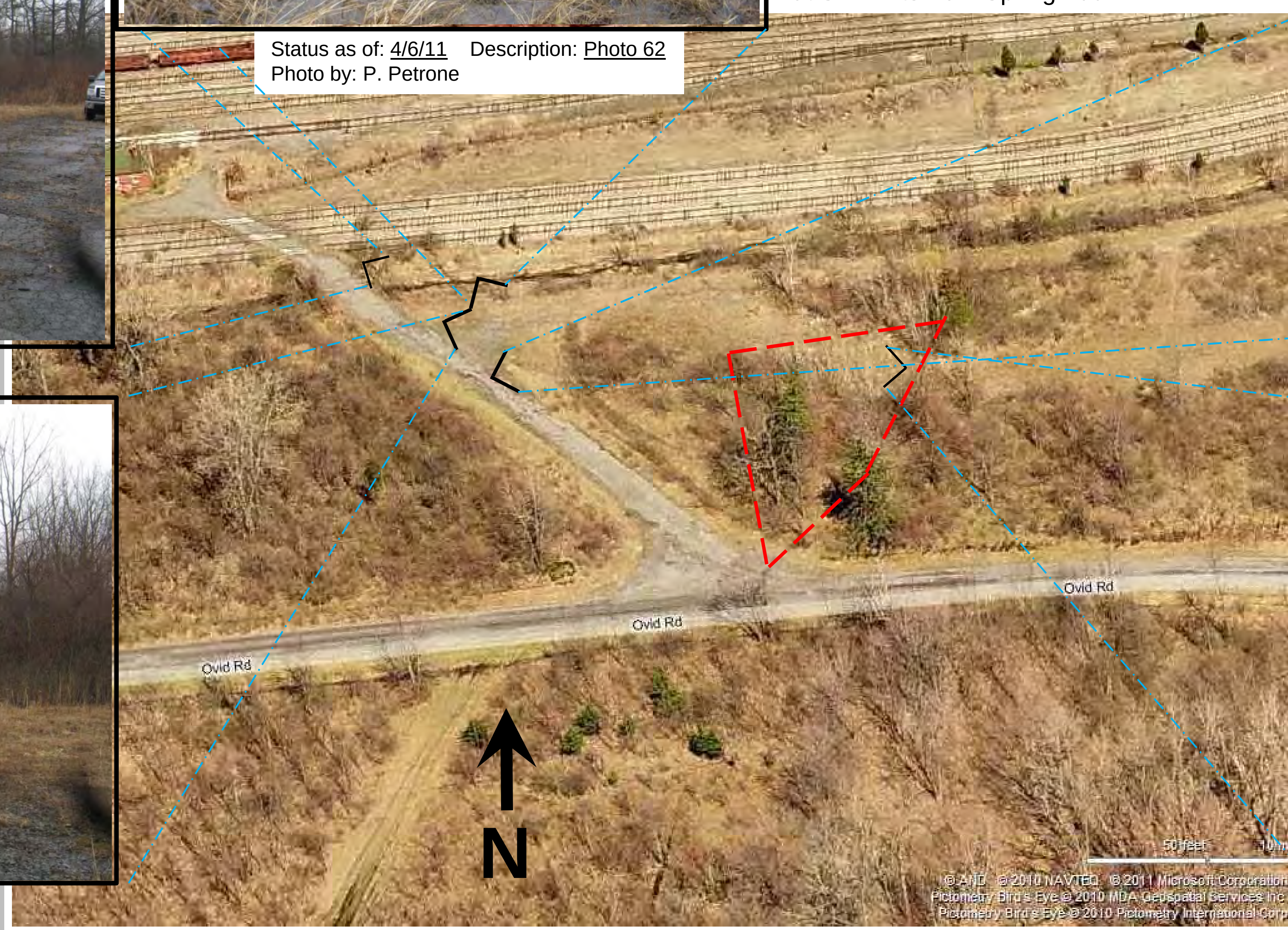
SEAD-64B is located within the Training Area Parcel.

2011 Site Visit Photo

Status as of: 4/6/11 Description: Photo 60
Photo by: P. Petrone

Status as of: 4/6/11 Description: Photo 59
Photo by: P. Petrone

Bing.com (Microsoft) Birds Eye Aerial of SEAD-64B; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.



2011 Site Visit Photo

Status as of: 4/6/11 Description: Photo 63
Photo by: P. Petrone

Status as of: 4/6/11 Description: Photo 61
Photo by: P. Petrone

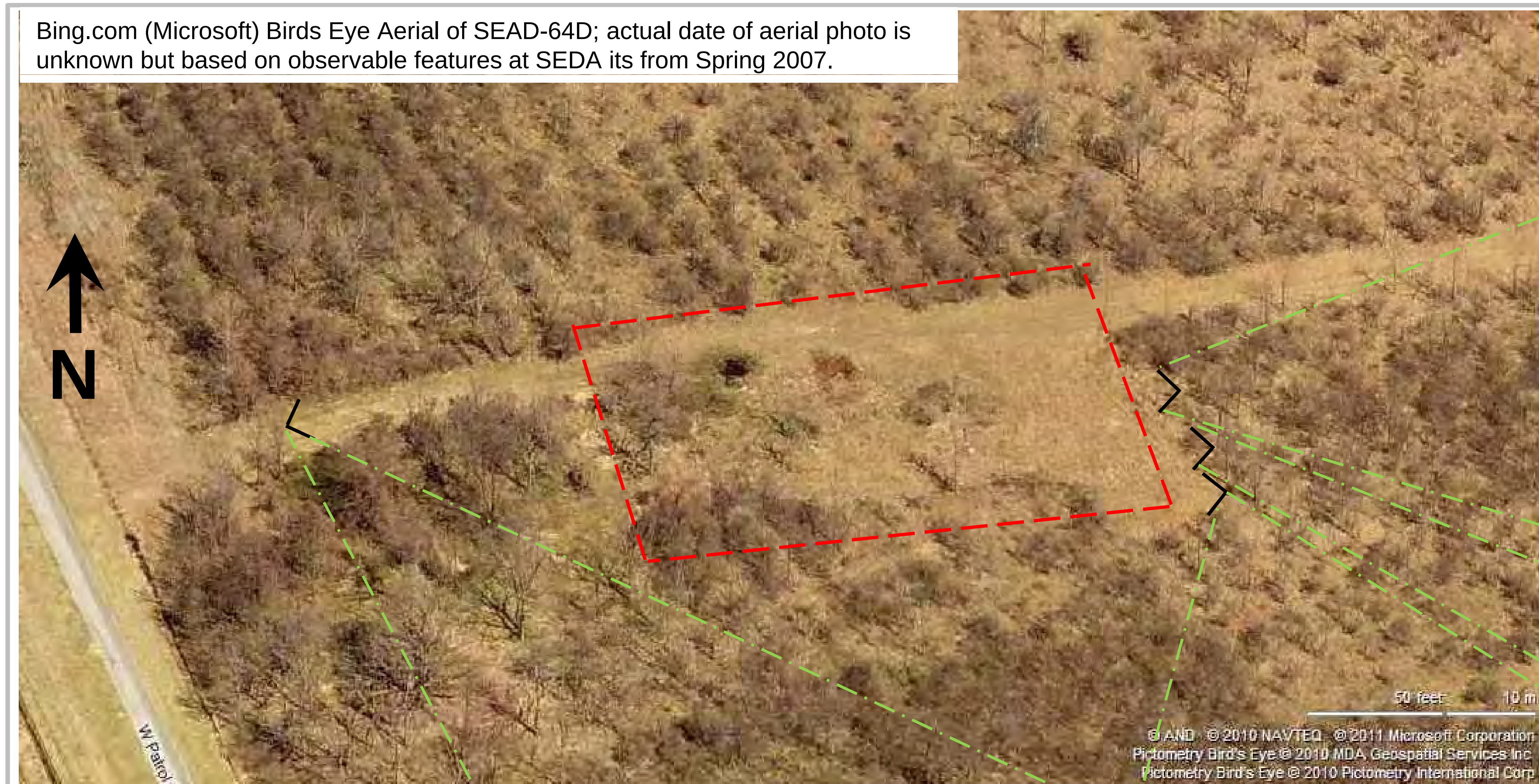
P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ SEAD-64B_Aerial_n_Ground_Photos.ppt

Figure A-22
5 Year Review - Site Visit Photo Log
SEAD-64D Garbage Disposal Area, Disposal Area West of Building 2203

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-64D, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

Bing.com (Microsoft) Birds Eye Aerial of SEAD-64D; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.



SEAD-64D is located within the Training Area Parcel.

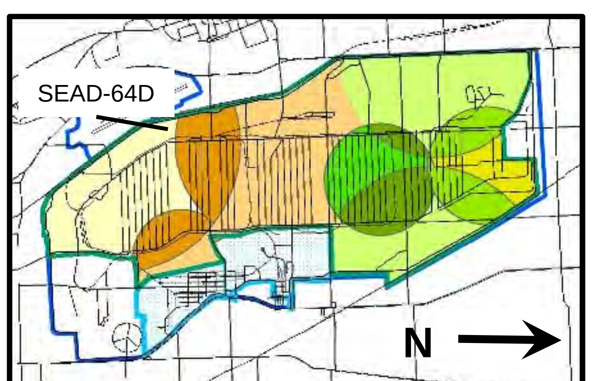
2011 Site Visit Photo

Status as of: 4/7/11 Description: Photo 85
Photo by: P. Petrone

Status as of: 4/7/11 Description: Photo 84
Photo by: P. Petrone

Photo Viewing Direction

SEDA Overall Map (no scale)



Status as of: 4/7/11 Description: Photo 86
Photo by: P. Petrone

Status as of: 4/7/11 Description: Photo 83
Photo by: P. Petrone

Approximate Site Boundary

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ SEAD-64D_Aerial_n_Ground_Photos.ppt

Figure A-23
5 Year Review - Site Visit Photo Log
SEAD-122B Small Arms Range, Airfield

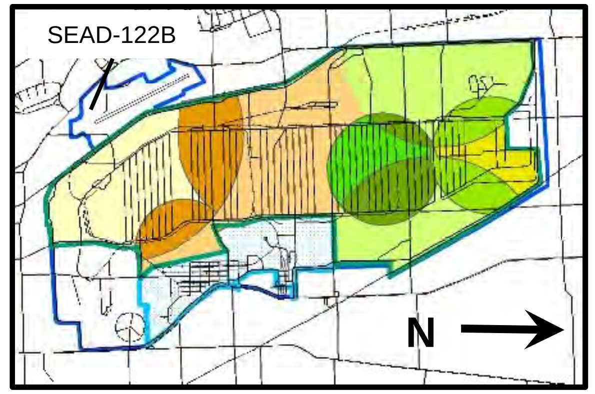
PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: SEAD-122B, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

2011 Site Visit Photo

Status as of: 4/7/11
Photo by: P. Petrone
Description: Photo 76

SEDA Overall Map (no scale)



SEAD-122B is located within the Airfield Parcel.

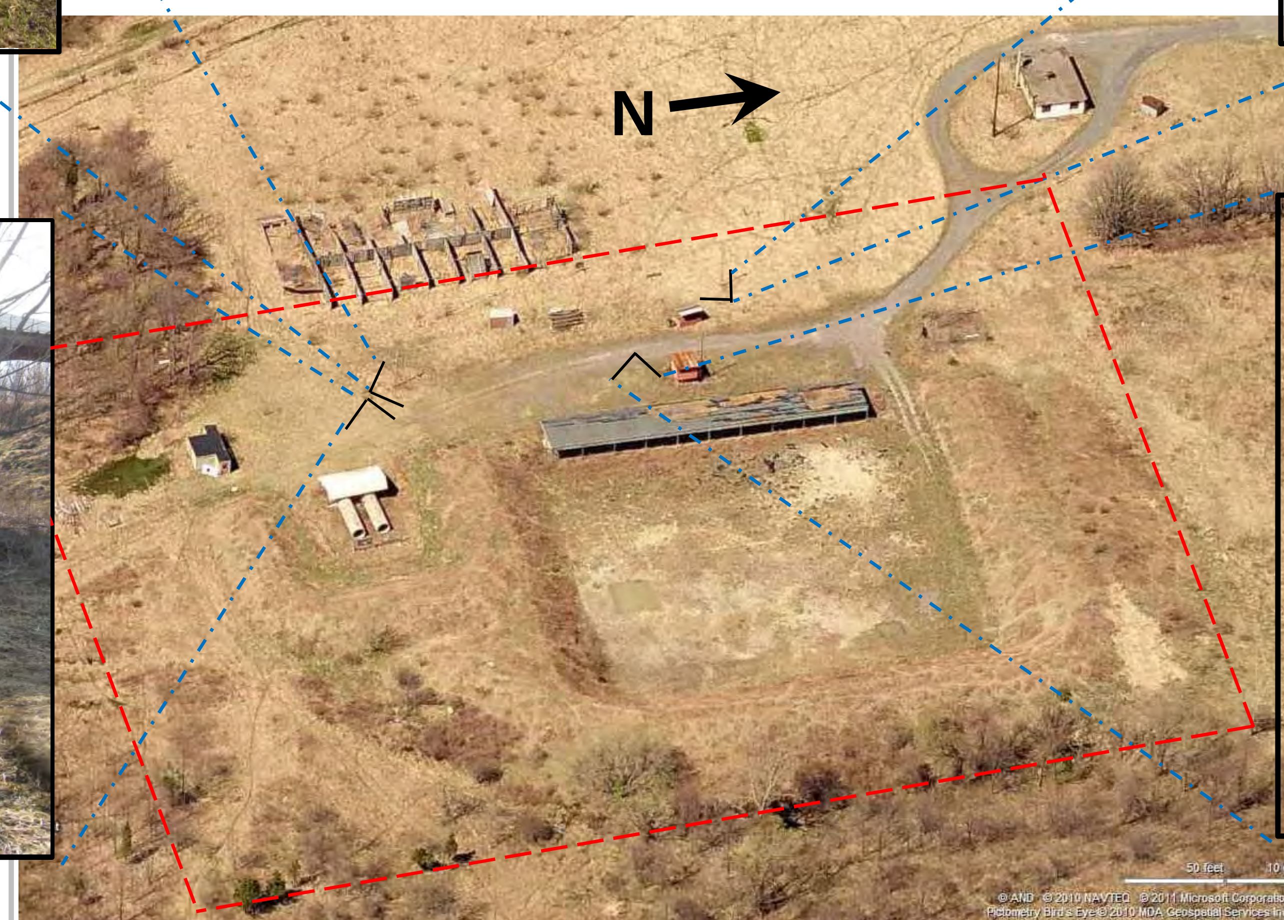
Approximate Site Boundary

Photo Viewing Direction

2011 Site Visit Photo

Status as of: 4/7/11
Photo by: P. Petrone
Description: Photo 78

Bing.com (Microsoft) Birds Eye Aerial of SEAD-122B; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.



2011 Site Visit Photo

Status as of: 4/7/11
Photo by: P. Petrone
Description: Photo 75

2011 Site Visit Photo

Status as of: 4/7/11
Photo by: P. Petrone
Description: Photo 77

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures \ SEAD-122B_Aerial_n_Ground_Photos.ppt

Figure A-24
5 Year Review - Site Visit Photo Log
SEAD-122E Plane Deicing Area

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

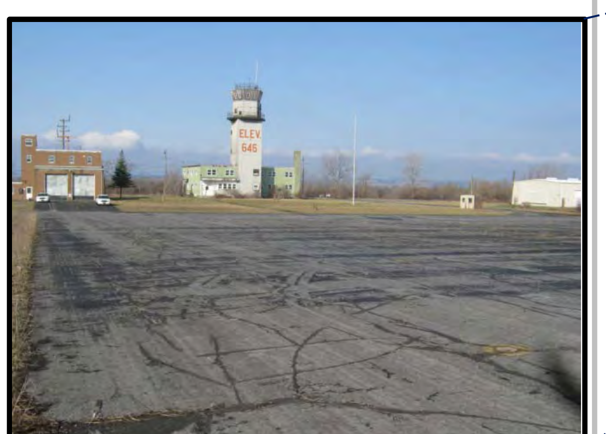
LOCATION: SEAD-122E, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year ReviewFigures \ SEAD-122E_Aerial_n_Ground_Photos.ppt

2011 Site Visit Photo

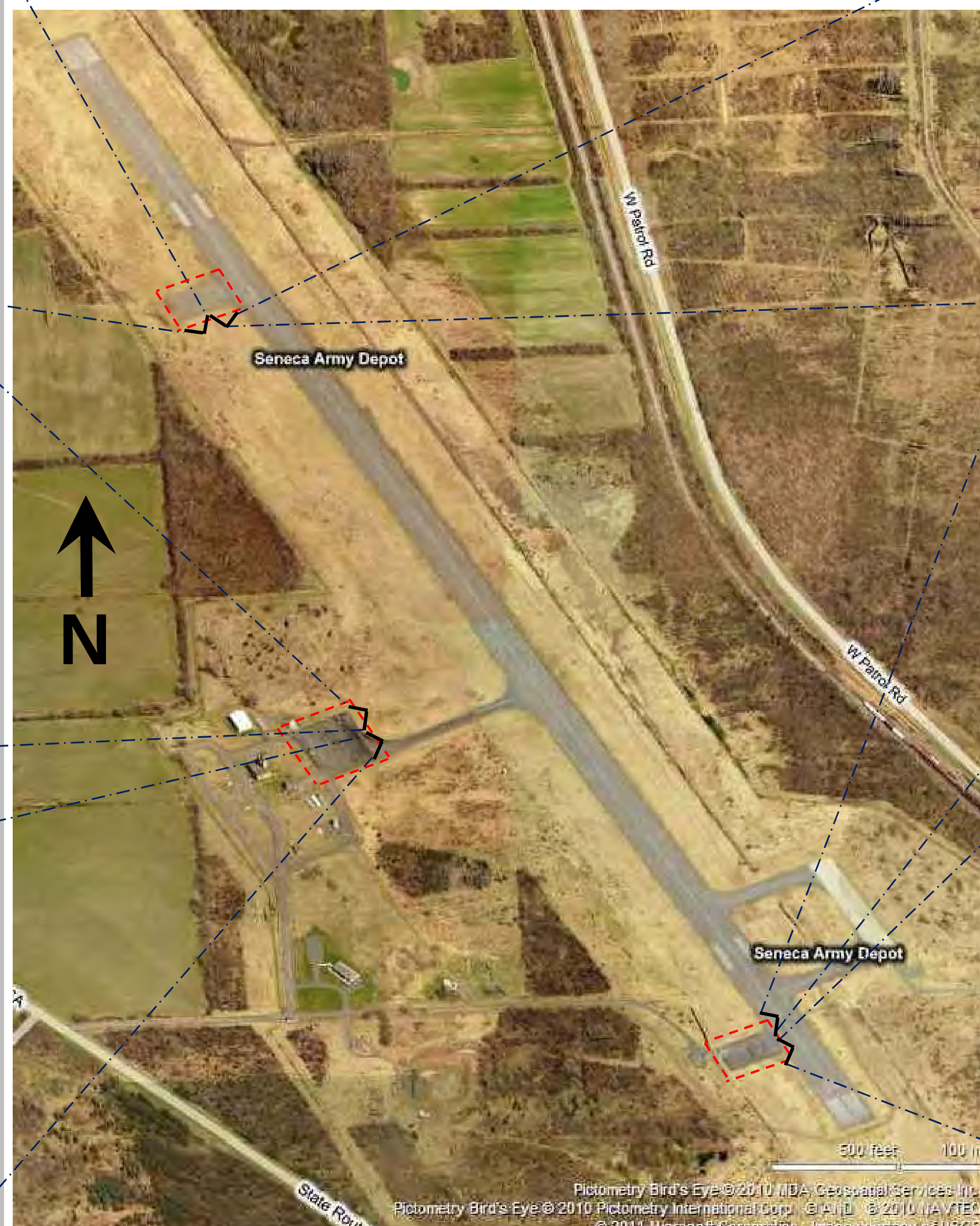
Status as of: 4/7/11 Description: Photo 473
Photo by: P. Petrone

Status as of: 4/7/11 Description: Photo 72
Photo by: P. Petrone



Status as of: 4/7/11 Description: Photo 71
Photo by: P. Petrone

Bing.com (Microsoft) Birds Eye Aerial of SEAD-122E; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2007.



2011 Site Visit Photo

Status as of: 4/7/11 Description: Photo 74
Photo by: P. Petrone

Status as of: 4/7/11 Description: Photo 70
Photo by: P. Petrone

Status as of: 4/7/11 Description: Photo 69
Photo by: P. Petrone

SEAD-122E is located within the Airfield Parcel.

Approximate Site Boundary

Photo Viewing Direction

SEDA Overall Map (no scale)

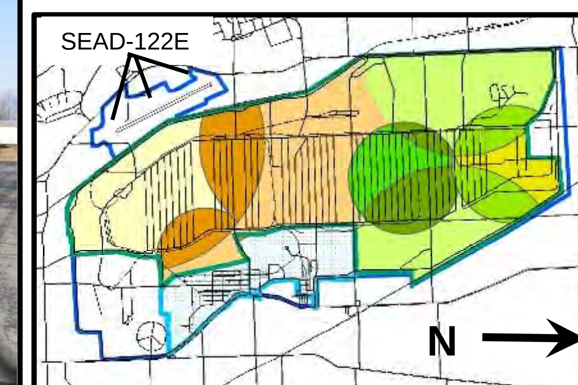


Figure A-25
5 Year Review - Site Visit Photo Log
Ash Landfill Operable Unit including SEADs 3, 6, 8, 14, & 15

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: Ash Landfill, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

Ash Landfill is located within the Development Reserve/Training Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

2011 Site Visit Photo

Status as of: 4/7/11 Description: Photo 105
Photo by: P. Petrone

Status as of: 4/7/11 Description: Photo 108
Photo by: P. Petrone

Status as of: 4/7/11 Description: Photo 103
Photo by: P. Petrone

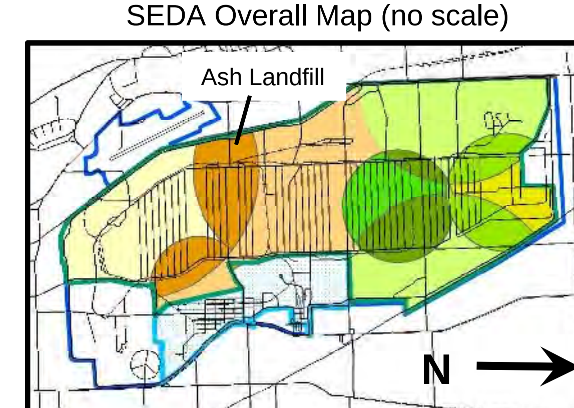
2011 Site Visit Photo

Status as of: 4/7/11 Description: Photo 102
Photo by: P. Petrone

Bing.com (Microsoft) Aerial of Ash Landfill; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.

