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July 25, 2007

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

Subject: Submittal of Final 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 122E); Contract DACA87-02-D-0005, Delivery Order 26 Seneca Army Depot Activity; File No. 1017A

Dear Mr. Nohrstedt:

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit the Final Record of Decision (ROD) 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 122E located at the Seneca Army Depot Activity in Romulus, New York. Copies of this ROD are provided in both paper and electronic formats.

The work was performed in accordance with the Scope of Work (SOW) for Delivery Order 26 under Contract DACA87-02-D-0005.

Parsons appreciates the opportunity to provide the Army with this document. Should you have any questions, please do not hesitate to call me at (617) 449-1570 to discuss them.

Sincerely,

Jeffrey Adams
Project Manager

Enclosures

cc: Mr. S. Absolom, SEDA
Mr. R. Battaglia, CENAN
Mr. K. Hoddinott, USACHPPM (PROV)
Mr. C. Boes, USAEC

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July 25, 2007

Mr. Julio F. Vazquez, Project Manager
U.S. Environmental Protection Agency, Region II
Superfund Federal Facilities Section
290 Broadway, 18th Floor
New York, NY 10007-1866

Mr. Kuldeep K. Gupta, P.E.
NYSDEC
Division of Environmental Remediation
Remedial Bureau A, Section C
625 Broadway
Albany, NY 12233-7015

Mr. Mark Sergott
Bureau of Environmental Exposure Investigation
New York Department of Health
Flanigan Square, Room 300
547 River Street
Troy, NY 12180

Subject: **Submittal of Final 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 122E)**
Seneca Army Depot Activity; NYS ID#8-50-006; CERCLIS ID# NY0213820830

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

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit the Draft Final Record of Decision (ROD) 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 122E located at the Seneca Army Depot Activity in Romulus, New York. Copies of this ROD are provided in both paper and electronic formats.

Should you have any questions, please do not hesitate to call me at (617) 449-1570 to discuss them.