Ash Landfill Operable Unit consists of:
- SEAD-3 Incinerator Cooling Water Pond
- SEAD-6 Abandoned Ash Landfill
- SEAD-8 Non-Combustible Fill Area
- SEAD-14 Refuse Burning Pits (2 units)
- SEAD-15 Abandoned Solid Waste Incinerator (Building 2207)

SEDA Overall Map (no scale)



P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ Ash_Landfill_Aerial_n_Ground_Photos.ppt

Figure A-26
5 Year Review - Site Visit Photo Log
Ash Landfill Operable Unit including SEADs 3, 6, 8, 14, & 15

PROJECT: Seneca Army Depot Periodic LUC Review
PROJECT #: 747547

LOCATION: Ash Landfill, Seneca Army Depot
CLIENT: U.S. Army Corp of Engineers

2011 Site Visit Photo

Status as of: 4/7/11 Description: Photo 107
Photo by: P. Petrone

Status as of: 4/7/11 Description: Photo 111
Photo by: P. Petrone

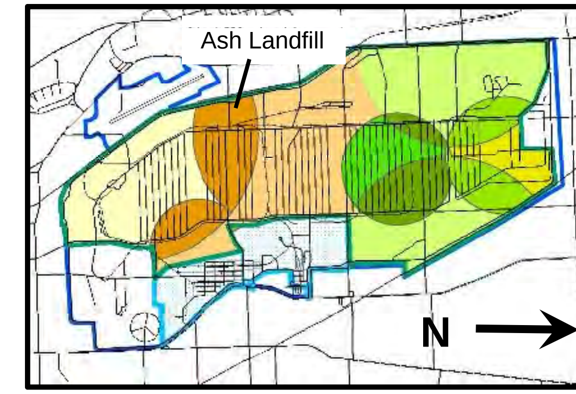
Ash Landfill is located within the Development Reserve/Training Area Parcel.

Approximate Site Boundary

Photo Viewing Direction

Ash Landfill Operable Unit consists of:
- SEAD-3 Incinerator Cooling Water Pond
- SEAD-6 Abandoned Ash Landfill
- SEAD-8 Non-Combustible Fill Area
- SEAD-14 Refuse Burning Pits (2 units)
- SEAD-15 Abandoned Solid Waste Incinerator (Building 2207)

SEDA Overall Map (no scale)



Bing.com (Microsoft) Aerial of Ash Landfill; actual date of aerial photo is unknown but based on observable features at SEDA its from Spring 2010.

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\Five Year Review\Figures\ Ash_Landfill_Aerial_n_Ground_Photos.ppt

APPENDIX B

SITE INSPECTION CHECKLISTS

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 1 Hazardous Waste Container Storage Facility (Building 307)	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** SUNNY 37 °F
Remedy Includes: (Check all that apply)	
☐ Landfill cover/containment ☐ Access controls ☒ Institutional controls ☐ Groundwater pump and treatment Other ______	☐ Monitored natural attenuation ☐ Groundwater containment ☐ Vertical barrier walls ☐ Surface water collection and treatment
Attachments: Inspection team roster attached Site map attached	

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

2. O&M staff ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

4. **Other interviews** (optional) Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. O&M Documents

O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A

Remarks____

____

2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A

Remarks____

____

3. O&M and OSHA Training Records	Readily available	Up to date	N/A

Remarks____

____

4. Permits and Service Agreements

Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits__________	Readily available	Up to date	N/A

Remarks____

____

5. Gas Generation Records	Readily available	Up to date	N/A

Remarks____

____

6. Settlement Monument Records	Readily available	Up to date	N/A

Remarks____

____

7. Groundwater Monitoring Records	Readily available	Up to date	N/A

Remarks____

____

8. Leachate Extraction Records	Readily available	Up to date	N/A

Remarks____

____

9. Discharge Compliance Records

Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A

Remarks____

____

10. Daily Access/Security Logs	Readily available	Up to date	N/A

Remarks____

____

IV. O&M COSTS   Applicable   N/A

1. O&M Organization

State in-house   Contractor for State
PRP in-house   Contractor for PRP
Federal Facility in-house   Contractor for Federal Facility
Other____

2. O&M Cost Records

Readily available   Up to date
Funding mechanism/agreement in place
Original O&M cost estimate____________________   Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
From______	To______	______	Breakdown attached
From______	To______	______	Breakdown attached
From______	To______	______	Breakdown attached
From______	To______	______	Breakdown attached
From______	To______	______	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____

V. ACCESS AND INSTITUTIONAL CONTROLS   Applicable   N/A

A. Fencing

1. Fencing damaged   Location shown on site map   Gates secured   N/A
Remarks____

B. Other Access Restrictions

1. Signs and other security measures   Location shown on site map   N/A
Remarks____

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY / WALK OVER
Frequency ____
Responsible party/agency ____
Contact ____________________ ____________________ __________ __________
Name   Title   Date   Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached
____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)

C. Institutional Controls (ICs) (continued)

2. Adequacy ICs are adequate ICs are inadequate N/A

Remarks

D. General

1. Vandalism/trespassing Location shown on site map No vandalism evident

Remarks

2. Land use changes on site N/A

Remarks

3. Land use changes off site N/A

Remarks

VI. ~~GENERAL~~ SITE CONDITIONS

A. Roads Applicable N/A

1. Roads damaged Location shown on site map Roads adequate N/A

Remarks

B. Other Site Conditions

Remarks

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident

Areal extent________ Depth________

Remarks

2. Cracks Location shown on site map Cracking not evident

Lengths________ Widths________ Depths________

Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____
____

4. Holes Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____
____

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____
____

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks____
____

7. Bulges Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____
____

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent____________
Ponding	Location shown on site map	Areal extent____________
Seeps	Location shown on site map	Areal extent____________
Soft subgrade	Location shown on site map	Areal extent____________

Remarks____
____

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks____
____

2. Bench Breached Location shown on site map N/A or okay
Remarks____
____

3. Bench Overtopped Location shown on site map N/A or okay
Remarks____
____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____
____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____
____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____
____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____
____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____
____

6. **Excessive Vegetative Growth** Type__________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____
____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____
____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks____

2. **Outlet Rock Inspected** Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent______________ Depth____________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent______________ Depth____________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement____________ Vertical displacement______________
Rotational displacement____________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. Vegetative Growth Location shown on site map N/A Vegetation does not impede flow Areal extent______ Type______ Remarks______
3. Erosion Location shown on site map Erosion not evident Areal extent______ Depth______ Remarks______
4. Discharge Structure Functioning N/A Remarks______

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. Settlement Location shown on site map Settlement not evident Areal extent______ Depth______ Remarks______
2. Performance Monitoring Type of monitoring______ Performance not monitored Frequency______ Evidence of breaching Head differential______ Remarks______

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. Pumps, Wellhead Plumbing, and Electrical Good condition All required wells properly operating Needs Maintenance N/A Remarks______
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks______
3. Spare Parts and Equipment Readily available Good condition Requires upgrade Needs to be provided Remarks______
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A
1. Collection Structures, Pumps, and Electrical Good condition Needs Maintenance Remarks______
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks______

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks____

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters____

Additive (*e.g.*, chelation agent, flocculent)____________________________

Others____

Good condition Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually____________________

Quantity of surface water treated annually____________________

Remarks____

2. Electrical Enclosures and Panels (properly rated and functional)

N/A Good condition Needs Maintenance

Remarks____

3. Tanks, Vaults, Storage Vessels

N/A Good condition Proper secondary containment Needs Maintenance

Remarks____

4. Discharge Structure and Appurtenances

N/A Good condition Needs Maintenance

Remarks____

5. Treatment Building(s)

N/A Good condition (esp. roof and doorways) Needs repair

Chemicals and equipment properly stored

Remarks____

6. Monitoring Wells (pump and treatment remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks____

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 2 PCB Transformer Storage Facility (Building 301)	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 40°F/RAIN

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ______________________ ______________ ________
Name Title Date
Interviewed at site at office by phone Phone no. ____________
Problems, suggestions; Report attached ______________________________

2. **O&M staff** ______________________ ______________ ________
Name Title Date
Interviewed at site at office by phone Phone no. ____________
Problems, suggestions; Report attached ______________________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________________
Contact ______________________ ____________ ________ __________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ______________________
Contact ______________________ ____________ ________ __________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ______________________
Contact ______________________ ____________ ________ __________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ______________________
Contact ______________________ ____________ ________ __________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

4. **Other interviews** (optional) Report attached ______________________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______________________________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits______________	Readily available	Up to date	N/A
Remarks______________________________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______________________________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______________________________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______________________________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______________________________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______________________________			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house Contractor for State
PRP in-house Contractor for PRP
Federal Facility in-house Contractor for Federal Facility
Other____________________

2. O&M Cost Records

Readily available Up to date
Funding mechanism/agreement in place
Original O&M cost estimate__________ Breakdown attached

Total annual cost by year for review period if available

From______ To______ ______ Breakdown attached
Date Date Total cost
From______ To______ ______ Breakdown attached
Date Date Total cost
From______ To______ ______ Breakdown attached
Date Date Total cost
From______ To______ ______ Breakdown attached
Date Date Total cost
From______ To______ ______ Breakdown attached
Date Date Total cost

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____________________

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks____________________

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks____________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented Yes No N/A
Site conditions imply ICs not being fully enforced Yes No N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY
Frequency ____________________
Responsible party/agency ____________________
Contact ______ ______ ______ ______
Name Title Date Phone #

Reporting is up-to-date Yes No N/A
Reports are verified by the lead agency Yes No N/A
Specific requirements in deed or decision documents have been met Yes No N/A
Violations have been reported Yes No N/A
Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)		
C. Institutional Controls (ICs) (continued)		

2. Adequacy ICs are adequate ICs are inadequate N/A
Remarks______________________________

D. General
1. **Vandalism/trespassing** Location shown on site map No vandalism evident
Remarks______________________________

2. **Land use changes on site** N/A
Remarks______________________________

3. **Land use changes off site** N/A
Remarks______________________________

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks______________________________

B. Other Site Conditions
Remarks______________________________

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident
Areal extent______________ Depth____________
Remarks______________________________

2. **Cracks** Location shown on site map Cracking not evident
Lengths____________ Widths____________ Depths__________
Remarks______________________________

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. Holes Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks____

7. Bulges Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent____________
Ponding	Location shown on site map	Areal extent____________
Seeps	Location shown on site map	Areal extent____________
Soft subgrade	Location shown on site map	Areal extent____________

Remarks____

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks____

2. Bench Breached Location shown on site map N/A or okay
Remarks____

3. Bench Overtopped Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. Material Degradation Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. Erosion Location shown on site map No evidence of erosion
Areal extent______________ Depth____________
Remarks____

4. Undercutting Location shown on site map No evidence of undercutting
Areal extent______________ Depth____________
Remarks____

5. Obstructions Type____________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____

6. Excessive Vegetative Growth Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____

D. Cover Penetrations Applicable N/A

1. Gas Vents Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. Gas Monitoring Probes
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. Monitoring Wells (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. Leachate Extraction Wells
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. Settlement Monuments Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)		
E. Gas Collection and Treatment	Applicable	N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks____

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer	Applicable	N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks____

2. Outlet Rock Inspected Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds	Applicable	N/A

1. Siltation Areal extent______________ Depth____________ N/A
Siltation not evident
Remarks____

2. Erosion Areal extent______________ Depth____________
Erosion not evident
Remarks____

3. Outlet Works Functioning N/A
Remarks____

4. Dam Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement____________ Vertical displacement______________
Rotational displacement____________
Remarks____

2. Degradation Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

I. Perimeter Ditches/Off-Site Discharge (continued)

2. Vegetative Growth Location shown on site map N/A
Vegetation does not impede flow
Areal extent______________ Type____________
Remarks____

3. Erosion Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. Discharge Structure Functioning N/A
Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A

1. Settlement Location shown on site map Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. Performance Monitoring Type of monitoring______________________
Performance not monitored
Frequency______________________ Evidence of breaching
Head differential______________________
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A

1. Pumps, Wellhead Plumbing, and Electrical
Good condition All required wells properly operating Needs Maintenance N/A
Remarks____

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances
Good condition Needs Maintenance
Remarks____

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks____

B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A

1. Collection Structures, Pumps, and Electrical
Good condition Needs Maintenance
Remarks____

2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances
Good condition Needs Maintenance
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks____

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters____

Additive (*e.g.*, chelation agent, flocculent)________________________

Others____

Good condition Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually________________

Quantity of surface water treated annually________________

Remarks____

2. Electrical Enclosures and Panels (properly rated and functional)

N/A Good condition Needs Maintenance

Remarks____

3. Tanks, Vaults, Storage Vessels

N/A Good condition Proper secondary containment Needs Maintenance

Remarks____

4. Discharge Structure and Appurtenances

N/A Good condition Needs Maintenance

Remarks____

5. Treatment Building(s)

N/A Good condition (esp. roof and doorways) Needs repair

Chemicals and equipment properly stored

Remarks____

6. Monitoring Wells (pump and treatment remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks____

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE
AND IS FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: SEAD 5 Sewage Sludge Waste Piles	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 45°F CLOUDY

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager ________________ ________________ ________________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ________________

2. O&M staff ________________ ________________ ________________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ________________
Contact ________________ ________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ________________

Agency ________________
Contact ________________ ________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ________________

Agency ________________
Contact ________________ ________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ________________

Agency ________________
Contact ________________ ________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ________________

4. Other interviews (optional) Report attached ________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______________________________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits__________	Readily available	Up to date	N/A
Remarks______________________________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______________________________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______________________________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______________________________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______________________________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______________________________			

IV. O&M COSTS   Applicable   N/A

1. O&M Organization

State in-house   Contractor for State
PRP in-house   Contractor for PRP
Federal Facility in-house   Contractor for Federal Facility
Other______________________________

2. O&M Cost Records

Readily available   Up to date
Funding mechanism/agreement in place
Original O&M cost estimate______________   Breakdown attached

Total annual cost by year for review period if available

From__________ To__________ __________ Breakdown attached
Date Date Total cost

From__________ To__________ __________ Breakdown attached
Date Date Total cost

From__________ To__________ __________ Breakdown attached
Date Date Total cost

From__________ To__________ __________ Breakdown attached
Date Date Total cost

From__________ To__________ __________ Breakdown attached
Date Date Total cost

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______________________________

V. ACCESS AND INSTITUTIONAL CONTROLS   Applicable   N/A

A. Fencing

1. Fencing damaged   Location shown on site map   Gates secured   N/A
Remarks______________________________

B. Other Access Restrictions

1. Signs and other security measures   Location shown on site map   N/A
Remarks______________________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented   Yes   No   N/A
Site conditions imply ICs not being fully enforced   Yes   No   N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY
Frequency ______________________________
Responsible party/agency ______________________________
Contact ______________________________
Name   Title   Date   Phone #

Reporting is up-to-date   Yes   No   N/A
Reports are verified by the lead agency   Yes   No   N/A
Specific requirements in deed or decision documents have been met   Yes   No   N/A
Violations have been reported   Yes   No   N/A
Other problems or suggestions: Report attached

____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. Adequacy ICs are adequate ICs are inadequate N/A Remarks
D. General **1. Vandalism/trespassing** Location shown on site map No vandalism evident Remarks
2. Land use changes on site N/A Remarks
3. Land use changes off site N/A Remarks

VI. GENERAL SITE CONDITIONS
A. Roads Applicable N/A
1. Roads damaged Location shown on site map Roads adequate N/A Remarks
B. Other Site Conditions Remarks

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. Settlement (Low spots) Location shown on site map Settlement not evident Areal extent_____ Depth_____ Remarks
2. Cracks Location shown on site map Cracking not evident Lengths_____ Widths_____ Depths_____ Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent______ Depth______
Remarks______

4. Holes Location shown on site map Holes not evident
Areal extent ~1-2 ft Depth 6-8"
Remarks PHOTOGRAPH # 25

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks______

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks______

7. Bulges Location shown on site map Bulges not evident
Areal extent______ Height______
Remarks______

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent______
Ponding	Location shown on site map	Areal extent______
Seeps	Location shown on site map	Areal extent______
Soft subgrade	Location shown on site map	Areal extent______

Remarks______

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent______
Remarks______

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks______

2. Bench Breached Location shown on site map N/A or okay
Remarks______

3. Bench Overtopped Location shown on site map N/A or okay
Remarks______

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent______ Depth______
Remarks______

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type______________ Areal extent____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth___________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth___________
Remarks____

5. **Obstructions** Type___________________ No obstructions
Location shown on site map Areal extent_____________
Size___________
Remarks____

6. **Excessive Vegetative Growth** Type__________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks

2. Outlet Rock Inspected Functioning N/A
Remarks

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent ______ Depth ______ N/A
Siltation not evident
Remarks

2. Erosion Areal extent ______ Depth ______
Erosion not evident
Remarks

3. Outlet Works Functioning N/A
Remarks

4. Dam Functioning N/A
Remarks

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement ______ Vertical displacement ______
Rotational displacement ______
Remarks

2. Degradation Location shown on site map Degradation not evident
Remarks

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent ______ Depth ______
Remarks

VII. LANDFILL COVERS (continued)

I. Perimeter Ditches/Off-Site Discharge (continued)

2. **Vegetative Growth** Location shown on site map N/A
Vegetation does not impede flow
Areal extent____________ Type__________
Remarks______________________________________

3. **Erosion** Location shown on site map Erosion not evident
Areal extent____________ Depth__________
Remarks______________________________________

4. **Discharge Structure** Functioning N/A
Remarks______________________________________

VIII. VERTICAL BARRIER WALLS Applicable N/A

1. **Settlement** Location shown on site map Settlement not evident
Areal extent____________ Depth__________
Remarks______________________________________

2. **Performance Monitoring** Type of monitoring____________________
Performance not monitored
Frequency____________________ Evidence of breaching
Head differential____________________
Remarks______________________________________

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A

A. Groundwater Extraction Wells, Pumps, **and** Pipelines Applicable N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
Good condition All required wells properly operating Needs Maintenance N/A
Remarks______________________________________

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
Good condition Needs Maintenance
Remarks______________________________________

3. **Spare Parts and Equipment**
Readily available Good condition Requires upgrade Needs to be provided
Remarks______________________________________

B. Surface Water Collection Structures, Pumps, **and** Pipelines Applicable N/A

1. **Collection Structures, Pumps, and Electrical**
Good condition Needs Maintenance
Remarks______________________________________

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
Good condition Needs Maintenance
Remarks______________________________________

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks___

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters___

Additive (*e.g.*, chelation agent, flocculent)___

Others___

Good condition Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually___

Quantity of surface water treated annually___

Remarks___

2. Electrical Enclosures and Panels (properly rated and functional)

N/A Good condition Needs Maintenance

Remarks___

3. Tanks, Vaults, Storage Vessels

N/A Good condition Proper secondary containment Needs Maintenance

Remarks___

4. Discharge Structure and Appurtenances

N/A Good condition Needs Maintenance

Remarks___

5. Treatment Building(s)

N/A Good condition (esp. roof and doorways) Needs repair

Chemicals and equipment properly stored

Remarks___

6. Monitoring Wells (pump and treatment remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks___

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks___

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

THE REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: SEAD 16 Building S311, Abandoned Deactivation Furnace	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 40°F / RAIN

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other LONG TERM GW MON

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______________________ ______________ ________

Name Title Date

Interviewed at site at office by phone Phone no. ________

Problems, suggestions; Report attached ______________________

2. O&M staff ______________________ ______________ ________

Name Title Date

Interviewed at site at office by phone Phone no. ________

Problems, suggestions; Report attached ______________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________________

Contact ______________________ ________ ______ ________

Name Title Date Phone #

Problems; suggestions; Report attached ______________________

Agency ______________________

Contact ______________________ ________ ______ ________

Name Title Date Phone #

Problems; suggestions; Report attached ______________________

Agency ______________________

Contact ______________________ ________ ______ ________

Name Title Date Phone #

Problems; suggestions; Report attached ______________________

Agency ______________________

Contact ______________________ ________ ______ ________

Name Title Date Phone #

Problems; suggestions; Report attached ______________________

4. **Other interviews** (optional) Report attached ______________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks____________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks____________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks____________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits____________	Readily available	Up to date	N/A
Remarks____________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks____________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks____________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks____________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks____________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks____________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks____________			

IV. O&M COSTS   Applicable   N/A

1. O&M Organization

State in-house   Contractor for State
PRP in-house   Contractor for PRP
Federal Facility in-house   Contractor for Federal Facility
Other ______________________________

2. O&M Cost Records

Readily available   Up to date
Funding mechanism/agreement in place
Original O&M cost estimate ____________   Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______________________________

V. ACCESS AND INSTITUTIONAL CONTROLS   Applicable   N/A

A. Fencing

1. Fencing damaged   Location shown on site map   Gates secured   N/A
Remarks ______________________________

B. Other Access Restrictions

1. Signs and other security measures   Location shown on site map   N/A
Remarks ______________________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY
Frequency ______________________________
Responsible party/agency ______________________________
Contact ______________________________

Name   Title   Date   Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)

C. Institutional Controls (ICs) (continued)

2. Adequacy ICs are adequate ICs are inadequate N/A

Remarks____

D. General

1. Vandalism/trespassing Location shown on site map No vandalism evident

Remarks____

2. Land use changes on site N/A

Remarks____

3. Land use changes off site N/A

Remarks____

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. Roads damaged Location shown on site map Roads adequate N/A

Remarks____

B. Other Site Conditions

Remarks____

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. Settlement (Low spots) Location shown on site map Settlement not evident

Areal extent__________ Depth__________

Remarks____

2. Cracks Location shown on site map Cracking not evident

Lengths__________ Widths__________ Depths__________

Remarks____

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent______ Depth______
Remarks______

4. Holes Location shown on site map Holes not evident
Areal extent______ Depth______
Remarks______

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks______

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks______

7. Bulges Location shown on site map Bulges not evident
Areal extent______ Height______
Remarks______

8. Wet Areas/Water Damage Wet areas/water damage not evident
Wet areas Location shown on site map Areal extent______
Ponding Location shown on site map Areal extent______
Seeps Location shown on site map Areal extent______
Soft subgrade Location shown on site map Areal extent______
Remarks______

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent______
Remarks______

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks______

2. Bench Breached Location shown on site map N/A or okay
Remarks______

3. Bench Overtopped Location shown on site map N/A or okay
Remarks______

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent______ Depth______
Remarks______

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____
____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent______________ Depth_____________
Remarks____
____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent______________ Depth_____________
Remarks____
____

5. **Obstructions** Type______________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____
____

6. **Excessive Vegetative Growth** Type_____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____
____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____
____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks______________________________

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks______________________________

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks______________________________

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks______________________________

2. **Outlet Rock Inspected** Functioning N/A
Remarks______________________________

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks______________________________

2. **Erosion** Areal extent__________ Depth__________
Erosion not evident
Remarks______________________________

3. **Outlet Works** Functioning N/A
Remarks______________________________

4. **Dam** Functioning N/A
Remarks______________________________

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks______________________________

2. **Degradation** Location shown on site map Degradation not evident
Remarks______________________________

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks______________________________

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. **Vegetative Growth** Location shown on site map N/A Vegetation does not impede flow Areal extent______________ Type____________ Remarks______________________________
3. **Erosion** Location shown on site map Erosion not evident Areal extent______________ Depth____________ Remarks______________________________
4. **Discharge Structure** Functioning N/A Remarks______________________________

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. **Settlement** Location shown on site map Settlement not evident Areal extent______________ Depth____________ Remarks______________________________
2. **Performance Monitoring** Type of monitoring__________________ Performance not monitored Frequency______________________ Evidence of breaching Head differential______________________ Remarks______________________________

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. **Pumps, Wellhead Plumbing, and Electrical** Good condition All required wells properly operating Needs Maintenance N/A Remarks______________________________
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks______________________________
3. **Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks______________________________
B. Surface Water Collection Structures, Pumps, **and** Pipelines Applicable N/A
1. **Collection Structures, Pumps, and Electrical** Good condition Needs Maintenance Remarks______________________________
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks______________________________

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment

Readily available   Good condition   Requires upgrade   Needs to be provided

Remarks____________________

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters__________
Additive (*e.g.*, chelation agent, flocculent)__________
Others__________
Good condition   Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually__________
Quantity of surface water treated annually__________

Remarks____________________

2. Electrical Enclosures and Panels (properly rated and functional)

N/A   Good condition   Needs Maintenance

Remarks____________________

3. Tanks, Vaults, Storage Vessels

N/A   Good condition   Proper secondary containment   Needs Maintenance

Remarks____________________

4. Discharge Structure and Appurtenances

N/A   Good condition   Needs Maintenance

Remarks____________________

5. Treatment Building(s)

N/A   Good condition (esp. roof and doorways)   Needs repair
Chemicals and equipment properly stored

Remarks____________________

6. Monitoring Wells (pump and treatment remedy)

Properly secured/locked   Functioning   Routinely sampled   Good condition
All required wells located   Needs Maintenance   N/A

Remarks____________________

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time   Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained   Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)

Properly secured/locked   Functioning   Routinely sampled   Good condition
All required wells located   Needs Maintenance   N/A

Remarks WELLS NOT LOCKED. SOME WELLS (I.E. WM 16-2) HAS APPARENTLY HEAVED PHOTO #36 & 37

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

THE REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: SEAD 17 Building 367, Active Deactivation Furnace	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 40°F / RAIN

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☒ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other LTGW MONITORING

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

2. **O&M staff** ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

4. **Other interviews** (optional) Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______________________________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits______________	Readily available	Up to date	N/A
Remarks______________________________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______________________________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______________________________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______________________________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______________________________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______________________________			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house | Contractor for State
PRP in-house | Contractor for PRP
Federal Facility in-house | Contractor for Federal Facility
Other____________________________

2. O&M Cost Records

Readily available | Up to date
Funding mechanism/agreement in place
Original O&M cost estimate________________ Breakdown attached

Total annual cost by year for review period if available

From________ To________ ________ Breakdown attached
Date Date Total cost
From________ To________ ________ Breakdown attached
Date Date Total cost
From________ To________ ________ Breakdown attached
Date Date Total cost
From________ To________ ________ Breakdown attached
Date Date Total cost
From________ To________ ________ Breakdown attached
Date Date Total cost

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____________________________

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks____________________________

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks____________________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY
Frequency ____________________________
Responsible party/agency ____________________________
Contact ________ ________ ________ ________
Name Title Date Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)

C. Institutional Controls (ICs) (continued)

2. Adequacy ICs are adequate ICs are inadequate N/A

Remarks____

D. General

1. Vandalism/trespassing Location shown on site map No vandalism evident

Remarks____

2. Land use changes on site N/A

Remarks____

3. Land use changes off site N/A

Remarks____

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. Roads damaged Location shown on site map Roads adequate N/A

Remarks____

B. Other Site Conditions

Remarks____

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. Settlement (Low spots) Location shown on site map Settlement not evident

Areal extent__________ Depth__________

Remarks____

2. Cracks Location shown on site map Cracking not evident

Lengths__________ Widths__________ Depths__________

Remarks____

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent____________ Depth____________
Remarks____

4. Holes Location shown on site map Holes not evident
Areal extent____________ Depth____________
Remarks____

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks____

7. Bulges Location shown on site map Bulges not evident
Areal extent____________ Height____________
Remarks____

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent____________
Ponding	Location shown on site map	Areal extent____________
Seeps	Location shown on site map	Areal extent____________
Soft subgrade	Location shown on site map	Areal extent____________

Remarks____

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent____________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks____

2. Bench Breached Location shown on site map N/A or okay
Remarks____

3. Bench Overtopped Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent____________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. Material Degradation Location shown on site map No evidence of degradation
Material type_____________ Areal extent_____________
Remarks____

3. Erosion Location shown on site map No evidence of erosion
Areal extent_____________ Depth_____________
Remarks____

4. Undercutting Location shown on site map No evidence of undercutting
Areal extent_____________ Depth_____________
Remarks____

5. Obstructions Type_____________ No obstructions
Location shown on site map Areal extent_____________
Size_____________
Remarks____

6. Excessive Vegetative Growth Type_____________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____

D. Cover Penetrations Applicable N/A

1. Gas Vents Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. Gas Monitoring Probes
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. Monitoring Wells (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. Leachate Extraction Wells
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. Settlement Monuments Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks____

2. **Outlet Rock Inspected** Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent__________ Depth__________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. Vegetative Growth Location shown on site map N/A Vegetation does not impede flow Areal extent______________ Type____________ Remarks____
3. Erosion Location shown on site map Erosion not evident Areal extent______________ Depth____________ Remarks____
4. Discharge Structure Functioning N/A Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. Settlement Location shown on site map Settlement not evident Areal extent______________ Depth____________ Remarks____
2. Performance Monitoring Type of monitoring__________________________ Performance not monitored Frequency______________________________ Evidence of breaching Head differential________________________ Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. Pumps, Wellhead Plumbing, and Electrical Good condition All required wells properly operating Needs Maintenance N/A Remarks____
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks____
3. Spare Parts and Equipment Readily available Good condition Requires upgrade Needs to be provided Remarks____
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A
1. Collection Structures, Pumps, and Electrical Good condition Needs Maintenance Remarks____
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters

Additive (*e.g.*, chelation agent, flocculent)

Others

Good condition Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually

Quantity of surface water treated annually

Remarks

2. Electrical Enclosures and Panels (properly rated and functional)

N/A Good condition Needs Maintenance

Remarks

3. Tanks, Vaults, Storage Vessels

N/A Good condition Proper secondary containment Needs Maintenance

Remarks

4. Discharge Structure and Appurtenances

N/A Good condition Needs Maintenance

Remarks

5. Treatment Building(s)

N/A Good condition (esp. roof and doorways) Needs repair

Chemicals and equipment properly stored

Remarks

6. Monitoring Wells (pump and treatment remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)

~~Properly secured/locked~~ Functioning Routinely sampled Good condition

All required wells located ~~Needs Maintenance N/A~~

Remarks WELLS ARE NOT LOCKED

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

THE REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 25 Fire Training and Demonstration Pad	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** SUNNY / 37°F

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other GW MONITORING

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

2. **O&M staff** ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

4. **Other interviews** (optional) Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. O&M Documents

O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A

Remarks____

2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A

Remarks____

3. O&M and OSHA Training Records	Readily available	Up to date	N/A

Remarks____

4. Permits and Service Agreements

Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits________	Readily available	Up to date	N/A

Remarks____

5. Gas Generation Records	Readily available	Up to date	N/A

Remarks____

6. Settlement Monument Records	Readily available	Up to date	N/A

Remarks____

7. Groundwater Monitoring Records	Readily available	Up to date	N/A

Remarks____

8. Leachate Extraction Records	Readily available	Up to date	N/A

Remarks____

9. Discharge Compliance Records

Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A

Remarks____

10. Daily Access/Security Logs	Readily available	Up to date	N/A

Remarks____

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house — Contractor for State
PRP in-house — Contractor for PRP
Federal Facility in-house — Contractor for Federal Facility
Other ______________________

2. O&M Cost Records

Readily available — Up to date
Funding mechanism/agreement in place
Original O&M cost estimate ____________ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______________________

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks ______________________

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks ______________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE-BY/WALKOVER
Frequency ______________________
Responsible party/agency ______________________
Contact ______________________

Name	Title	Date	Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. **Adequacy** ICs are adequate ICs are inadequate N/A Remarks
D. General 1. **Vandalism/trespassing** Location shown on site map No vandalism evident Remarks
2. **Land use changes on site** N/A Remarks
3. **Land use changes off site** N/A Remarks

VI. GENERAL SITE CONDITIONS
A. Roads Applicable N/A
1. **Roads damaged** Location shown on site map Roads adequate N/A Remarks
B. Other Site Conditions Remarks

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. **Settlement** (Low spots) Location shown on site map Settlement not evident Areal extent Depth Remarks
2. **Cracks** Location shown on site map Cracking not evident Lengths Widths Depths Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent______ Depth______
Remarks______

4. Holes Location shown on site map Holes not evident
Areal extent______ Depth______
Remarks______

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks EXCAVATION AREA IS GRAVEL COVERED

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks______

7. Bulges Location shown on site map Bulges not evident
Areal extent______ Height______
Remarks______

8. Wet Areas/Water Damage Wet areas/water damage not evident
Wet areas Location shown on site map Areal extent______
Ponding Location shown on site map Areal extent ~ 40 ft² BUT OUTSIDE OF EXCAVATION AREA
Seeps Location shown on site map Areal extent______
Soft subgrade Location shown on site map Areal extent______
Remarks HEAVY RAIN FALL ON PREVIOUS DAY

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent______ N/A
Remarks______

B. Benches Applicable N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks______

2. Bench Breached Location shown on site map N/A or okay
Remarks______

3. Bench Overtopped Location shown on site map N/A or okay
Remarks______

C. Letdown Channels Applicable N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent______ Depth______
Remarks______

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent_____________
Size____________
Remarks____

6. **Excessive Vegetative Growth** Type___________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks_______________

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks_______________

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks_______________

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks_______________

2. Outlet Rock Inspected Functioning N/A
Remarks_______________

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks_______________

2. Erosion Areal extent__________ Depth__________
Erosion not evident
Remarks_______________

3. Outlet Works Functioning N/A
Remarks_______________

4. Dam Functioning N/A
Remarks_______________

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement__________ **Vertical displacement**__________
Rotational displacement__________
Remarks_______________

2. Degradation Location shown on site map Degradation not evident
Remarks_______________

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks_______________

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. Vegetative Growth Location shown on site map N/A Vegetation does not impede flow Areal extent______________ Type___________ Remarks____
3. Erosion Location shown on site map Erosion not evident Areal extent______________ Depth___________ Remarks____
4. Discharge Structure Functioning N/A Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. Settlement Location shown on site map Settlement not evident Areal extent______________ Depth___________ Remarks____
2. Performance Monitoring Type of monitoring________________________ Performance not monitored Frequency____________________________ Evidence of breaching Head differential_______________________ Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, **and** Pipelines Applicable N/A
1. Pumps, Wellhead Plumbing, and Electrical Good condition All required wells properly operating Needs Maintenance N/A Remarks____
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks____
3. Spare Parts and Equipment Readily available Good condition Requires upgrade Needs to be provided Remarks____
B. Surface Water Collection Structures, Pumps, **and** Pipelines Applicable N/A
1. Collection Structures, Pumps, and Electrical Good condition Needs Maintenance Remarks____
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks

C. Treatment System Applicable N/A

1. **Treatment Train** (Check components that apply)
Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters
Additive (*e.g.*, chelation agent, flocculent)
Others
Good condition Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually
Quantity of surface water treated annually
Remarks

2. **Electrical Enclosures and Panels** (properly rated and functional)
N/A Good condition Needs Maintenance
Remarks

3. **Tanks, Vaults, Storage Vessels**
N/A Good condition Proper secondary containment Needs Maintenance
Remarks

4. **Discharge Structure and Appurtenances**
N/A Good condition Needs Maintenance
Remarks

5. **Treatment Building(s)**
N/A Good condition (esp. roof and doorways) Needs repair
Chemicals and equipment properly stored
Remarks

6. **Monitoring Wells** (pump and treatment remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks

D. Monitoring Data

1. Monitoring **Data**
Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:
Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation N/A

1. **Monitoring Wells** (~~natural attenuation remedy~~) GW MONITORING
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks WELL UNLOCKED & INNER CAP MISSING

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: SEAD 26 Fire Training Pit	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** CLOUDY 46°F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______________________ ______________ __________
Name Title Date
Interviewed at site at office by phone Phone no. __________
Problems, suggestions; Report attached ______________________________

2. O&M staff ______________________ ______________ __________
Name Title Date
Interviewed at site at office by phone Phone no. __________
Problems, suggestions; Report attached ______________________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________________
Contact ______________________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ______________________
Contact ______________________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ______________________
Contact ______________________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ______________________
Contact ______________________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

4. Other interviews (optional) Report attached ______________________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits______	Readily available	Up to date	N/A
Remarks______			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house / Contractor for State
PRP in-house / Contractor for PRP
Federal Facility in-house / Contractor for Federal Facility
Other ______

2. O&M Cost Records

Readily available / Up to date
Funding mechanism/agreement in place
Original O&M cost estimate ______ Breakdown attached

Total annual cost by year for review period if available

From	To		
Date	Date	Total cost	Breakdown attached
Date	Date	Total cost	Breakdown attached
Date	Date	Total cost	Breakdown attached
Date	Date	Total cost	Breakdown attached
Date	Date	Total cost	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks ______

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks ______

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE-BY
Frequency ______
Responsible party/agency ______
Contact ______

Name Title Date Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. **Adequacy** ICs are adequate ICs are inadequate N/A Remarks________________
D. General 1. **Vandalism/trespassing** Location shown on site map No vandalism evident Remarks________________ 2. **Land use changes on site** N/A Remarks________________ 3. **Land use changes off site** N/A Remarks________________

VI. GENERAL SITE CONDITIONS
A. Roads Applicable N/A
1. **Roads damaged** Location shown on site map Roads adequate N/A Remarks________________
B. Other Site Conditions Remarks________________

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. **Settlement** (Low spots) Location shown on site map Settlement not evident Areal extent__________ Depth__________ Remarks________________
2. **Cracks** Location shown on site map Cracking not evident Lengths__________ Widths__________ Depths__________ Remarks________________

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. **Erosion** Location shown on site map Erosion not evident
Areal extent__________ Depth__________
Remarks____

4. **Holes** Location shown on site map Holes not evident
Areal extent__________ Depth__________
Remarks____

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks____

7. **Bulges** Location shown on site map Bulges not evident
Areal extent__________ Height__________
Remarks____

8. **Wet Areas/Water Damage** Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent__________
Ponding	Location shown on site map	Areal extent__________
Seeps	Location shown on site map	Areal extent__________
Soft subgrade	Location shown on site map	Areal extent__________

Remarks____

9. **Slope Instability** Slides Location shown on site map No evidence of slope instability
Areal extent__________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks____

2. **Bench Breached** Location shown on site map N/A or okay
Remarks____

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent__________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent_____________
Size____________
Remarks____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks____

2. **Outlet Rock Inspected** Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent____________ Depth__________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent____________ Depth__________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent____________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)

I. Perimeter Ditches/Off-Site Discharge (continued)

2. Vegetative Growth Location shown on site map N/A
Vegetation does not impede flow
Areal extent______________ Type____________
Remarks____
____

3. Erosion Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____
____

4. Discharge Structure Functioning N/A
Remarks____
____

VIII. VERTICAL BARRIER WALLS Applicable N/A

1. Settlement Location shown on site map Settlement not evident
Areal extent______________ Depth____________
Remarks____
____

2. Performance Monitoring Type of monitoring__________________________
Performance not monitored
Frequency_______________________________ Evidence of breaching
Head differential__________________________
Remarks____
____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A

1. Pumps, Wellhead Plumbing, and Electrical
Good condition All required wells properly operating Needs Maintenance N/A
Remarks____
____
____

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances
Good condition Needs Maintenance
Remarks____
____

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks____
____

B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A

1. Collection Structures, Pumps, and Electrical
Good condition Needs Maintenance
Remarks____
____

2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances
Good condition Needs Maintenance
Remarks____
____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks____

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)
Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters____
Additive (*e.g.*, chelation agent, flocculent)____________________________
Others____
Good condition Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually__________________
Quantity of surface water treated annually__________________
Remarks____

2. Electrical Enclosures and Panels (properly rated and functional)
N/A Good condition Needs Maintenance
Remarks____

3. Tanks, Vaults, Storage Vessels
N/A Good condition Proper secondary containment Needs Maintenance
Remarks____

4. Discharge Structure and Appurtenances
N/A Good condition Needs Maintenance
Remarks____

5. Treatment Building(s)
N/A Good condition (esp. roof and doorways) Needs repair
Chemicals and equipment properly stored
Remarks____

6. Monitoring Wells (pump and treatment remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks____

D. Monitoring Data

1. Monitoring Data
Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:
Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy appears to be effective and functioning as designed

B. Adequacy of O&M
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 27 Steam Cleaning Waste Tank (Building 360 - Steam Jenny Pit)	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** SUNNY/37 °F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______________________
Name Title Date
Interviewed at site at office by phone Phone no. __________
Problems, suggestions; Report attached ______________________

2. O&M staff ______________________
Name Title Date
Interviewed at site at office by phone Phone no. __________
Problems, suggestions; Report attached ______________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________________
Contact ______________________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ______________________
Contact ______________________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ______________________
Contact ______________________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ______________________
Contact ______________________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

4. **Other interviews** (optional) Report attached ______________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______________________________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits__________	Readily available	Up to date	N/A
Remarks______________________________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______________________________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______________________________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______________________________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______________________________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______________________________			

IV. O&M COSTS   Applicable   N/A

1. O&M Organization

State in-house   Contractor for State
PRP in-house   Contractor for PRP
Federal Facility in-house   Contractor for Federal Facility
Other________________________________

2. O&M Cost Records

Readily available   Up to date
Funding mechanism/agreement in place
Original O&M cost estimate____________   Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ________________________________

V. ACCESS AND INSTITUTIONAL CONTROLS   Applicable   N/A

A. Fencing

1. Fencing damaged   Location shown on site map   Gates secured   N/A
Remarks________________________________

B. Other Access Restrictions

1. Signs and other security measures   Location shown on site map   N/A
Remarks________________________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE-BY
Frequency ________________________
Responsible party/agency ________________________
Contact ____________ ____________ ________ ________

Name	Title	Date	Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached
____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. **Adequacy** ICs are adequate ICs are inadequate N/A Remarks VERIFIED BUILDING ON PUBLIC WATER/NO WELLS
D. General 1. **Vandalism/trespassing** Location shown on site map No vandalism evident Remarks
2. **Land use changes on site** N/A Remarks
3. **Land use changes off site** N/A Remarks

VI. GENERAL SITE CONDITIONS
A. Roads Applicable N/A
1. **Roads damaged** Location shown on site map Roads adequate N/A Remarks
B. Other Site Conditions Remarks

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. **Settlement** (Low spots) Location shown on site map Settlement not evident Areal extent ______ Depth ______ Remarks
2. **Cracks** Location shown on site map Cracking not evident Lengths ______ Widths ______ Depths ______ Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent________ Depth________
Remarks________

4. Holes Location shown on site map Holes not evident
Areal extent________ Depth________
Remarks________

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks________

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks________

7. Bulges Location shown on site map Bulges not evident
Areal extent________ Height________
Remarks________

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent________
Ponding	Location shown on site map	Areal extent________
Seeps	Location shown on site map	Areal extent________
Soft subgrade	Location shown on site map	Areal extent________

Remarks________

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent________
Remarks________

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks________

2. Bench Breached Location shown on site map N/A or okay
Remarks________

3. Bench Overtopped Location shown on site map N/A or okay
Remarks________

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent________ Depth________
Remarks________

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. Material Degradation Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. Erosion Location shown on site map No evidence of erosion
Areal extent______________ Depth____________
Remarks____

4. Undercutting Location shown on site map No evidence of undercutting
Areal extent______________ Depth____________
Remarks____

5. Obstructions Type____________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____

6. Excessive Vegetative Growth Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____

D. Cover Penetrations Applicable N/A

1. Gas Vents Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. Gas Monitoring Probes
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. Monitoring Wells (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. Leachate Extraction Wells
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. Settlement Monuments Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks______________________________

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks______________________________

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks______________________________

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks______________________________

2. Outlet Rock Inspected Functioning N/A
Remarks______________________________

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks______________________________

2. Erosion Areal extent__________ Depth__________
Erosion not evident
Remarks______________________________

3. Outlet Works Functioning N/A
Remarks______________________________

4. Dam Functioning N/A
Remarks______________________________

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks______________________________

2. Degradation Location shown on site map Degradation not evident
Remarks______________________________

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks______________________________

VII. LANDFILL COVERS (continued)

I. Perimeter Ditches/Off-Site **Discharge (continued)**

2. **Vegetative Growth** Location shown on site map N/A
Vegetation does not impede flow
Areal extent____________ Type__________
Remarks____

3. **Erosion** Location shown on site map Erosion not evident
Areal extent____________ Depth__________
Remarks____

4. **Discharge Structure** Functioning N/A
Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A