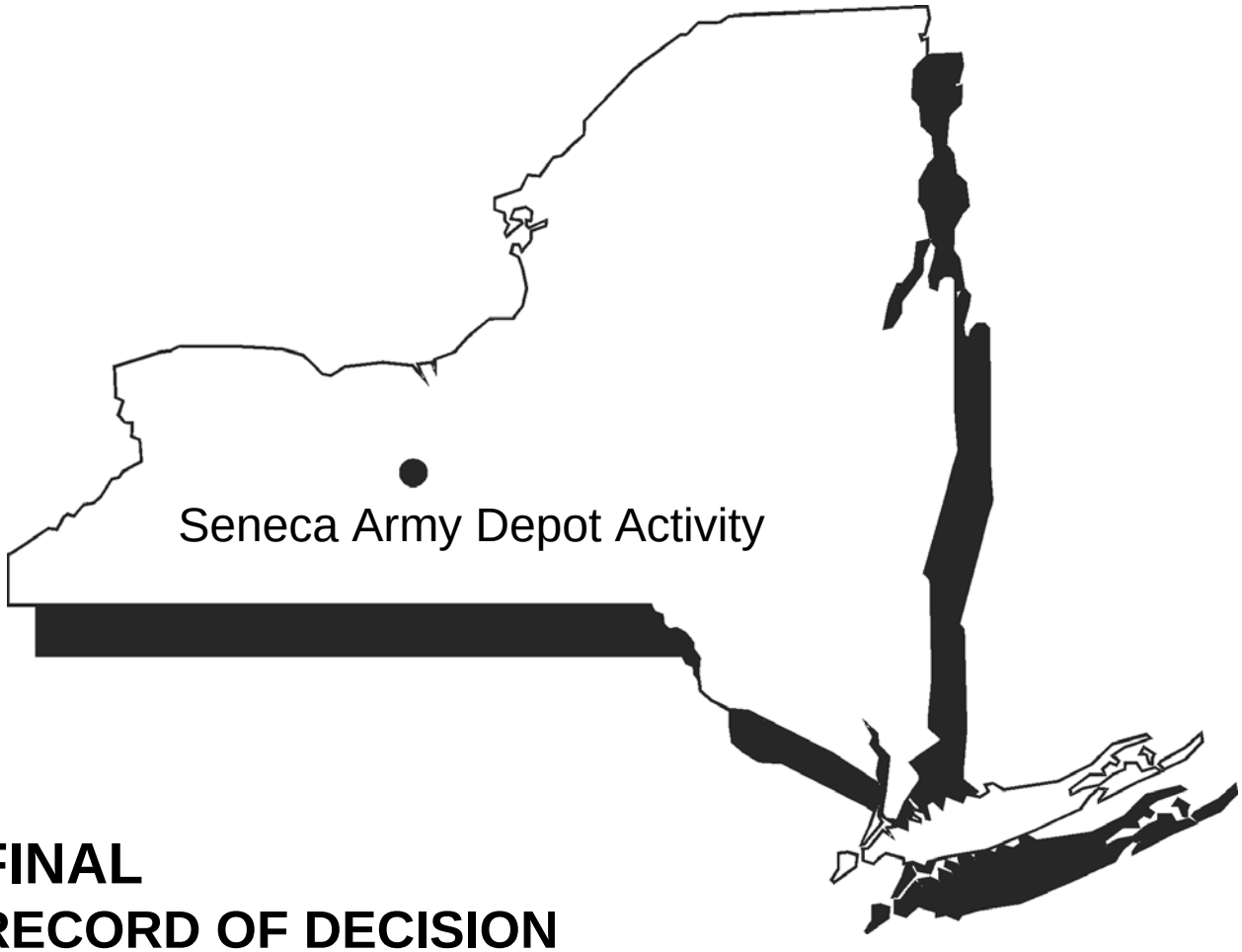
Sincerely,

Jeffrey Adams
Project Manager

Enclosures
cc: Mr. J. Nohrstedt, CEHNC
Mr. S. Absolom, SEDA
Mr. K. Hoddinott, USACHPPM (PROV)
Mr. C. Boes, USAEC
Mr. R. Battaglia, CENAN
Mr. M. Heaney, Techlaw

US Army, Engineering & Support Center
Huntsville, AL

Seneca Army Depot Activity
Romulus, NY



FINAL
RECORD OF DECISION

FOR SEVENTEEN SWMUs REQUIRING LAND USE CONTROLS (SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E)
SENECA ARMY DEPOT ACTIVITY (SEDA)

EPA Site ID# NY0213820830
NY Site ID# 8-50-006
CONTRACT NO. DACA87-02-D-0005
DELIVERY ORDER NO. 0026

PARSONS
March 2007

FINAL
RECORD OF DECISION
FOR
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)

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared for:

SENECA ARMY DEPOT ACTIVITY
5786 STATE ROUTE 96
ROMULUS, NEW YORK 14541

and

UNITED STATES ARMY CORPS OF ENGINEERS
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Prepared By:

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Contract Number: DACA87-02-D-0005
Delivery Orders: 0026
USEPA Site ID: NY0213820830; NY Site ID: 8-50-006 **March 2007**

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ACRONYMS AND ABBREVIATIONS

AOC(s)	Area(s) of Concern
AWQS	Ambient Water Quality Standard
bgs	below ground surface or below grade surface
BRAC	Base Realignment and Closure
BTEQ	Benzo(a)pyrene Toxicity Equivalents
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Protocol
COC	Contaminant of Concern
COPC	Chemicals of Potential Concern
cPAH	Carcinogenic polycyclic aromatic hydrocarbons
CTE	Central Tendency Exposure
cy	Cubic yard or cubic yard, as appropriate based on context
DoD	Department of Defense
ECL	Environmental Conservation Law
EPC	Exposure Point Concentration
EQ	Ecological Quotient
ESI	Expanded Site Investigation
FFA	Federal Facilities Agreement
ft.	foot or feet (dependent on context)
GA	NYSDEC groundwater classification for a source that is suitable for drinking water
GPR	Ground Penetrating Radar
HI(s)	Hazard Index (Indices)
IC(s)	Institutional Control(s)
in.	inch or inches (dependent of context)
IRFNA	Inhibited Red Fuming Nitric Acid
IRIS	Integrated Risk Information System
J	When used in conjunction with a concentration (e.g., 2 J µg/L or 2 J mg/Kg) it signifies that the concentration is an estimated value.