1. **Settlement** Location shown on site map Settlement not evident
Areal extent____________ Depth__________
Remarks____

2. **Performance Monitoring** Type of monitoring__________
Performance not monitored
Frequency______________________ Evidence of breaching
Head differential__________________
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
Good condition All required wells properly operating Needs Maintenance N/A
Remarks____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
Good condition Needs Maintenance
Remarks____

3. **Spare Parts and Equipment**
Readily available Good condition Requires upgrade Needs to be provided
Remarks____

B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A

1. **Collection Structures, Pumps, and Electrical**
Good condition Needs Maintenance
Remarks____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
Good condition Needs Maintenance
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks____

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)
Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters____
Additive (*e.g.*, chelation agent, flocculent)______________________________
Others____
Good condition Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually__________________
Quantity of surface water treated annually__________________
Remarks____

2. Electrical Enclosures and Panels (properly rated and functional)
N/A Good condition Needs Maintenance
Remarks____

3. Tanks, Vaults, Storage Vessels
N/A Good condition Proper secondary containment Needs Maintenance
Remarks____

4. Discharge Structure and Appurtenances
N/A Good condition Needs Maintenance
Remarks____

5. Treatment Building(s)
N/A Good condition (esp. roof and doorways) Needs repair
Chemicals and equipment properly stored
Remarks____

6. Monitoring Wells (pump and treatment remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks____

D. Monitoring Data

1. Monitoring Data
Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:
Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 39 Building 121 Boiler Plant Blowdown Leach Pit	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 44°F / OVERCAST

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ______________ ______________ ______________
Name Title Date
Interviewed at site at office by phone Phone no. ______________
Problems, suggestions; Report attached ______________________

2. **O&M staff** ______________ ______________ ______________
Name Title Date
Interviewed at site at office by phone Phone no. ______________
Problems, suggestions; Report attached ______________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

4. **Other interviews** (optional) Report attached ______________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits______	Readily available	Up to date	N/A
Remarks______			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house Contractor for State
PRP in-house Contractor for PRP
Federal Facility in-house Contractor for Federal Facility
Other ____________________

2. O&M Cost Records

Readily available Up to date
Funding mechanism/agreement in place
Original O&M cost estimate ____________ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____________________

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks ____________________

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks ____________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY/WALK OVER
Frequency ____________________
Responsible party/agency ____________________
Contact ____________________

Name Title Date Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)

C. Institutional Controls (ICs) (continued)

2. **Adequacy** ICs are adequate ICs are inadequate N/A
Remarks____

D. General

1. **Vandalism/trespassing** Location shown on site map No vandalism evident
Remarks____

2. **Land use changes on site** N/A
Remarks____

3. **Land use changes off site** N/A
Remarks____

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks____

B. Other Site Conditions

Remarks____

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. **Cracks** Location shown on site map Cracking not evident
Lengths____________ Widths____________ Depths__________
Remarks____

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. Holes Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks____

7. Bulges Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent____________
Ponding	Location shown on site map	Areal extent____________
Seeps	Location shown on site map	Areal extent____________
Soft subgrade	Location shown on site map	Areal extent____________

Remarks____

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks____

2. Bench Breached Location shown on site map N/A or okay
Remarks____

3. Bench Overtopped Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____
____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____
____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____
____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____
____

6. **Excessive Vegetative Growth** Type___________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____
____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____
____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks____

2. **Outlet Rock Inspected** Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent__________ Depth__________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)

I. Perimeter Ditches/Off-Site **Discharge (continued)**

2. **Vegetative Growth** Location shown on site map N/A

Vegetation does not impede flow

Areal extent______________ Type____________

Remarks____

3. **Erosion** Location shown on site map Erosion not evident

Areal extent______________ Depth____________

Remarks____

4. **Discharge Structure** Functioning N/A

Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A

1. **Settlement** Location shown on site map Settlement not evident

Areal extent______________ Depth____________

Remarks____

2. **Performance Monitoring** Type of monitoring__________________________

Performance not monitored

Frequency_______________________________ Evidence of breaching

Head differential__________________________

Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A

A. Groundwater Extraction Wells, **Pumps, and Pipelines** Applicable N/A

1. **Pumps, Wellhead Plumbing, and Electrical**

Good condition All required wells properly operating Needs Maintenance N/A

Remarks____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**

Good condition Needs Maintenance

Remarks____

3. **Spare Parts and Equipment**

Readily available Good condition Requires upgrade Needs to be provided

Remarks____

B. Surface Water Collection Structures, **Pumps, and** Pipelines Applicable N/A

1. **Collection Structures, Pumps, and Electrical**

Good condition Needs Maintenance

Remarks____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**

Good condition Needs Maintenance

Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)
B. Surface Water Collection Structures, Pumps, and Pipelines **(continued)**

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks___

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)
Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters___
Additive (*e.g.*, chelation agent, flocculent)___
Others___
Good condition Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually___
Quantity of surface water treated annually___
Remarks___

2. Electrical Enclosures and Panels (properly rated and functional)
N/A Good condition Needs Maintenance
Remarks___

3. Tanks, Vaults, Storage Vessels
N/A Good condition Proper secondary containment Needs Maintenance
Remarks___

4. Discharge Structure and Appurtenances
N/A Good condition Needs Maintenance
Remarks___

5. Treatment Building(s)
N/A Good condition (esp. roof and doorways) Needs repair
Chemicals and equipment properly stored
Remarks___

6. Monitoring Wells (pump and treatment remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks___

D. Monitoring Data

1. Monitoring Data
Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:
Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks___

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 40 Building 319 Boiler Plant Blowdown Leach Pit	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** SUNNY 37°F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ____________
Problems, suggestions; Report attached ____________

2. O&M staff ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ____________
Problems, suggestions; Report attached ____________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

4. **Other interviews** (optional) Report attached ____________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______________________________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits______________	Readily available	Up to date	N/A
Remarks______________________________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______________________________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______________________________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______________________________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______________________________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______________________________			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house — Contractor for State
PRP in-house — Contractor for PRP
Federal Facility in-house — Contractor for Federal Facility
Other ______

2. O&M Cost Records

Readily available — Up to date
Funding mechanism/agreement in place
Original O&M cost estimate ______ Breakdown attached

Total annual cost by year for review period if available

From	To		
______ Date	______ Date	______ Total cost	Breakdown attached
______ Date	______ Date	______ Total cost	Breakdown attached
______ Date	______ Date	______ Total cost	Breakdown attached
______ Date	______ Date	______ Total cost	Breakdown attached
______ Date	______ Date	______ Total cost	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks ______

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks ______

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY / WALK-OVER
Frequency ______
Responsible party/agency ______
Contact ______ Name ______ Title ______ Date ______ Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. Adequacy ICs are adequate ICs are inadequate N/A Remarks_______
D. General **1. Vandalism/trespassing** Location shown on site map No vandalism evident Remarks_______
2. Land use changes on site N/A Remarks_______
3. Land use changes off site N/A Remarks_______

VI. GENERAL SITE CONDITIONS
A. Roads Applicable N/A
1. Roads damaged Location shown on site map Roads adequate N/A Remarks_______
B. Other Site Conditions Remarks_______

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. Settlement (Low spots) Location shown on site map Settlement not evident Areal extent_______ Depth_______ Remarks_______
2. Cracks Location shown on site map Cracking not evident Lengths_______ Widths_______ Depths_______ Remarks_______

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident

Areal extent______________ Depth____________

Remarks____

4. Holes Location shown on site map Holes not evident

Areal extent______________ Depth____________

Remarks____

5. Vegetative Cover Grass Cover properly established No signs of stress

Trees/Shrubs (indicate size and locations on a diagram)

Remarks____

6. Alternative Cover (armored rock, concrete, etc.) N/A

Remarks____

7. Bulges Location shown on site map Bulges not evident

Areal extent______________ Height____________

Remarks____

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas Location shown on site map Areal extent____________

Ponding Location shown on site map Areal extent____________

Seeps Location shown on site map Areal extent____________

Soft subgrade Location shown on site map Areal extent____________

Remarks____

9. Slope Instability Slides Location shown on site map No evidence of slope instability

Areal extent______________

Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay

Remarks____

2. Bench Breached Location shown on site map N/A or okay

Remarks____

3. Bench Overtopped Location shown on site map N/A or okay

Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement

Areal extent______________ Depth____________

Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. Material Degradation Location shown on site map No evidence of degradation
Material type______________ Areal extent____________
Remarks____
____

3. Erosion Location shown on site map No evidence of erosion
Areal extent_____________ Depth___________
Remarks____
____

4. Undercutting Location shown on site map No evidence of undercutting
Areal extent_____________ Depth___________
Remarks____
____

5. Obstructions Type____________________ No obstructions
Location shown on site map Areal extent_____________
Size___________
Remarks____
____

6. Excessive Vegetative Growth Type___________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____
____

D. Cover Penetrations Applicable N/A

1. Gas Vents Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

2. Gas Monitoring Probes
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

3. Monitoring Wells (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

4. Leachate Extraction Wells
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

5. Settlement Monuments Located Routinely surveyed N/A
Remarks____
____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks____

2. **Outlet Rock Inspected** Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent__________ Depth__________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)

2. Vegetative Growth Location shown on site map N/A

Vegetation does not impede flow

Areal extent______________ Type____________

Remarks____

____

3. Erosion Location shown on site map Erosion not evident

Areal extent______________ Depth____________

Remarks____

____

4. Discharge Structure Functioning N/A

Remarks____

____

VIII. VERTICAL BARRIER WALLS Applicable N/A

1. Settlement Location shown on site map Settlement not evident

Areal extent______________ Depth____________

Remarks____

____

2. Performance Monitoring Type of monitoring__________________________

Performance not monitored

Frequency______________________________ Evidence of breaching

Head differential_________________________

Remarks____

____

IX. GROUNDWATER/SURFACE WATER REMEDIES	Applicable	N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines	Applicable	N/A

1. Pumps, Wellhead Plumbing, and Electrical

Good condition All required wells properly operating Needs Maintenance N/A

Remarks____

____

____

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances

Good condition Needs Maintenance

Remarks____

____

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks____

____

B. Surface Water Collection Structures, **Pumps, and** Pipelines Applicable N/A

1. Collection Structures, Pumps, and Electrical

Good condition Needs Maintenance

Remarks____

____

2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances

Good condition Needs Maintenance

Remarks____

____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks____

C. Treatment System Applicable N/A

1. **Treatment Train** (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters____

Additive (*e.g.*, chelation agent, flocculent)________________________________

Others____

Good condition Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually____________________

Quantity of surface water treated annually____________________

Remarks____

2. **Electrical Enclosures and Panels** (properly rated and functional)

N/A Good condition Needs Maintenance

Remarks____

3. **Tanks, Vaults, Storage Vessels**

N/A Good condition Proper secondary containment Needs Maintenance

Remarks____

4. **Discharge Structure and Appurtenances**

N/A Good condition Needs Maintenance

Remarks____

5. **Treatment Building(s)**

N/A Good condition (esp. roof and doorways) Needs repair

Chemicals and equipment properly stored

Remarks____

6. **Monitoring Wells** (pump and treatment remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks____

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks____

X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE
AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 59 Fill Area West of Building 135	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 44 OVERCAST
Remedy Includes: (Check all that apply)	
☐ Landfill cover/containment ☐ Access controls ☒ Institutional controls ☐ Groundwater pump and treatment Other ______	☐ Monitored natural attenuation ☐ Groundwater containment ☐ Vertical barrier walls ☐ Surface water collection and treatment
Attachments: Inspection team roster attached Site map attached	

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

2. O&M staff ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

3. Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

4. Other interviews (optional) Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks___			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks___			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks___			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits___	Readily available	Up to date	N/A
Remarks___			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks___			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks___			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks___			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks___			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks___			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks___			

IV. O&M COSTS   Applicable   N/A

1. O&M Organization

State in-house   Contractor for State
PRP in-house   Contractor for PRP
Federal Facility in-house   Contractor for Federal Facility
Other______________________________

2. O&M Cost Records

Readily available   Up to date
Funding mechanism/agreement in place
Original O&M cost estimate__________   Breakdown attached

Total annual cost by year for review period if available

From______ (Date)	To______ (Date)	______ (Total cost)	Breakdown attached
From______ (Date)	To______ (Date)	______ (Total cost)	Breakdown attached
From______ (Date)	To______ (Date)	______ (Total cost)	Breakdown attached
From______ (Date)	To______ (Date)	______ (Total cost)	Breakdown attached
From______ (Date)	To______ (Date)	______ (Total cost)	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______________________________

V. ACCESS AND INSTITUTIONAL CONTROLS   Applicable   N/A

A. Fencing

1. **Fencing damaged**   Location shown on site map   Gates secured   N/A
Remarks______________________________

B. Other Access Restrictions

1. **Signs and other security measures**   Location shown on site map   N/A
Remarks______________________________

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY/WALK OVER
Frequency ______________________________
Responsible party/agency ______________________________
Contact ______ (Name) ______ (Title) ______ (Date) ______ (Phone #)

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)			
C. Institutional Controls (ICs) (continued)			
2. Adequacy	ICs are adequate	ICs are inadequate	N/A
Remarks			

D. General

1. **Vandalism/trespassing** Location shown on site map No vandalism evident
Remarks

2. **Land use changes on site** N/A
Remarks

3. **Land use changes off site** N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks

B. Other Site Conditions
Remarks

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident
Areal extent______________ Depth____________
Remarks

2. **Cracks** Location shown on site map Cracking not evident
Lengths____________ Widths___________ Depths__________
Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. **Erosion** Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. **Holes** Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks____

7. **Bulges** Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____

8. **Wet Areas/Water Damage** Wet areas/water damage not evident
Wet areas Location shown on site map Areal extent______________
Ponding Location shown on site map Areal extent______________
Seeps Location shown on site map Areal extent______________
Soft subgrade Location shown on site map Areal extent______________
Remarks____

9. **Slope Instability** Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks____

2. **Bench Breached** Location shown on site map N/A or okay
Remarks____

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent______________ Depth____________
Remarks____

____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent______________ Depth____________
Remarks____

____

5. **Obstructions** Type_____________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____

____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____

____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks________________________________

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks________________________________

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks________________________________

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks________________________________

2. **Outlet Rock Inspected** Functioning N/A
Remarks________________________________

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks________________________________

2. **Erosion** Areal extent__________ Depth__________
Erosion not evident
Remarks________________________________

3. **Outlet Works** Functioning N/A
Remarks________________________________

4. **Dam** Functioning N/A
Remarks________________________________

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks________________________________

2. **Degradation** Location shown on site map Degradation not evident
Remarks________________________________

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks________________________________

VII. LANDFILL COVERS (continued)		
I. Perimeter Ditches/Off-Site Discharge (continued)		
2. **Vegetative Growth**	Location shown on site map	N/A
Vegetation does not impede flow		
Areal extent______________ Type____________		
Remarks______________________________		
3. **Erosion**	Location shown on site map	Erosion not evident
Areal extent______________ Depth____________		
Remarks______________________________		
4. **Discharge Structure** Functioning N/A		
Remarks______________________________		

VIII. VERTICAL BARRIER WALLS Applicable N/A		
1. **Settlement**	Location shown on site map	Settlement not evident
Areal extent______________ Depth____________		
Remarks______________________________		
2. **Performance Monitoring**	Type of monitoring__________________	
Performance not monitored		
Frequency______________________		Evidence of breaching
Head differential______________________		
Remarks______________________________		

IX. GROUNDWATER/SURFACE WATER REMEDIES		Applicable	N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		Applicable	N/A
1. **Pumps, Wellhead Plumbing, and Electrical**			
Good condition	All required wells properly operating	Needs Maintenance	N/A
Remarks______________________________			
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**			
Good condition	Needs Maintenance		
Remarks______________________________			
3. **Spare Parts and Equipment**			
Readily available	Good condition	Requires upgrade	Needs to be provided
Remarks______________________________			
B. Surface Water Collection Structures, **Pumps, and** Pipelines Applicable N/A			
1. **Collection Structures, Pumps, and Electrical**			
Good condition	Needs Maintenance		
Remarks______________________________			
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**			
Good condition	Needs Maintenance		
Remarks______________________________			

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment
Readily available   Good condition   Requires upgrade   Needs to be provided
Remarks____

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)
Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters____
Additive (*e.g.*, chelation agent, flocculent)______________________
Others____
Good condition   Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually______________________
Quantity of surface water treated annually______________________
Remarks____

2. Electrical Enclosures and Panels (properly rated and functional)
N/A   Good condition   Needs Maintenance
Remarks____

3. Tanks, Vaults, Storage Vessels
N/A   Good condition   Proper secondary containment   Needs Maintenance
Remarks____

4. Discharge Structure and Appurtenances
N/A   Good condition   Needs Maintenance
Remarks____

5. Treatment Building(s)
N/A   Good condition (esp. roof and doorways)   Needs repair
Chemicals and equipment properly stored
Remarks____

6. Monitoring Wells (pump and treatment remedy)
Properly secured/locked   Functioning   Routinely sampled   Good condition
All required wells located   Needs Maintenance   N/A
Remarks____

D. Monitoring Data

1. Monitoring Data
Is routinely submitted on time   Is of acceptable quality

2. Monitoring data suggests:
Groundwater plume is effectively contained   Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)
Properly secured/locked   Functioning   Routinely sampled   Good condition
All required wells located   Needs Maintenance   N/A
Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 64A Garbage Disposal Area, Debris Landfill south of Storage Pad	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 46°F Cloudy
Remedy Includes: (Check all that apply)	
☐ Landfill cover/containment ☐ Access controls ☒ Institutional controls ☐ Groundwater pump and treatment Other ______	☐ Monitored natural attenuation ☐ Groundwater containment ☐ Vertical barrier walls ☐ Surface water collection and treatment
Attachments: Inspection team roster attached Site map attached	

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

2. O&M staff ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

4. **Other interviews** (optional) Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits______________	Readily available	Up to date	N/A
Remarks______________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______________			

IV. O&M COSTS	Applicable	N/A

1. O&M Organization

State in-house — Contractor for State
PRP in-house — Contractor for PRP
Federal Facility in-house — Contractor for Federal Facility
Other ______

2. O&M Cost Records

Readily available — Up to date
Funding mechanism/agreement in place
Original O&M cost estimate ______ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______

V. ACCESS AND INSTITUTIONAL CONTROLS	Applicable	N/A

A. Fencing

1. Fencing damaged — Location shown on site map — Gates secured — N/A
Remarks ______

B. Other Access Restrictions

1. Signs and other security measures — Location shown on site map — N/A
Remarks ______

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY
Frequency ______
Responsible party/agency ______
Contact ______ (Name) ______ (Title) ______ (Date) ______ (Phone #)

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. Adequacy ICs are adequate ICs are inadequate N/A Remarks
D. General 1. **Vandalism/trespassing** Location shown on site map No vandalism evident Remarks
2. **Land use changes on site** N/A Remarks
3. **Land use changes off site** N/A Remarks

VI. GENERAL SITE CONDITIONS
A. Roads Applicable N/A
1. **Roads damaged** Location shown on site map Roads adequate N/A Remarks
B. Other Site Conditions Remarks NO SIGNS OF UNAUTHORIZED EXCAVATION

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. **Settlement** (Low spots) Location shown on site map Settlement not evident Areal extent ______ Depth ______ Remarks
2. **Cracks** Location shown on site map Cracking not evident Lengths ______ Widths ______ Depths ______ Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident

Areal extent______________ Depth____________

Remarks____

4. Holes Location shown on site map Holes not evident

Areal extent______________ Depth____________

Remarks____

5. Vegetative Cover Grass Cover properly established No signs of stress

Trees/Shrubs (indicate size and locations on a diagram)

Remarks____

6. Alternative Cover (armored rock, concrete, etc.) N/A

Remarks____

7. Bulges Location shown on site map Bulges not evident

Areal extent______________ Height____________

Remarks____

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas Location shown on site map Areal extent______________

Ponding Location shown on site map Areal extent______________

Seeps Location shown on site map Areal extent______________

Soft subgrade Location shown on site map Areal extent______________

Remarks____

9. Slope Instability Slides Location shown on site map No evidence of slope instability

Areal extent______________

Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay

Remarks____

2. Bench Breached Location shown on site map N/A or okay

Remarks____

3. Bench Overtopped Location shown on site map N/A or okay

Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement

Areal extent______________ Depth____________

Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. Material Degradation Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. Erosion Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____

4. Undercutting Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____

5. Obstructions Type_____________________ No obstructions
Location shown on site map Areal extent_____________
Size___________
Remarks____

6. Excessive Vegetative Growth Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____

D. Cover Penetrations Applicable N/A

1. Gas Vents Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. Gas Monitoring Probes
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. Leachate Extraction Wells
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. Settlement Monuments Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks______________________________

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks______________________________

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks______________________________

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks______________________________

2. Outlet Rock Inspected Functioning N/A
Remarks______________________________

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent____________ Depth__________ N/A
Siltation not evident
Remarks______________________________

2. Erosion Areal extent____________ Depth__________
Erosion not evident
Remarks______________________________

3. Outlet Works Functioning N/A
Remarks______________________________

4. Dam Functioning N/A
Remarks______________________________

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement____________
Rotational displacement__________
Remarks______________________________

2. Degradation Location shown on site map Degradation not evident
Remarks______________________________

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent____________ Depth__________
Remarks______________________________

VII. LANDFILL COVERS (continued)

I. Perimeter Ditches/Off-Site Discharge (continued)

2. Vegetative Growth Location shown on site map N/A
Vegetation does not impede flow
Areal extent______________ Type____________
Remarks____

3. Erosion Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. Discharge Structure Functioning N/A
Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A

1. Settlement Location shown on site map Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. Performance Monitoring Type of monitoring__________________________
Performance not monitored
Frequency______________________________ Evidence of breaching
Head differential________________________
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A

1. Pumps, Wellhead Plumbing, and Electrical
Good condition All required wells properly operating Needs Maintenance N/A
Remarks____

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances
Good condition Needs Maintenance
Remarks____

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks____

B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A

1. Collection Structures, Pumps, and Electrical
Good condition Needs Maintenance
Remarks____

2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances
Good condition Needs Maintenance
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, **and** Pipelines (continued)

3. Spare Parts and Equipment

Readily available   Good condition   Requires upgrade   Needs to be provided

Remarks____

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters____

Additive (*e.g.*, chelation agent, flocculent)______________________

Others____

Good condition   Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually__________________

Quantity of surface water treated annually__________________

Remarks____

2. Electrical Enclosures and Panels (properly rated and functional)

N/A   Good condition   Needs Maintenance

Remarks____

3. Tanks, Vaults, Storage Vessels

N/A   Good condition   Proper secondary containment   Needs Maintenance

Remarks____

4. Discharge Structure and Appurtenances

N/A   Good condition   Needs Maintenance

Remarks____

5. Treatment Building(s)

N/A   Good condition (esp. roof and doorways)   Needs repair

Chemicals and equipment properly stored

Remarks____

6. Monitoring Wells (pump and treatment remedy)

Properly secured/locked   Functioning   Routinely sampled   Good condition

All required wells located   Needs Maintenance   N/A

Remarks____

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time   Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained   Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)

Properly secured/locked   Functioning   Routinely sampled   Good condition

All required wells located   Needs Maintenance   N/A

Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 66 Pesticide Storage Area near Buildings 5 and 6	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 40°F/RAIN

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

2. **O&M staff** ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

4. **Other interviews** (optional) Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks____________________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks____________________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks____________________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits__________	Readily available	Up to date	N/A
Remarks____________________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks____________________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks____________________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks____________________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks____________________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks____________________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks____________________			

IV. O&M COSTS   Applicable   N/A

1. O&M Organization

State in-house   Contractor for State
PRP in-house   Contractor for PRP
Federal Facility in-house   Contractor for Federal Facility
Other ____________________

2. O&M Cost Records

Readily available   Up to date
Funding mechanism/agreement in place
Original O&M cost estimate ____________   Breakdown attached

Total annual cost by year for review period if available

From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____________________

V. ACCESS AND INSTITUTIONAL CONTROLS   Applicable   N/A

A. Fencing

1. Fencing damaged   Location shown on site map   Gates secured   N/A
Remarks ____________________

B. Other Access Restrictions

1. Signs and other security measures   Location shown on site map   N/A
Remarks ____________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE-BY/WALK-OVER
Frequency ____________________
Responsible party/agency ____________________
Contact ______ (Name) ______ (Title) ______ (Date) ______ (Phone #)

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	~~N/A~~
Violations have been reported	~~Yes~~	No	N/A

Other problems or suggestions: Report attached
____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)

2. **Adequacy** ICs are adequate ICs are inadequate N/A
Remarks

D. General
1. **Vandalism/trespassing** Location shown on site map No vandalism evident
Remarks

2. **Land use changes on site** N/A
Remarks

3. **Land use changes off site** N/A
Remarks

VI. ~~GENERAL~~ SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks

B. Other Site Conditions
Remarks

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident
Areal extent________ Depth________
Remarks

2. **Cracks** Location shown on site map Cracking not evident
Lengths________ Widths________ Depths________
Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. **Erosion** Location shown on site map Erosion not evident
Areal extent________ Depth________
Remarks________

4. **Holes** Location shown on site map Holes not evident
Areal extent________ Depth________
Remarks________

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks________

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks________

7. **Bulges** Location shown on site map Bulges not evident
Areal extent________ Height________
Remarks________

8. **Wet Areas/Water Damage** Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent________
Ponding	Location shown on site map	Areal extent________
Seeps	Location shown on site map	Areal extent________
Soft subgrade	Location shown on site map	Areal extent________

Remarks________

9. **Slope Instability** Slides Location shown on site map No evidence of slope instability
Areal extent________
Remarks________

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks________

2. **Bench Breached** Location shown on site map N/A or okay
Remarks________

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks________

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent________ Depth________
Remarks________

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent______________ Depth____________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent______________ Depth____________
Remarks____

5. **Obstructions** Type_____________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks____

2. **Outlet Rock Inspected** Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent______________ Depth____________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent______________ Depth____________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement____________ Vertical displacement______________
Rotational displacement____________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)		
I. Perimeter Ditches/Off-Site Discharge (continued)		
2. Vegetative Growth	Location shown on site map	N/A
Vegetation does not impede flow		
Areal extent______________ Type_____________		
Remarks___________________________________		
3. Erosion	Location shown on site map	Erosion not evident
Areal extent______________ Depth____________		
Remarks___________________________________		
4. Discharge Structure Functioning N/A		
Remarks___________________________________		

VIII. VERTICAL BARRIER WALLS Applicable N/A		
1. Settlement	Location shown on site map	Settlement not evident
Areal extent______________ Depth____________		
Remarks___________________________________		
2. Performance Monitoring	Type of monitoring__________________	
Performance not monitored		
Frequency______________________________		Evidence of breaching
Head differential_________________________		
Remarks___________________________________		

IX. GROUNDWATER/SURFACE WATER REMEDIES		Applicable	N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		Applicable	N/A
1. Pumps, Wellhead Plumbing, and Electrical			
Good condition	All required wells properly operating	Needs Maintenance	N/A
Remarks___________________________________			
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances			
Good condition	Needs Maintenance		
Remarks___________________________________			
3. Spare Parts and Equipment			
Readily available	Good condition	Requires upgrade	Needs to be provided
Remarks___________________________________			
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A			
1. Collection Structures, Pumps, and Electrical			
Good condition	Needs Maintenance		
Remarks___________________________________			
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances			
Good condition	Needs Maintenance		
Remarks___________________________________			

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)
B. Surface Water Collection Structures, Pumps, and Pipelines (continued)
3. Spare Parts and Equipment Readily available Good condition Requires upgrade Needs to be provided Remarks
C. Treatment System Applicable N/A
1. Treatment Train (Check components that apply) Metals removal Oil/water separation Bioremediation ir stripping Carbon adsorbers Filters Additive (*e.g.*, chelation agent, flocculent) Others Good condition Needs Maintenance Sampling ports properly marked and functional Sampling/maintenance log displayed and up to date Equipment properly identified Quantity of groundwater treated annually Quantity of surface water treated annually Remarks
2. Electrical Enclosures and Panels (properly rated and functional) N/A Good condition Needs Maintenance Remarks
3. Tanks, Vaults, Storage Vessels N/A Good condition Proper secondary containment Needs Maintenance Remarks
4. Discharge Structure and Appurtenances N/A Good condition Needs Maintenance Remarks
5. Treatment Building(s) N/A Good condition (esp. roof and doorways) Needs repair Chemicals and equipment properly stored Remarks
6. Monitoring Wells (pump and treatment remedy) Properly secured/locked Functioning Routinely sampled Good condition All required wells located Needs Maintenance N/A Remarks
D. Monitoring Data
1. Monitoring Data Is routinely submitted on time Is of acceptable quality 2. Monitoring data suggests: Groundwater plume is effectively contained Contaminant concentrations are declining
E. Monitored Natural Attenuation
1. Monitoring Wells (natural attenuation remedy) Properly secured/locked Functioning Routinely sampled Good condition All required wells located Needs Maintenance N/A Remarks

X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE

AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: SEAD 67 Dump Site east of Sewage Treatment Plant No. 4	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 40°F/RAIN

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ________________ __________ ________

Name Title Date

Interviewed at site at office by phone Phone no. __________

Problems, suggestions; Report attached ____________________

2. **O&M staff** ________________ __________ ________

Name Title Date

Interviewed at site at office by phone Phone no. __________

Problems, suggestions; Report attached ____________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ________________
Contact ________________ __________ ______ ________

Name Title Date Phone #

Problems; suggestions; Report attached ____________________

Agency ________________
Contact ________________ __________ ______ ________

Name Title Date Phone #

Problems; suggestions; Report attached ____________________

Agency ________________
Contact ________________ __________ ______ ________

Name Title Date Phone #

Problems; suggestions; Report attached ____________________

Agency ________________
Contact ________________ __________ ______ ________

Name Title Date Phone #

Problems; suggestions; Report attached ____________________

4. **Other interviews** (optional) Report attached ____________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits	Readily available	Up to date	N/A
Remarks			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks			

IV. O&M COSTS   Applicable   N/A

1. O&M Organization

State in-house   Contractor for State
PRP in-house   Contractor for PRP
Federal Facility in-house   Contractor for Federal Facility
Other____________________________

2. O&M Cost Records

Readily available   Up to date
Funding mechanism/agreement in place
Original O&M cost estimate______________   Breakdown attached

Total annual cost by year for review period if available

From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____________________________

V. ACCESS AND INSTITUTIONAL CONTROLS   Applicable   N/A

A. Fencing

1. Fencing damaged   ~~Location shown on site map~~   Gates secured   N/A
Remarks____________________________

B. Other Access Restrictions

1. Signs and other security measures   Location shown on site map   N/A
Remarks____________________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) Drive By
Frequency ____________________________
Responsible party/agency ____________________________
Contact __________ (Name)   __________ (Title)   ______ (Date)   ______ (Phone #)

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	2 Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	~~N/A~~
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)

2. Adequacy ICs are adequate ICs are inadequate N/A
Remarks____

D. General
1. Vandalism/trespassing Location shown on site map No vandalism evident
Remarks____

2. Land use changes on site N/A
Remarks____

3. Land use changes off site N/A
Remarks____

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. Roads damaged Location shown on site map Roads adequate N/A
Remarks____

B. Other Site Conditions
Remarks____

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. Settlement (Low spots) Location shown on site map Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. Cracks Location shown on site map Cracking not evident
Lengths____________ Widths___________ Depths__________
Remarks____

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident

Areal extent______________ Depth____________

Remarks____

____

4. Holes Location shown on site map Holes not evident

Areal extent______________ Depth____________

Remarks____

____

5. Vegetative Cover Grass Cover properly established No signs of stress

Trees/Shrubs (indicate size and locations on a diagram)

Remarks____

____

6. Alternative Cover (armored rock, concrete, etc.) N/A

Remarks____

____

7. Bulges Location shown on site map Bulges not evident

Areal extent______________ Height____________

Remarks____

____

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent______________
Ponding	Location shown on site map	Areal extent______________
Seeps	Location shown on site map	Areal extent______________
Soft subgrade	Location shown on site map	Areal extent______________

Remarks____

____

9. Slope Instability Slides Location shown on site map No evidence of slope instability

Areal extent______________

Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay

Remarks____

____

2. Bench Breached Location shown on site map N/A or okay

Remarks____

____

3. Bench Overtopped Location shown on site map N/A or okay

Remarks____

____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement

Areal extent______________ Depth____________

Remarks____

____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type__________ Areal extent__________
Remarks______________________________

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent__________ Depth__________
Remarks______________________________

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent__________ Depth__________
Remarks______________________________

5. **Obstructions** Type__________ No obstructions
Location shown on site map Areal extent__________
Size__________
Remarks______________________________

6. **Excessive Vegetative Growth** Type__________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent__________
Remarks______________________________

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks______________________________

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks______________________________

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks______________________________

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks______________________________

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks______________________________

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks____

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks____

2. **Outlet Rock Inspected** Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent______________ Depth____________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent______________ Depth____________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement____________ Vertical displacement______________
Rotational displacement____________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. **Vegetative Growth** Location shown on site map N/A Vegetation does not impede flow Areal extent______________ Type____________ Remarks____
3. **Erosion** Location shown on site map Erosion not evident Areal extent______________ Depth____________ Remarks____
4. **Discharge Structure** Functioning N/A Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. **Settlement** Location shown on site map Settlement not evident Areal extent______________ Depth____________ Remarks____
2. **Performance Monitoring** Type of monitoring__________________________ Performance not monitored Frequency______________________________ Evidence of breaching Head differential_________________________ Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. **Pumps, Wellhead Plumbing, and Electrical** Good condition All required wells properly operating Needs Maintenance N/A Remarks____
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks____
3. **Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks____
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A
1. **Collection Structures, Pumps, and Electrical** Good condition Needs Maintenance Remarks____
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)
B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks______________________________

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)
Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters______________________________
Additive (*e.g.*, chelation agent, flocculent)______________________________
Others______________________________
Good condition Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually______________________________
Quantity of surface water treated annually______________________________
Remarks______________________________

2. Electrical Enclosures and Panels (properly rated and functional)
N/A Good condition Needs Maintenance
Remarks______________________________

3. Tanks, Vaults, Storage Vessels
N/A Good condition Proper secondary containment Needs Maintenance
Remarks______________________________

4. Discharge Structure and Appurtenances
N/A Good condition Needs Maintenance
Remarks______________________________

5. Treatment Building(s)
N/A Good condition (esp. roof and doorways) Needs repair
Chemicals and equipment properly stored
Remarks______________________________

6. Monitoring Wells (pump and treatment remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks______________________________

D. Monitoring Data

1. Monitoring Data
Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:
Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks______________________________

X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE
AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 71 Alleged Paint Disposal Area	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 44°F/OVERCAST

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ______________ ______________ ______________
Name Title Date
Interviewed at site at office by phone Phone no. ______________
Problems, suggestions; Report attached ______________________________

2. **O&M staff** ______________ ______________ ______________
Name Title Date
Interviewed at site at office by phone Phone no. ______________
Problems, suggestions; Report attached ______________________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

4. **Other interviews** (optional) Report attached ______________________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______________________________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits__________	Readily available	Up to date	N/A
Remarks______________________________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______________________________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______________________________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______________________________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______________________________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______________________________			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house — Contractor for State
PRP in-house — Contractor for PRP
Federal Facility in-house — Contractor for Federal Facility
Other____________________

2. O&M Cost Records

Readily available — Up to date
Funding mechanism/agreement in place
Original O&M cost estimate__________ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: __________

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks__________

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks__________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE-BY/WALK OVER
Frequency __________
Responsible party/agency __________
Contact __________

Name	Title	Date	Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)

2. **Adequacy** ICs are adequate ICs are inadequate N/A
Remarks____

D. General
1. **Vandalism/trespassing** Location shown on site map No vandalism evident
Remarks____

2. **Land use changes on site** N/A
Remarks____

3. **Land use changes off site** N/A
Remarks____

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks____

B. Other Site Conditions
Remarks____

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident
Areal extent__________ Depth__________
Remarks____

2. **Cracks** Location shown on site map Cracking not evident
Lengths__________ Widths__________ Depths__________
Remarks____

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. Holes Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks____

7. Bulges Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent______________
Ponding	Location shown on site map	Areal extent______________
Seeps	Location shown on site map	Areal extent______________
Soft subgrade	Location shown on site map	Areal extent______________

Remarks____

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks____

2. Bench Breached Location shown on site map N/A or okay
Remarks____

3. Bench Overtopped Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type______________ Areal extent____________
Remarks____

____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth___________
Remarks____

____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth___________
Remarks____

____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent_____________
Size___________
Remarks____

____

6. **Excessive Vegetative Growth** Type___________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____

____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks____

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks____

2. Outlet Rock Inspected Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent____________ Depth__________ N/A
Siltation not evident
Remarks____

2. Erosion Areal extent____________ Depth__________
Erosion not evident
Remarks____

3. Outlet Works Functioning N/A
Remarks____

4. Dam Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement____________
Rotational displacement__________
Remarks____

2. Degradation Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent____________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)

I. Perimeter Ditches/Off-Site Discharge (continued)

2. Vegetative Growth Location shown on site map N/A
Vegetation does not impede flow
Areal extent______________ Type____________
Remarks____

3. Erosion Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. Discharge Structure Functioning N/A
Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A

1. Settlement Location shown on site map Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. Performance Monitoring Type of monitoring_________________________
Performance not monitored
Frequency______________________________ Evidence of breaching
Head differential__________________________
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A

1. Pumps, Wellhead Plumbing, and Electrical
Good condition All required wells properly operating Needs Maintenance N/A
Remarks____

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances
Good condition Needs Maintenance
Remarks____

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks____

B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A

1. Collection Structures, Pumps, and Electrical
Good condition Needs Maintenance
Remarks____

2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances
Good condition Needs Maintenance
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)
B. Surface Water Collection Structures, Pumps, and Pipelines (continued)
3. Spare Parts and Equipment Readily available Good condition Requires upgrade Needs to be provided Remarks___
C. Treatment System Applicable N/A
1. Treatment Train (Check components that apply) Metals removal Oil/water separation Bioremediation ir stripping Carbon adsorbers Filters___ Additive (*e.g.*, chelation agent, flocculent)___ Others___ Good condition Needs Maintenance Sampling ports properly marked and functional Sampling/maintenance log displayed and up to date Equipment properly identified Quantity of groundwater treated annually___ Quantity of surface water treated annually___ Remarks___
2. Electrical Enclosures and Panels (properly rated and functional) N/A Good condition Needs Maintenance Remarks___
3. Tanks, Vaults, Storage Vessels N/A Good condition Proper secondary containment Needs Maintenance Remarks___
4. Discharge Structure and Appurtenances N/A Good condition Needs Maintenance Remarks___
5. Treatment Building(s) N/A Good condition (esp. roof and doorways) Needs repair Chemicals and equipment properly stored Remarks___
6. Monitoring Wells (pump and treatment remedy) Properly secured/locked Functioning Routinely sampled Good condition All required wells located Needs Maintenance N/A Remarks___
D. Monitoring Data
1. Monitoring Data Is routinely submitted on time Is of acceptable quality 2. Monitoring data suggests: Groundwater plume is effectively contained Contaminant concentrations are declining
E. Monitored Natural Attenuation
1. Monitoring Wells (natural attenuation remedy) Properly secured/locked Functioning Routinely sampled Good condition All required wells located Needs Maintenance N/A Remarks___

X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE
AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 121C Defense Reutilization and Marketing Office (DRMO) Yard	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** SUNNY / 37°F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ______________________

2. O&M staff ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ______________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

4. **Other interviews** (optional) Report attached ______________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks___			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks___			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks___			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits___	Readily available	Up to date	N/A
Remarks___			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks___			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks___			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks___			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks___			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks___			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks___			

IV. O&M COSTS   Applicable   N/A

1. O&M Organization

State in-house   Contractor for State
PRP in-house   Contractor for PRP
Federal Facility in-house   Contractor for Federal Facility
Other____

2. O&M Cost Records

Readily available   Up to date
Funding mechanism/agreement in place
Original O&M cost estimate_______________   Breakdown attached

Total annual cost by year for review period if available

From________ (Date)	To________ (Date)	________ (Total cost)	Breakdown attached
From________ (Date)	To________ (Date)	________ (Total cost)	Breakdown attached
From________ (Date)	To________ (Date)	________ (Total cost)	Breakdown attached
From________ (Date)	To________ (Date)	________ (Total cost)	Breakdown attached
From________ (Date)	To________ (Date)	________ (Total cost)	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ________________________________

V. ACCESS AND INSTITUTIONAL CONTROLS   Applicable   N/A

A. Fencing

1. Fencing damaged   Location shown on site map   Gates secured   N/A
Remarks____

B. Other Access Restrictions

1. Signs and other security measures   Location shown on site map   N/A
Remarks____

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) ______________________
Frequency ______________________________
Responsible party/agency ______________________________
Contact ____________ (Name)   ____________ (Title)   ________ (Date)   ________ (Phone #)

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)

C. Institutional Controls (ICs) (continued)

2. **Adequacy** ICs are adequate ICs are inadequate N/A
Remarks

D. General

1. **Vandalism/trespassing** Location shown on site map No vandalism evident
Remarks

2. **Land use changes on site** N/A
Remarks

3. **Land use changes off site** N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks

B. Other Site Conditions

Remarks

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident
Areal extent______ Depth______
Remarks

2. **Cracks** Location shown on site map Cracking not evident
Lengths______ Widths______ Depths______
Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. Holes Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks____

7. Bulges Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____

8. Wet Areas/Water Damage Wet areas/water damage not evident
Wet areas Location shown on site map Areal extent____________
Ponding Location shown on site map Areal extent____________
Seeps Location shown on site map Areal extent____________
Soft subgrade Location shown on site map Areal extent____________
Remarks____

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks____

2. Bench Breached Location shown on site map N/A or okay
Remarks____

3. Bench Overtopped Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent_____________
Size____________
Remarks____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** **Functioning** N/A
Remarks____

2. **Outlet Rock Inspected** **Functioning** N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent__________ Depth__________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. **Vegetative Growth** Location shown on site map N/A Vegetation does not impede flow Areal extent______________ Type____________ Remarks____ ____ 3. **Erosion** Location shown on site map Erosion not evident Areal extent______________ Depth____________ Remarks____ ____ 4. **Discharge Structure** Functioning N/A Remarks____ ____

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. **Settlement** Location shown on site map Settlement not evident Areal extent______________ Depth____________ Remarks____ ____ 2. **Performance Monitoring** Type of monitoring__________________________ Performance not monitored Frequency______________________________ Evidence of breaching Head differential__________________________ Remarks____ ____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. **Pumps, Wellhead Plumbing, and Electrical** Good condition All required wells properly operating Needs Maintenance N/A Remarks____ ____ ____ 2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks____ ____ 3. **Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks____ ____
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A
1. **Collection Structures, Pumps, and Electrical** Good condition Needs Maintenance Remarks____ ____ 2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks____ ____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment

Readily available   Good condition   Requires upgrade   Needs to be provided

Remarks____________________

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters____________________

Additive (*e.g.*, chelation agent, flocculent)____________________

Others____________________

Good condition   Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually____________________

Quantity of surface water treated annually____________________

Remarks____________________

2. Electrical Enclosures and Panels (properly rated and functional)

N/A   Good condition   Needs Maintenance

Remarks____________________

3. Tanks, Vaults, Storage Vessels

N/A   Good condition   Proper secondary containment   Needs Maintenance

Remarks____________________

4. Discharge Structure and Appurtenances

N/A   Good condition   Needs Maintenance

Remarks____________________

5. Treatment Building(s)

N/A   Good condition (esp. roof and doorways)   Needs repair

Chemicals and equipment properly stored

Remarks____________________

6. Monitoring Wells (pump and treatment remedy)

Properly secured/locked   Functioning   Routinely sampled   Good condition

All required wells located   Needs Maintenance   N/A

Remarks____________________

D. Monitoring Data N/A

1. Monitoring Data

Is routinely submitted on time   Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained   Contaminant concentrations are declining

E. Monitored Natural Attenuation N/A

1. Monitoring Wells (natural attenuation remedy)

Properly secured/locked   Functioning   Routinely sampled   Good condition

All required wells located   Needs Maintenance   N/A

Remarks____________________

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 121I Rumored Cosmoline Disposal Area	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** SUNNY 37°F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______________ ______________ ______________
Name Title Date
Interviewed at site at office by phone Phone no. ______________
Problems, suggestions; Report attached ______________

2. O&M staff ______________ ______________ ______________
Name Title Date
Interviewed at site at office by phone Phone no. ______________
Problems, suggestions; Report attached ______________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________