ACRONYMS AND ABBREVIATIONS
(Continued)

LRA	Seneca Army Depot Local Redevelopment Authority
LSP	Limited Sampling Program
LUC(s)	Land Use Control(s)
MCL	Maximum Contaminant Level
mg	milligrams
mg/L	milligrams per liter
mg/Kg	milligrams per kilogram
mL	milliliters
NCP	National Contingency Plan or National Oil and Hazardous Substances Pollution Contingency Plan
NTU	Nephelometric Turbidity Units
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OE	explosive ordnance
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PID	Planned Industrial/Office Development
ppb	part per billion or parts per billion, as appropriate based on context
ppm	part per million or parts per million, as appropriate based on context
QA	quality assurance
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RfD	Reference Dose
RI/FS	Remedial Investigation/Feasibility Study
RME	Reasonable Maximum Exposure
ROD	Record of Decision

ACRONYMS AND ABBREVIATIONS
(Continued)

SAR	Small Arms Range
SCIDA	Seneca County Industrial Development Agency
SEAD	Acronym for the Seneca Army Depot used to designate SWMU numbers
SEDA	Seneca Army Depot Activity
SF	Slope Factor
SI	Site Inspections or Supplemental Investigation
SPLP	Synthetic Precipitation Leaching Procedure
SOW	Statement of Work
SVOC(s)	Semivolatile Organic Compound(s)
SWMU	Solid Waste Management Unit
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCRA	Time Critical Removal Action
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
TSDF	Treatment, Storage, and Disposal Facility
µg/L	micrograms per liter
USEPA	U.S. Environmental Protection Agency
UXO	unexploded ordnance
VOC(s)	Volatile Organic Compound(s)

1.0 DECLARATION OF THE RECORD OF DECISION

Site Names and Location

Seneca Army Depot Activity
CERCLIS ID# NY0213820830
New York Site ID# 8-50-0006
Romulus, Seneca County, New York

This Record of Decision (ROD) formalizes and documents the U.S Army's (Army's) and U.S Environmental Protection Agency's (USEPA's) selected remedy for 17 historic solid waste management units (SWMUs) at the former Seneca Army Depot Activity (SEDA). Each of the Army's selected remedies for the 17 former SWMUs requires the definition and use of Land Use Controls (LUCs). The 17 former SWMUs discussed in this ROD include:

- SEAD-13, Inhibited Red-Fuming Nitric Acid (IRFNA) Disposal Site;
- SEAD-39, Building 121 Boiler Blowdown Leach Pit;
- SEAD-40, Building 319 Boiler Blowdown Leach Pit;
- SEAD-41, Building 718 Boiler Blowdown Leaching Pit;
- SEADs-43/56/69, Building 606 – Old Missile Propellant Test Laboratory/Herbicide and Pesticide Storage/Disposal Area;
- SEAD-44A, Quality Assurance Test Laboratory;
- SEAD-44B, Quality Assurance Test Laboratory;
- SEAD-52, Buildings 608 and 612 – Ammunition Breakdown Area;
- SEAD-62, Nicotine Sulfate Disposal Area near Buildings 606 and 612;
- SEAD-64B, Garbage Disposal Area;
- SEAD-64C, Garbage Disposal Area;
- SEAD-64D, Garbage Disposal Area;
- SEAD-67, Dump Site East of Sewage Treatment Plant No. 4;
- SEAD-122B, Small Arms Range, Airfield Parcel; and
- SEAD-122E, Plane Deicing Area.