4. Other interviews (optional) Report attached ______________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits	Readily available	Up to date	N/A
Remarks			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks			

IV. O&M COSTS   Applicable   N/A

1. O&M Organization

State in-house   Contractor for State
PRP in-house   Contractor for PRP
Federal Facility in-house   Contractor for Federal Facility
Other____

2. O&M Cost Records

Readily available   Up to date
Funding mechanism/agreement in place
Original O&M cost estimate____________________   Breakdown attached

Total annual cost by year for review period if available

From__________ To__________ __________ Breakdown attached
Date   Date   Total cost
From__________ To__________ __________ Breakdown attached
Date   Date   Total cost
From__________ To__________ __________ Breakdown attached
Date   Date   Total cost
From__________ To__________ __________ Breakdown attached
Date   Date   Total cost
From__________ To__________ __________ Breakdown attached
Date   Date   Total cost

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ________________________________

V. ACCESS AND INSTITUTIONAL CONTROLS   Applicable   N/A

A. Fencing

1. **Fencing damaged**   Location shown on site map   Gates secured   N/A

Remarks____

B. Other Access Restrictions

1. **Signs and other security measures**   Location shown on site map   N/A

Remarks____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented   Yes   No   N/A
Site conditions imply ICs not being fully enforced   Yes   No   N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE-BY
Frequency ________________________________
Responsible party/agency ________________________________
Contact ______________ ______________ ________ ________
Name   Title   Date   Phone #

Reporting is up-to-date   Yes   No   N/A
Reports are verified by the lead agency   Yes   No   N/A
Specific requirements in deed or decision documents have been met   Yes   No   N/A
Violations have been reported   PMD ~~Yes~~   No   N/A
Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)

C. Institutional Controls (ICs) (continued)

2. **Adequacy** ICs are adequate ICs are inadequate N/A
Remarks

D. General
1. **Vandalism/trespassing** Location shown on site map No vandalism evident
Remarks

2. **Land use changes on site** N/A
Remarks

3. **Land use changes off site** N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks

B. Other Site Conditions
Remarks

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident
Areal extent Depth
Remarks

2. **Cracks** Location shown on site map Cracking not evident
Lengths Widths Depths
Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent____________ Depth__________
Remarks____

4. Holes Location shown on site map Holes not evident
Areal extent____________ Depth__________
Remarks____

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks____

7. Bulges Location shown on site map Bulges not evident
Areal extent____________ Height__________
Remarks____

8. Wet Areas/Water Damage Wet areas/water damage not evident
Wet areas Location shown on site map Areal extent____________
Ponding Location shown on site map Areal extent____________
Seeps Location shown on site map Areal extent____________
Soft subgrade Location shown on site map Areal extent____________
Remarks____

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent____________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks____

2. Bench Breached Location shown on site map N/A or okay
Remarks____

3. Bench Overtopped Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent____________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____
____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____
____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____
____

5. **Obstructions** Type_____________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____
____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____
____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____
____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks____

2. **Outlet Rock Inspected** Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent__________ Depth__________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)		
I. Perimeter Ditches/Off-Site Discharge (continued)		
2. Vegetative Growth	Location shown on site map	N/A
Vegetation does not impede flow		
Areal extent______________ Type____________		
Remarks____		
3. Erosion	Location shown on site map	Erosion not evident
Areal extent______________ Depth____________		
Remarks____		
4. Discharge Structure Functioning N/A		
Remarks____		

VIII. VERTICAL BARRIER WALLS Applicable N/A		
1. Settlement	Location shown on site map	Settlement not evident
Areal extent______________ Depth____________		
Remarks____		
2. Performance Monitoring	Type of monitoring________________________	
Performance not monitored		
Frequency_____________________________		Evidence of breaching
Head differential_______________________		
Remarks____		

IX. GROUNDWATER/SURFACE WATER REMEDIES		Applicable	N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		Applicable	N/A
1. Pumps, Wellhead Plumbing, and Electrical			
Good condition	All required wells properly operating	Needs Maintenance	N/A
Remarks____			
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances			
Good condition	Needs Maintenance		
Remarks____			
3. Spare Parts and Equipment			
Readily available	Good condition	Requires upgrade	Needs to be provided
Remarks____			
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A			
1. Collection Structures, Pumps, and Electrical			
Good condition	Needs Maintenance		
Remarks____			
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances			
Good condition	Needs Maintenance		
Remarks____			

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, **and** Pipelines (continued)

3. **Spare Parts and Equipment**

Readily available   Good condition   Requires upgrade   Needs to be provided

Remarks____

C. Treatment System Applicable N/A

1. **Treatment Train** (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters____

Additive (*e.g.*, chelation agent, flocculent)_______________________________

Others____

Good condition   Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually____________________

Quantity of surface water treated annually____________________

Remarks____

2. **Electrical Enclosures and Panels** (properly rated and functional)

N/A   Good condition   Needs Maintenance

Remarks____

3. **Tanks, Vaults, Storage Vessels**

N/A   Good condition   Proper secondary containment   Needs Maintenance

Remarks____

4. **Discharge Structure and Appurtenances**

N/A   Good condition   Needs Maintenance

Remarks____

5. **Treatment Building(s)**

N/A   Good condition (esp. roof and doorways)   Needs repair

Chemicals and equipment properly stored

Remarks____

6. **Monitoring Wells** (pump and treatment remedy)

Properly secured/locked   Functioning   Routinely sampled   Good condition

All required wells located   Needs Maintenance   N/A

Remarks____

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time   Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained   Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

Properly secured/locked   Functioning   Routinely sampled   Good condition

All required wells located   Needs Maintenance   N/A

Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE
AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 13 Inhibited Red Fuming Nitric Acid (IRFNA) Disposal Site	**Date of inspection:** 4/4/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 40°F / RAIN

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other____

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ________________ ____________ ________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ____________________

2. **O&M staff** ________________ ____________ ________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ____________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ________________
Contact ________________ ________ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ____________________

Agency ________________
Contact ________________ ________ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ____________________

Agency ________________
Contact ________________ ________ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ____________________

Agency ________________
Contact ________________ ________ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ____________________

4. **Other interviews** (optional) Report attached ____________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks____________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks____________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks____________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits____________	Readily available	Up to date	N/A
Remarks____________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks____________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks____________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks____________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks____________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks____________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks____________			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house | Contractor for State
PRP in-house | Contractor for PRP
Federal Facility in-house | Contractor for Federal Facility
Other______________________________

2. O&M Cost Records

Readily available | Up to date
Funding mechanism/agreement in place
Original O&M cost estimate__________ Breakdown attached

Total annual cost by year for review period if available

From	To		
______ Date	______ Date	______ Total cost	Breakdown attached
______ Date	______ Date	______ Total cost	Breakdown attached
______ Date	______ Date	______ Total cost	Breakdown attached
______ Date	______ Date	______ Total cost	Breakdown attached
______ Date	______ Date	______ Total cost	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______________________________

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks______________________________

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks______________________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY/WALKOVER
Frequency ______________________________
Responsible party/agency ______________________________
Contact ______ Name ______ Title ______ Date ______ Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	~~N/A~~
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. **Adequacy** ICs are adequate ICs are inadequate N/A Remarks
D. General 1. **Vandalism/trespassing** Location shown on site map No vandalism evident Remarks
2. **Land use changes on site** N/A Remarks
3. **Land use changes off site** N/A Remarks

VI. ~~GENERAL~~ SITE CONDITIONS
A. Roads Applicable N/A
1. **Roads damaged** Location shown on site map Roads adequate N/A Remarks
B. Other Site Conditions Remarks

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. **Settlement** (Low spots) Location shown on site map Settlement not evident Areal extent ______ Depth ______ Remarks
2. **Cracks** Location shown on site map Cracking not evident Lengths ______ Widths ______ Depths ______ Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. **Erosion** Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. **Holes** Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks____

7. **Bulges** Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____

8. **Wet Areas/Water Damage** Wet areas/water damage not evident
Wet areas Location shown on site map Areal extent______________
Ponding Location shown on site map Areal extent______________
Seeps Location shown on site map Areal extent______________
Soft subgrade Location shown on site map Areal extent______________
Remarks____

9. **Slope Instability** Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks____

2. **Bench Breached** Location shown on site map N/A or okay
Remarks____

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent______________ Depth____________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent______________ Depth____________
Remarks____

5. **Obstructions** Type_____________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks____

2. **Outlet Rock Inspected** Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent__________ Depth__________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)		
I. Perimeter Ditches/Off-Site Discharge (continued)		
2. **Vegetative Growth**	Location shown on site map	N/A
Vegetation does not impede flow		
Areal extent______ Type______		
Remarks______		
3. **Erosion**	Location shown on site map	Erosion not evident
Areal extent______ Depth______		
Remarks______		
4. **Discharge Structure** Functioning N/A		
Remarks______		

VIII. VERTICAL BARRIER WALLS Applicable N/A		
1. **Settlement**	Location shown on site map	Settlement not evident
Areal extent______ Depth______		
Remarks______		
2. **Performance Monitoring**	Type of monitoring______	
Performance not monitored		
Frequency______		Evidence of breaching
Head differential______		
Remarks______		

IX. GROUNDWATER/SURFACE WATER REMEDIES		Applicable	N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		Applicable	N/A
1. **Pumps, Wellhead Plumbing, and Electrical**			
Good condition	All required wells properly operating	Needs Maintenance	N/A
Remarks______			
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**			
Good condition	Needs Maintenance		
Remarks______			
3. **Spare Parts and Equipment**			
Readily available	Good condition	Requires upgrade	Needs to be provided
Remarks______			
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A			
1. **Collection Structures, Pumps, and Electrical**			
Good condition	Needs Maintenance		
Remarks______			
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**			
Good condition	Needs Maintenance		
Remarks______			

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks____

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters____

Additive (*e.g.*, chelation agent, flocculent)______________________________

Others____

Good condition Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually______________________

Quantity of surface water treated annually______________________

Remarks____

2. Electrical Enclosures and Panels (properly rated and functional)

N/A Good condition Needs Maintenance

Remarks____

3. Tanks, Vaults, Storage Vessels

N/A Good condition Proper secondary containment Needs Maintenance

Remarks____

4. Discharge Structure and Appurtenances

N/A Good condition Needs Maintenance

Remarks____

5. Treatment Building(s)

N/A Good condition (esp. roof and doorways) Needs repair

Chemicals and equipment properly stored

Remarks____

6. Monitoring Wells (pump and treatment remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks____

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks____

X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 23 Open Burning Ground	**Date of inspection:** 4/7/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 46°F / P.CLOUDY

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______________________
Name Title Date
Interviewed at site at office by phone Phone no. __________
Problems, suggestions; Report attached ______________________

2. O&M staff ______________________
Name Title Date
Interviewed at site at office by phone Phone no. __________
Problems, suggestions; Report attached ______________________

3. Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________________
Contact ______________________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ______________________
Contact ______________________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ______________________
Contact ______________________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

Agency ______________________
Contact ______________________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________

4. Other interviews (optional) Report attached ______________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits______	Readily available	Up to date	N/A
Remarks______			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______			

IV. O&M COSTS   Applicable   N/A

1. O&M Organization

State in-house   Contractor for State
PRP in-house   Contractor for PRP
Federal Facility in-house   Contractor for Federal Facility
Other ______________________________

2. O&M Cost Records

Readily available   Up to date
Funding mechanism/agreement in place
Original O&M cost estimate ____________   Breakdown attached

Total annual cost by year for review period if available

From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached
From ______ (Date)	To ______ (Date)	______ (Total cost)	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______________________________

V. ACCESS AND INSTITUTIONAL CONTROLS   Applicable   N/A

A. Fencing

1. Fencing damaged   Location shown on site map   Gates secured   N/A
Remarks ______________________________

B. Other Access Restrictions

1. Signs and other security measures   Location shown on site map   N/A
Remarks ______________________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) SELF REPORTING
Frequency ANNUAL
Responsible party/agency ARMY
Contact ______ (Name) ______ (Title) ______ (Date) ______ (Phone #)

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached
____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)

2. Adequacy ICs are adequate ICs are inadequate N/A
Remarks

D. General
1. **Vandalism/trespassing** Location shown on site map No vandalism evident
Remarks

2. **Land use changes on site** N/A
Remarks

3. **Land use changes off site** N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks
WASH OUT OBSERVED ON ONE INTERIOR GRAVEL ROAD. ALSO NOTED IN LTM REPORT.

B. Other Site Conditions
Remarks

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. Settlement (Low spots) Location shown on site map Settlement not evident
Areal extent Depth
Remarks TOPOGRAPHIC LOWS PROVIDE CONTAINMENT

2. **Cracks** Location shown on site map Cracking ~~not evident~~
Lengths Widths Depths
Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. **Erosion** Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. **Holes** Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks____

7. **Bulges** Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____

8. **Wet Areas/Water Damage** Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent____________
Ponding	Location shown on site map	Areal extent____________
Seeps	Location shown on site map	Areal extent____________
Soft subgrade	Location shown on site map	Areal extent____________

Remarks____

9. **Slope Instability** Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks____

2. **Bench Breached** Location shown on site map N/A or okay
Remarks____

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent____________
Size____________
Remarks____

6. **Excessive Vegetative Growth** Type__________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks____

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks____

2. Outlet Rock Inspected Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent________ Depth________ N/A
Siltation not evident
Remarks____

2. Erosion Areal extent________ Depth________
Erosion not evident
Remarks____

3. Outlet Works Functioning N/A
Remarks____

4. Dam Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement________ Vertical displacement________
Rotational displacement________
Remarks____

2. Degradation Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent________ Depth________
Remarks____

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. Vegetative Growth Location shown on site map N/A Vegetation does not impede flow Areal extent______________ Type____________ Remarks____
3. Erosion Location shown on site map Erosion not evident Areal extent______________ Depth____________ Remarks____
4. Discharge Structure Functioning N/A Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. Settlement Location shown on site map Settlement not evident Areal extent______________ Depth____________ Remarks____
2. Performance Monitoring Type of monitoring________________ Performance not monitored Frequency______________________ Evidence of breaching Head differential______________________ Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. Pumps, Wellhead Plumbing, and Electrical Good condition All required wells properly operating Needs Maintenance N/A Remarks____
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks____
3. Spare Parts and Equipment Readily available Good condition Requires upgrade Needs to be provided Remarks____
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A
1. Collection Structures, Pumps, and Electrical Good condition Needs Maintenance Remarks____
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks______________________________

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)
Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters______________________________
Additive (*e.g.*, chelation agent, flocculent)______________________________
Others______________________________
Good condition Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually______________________________
Quantity of surface water treated annually______________________________
Remarks______________________________

2. Electrical Enclosures and Panels (properly rated and functional)
N/A Good condition Needs Maintenance
Remarks______________________________

3. Tanks, Vaults, Storage Vessels
N/A Good condition Proper secondary containment Needs Maintenance
Remarks______________________________

4. Discharge Structure and Appurtenances
N/A Good condition Needs Maintenance
Remarks______________________________

5. Treatment Building(s)
N/A Good condition (esp. roof and doorways) Needs repair
Chemicals and equipment properly stored
Remarks______________________________

6. Monitoring Wells (pump and treatment remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks______________________________

D. Monitoring Data

1. Monitoring Data
Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:
Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks______________________________

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 41 Building 718 Boiler Plant Blowdown Leach Pit	**Date of inspection:** 4/7/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 40°F / CLOUDY

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ____________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** PHIL — MAINT. MANAGER — 4/7/11
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ASKED ABOUT CITY WATER VS. WELL WATER - CONFIRMED CITY WATER (PHOTO 4)

2. **O&M staff** ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

4. **Other interviews** (optional) Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______________________________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits_______________	Readily available	Up to date	N/A
Remarks______________________________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______________________________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______________________________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______________________________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______________________________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______________________________			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house Contractor for State
PRP in-house Contractor for PRP
Federal Facility in-house Contractor for Federal Facility
Other____

2. O&M Cost Records

Readily available Up to date
Funding mechanism/agreement in place
Original O&M cost estimate____________________ Breakdown attached

Total annual cost by year for review period if available

From________ (Date)	To________ (Date)	________ (Total cost)	Breakdown attached
From________ (Date)	To________ (Date)	________ (Total cost)	Breakdown attached
From________ (Date)	To________ (Date)	________ (Total cost)	Breakdown attached
From________ (Date)	To________ (Date)	________ (Total cost)	Breakdown attached
From________ (Date)	To________ (Date)	________ (Total cost)	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______________________________________

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks____

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks____

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY
Frequency ____
Responsible party/agency ________________________________
Contact ____________ (Name) ____________ (Title) ________ (Date) ________ (Phone #)

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached
____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)

2. **Adequacy** ICs are adequate ICs are inadequate N/A
Remarks

D. General
1. **Vandalism/trespassing** Location shown on site map No vandalism evident
Remarks

2. **Land use changes on site** N/A
Remarks

3. **Land use changes off site** N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks

B. Other Site Conditions
Remarks NOTED ANIMAL BURROWS - ADJACENT TO SEED. MWS LOCKED

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident
Areal extent______ Depth______
Remarks

2. **Cracks** Location shown on site map Cracking not evident
Lengths______ Widths______ Depths______
Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. **Erosion** Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____
____

4. **Holes** Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____
____

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____
____

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks____
____

7. **Bulges** Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____
____

8. **Wet Areas/Water Damage** Wet areas/water damage not evident
Wet areas Location shown on site map Areal extent______________
Ponding Location shown on site map Areal extent______________
Seeps Location shown on site map Areal extent______________
Soft subgrade Location shown on site map Areal extent______________
Remarks____
____

9. **Slope Instability** Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks____
____

2. **Bench Breached** Location shown on site map N/A or okay
Remarks____
____

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks____
____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____
____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent_____________
Size____________
Remarks____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks____

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks____

2. Outlet Rock Inspected Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent______________ Depth____________ N/A
Siltation not evident
Remarks____

2. Erosion Areal extent______________ Depth____________
Erosion not evident
Remarks____

3. Outlet Works Functioning N/A
Remarks____

4. Dam Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement____________ Vertical displacement_______________
Rotational displacement____________
Remarks____

2. Degradation Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. **Vegetative Growth** Location shown on site map N/A Vegetation does not impede flow Areal extent______ Type______ Remarks______
3. **Erosion** Location shown on site map Erosion not evident Areal extent______ Depth______ Remarks______
4. **Discharge Structure** Functioning N/A Remarks______

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. **Settlement** Location shown on site map Settlement not evident Areal extent______ Depth______ Remarks______
2. **Performance Monitoring** Type of monitoring______ Performance not monitored Frequency______ Evidence of breaching Head differential______ Remarks______

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. **Pumps, Wellhead Plumbing, and Electrical** Good condition All required wells properly operating Needs Maintenance N/A Remarks______
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks______
3. **Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks______
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A
1. **Collection Structures, Pumps, and Electrical** Good condition Needs Maintenance Remarks______
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks______

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment
Readily available   Good condition   Requires upgrade   Needs to be provided
Remarks______________________________

C. Treatment System Applicable N/A

1. **Treatment Train** (Check components that apply)
    Metals removal Oil/water separation Bioremediation
    ir stripping Carbon adsorbers
    Filters______________________________
    Additive (*e.g.*, chelation agent, flocculent)______________________________
    Others______________________________
    Good condition   Needs Maintenance
    Sampling ports properly marked and functional
    Sampling/maintenance log displayed and up to date
    Equipment properly identified
    Quantity of groundwater treated annually______________
    Quantity of surface water treated annually______________
Remarks______________________________

2. **Electrical Enclosures and Panels** (properly rated and functional)
N/A   Good condition   Needs Maintenance
Remarks______________________________

3. **Tanks, Vaults, Storage Vessels**
N/A   Good condition   Proper secondary containment   Needs Maintenance
Remarks______________________________

4. **Discharge Structure and Appurtenances**
N/A   Good condition   Needs Maintenance
Remarks______________________________

5. **Treatment Building(s)**
N/A   Good condition (esp. roof and doorways)   Needs repair
Chemicals and equipment properly stored
Remarks______________________________

6. **Monitoring Wells** (pump and treatment remedy)
Properly secured/locked   Functioning   Routinely sampled   Good condition
All required wells located   Needs Maintenance   N/A
Remarks______________________________

D. Monitoring Data

1. Monitoring Data
    Is routinely submitted on time   Is of acceptable quality

2. Monitoring data suggests:
    Groundwater plume is effectively contained   Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
Properly secured/locked   Functioning   Routinely sampled   Good condition
All required wells located   Needs Maintenance   N/A
Remarks______________________________

X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

THE REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SUPERINTENDENT
JOHN B. LEMPKE

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD-43 Building 606 Old Missile Propellant Test Laboratory/SEAD-56 Building 606 Herbicide and Pesticide Storage/SEAD-69 Building 606 Disposal Area	**Date of inspection:** 4/7/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 47°F / P. Cloudy

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager G. PERRY — OFFICER — 4/7/11
Name / Title / Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached
VERIFIED STILL OPERATING PRISON - ADDING ON

PHOTOS NOT ALLOWED ON SITE

2. O&M staff ______________________
Name / Title / Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ______________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________________
Contact ______________________
Name / Title / Date / Phone #
Problems; suggestions; Report attached ______________________

Agency ______________________
Contact ______________________
Name / Title / Date / Phone #
Problems; suggestions; Report attached ______________________

Agency ______________________
Contact ______________________
Name / Title / Date / Phone #
Problems; suggestions; Report attached ______________________

Agency ______________________
Contact ______________________
Name / Title / Date / Phone #
Problems; suggestions; Report attached ______________________

4. **Other interviews** (optional) Report attached ______________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. **O&M Documents**			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________________			
2. **Site-Specific Health and Safety Plan**	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________________			
3. **O&M and OSHA Training Records**	Readily available	Up to date	N/A
Remarks______________________________			
4. **Permits and Service Agreements**			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits______________	Readily available	Up to date	N/A
Remarks______________________________			
5. **Gas Generation Records**	Readily available	Up to date	N/A
Remarks______________________________			
6. **Settlement Monument Records**	Readily available	Up to date	N/A
Remarks______________________________			
7. **Groundwater Monitoring Records**	Readily available	Up to date	N/A
Remarks______________________________			
8. **Leachate Extraction Records**	Readily available	Up to date	N/A
Remarks______________________________			
9. **Discharge Compliance Records**			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________________			
10. **Daily Access/Security Logs**	Readily available	Up to date	N/A
Remarks______________________________			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house — Contractor for State
PRP in-house — Contractor for PRP
Federal Facility in-house — Contractor for Federal Facility
Other____

2. O&M Cost Records

Readily available — Up to date
Funding mechanism/agreement in place
Original O&M cost estimate________________ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged — Location shown on site map — Gates secured — N/A
Remarks____

B. Other Access Restrictions

1. Signs and other security measures — Location shown on site map — N/A
Remarks____

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY
Frequency ____
Responsible party/agency ____
Contact ____

Name — Title — Date — Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. Adequacy ICs are adequate ICs are inadequate N/A Remarks______________________________
D. General 1. **Vandalism/trespassing** Location shown on site map No vandalism evident Remarks______________________________
2. Land use changes on site N/A Remarks______________________________
3. Land use changes off site N/A Remarks______________________________

VI. GENERAL SITE CONDITIONS
A. Roads Applicable N/A
1. **Roads damaged** Location shown on site map Roads adequate N/A Remarks______________________________
B. Other Site Conditions Remarks______________________________

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. **Settlement** (Low spots) Location shown on site map Settlement not evident Areal extent______________ Depth___________ Remarks______________________________
2. **Cracks** Location shown on site map Cracking not evident Lengths___________ Widths__________ Depths_________ Remarks______________________________

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. Holes Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____

5. Vegetative Cover Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. Alternative Cover (armored rock, concrete, etc.) N/A
Remarks____

7. Bulges Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____

8. Wet Areas/Water Damage Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent______________
Ponding	Location shown on site map	Areal extent______________
Seeps	Location shown on site map	Areal extent______________
Soft subgrade	Location shown on site map	Areal extent______________

Remarks____

9. Slope Instability Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench Location shown on site map N/A or okay
Remarks____

2. Bench Breached Location shown on site map N/A or okay
Remarks____

3. Bench Overtopped Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent______________ Depth____________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent______________ Depth____________
Remarks____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks______________________________

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks______________________________

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks______________________________

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks______________________________

2. Outlet Rock Inspected Functioning N/A
Remarks______________________________

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent______ Depth______ N/A
Siltation not evident
Remarks______________________________

2. Erosion Areal extent______ Depth______
Erosion not evident
Remarks______________________________

3. Outlet Works Functioning N/A
Remarks______________________________

4. Dam Functioning N/A
Remarks______________________________

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement______ Vertical displacement______
Rotational displacement______
Remarks______________________________

2. Degradation Location shown on site map Degradation not evident
Remarks______________________________

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent______ Depth______
Remarks______________________________

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. Vegetative Growth Location shown on site map N/A Vegetation does not impede flow Areal extent______________ Type____________ Remarks____
3. Erosion Location shown on site map Erosion not evident Areal extent______________ Depth____________ Remarks____
4. Discharge Structure Functioning N/A Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. Settlement Location shown on site map Settlement not evident Areal extent______________ Depth____________ Remarks____
2. Performance Monitoring Type of monitoring__________________________ Performance not monitored Frequency________________________________ Evidence of breaching Head differential__________________________ Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. Pumps, Wellhead Plumbing, and Electrical Good condition All required wells properly operating Needs Maintenance N/A Remarks____
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks____
3. Spare Parts and Equipment Readily available Good condition Requires upgrade Needs to be provided Remarks____
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A
1. Collection Structures, Pumps, and Electrical Good condition Needs Maintenance Remarks____
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. **Spare Parts and Equipment**
Readily available Good condition Requires upgrade Needs to be provided
Remarks____

C. Treatment System Applicable N/A

1. **Treatment Train** (Check components that apply)
Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters____
Additive (*e.g.*, chelation agent, flocculent)_______________________________
Others____
Good condition Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually______________________
Quantity of surface water treated annually______________________
Remarks____

2. **Electrical Enclosures and Panels** (properly rated and functional)
N/A Good condition Needs Maintenance
Remarks____

3. **Tanks, Vaults, Storage Vessels**
N/A Good condition Proper secondary containment Needs Maintenance
Remarks____

4. **Discharge Structure and Appurtenances**
N/A Good condition Needs Maintenance
Remarks____

5. **Treatment Building(s)**
N/A Good condition (esp. roof and doorways) Needs repair
Chemicals and equipment properly stored
Remarks____

6. **Monitoring Wells** (pump and treatment remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks____

D. Monitoring Data

1. Monitoring Data
Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:
Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks____

X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

THE REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 44B Quality Assurance Test Laboratory, Brady Road	**Date of inspection:** SEE SEAD 43/56/69
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:**
Remedy Includes: (Check all that apply)	
☐ Landfill cover/containment ☐ Access controls ☐ Institutional controls ☐ Groundwater pump and treatment Other ______	☐ Monitored natural attenuation ☐ Groundwater containment ☐ Vertical barrier walls ☐ Surface water collection and treatment
Attachments: Inspection team roster attached Site map attached	

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

2. O&M staff ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

4. **Other interviews** (optional) Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits	Readily available	Up to date	N/A
Remarks			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks			

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 44A Quality Assurance Test Laboratory, West of Building 616	**Date of inspection:** SEE SEAD 43/56/69
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:**

Remedy Includes: (Check all that apply)

☐ Landfill cover/containment
☐ Access controls
☐ Institutional controls
☐ Groundwater pump and treatment
☐ Monitored natural attenuation
☐ Groundwater containment
☐ Vertical barrier walls
☐ Surface water collection and treatment

Other ____________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ____________
Problems, suggestions; Report attached ____________

2. **O&M staff** ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ____________
Problems, suggestions; Report attached ____________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

4. **Other interviews** (optional) Report attached ____________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. **O&M Documents**			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________			
2. **Site-Specific Health and Safety Plan**	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________			
3. **O&M and OSHA Training Records**	Readily available	Up to date	N/A
Remarks______________________			
4. **Permits and Service Agreements**			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits____________	Readily available	Up to date	N/A
Remarks______________________			
5. **Gas Generation Records**	Readily available	Up to date	N/A
Remarks______________________			
6. **Settlement Monument Records**	Readily available	Up to date	N/A
Remarks______________________			
7. **Groundwater Monitoring Records**	Readily available	Up to date	N/A
Remarks______________________			
8. **Leachate Extraction Records**	Readily available	Up to date	N/A
Remarks______________________			
9. **Discharge Compliance Records**			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________			
10. **Daily Access/Security Logs**	Readily available	Up to date	N/A
Remarks______________________			

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 52 Building 608 and 612 Ammunition Breakdown Area	**Date of inspection:** SEE SEAD 43/56/69
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:**

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ____________
Problems, suggestions; Report attached ____________

2. **O&M staff** ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ____________
Problems, suggestions; Report attached ____________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

4. **Other interviews** (optional) Report attached ____________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______________________________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits______________	Readily available	Up to date	N/A
Remarks______________________________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______________________________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______________________________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______________________________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______________________________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______________________________			

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 62 Nicotine Sulfate Disposal Area near Building 606 and 612	**Date of inspection:** SEE SEAD 43/56/69
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:**

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ____________
Problems, suggestions; Report attached ____________

2. **O&M staff** ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ____________
Problems, suggestions; Report attached ____________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

Agency ____________
Contact ____________ ____________ ____________ ____________
Name Title Date Phone #
Problems; suggestions; Report attached ____________

4. **Other interviews** (optional) Report attached ____________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits	Readily available	Up to date	N/A
Remarks			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks			

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 64C Garbage Disposal Area, Proposed Landfill Site	**Date of inspection:** SEE SEAD 43/56/69
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:**

Remedy Includes: (Check all that apply)

☐ Landfill cover/containment
☐ Access controls
☐ Institutional controls
☐ Groundwater pump and treatment
☐ Monitored natural attenuation
☐ Groundwater containment
☐ Vertical barrier walls
☐ Surface water collection and treatment

Other ______________________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ______________________________

2. **O&M staff** ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ______________________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ____________
Contact ____________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ____________
Contact ____________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ____________
Contact ____________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

Agency ____________
Contact ____________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ______________________________

4. **Other interviews** (optional) Report attached ______________________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. **O&M Documents**			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks			
2. **Site-Specific Health and Safety Plan**	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks			
3. **O&M and OSHA Training Records**	Readily available	Up to date	N/A
Remarks			
4. **Permits and Service Agreements**			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits	Readily available	Up to date	N/A
Remarks			
5. **Gas Generation Records**	Readily available	Up to date	N/A
Remarks			
6. **Settlement Monument Records**	Readily available	Up to date	N/A
Remarks			
7. **Groundwater Monitoring Records**	Readily available	Up to date	N/A
Remarks			
8. **Leachate Extraction Records**	Readily available	Up to date	N/A
Remarks			
9. **Discharge Compliance Records**			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks			
10. **Daily Access/Security Logs**	Readily available	Up to date	N/A
Remarks			

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 64B Garbage Disposal Area, Disposal Area South of Classification Area	**Date of inspection:** 4/6/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 39°/RAIN

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ______________ ______________ ______________
Name Title Date
Interviewed at site at office by phone Phone no. ______________
Problems, suggestions; Report attached ______________

2. **O&M staff** ______________ ______________ ______________
Name Title Date
Interviewed at site at office by phone Phone no. ______________
Problems, suggestions; Report attached ______________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________

Agency ______________
Contact ______________ ______________ ______________ ______________
Name Title Date Phone #
Problems; suggestions; Report attached ______________

4. **Other interviews** (optional) Report attached ______________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. O&M Documents

O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A

Remarks____

2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A

Remarks____

3. O&M and OSHA Training Records	Readily available	Up to date	N/A

Remarks____

4. Permits and Service Agreements

Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits__________	Readily available	Up to date	N/A

Remarks____

5. Gas Generation Records	Readily available	Up to date	N/A

Remarks____

6. Settlement Monument Records	Readily available	Up to date	N/A

Remarks____

7. Groundwater Monitoring Records	Readily available	Up to date	N/A

Remarks____

8. Leachate Extraction Records	Readily available	Up to date	N/A

Remarks____

9. Discharge Compliance Records

Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A

Remarks____

10. Daily Access/Security Logs	Readily available	Up to date	N/A

Remarks____

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house Contractor for State
PRP in-house Contractor for PRP
Federal Facility in-house Contractor for Federal Facility
Other____________________

2. O&M Cost Records

Readily available Up to date
Funding mechanism/agreement in place
Original O&M cost estimate__________ Breakdown attached

Total annual cost by year for review period if available

From____ Date	To____ Date	____ Total cost	Breakdown attached
From____ Date	To____ Date	____ Total cost	Breakdown attached
From____ Date	To____ Date	____ Total cost	Breakdown attached
From____ Date	To____ Date	____ Total cost	Breakdown attached
From____ Date	To____ Date	____ Total cost	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____________________

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A

Remarks____________________

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A

Remarks____________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) Drive By/Walk over
Frequency____________________
Responsible party/agency____________________
Contact ____ Name ____ Title ____ Date ____ Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)

C. Institutional Controls (ICs) (continued)

2. **Adequacy** ICs are adequate ICs are inadequate N/A

Remarks________________________________

D. General

1. **Vandalism/trespassing** Location shown on site map No vandalism evident

Remarks________________________________

2. **Land use changes on site** N/A

Remarks________________________________

3. **Land use changes off site** N/A

Remarks________________________________

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A

Remarks________________________________

B. Other Site Conditions

Remarks COVER IS VEGETATED WITH NO SIGNS OF EROSION EVIDENT

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident

Areal extent__________ Depth__________

Remarks________________________________

2. **Cracks** Location shown on site map Cracking not evident

Lengths__________ Widths__________ Depths__________

Remarks________________________________

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. **Erosion** Location shown on site map Erosion not evident
Areal extent______ Depth______
Remarks______

4. **Holes** Location shown on site map Holes not evident
Areal extent______ Depth______
Remarks______

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks______

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks______

7. **Bulges** Location shown on site map ~~Bulges not evident~~
Areal extent______ Height______
Remarks______

8. **Wet Areas/Water Damage** Wet areas/water damage not evident
Wet areas ~~Location shown on site map~~ Areal extent______
Ponding Location shown on site map Areal extent______
Seeps Location shown on site map Areal extent______
Soft subgrade Location shown on site map Areal extent______
Remarks______

9. **Slope Instability** Slides Location shown on site map No evidence of slope instability
Areal extent______
Remarks______

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the ~~runoff~~ to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks______

2. **Bench Breached** Location shown on site map N/A or okay
Remarks______

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks______

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent______ Depth______
Remarks______

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type______________ Areal extent____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent______________ Depth____________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent______________ Depth____________
Remarks____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent____________
Size____________
Remarks____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks______________________________

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks______________________________

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks______________________________

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks______________________________

2. Outlet Rock Inspected Functioning N/A
Remarks______________________________

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks______________________________

2. Erosion Areal extent__________ Depth__________
Erosion not evident
Remarks______________________________

3. Outlet Works Functioning N/A
Remarks______________________________

4. Dam Functioning N/A
Remarks______________________________

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks______________________________

2. Degradation Location shown on site map Degradation not evident
Remarks______________________________

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks______________________________

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. **Vegetative Growth** Location shown on site map N/A Vegetation does not impede flow Areal extent__________ Type__________ Remarks______________________________ 3. **Erosion** Location shown on site map Erosion not evident Areal extent__________ Depth__________ Remarks______________________________ 4. **Discharge Structure** Functioning N/A Remarks______________________________

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. **Settlement** Location shown on site map Settlement not evident Areal extent__________ Depth__________ Remarks______________________________ 2. **Performance Monitoring** Type of monitoring__________ Performance not monitored Frequency__________ Evidence of breaching Head differential__________ Remarks______________________________

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. **Pumps, Wellhead Plumbing, and Electrical** Good condition All required wells properly operating Needs Maintenance N/A Remarks______________________________ 2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks______________________________ 3. **Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks______________________________
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A
1. **Collection Structures, Pumps, and Electrical** Good condition Needs Maintenance Remarks______________________________ 2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks______________________________

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment
Readily available Good condition Requires upgrade Needs to be provided
Remarks____

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)
Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters____
Additive (*e.g.*, chelation agent, flocculent)______________________
Others____
Good condition Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually____________________
Quantity of surface water treated annually____________________
Remarks____

2. Electrical Enclosures and Panels (properly rated and functional)
N/A Good condition Needs Maintenance
Remarks____

3. Tanks, Vaults, Storage Vessels
N/A Good condition Proper secondary containment Needs Maintenance
Remarks____

4. Discharge Structure and Appurtenances
N/A Good condition Needs Maintenance
Remarks____

5. Treatment Building(s)
N/A Good condition (esp. roof and doorways) Needs repair
Chemicals and equipment properly stored
Remarks____

6. Monitoring Wells (pump and treatment remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks____

D. Monitoring Data

1. Monitoring Data
Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:
Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

THE REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 64D Garbage Disposal Area, Disposal Area West of Building 2203	**Date of inspection:** 4/7/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 43°F / CLOUDY

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ____________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ____________________

2. **O&M staff** ____________ ____________ ____________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ____________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ____________
Contact ____________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ____________________

Agency ____________
Contact ____________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ____________________

Agency ____________
Contact ____________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ____________________

Agency ____________
Contact ____________ ____________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ____________________

4. **Other interviews** (optional) Report attached ____________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks______________________________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks______________________________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks______________________________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits_______________	Readily available	Up to date	N/A
Remarks______________________________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks______________________________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks______________________________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks______________________________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks______________________________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks______________________________			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks______________________________			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house — Contractor for State
PRP in-house — Contractor for PRP
Federal Facility in-house — Contractor for Federal Facility
Other____

2. O&M Cost Records

Readily available — Up to date
Funding mechanism/agreement in place
Original O&M cost estimate____________________ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks____

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks____

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) ____________________________
Frequency ____
Responsible party/agency ____________________________________
Contact ____

Name	Title	Date	Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	~~N/A~~
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)

2. Adequacy ICs are adequate ICs are inadequate N/A
Remarks______

D. General
1. **Vandalism/trespassing** Location shown on site map No vandalism evident
Remarks______

2. **Land use changes on site** N/A
Remarks______

3. **Land use changes off site** N/A
Remarks______

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks______

B. Other Site Conditions
Remarks______

VII. LANDFILL COVERS Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident
Areal extent______ Depth______
Remarks______

2. **Cracks** Location shown on site map Cracking not evident
Lengths______ Widths______ Depths______
Remarks______

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. **Erosion** Location shown on site map Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. **Holes** Location shown on site map Holes not evident
Areal extent______________ Depth____________
Remarks____

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks____

7. **Bulges** Location shown on site map Bulges not evident
Areal extent______________ Height____________
Remarks____

8. **Wet Areas/Water Damage** ~~Wet areas/water damage not~~ evident

Wet areas	Location shown on site map	Areal extent______________
Ponding	Location shown on site map	Areal extent______________
Seeps	Location shown on site map	Areal extent______________
Soft subgrade	Location shown on site map	Areal extent______________

Remarks____

9. **Slope Instability** Slides Location shown on site map No evidence of slope instability
Areal extent______________
Remarks____

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks____

2. **Bench Breached** Location shown on site map N/A or okay
Remarks____

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks____

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent______________ Depth____________
Remarks____

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type______________ Areal extent_____________
Remarks____

____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____

____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____

____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent_____________
Size____________
Remarks____

____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____

____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks______________________________

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks______________________________

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks______________________________

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks______________________________

2. **Outlet Rock Inspected** Functioning N/A
Remarks______________________________

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks______________________________

2. **Erosion** Areal extent__________ Depth__________
Erosion not evident
Remarks______________________________

3. **Outlet Works** Functioning N/A
Remarks______________________________

4. **Dam** Functioning N/A
Remarks______________________________

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks______________________________

2. **Degradation** Location shown on site map Degradation not evident
Remarks______________________________

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks______________________________

VII. LANDFILL COVERS (continued)		
I. Perimeter Ditches/Off-Site Discharge (continued)		
2. Vegetative Growth	Location shown on site map	N/A
Vegetation does not impede flow		
Areal extent______________ Type____________		
Remarks______________________________		
3. Erosion	Location shown on site map	Erosion not evident
Areal extent______________ Depth____________		
Remarks______________________________		
4. Discharge Structure Functioning N/A		
Remarks______________________________		

VIII. VERTICAL BARRIER WALLS Applicable N/A		
1. Settlement	Location shown on site map	Settlement not evident
Areal extent______________ Depth____________		
Remarks______________________________		
2. Performance Monitoring	Type of monitoring____________________	
Performance not monitored		
Frequency______________________________		Evidence of breaching
Head differential_______________________		
Remarks______________________________		

IX. GROUNDWATER/SURFACE WATER REMEDIES		Applicable	N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		Applicable	N/A
1. Pumps, Wellhead Plumbing, and Electrical			
Good condition	All required wells properly operating	Needs Maintenance	N/A
Remarks______________________________			
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances			
Good condition	Needs Maintenance		
Remarks______________________________			
3. Spare Parts and Equipment			
Readily available	Good condition	Requires upgrade	Needs to be provided
Remarks______________________________			
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A			
1. Collection Structures, Pumps, and Electrical			
Good condition	Needs Maintenance		
Remarks______________________________			
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances			
Good condition	Needs Maintenance		
Remarks______________________________			

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)
B. Surface Water Collection Structures, Pumps, and Pipelines (continued)
3. Spare Parts and Equipment Readily available Good condition Requires upgrade Needs to be provided Remarks______________________________
C. Treatment System Applicable N/A
1. Treatment Train (Check components that apply) Metals removal Oil/water separation Bioremediation ir stripping Carbon adsorbers Filters______________________________ Additive (*e.g.*, chelation agent, flocculent)______________________________ Others______________________________ Good condition Needs Maintenance Sampling ports properly marked and functional Sampling/maintenance log displayed and up to date Equipment properly identified Quantity of groundwater treated annually______________ Quantity of surface water treated annually______________ Remarks______________________________ **2. Electrical Enclosures and Panels** (properly rated and functional) N/A Good condition Needs Maintenance Remarks______________________________ **3. Tanks, Vaults, Storage Vessels** N/A Good condition Proper secondary containment Needs Maintenance Remarks______________________________ **4. Discharge Structure and Appurtenances** N/A Good condition Needs Maintenance Remarks______________________________ **5. Treatment Building(s)** N/A Good condition (esp. roof and doorways) Needs repair Chemicals and equipment properly stored Remarks______________________________ **6. Monitoring Wells** (pump and treatment remedy) Properly secured/locked Functioning Routinely sampled Good condition All required wells located Needs Maintenance N/A Remarks______________________________
D. Monitoring Data
1. Monitoring Data Is routinely submitted on time Is of acceptable quality 2. Monitoring data suggests: Groundwater plume is effectively contained Contaminant concentrations are declining
E. Monitored Natural Attenuation
1. Monitoring Wells (natural attenuation remedy) Properly secured/locked Functioning Routinely sampled Good condition All required wells located Needs Maintenance N/A Remarks______________________________

X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

THE REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 122B Small Arms Range, Airfield	**Date of inspection:** 4/7/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 43°F/PARTLY CLOUDY

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ________________

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ________________ ________________ ________________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ________________

2. **O&M staff** ________________ ________________ ________________
Name Title Date
Interviewed at site at office by phone Phone no. ________
Problems, suggestions; Report attached ________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ________________
Contact ________________ ________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ________________

Agency ________________
Contact ________________ ________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ________________

Agency ________________
Contact ________________ ________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ________________

Agency ________________
Contact ________________ ________ ________ ________
Name Title Date Phone #
Problems; suggestions; Report attached ________________

4. **Other interviews** (optional) Report attached ________________

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks_______________			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks_______________			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks_______________			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits_______________	Readily available	Up to date	N/A
Remarks_______________			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks_______________			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks_______________			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks_______________			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks_______________			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks_______________			
10. **Daily Access/Security Logs**	Readily available	Up to date	N/A
Remarks_______________			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house — Contractor for State
PRP in-house — Contractor for PRP
Federal Facility in-house — Contractor for Federal Facility
Other____________________

2. O&M Cost Records

Readily available — Up to date
Funding mechanism/agreement in place
Original O&M cost estimate__________ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached
			Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____________________

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks____________________

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks____________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE-BY
Frequency____________________
Responsible party/agency____________________
Contact__________ __________ __________ __________
Name Title Date Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. **Adequacy** ICs are adequate ICs are inadequate N/A Remarks____________
D. General 1. **Vandalism/trespassing** Location shown on site map No vandalism evident Remarks____________
2. **Land use changes on site** N/A Remarks____________
3. **Land use changes off site** N/A Remarks____________