These SWMUs are also referred to below as "Areas of Concern" or "AOCs" or individually as an "Area of Concern" or "AOC."

Statement of Basis and Purpose

This decision document presents the Army's and the USEPA's selected remedy for SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E (or the AOCs), located at the Seneca Army Depot Activity (SEDA or the Depot) in the Towns of Romulus and Varick, Seneca County, New York. The decisions were developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, 42 U.S.C. §9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP),

40 CFR Part 300. The Base Realignment and Closure (BRAC) Environmental Coordinator, the Chief, Alpha Branch, Army BRAC Division, and the USEPA Region 2 have been delegated the authority to approve this Record of Decision (ROD).

This ROD is based on the Administrative Record that has been developed by the Army in accordance with Section 113(k) of CERCLA. The Administrative Record is available for public review at the Seneca Army Depot Activity, 5786 State Route 96, Building 123, Romulus, NY 14541. The Administrative Record Index identifies each of the items considered during the selection of the remedial action. This index is included in **Appendix A**.

The New York State Department of Environmental Conservation (NYSDEC) has concurred with the selected remedy. The NYSDEC Declaration of Concurrence is provided in **Appendix B** of this ROD.

Site Assessment

The response action selected for each SWMU identified in this ROD is necessary to protect human health or the environment from actual or threatened releases of hazardous substances into the environment or from actual or threatened releases of pollutants or contaminants from these SWMUs, which may present an imminent and substantial endangerment to public health or welfare.

Description of the Selected Remedy

The selected remedy for each of the 17 AOCs discussed in this ROD is either No Action (NA) or No Further Action (NFA) combined with the establishment, maintenance, and monitoring of Land Use Controls (LUCs). AOCs where the selected remedy is NA with LUCs include:

- SEAD-13, Inhibited Red-Fuming Nitric Acid (IRFNA) Disposal Site;
- SEADs-43/56/69, Building 606 – Old Missile Propellant Test Laboratory/Herbicide and Pesticide Storage/Disposal Area;
- SEAD-44B, Quality Assurance Test Laboratory;
- SEAD-52, Buildings 608 and 612 – Ammunition Breakdown Area;
- SEAD-62, Nicotine Sulfate Disposal Area near Buildings 606 and 612;
- SEAD-64C, Garbage Disposal Area; and
- SEAD-122E, Plane Deicing Area.

AOCs where the Army's selected remedy is NFA with LUCs include:

- SEAD-39, Building 121 Boiler Blowdown Leach Pit;
- SEAD-40, Building 319 Boiler Blowdown Leach Pit;
- SEAD-41, Building 718 Boiler Blowdown Leaching Pit;
- SEAD-44A, Quality Assurance Test Laboratory;
- SEAD-64B, Garbage Disposal Area;
- SEAD-64D, Garbage Disposal Area;
- SEAD-67, Dump Site East of Sewage Treatment Plant No. 4; and,
- SEAD-122B, Small Arms Range, Airfield Parcel.

At 12 of the AOCs (i.e., SEADs 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64C, and 67), LUCs previously documented by the Army will be imposed, monitored, and maintained until the concentrations of hazardous substances remaining at the site allow for the unlimited exposure and unrestricted use. It is also recommended that other LUCs previously not documented be imposed at five AOCs (i.e., SEADs 13, 64B, 64C, 122B and 122E) that are subject of this ROD.

The Army has previously documented and imposed LUCs within three portions of the former Depot: in the southeastern corner of the Depot where the Five Points Correctional Facility ("Prison Area") currently is located; in the east central potion of the Depot where the Planned Industrial/Office Development (PID Area) and Warehousing Area is located; and, in the north-central portion (i.e., "North End Barracks" Area) of the Depot where the Hillside Children's Center is currently located. One or more of the 12 AOCs defined above (i.e., SEADs 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64C, and 67) are located within land covered by existing LUCs imposed on land within these three parcels of the former Depot. Within this ROD, the Army formalizes and documents its intention to impose the existing LUCs on the AOCs located within each of these parcels under CERCLA. Land within the "Prison Area" and the area currently occupied by the Hillside Children's Center have been transferred to the community [i.e., to the people of the State of New York and Seneca County Industrial Development Agency (SCIDA), respectively] under deeds that have been recorded by the Seneca County Clerk. Land within the PID and Warehousing Area of the Depot has not yet been transferred to the community, but LUCs including a residential activity use restriction and a groundwater use/access restriction have been identified and documented within the "Final Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Area, Seneca Army Depot Activity" (September 2004).