VI. GENERAL SITE CONDITIONS
A. Roads Applicable N/A
1. **Roads damaged** Location shown on site map Roads adequate N/A Remarks____________
B. Other Site Conditions Remarks____________

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. **Settlement** (Low spots) Location shown on site map Settlement not evident Areal extent________ Depth________ Remarks____________
2. **Cracks** Location shown on site map Cracking not evident Lengths________ Widths________ Depths________ Remarks____________

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. **Erosion** Location shown on site map Erosion not evident
Areal extent__________ Depth__________
Remarks__________

4. **Holes** Location shown on site map Holes not evident
Areal extent__________ Depth__________
Remarks__________

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks__________

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks__________

7. **Bulges** Location shown on site map Bulges not evident
Areal extent__________ Height__________
Remarks__________

8. **Wet Areas/Water Damage** Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent__________
Ponding	Location shown on site map	Areal extent__________
Seeps	Location shown on site map	Areal extent__________
Soft subgrade	Location shown on site map	Areal extent__________

Remarks__________

9. **Slope Instability** Slides Location shown on site map No evidence of slope instability
Areal extent__________
Remarks__________

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks__________

2. **Bench Breached** Location shown on site map N/A or okay
Remarks__________

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks__________

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent__________ Depth__________
Remarks__________

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. Material Degradation Location shown on site map No evidence of degradation
Material type______________ Areal extent____________
Remarks____
____

3. Erosion Location shown on site map No evidence of erosion
Areal extent_____________ Depth___________
Remarks____
____

4. Undercutting Location shown on site map No evidence of undercutting
Areal extent_____________ Depth___________
Remarks____
____

5. Obstructions Type____________________ No obstructions
Location shown on site map Areal extent_____________
Size___________
Remarks____
____

6. Excessive Vegetative Growth Type___________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____
____

D. Cover Penetrations Applicable N/A

1. Gas Vents Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

2. Gas Monitoring Probes
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

3. Monitoring Wells (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

4. Leachate Extraction Wells
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____
____

5. Settlement Monuments Located Routinely surveyed N/A
Remarks____
____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks______________________________

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks______________________________

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks______________________________

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks______________________________

2. Outlet Rock Inspected Functioning N/A
Remarks______________________________

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent__________ Depth__________ N/A
Siltation not evident
Remarks______________________________

2. Erosion Areal extent__________ Depth__________
Erosion not evident
Remarks______________________________

3. Outlet Works Functioning N/A
Remarks______________________________

4. Dam Functioning N/A
Remarks______________________________

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement__________
Rotational displacement__________
Remarks______________________________

2. Degradation Location shown on site map Degradation not evident
Remarks______________________________

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent__________ Depth__________
Remarks______________________________

VII. LANDFILL COVERS (continued)		
I. Perimeter Ditches/Off-Site Discharge (continued)		
2. **Vegetative Growth**	Location shown on site map	N/A
Vegetation does not impede flow		
Areal extent______________ Type____________		
Remarks______________________________		
3. **Erosion**	Location shown on site map	Erosion not evident
Areal extent______________ Depth____________		
Remarks______________________________		
4. **Discharge Structure** Functioning N/A		
Remarks______________________________		

VIII. VERTICAL BARRIER WALLS Applicable N/A		
1. **Settlement**	Location shown on site map	Settlement not evident
Areal extent______________ Depth____________		
Remarks______________________________		
2. **Performance Monitoring**	Type of monitoring__________________	
Performance not monitored		
Frequency______________________________		Evidence of breaching
Head differential__________________________		
Remarks______________________________		

IX. GROUNDWATER/SURFACE WATER REMEDIES		Applicable	N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		Applicable	N/A
1. **Pumps, Wellhead Plumbing, and Electrical**			
Good condition	All required wells properly operating	Needs Maintenance	N/A
Remarks______________________________			
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**			
Good condition	Needs Maintenance		
Remarks______________________________			
3. **Spare Parts and Equipment**			
Readily available	Good condition	Requires upgrade	Needs to be provided
Remarks______________________________			
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A			
1. **Collection Structures, Pumps, and Electrical**			
Good condition	Needs Maintenance		
Remarks______________________________			
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**			
Good condition	Needs Maintenance		
Remarks______________________________			

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment

Readily available   Good condition   Requires upgrade   Needs to be provided

Remarks____

C. Treatment System Applicable N/A

1. **Treatment Train** (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters____

Additive (*e.g.*, chelation agent, flocculent)__________________________

Others____

Good condition   Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually____________________

Quantity of surface water treated annually____________________

Remarks____

2. **Electrical Enclosures and Panels** (properly rated and functional)

N/A   Good condition   Needs Maintenance

Remarks____

3. **Tanks, Vaults, Storage Vessels**

N/A   Good condition   Proper secondary containment   Needs Maintenance

Remarks____

4. **Discharge Structure and Appurtenances**

N/A   Good condition   Needs Maintenance

Remarks____

5. **Treatment Building(s)**

N/A   Good condition (esp. roof and doorways)   Needs repair

Chemicals and equipment properly stored

Remarks____

6. **Monitoring Wells** (pump and treatment remedy)

Properly secured/locked   Functioning   Routinely sampled   Good condition

All required wells located   Needs Maintenance   N/A

Remarks____

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time   Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained   Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

Properly secured/locked   Functioning   Routinely sampled   Good condition

All required wells located   Needs Maintenance   N/A

Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SEAD 122E Plane Deicing Area	**Date of inspection:** 4/7/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 43°F/ PARTLY CLOUDY
Remedy Includes: (Check all that apply)	
☐ Landfill cover/containment	☐ Monitored natural attenuation
☒ ~~Access controls~~	☐ Groundwater containment
☒ Institutional controls	☐ Vertical barrier walls
☐ Groundwater pump and treatment	☐ Surface water collection and treatment
Other	
Attachments: Inspection team roster attached Site map attached	

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______ Name ______ Title ______ Date

Interviewed at site at office by phone Phone no. ______

Problems, suggestions; Report attached ______

2. O&M staff ______ Name ______ Title ______ Date

Interviewed at site at office by phone Phone no. ______

Problems, suggestions; Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______

Contact ______ Name ______ Title ______ Date ______ Phone #

Problems; suggestions; Report attached ______

Agency ______

Contact ______ Name ______ Title ______ Date ______ Phone #

Problems; suggestions; Report attached ______

Agency ______

Contact ______ Name ______ Title ______ Date ______ Phone #

Problems; suggestions; Report attached ______

Agency ______

Contact ______ Name ______ Title ______ Date ______ Phone #

Problems; suggestions; Report attached ______

4. **Other interviews** (optional) Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks___			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks___			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks___			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits___	Readily available	Up to date	N/A
Remarks___			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks___			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks___			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks___			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks___			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks___			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks___			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house | Contractor for State
PRP in-house | Contractor for PRP
Federal Facility in-house | Contractor for Federal Facility
Other____

2. O&M Cost Records

Readily available | Up to date
Funding mechanism/agreement in place
Original O&M cost estimate________________ Breakdown attached

Total annual cost by year for review period if available

From ______ Date	To ______ Date	______ Total cost	Breakdown attached
From ______ Date	To ______ Date	______ Total cost	Breakdown attached
From ______ Date	To ______ Date	______ Total cost	Breakdown attached
From ______ Date	To ______ Date	______ Total cost	Breakdown attached
From ______ Date	To ______ Date	______ Total cost	Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ____________________________

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks____________________________________

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks____________________________________

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY
Frequency ____________________________________
Responsible party/agency ____________________________
Contact ____________ Name ________ Title ______ Date ______ Phone #

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached
____

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. Adequacy ICs are adequate ICs are inadequate N/A Remarks
D. General 1. **Vandalism/trespassing** Location shown on site map No vandalism evident Remarks
2. **Land use changes on site** N/A Remarks
3. **Land use changes off site** N/A Remarks

VI. GENERAL SITE CONDITIONS
A. Roads Applicable N/A
1. **Roads damaged** Location shown on site map Roads adequate N/A Remarks
B. Other Site Conditions Remarks

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. **Settlement** (Low spots) Location shown on site map Settlement not evident Areal extent______ Depth______ Remarks
2. **Cracks** Location shown on site map Cracking not evident Lengths______ Widths______ Depths______ Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. **Erosion** Location shown on site map Erosion not evident
Areal extent______ Depth______
Remarks______

4. **Holes** Location shown on site map Holes not evident
Areal extent______ Depth______
Remarks______

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks______

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks______

7. **Bulges** Location shown on site map Bulges not evident
Areal extent______ Height______
Remarks______

8. **Wet Areas/Water Damage** Wet areas/water damage not evident
Wet areas Location shown on site map Areal extent______
Ponding Location shown on site map Areal extent______
Seeps Location shown on site map Areal extent______
Soft subgrade Location shown on site map Areal extent______
Remarks______

9. **Slope Instability** Slides Location shown on site map No evidence of slope instability
Areal extent______
Remarks______

B. Benches Applicable N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks______

2. **Bench Breached** Location shown on site map N/A or okay
Remarks______

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks______

C. Letdown Channels Applicable N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent______ Depth______
Remarks______

VII. LANDFILL COVERS (continued)

C. Letdown Channels (continued)

2. Material Degradation Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. Erosion Location shown on site map No evidence of erosion
Areal extent______________ Depth____________
Remarks____

4. Undercutting Location shown on site map No evidence of undercutting
Areal extent______________ Depth____________
Remarks____

5. Obstructions Type____________________ No obstructions
Location shown on site map Areal extent______________
Size____________
Remarks____

6. Excessive Vegetative Growth Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent______________
Remarks____

D. Cover Penetrations Applicable N/A

1. Gas Vents Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. Gas Monitoring Probes
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. Monitoring Wells (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

4. Leachate Extraction Wells
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. Settlement Monuments Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. **Gas Treatment Facilities**
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
Good condition Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks____

F. Cover Drainage Layer Applicable N/A

1. **Outlet Pipes Inspected** Functioning N/A
Remarks____

2. **Outlet Rock Inspected** Functioning N/A
Remarks____

G. Detention/Sedimentation Ponds Applicable N/A

1. **Siltation** Areal extent____________ Depth__________ N/A
Siltation not evident
Remarks____

2. **Erosion** Areal extent____________ Depth__________
Erosion not evident
Remarks____

3. **Outlet Works** Functioning N/A
Remarks____

4. **Dam** Functioning N/A
Remarks____

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
Horizontal displacement__________ Vertical displacement____________
Rotational displacement__________
Remarks____

2. **Degradation** Location shown on site map Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
Areal extent____________ Depth__________
Remarks____

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. **Vegetative Growth** Location shown on site map N/A Vegetation does not impede flow Areal extent______________ Type____________ Remarks____ ____
3. **Erosion** Location shown on site map Erosion not evident Areal extent______________ Depth____________ Remarks____ ____
4. **Discharge Structure** Functioning N/A Remarks____ ____

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. **Settlement** Location shown on site map Settlement not evident Areal extent______________ Depth____________ Remarks____ ____
2. **Performance Monitoring** Type of monitoring__________________________ Performance not monitored Frequency______________________________ Evidence of breaching Head differential_________________________ Remarks____ ____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. **Pumps, Wellhead Plumbing, and Electrical** Good condition All required wells properly operating Needs Maintenance N/A Remarks____ ____ ____
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks____ ____
3. **Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks____ ____
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A
1. **Collection Structures, Pumps, and Electrical** Good condition Needs Maintenance Remarks____ ____
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks____ ____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. Spare Parts and Equipment

Readily available Good condition Requires upgrade Needs to be provided

Remarks____

C. Treatment System Applicable N/A

1. Treatment Train (Check components that apply)

Metals removal Oil/water separation Bioremediation

ir stripping Carbon adsorbers

Filters____

Additive (*e.g.*, chelation agent, flocculent)______________________________________

Others____

Good condition Needs Maintenance

Sampling ports properly marked and functional

Sampling/maintenance log displayed and up to date

Equipment properly identified

Quantity of groundwater treated annually____________________

Quantity of surface water treated annually____________________

Remarks____

2. Electrical Enclosures and Panels (properly rated and functional)

N/A Good condition Needs Maintenance

Remarks____

3. Tanks, Vaults, Storage Vessels

N/A Good condition Proper secondary containment Needs Maintenance

Remarks____

4. Discharge Structure and Appurtenances

N/A Good condition Needs Maintenance

Remarks____

5. Treatment Building(s)

N/A Good condition (esp. roof and doorways) Needs repair

Chemicals and equipment properly stored

Remarks____

6. Monitoring Wells (pump and treatment remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks____

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)

Properly secured/locked Functioning Routinely sampled Good condition

All required wells located Needs Maintenance N/A

Remarks____

X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

REMEDY APPEARS TO BE EFFECTIVE
AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

SEDA Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: **Ash Landfill Operable Unit - SEAD-3 Incinerator Cooling Water Pond/SEAD-6 Abandoned Ash Landfill/SEAD-8 Non-Combustible Fill Area/SEAD-14 Refuse Burning Pits (2 units)/SEAD-15 Abandoned Solid Waste Incinerator (Building 2207)**	**Date of inspection:** 4/7/11
Location and Region: Romulus, Seneca County, New York Region 2	**EPA ID: NY0213820830**
Agency, office, or company leading the five-year review:	**Weather/temperature:** 43°F / PARTLY CLOUDY

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☒ Vertical barrier walls
- ☐ Surface water collection and treatment

Other ______

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

2. O&M staff ______ ______ ______
Name Title Date
Interviewed at site at office by phone Phone no. ______
Problems, suggestions; Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name Title Date Phone #
Problems; suggestions; Report attached ______

4. **Other interviews** (optional) Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents			
O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	Readily available	Up to date	N/A
Remarks____			
2. Site-Specific Health and Safety Plan	Readily available	Up to date	N/A
Contingency plan/emergency response plan	Readily available	Up to date	N/A
Remarks____			
3. O&M and OSHA Training Records	Readily available	Up to date	N/A
Remarks____			
4. Permits and Service Agreements			
Air discharge permit	Readily available	Up to date	N/A
Effluent discharge	Readily available	Up to date	N/A
Waste disposal, POTW	Readily available	Up to date	N/A
Other permits____________	Readily available	Up to date	N/A
Remarks____			
5. Gas Generation Records	Readily available	Up to date	N/A
Remarks____			
6. Settlement Monument Records	Readily available	Up to date	N/A
Remarks____			
7. Groundwater Monitoring Records	Readily available	Up to date	N/A
Remarks____			
8. Leachate Extraction Records	Readily available	Up to date	N/A
Remarks____			
9. Discharge Compliance Records			
Air	Readily available	Up to date	N/A
Water (effluent)	Readily available	Up to date	N/A
Remarks____			
10. Daily Access/Security Logs	Readily available	Up to date	N/A
Remarks____			

IV. O&M COSTS Applicable N/A

1. O&M Organization

State in-house — Contractor for State
PRP in-house — Contractor for PRP
Federal Facility in-house — Contractor for Federal Facility
Other ______

2. O&M Cost Records

Readily available — Up to date
Funding mechanism/agreement in place
Original O&M cost estimate ______ Breakdown attached

Total annual cost by year for review period if available

From ______ (Date) To ______ (Date) ______ (Total cost) Breakdown attached
From ______ (Date) To ______ (Date) ______ (Total cost) Breakdown attached
From ______ (Date) To ______ (Date) ______ (Total cost) Breakdown attached
From ______ (Date) To ______ (Date) ______ (Total cost) Breakdown attached
From ______ (Date) To ______ (Date) ______ (Total cost) Breakdown attached

3. Unanticipated or Unusually High O&M Costs during Review Period

Describe costs and reasons: ______

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. Fencing damaged Location shown on site map Gates secured N/A
Remarks ______

B. Other Access Restrictions

1. Signs and other security measures Location shown on site map N/A
Remarks ______

C. Institutional Controls (ICs)

1. Implementation and enforcement

Site conditions imply ICs not properly implemented	Yes	No	N/A
Site conditions imply ICs not being fully enforced	Yes	No	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) DRIVE BY / WALK OVER
Frequency ______
Responsible party/agency ______
Contact ______ (Name) ______ (Title) ______ (Date) ______ (Phone #)

Reporting is up-to-date	Yes	No	N/A
Reports are verified by the lead agency	Yes	No	N/A
Specific requirements in deed or decision documents have been met	Yes	No	N/A
Violations have been reported	Yes	No	N/A

Other problems or suggestions: Report attached
______

V. ACCESS AND INSTITUTIONAL CONTROLS (continued)
C. Institutional Controls (ICs) (continued)
2. **Adequacy** ICs are adequate ICs are inadequate N/A Remarks
D. General 1. **Vandalism/trespassing** Location shown on site map No vandalism evident Remarks 2. **Land use changes on site** N/A Remarks 3. **Land use changes off site** N/A Remarks

VI. GENERAL SITE CONDITIONS
A. Roads Applicable N/A 1. **Roads damaged** Location shown on site map Roads adequate N/A Remarks **B. Other Site Conditions** Remarks

VII. LANDFILL COVERS Applicable N/A
A. Landfill Surface
1. **Settlement** (Low spots) Location shown on site map Settlement not evident Areal extent Depth Remarks 2. **Cracks** Location shown on site map Cracking not evident Lengths Widths Depths Remarks

VII. LANDFILL COVERS (continued)

A. Landfill Surface (continued)

3. Erosion — Location shown on site map — Erosion not evident
Areal extent______ Depth 8"-10"
Remarks Photo #'s 93-98

4. Holes — Location shown on site map — Holes not evident
Areal extent______ Depth______
Remarks Photo #'s 90-92 & 106-111

5. Vegetative Cover — Grass Cover properly established — No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks______

6. Alternative Cover (armored rock, concrete, etc.) — N/A
Remarks______

7. Bulges — Location shown on site map — Bulges not evident
Areal extent______ Height______
Remarks______

8. Wet Areas/Water Damage — Wet areas/water damage not evident

Wet areas	Location shown on site map	Areal extent______
Ponding	Location shown on site map	Areal extent______
Seeps	Location shown on site map	Areal extent______
Soft subgrade	Location shown on site map	Areal extent______

Remarks______

9. Slope Instability — Slides — Location shown on site map — No evidence of slope instability
Areal extent______
Remarks______

B. Benches — Applicable — N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench — Location shown on site map — N/A or okay
Remarks______

2. Bench Breached — Location shown on site map — N/A or okay
Remarks______

3. Bench Overtopped — Location shown on site map — N/A or okay
Remarks______

C. Letdown Channels — Applicable — N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement — Location shown on site map — No evidence of settlement
Areal extent______ Depth______
Remarks______

C. Letdown Channels (continued)

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____________ Depth____________
Remarks____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____________ Depth____________
Remarks____

5. **Obstructions** Type____________________ No obstructions
Location shown on site map Areal extent_____________
Size___________
Remarks____

6. **Excessive Vegetative Growth** Type____________________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____________
Remarks____

D. Cover Penetrations Applicable ~~N/A~~

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks MW NOT LOCKED

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks____

VII. LANDFILL COVERS (continued)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities
Flaring Thermal destruction Collection for reuse
Good condition Needs Maintenance
Remarks

2. Gas Collection Wells, Manifolds and Piping
Good condition Needs Maintenance
Remarks

3. Gas Monitoring Facilities (*e.g.*, gas monitoring of adjacent homes or buildings)
Good condition Needs Maintenance N/A
Remarks

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A
Remarks

2. Outlet Rock Inspected Functioning N/A
Remarks

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation Areal extent ________ Depth ________ N/A
Siltation not evident
Remarks

2. Erosion Areal extent ________ Depth ________
Erosion not evident
Remarks

3. Outlet Works Functioning N/A
Remarks

4. Dam Functioning N/A
Remarks

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident
Horizontal displacement ________ Vertical displacement ________
Rotational displacement ________
Remarks

2. Degradation Location shown on site map Degradation not evident
Remarks

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. Siltation Location shown on site map Siltation not evident
Areal extent ________ Depth ________
Remarks

VII. LANDFILL COVERS (continued)
I. Perimeter Ditches/Off-Site Discharge (continued)
2. Vegetative Growth Location shown on site map N/A Vegetation does not impede flow Areal extent______________ Type____________ Remarks____
3. Erosion Location shown on site map Erosion not evident Areal extent______________ Depth____________ Remarks____
4. Discharge Structure Functioning N/A Remarks____

VIII. VERTICAL BARRIER WALLS Applicable N/A
1. Settlement Location shown on site map Settlement not evident Areal extent______________ Depth____________ Remarks____
2. Performance Monitoring Type of monitoring M W SAMPLING Performance not monitored Frequency________________________ Evidence of breaching Head differential____________________ Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. Pumps, Wellhead Plumbing, and Electrical Good condition All required wells properly operating Needs Maintenance N/A Remarks____
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks____
3. Spare Parts and Equipment Readily available Good condition Requires upgrade Needs to be provided Remarks____
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable N/A
1. Collection Structures, Pumps, and Electrical Good condition Needs Maintenance Remarks____
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs Maintenance Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES (continued)

B. Surface Water Collection Structures, Pumps, and Pipelines (continued)

3. **Spare Parts and Equipment**
Readily available Good condition Requires upgrade Needs to be provided
Remarks____

C. Treatment System Applicable N/A

1. **Treatment Train** (Check components that apply)
Metals removal Oil/water separation Bioremediation
ir stripping Carbon adsorbers
Filters____
Additive (*e.g.*, chelation agent, flocculent)________________________
Others____
Good condition Needs Maintenance
Sampling ports properly marked and functional
Sampling/maintenance log displayed and up to date
Equipment properly identified
Quantity of groundwater treated annually____________________
Quantity of surface water treated annually____________________
Remarks____

2. **Electrical Enclosures and Panels** (properly rated and functional)
N/A Good condition Needs Maintenance
Remarks____

3. **Tanks, Vaults, Storage Vessels**
N/A Good condition Proper secondary containment Needs Maintenance
Remarks____

4. **Discharge Structure and Appurtenances**
N/A Good condition Needs Maintenance
Remarks____

5. **Treatment Building(s)**
N/A Good condition (esp. roof and doorways) Needs repair
Chemicals and equipment properly stored
Remarks____

6. **Monitoring Wells** (pump and treatment remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks____

D. Monitoring Data

1. Monitoring Data
Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:
Groundwater plume is effectively contained Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A
Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

THE REMEDY APPEARS TO BE EFFECTIVE AND FUNCTIONING AS DESIGNED

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.