New LUCs are proposed for the remaining five AOCs (SEADs 13, 64B, 64D, 122B, and 122E) discussed within this ROD. The groundwater use/access restriction proposed for SEAD-13 and SEAD-64D, and the residential use/activity restriction proposed for SEAD-122E result from the Army's determination that potential risks to human health or the environment exist due to the presence of hazardous substances at the historic SWMUs. The Army further recommends that the residential use/activity restriction proposed for SEAD-122E is imposed throughout the area occupied by the former Sampson / Seneca Army Depot Airfield to facilitate its transfer to the SCIDA; this LUC would encompass the entire parcel known as the Airfield. The LUC proposed for implementation at SEAD-64B (no unauthorized excavation and maintenance of cover) results from historic requirements of New York State Solid Waste Management Regulations; this LUC will also be applied along with the groundwater access/use restriction at SEAD-64D.

The specific LUCs selected for each AOC are summarized in **Table 1-1** and described more completely as follows:

"Prison Area" Land Use Controls (SEADs 43/56/69, 44A, 44B, 52, 62, and 64C):

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[1], to convey land in the southeastern part of the former Depot (i.e., Prison Area, see **Figure 1-1**) 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"[2] and that "the property shall not be sold, leased, mortgaged, assigned or otherwise disposed of"[3] 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,"[4] 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."[5]

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.

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.

[1] 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.
[2] 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.
[3] Ibid.
[4] Ibid.
[5] Ibid.

"PID Area" Land Use Controls (SEADs 39, 40 and 67):

Residential Use and Groundwater Access/Use Restrictions

A ROD was previously signed by the Army and USEPA in 2004 for land within the Planned Industrial/Office Development (PID) and Warehousing Area (see **Figure 1-1**) 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 LUCs are documented in the "Final, Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Area, Seneca Army Depot Activity" (September 2004).

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 will now be applied to three AOCs discussed in this Record of Decision 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, USEPA, 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.

"North End Barracks" Area Land Use Controls (SEAD-41):

Existing Deed with Groundwater Notification

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 1-1**) 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 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." 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. It is recommended that the LUC documented in the existing deed for the "North End Barracks" parcel be continued until the concentrations of hazardous substances in groundwater have been reduced to levels that allow for unrestricted use.

Land Use Controls (SEADs 13, 64B, 64D, 122B and 122E):

Groundwater Use/Access Restriction (SEAD-13)

A groundwater use/access restriction is also proposed at the following site:

- SEAD-13: Inhibited Red-Fuming Nitric Acid (IRFNA) Disposal Site.

The proposed groundwater use/access restriction is intended to eliminate human contact with groundwater, thereby reducing risk to 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 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 will be 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 USEPA approval.

Residential Activities Restriction (SEAD-122B and SEAD-122E)

The development and use of property for residential housing, elementary or secondary schools, child care facilities, and playgrounds will be prohibited in the following two AOCs:

- SEAD-122B: Small Arms Range, Airfield Parcel
- SEAD-122E: Plane Deicing Area

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 USEPA, to substantiate its request that the identified location is suitable for unlimited exposure and unrestricted use.

The boundary of the Airfield Area is defined as the boundary of the Airfield Special Events, Institutional, and Training area highlighted on **Figure 1-1**.

Unauthorized Digging Restriction (SEAD-64B)

A LUC that prohibits unauthorized digging and excavations within the bounds of the SWMU will 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, and concentrations of hazardous substances allow for unlimited exposure and unrestricted use.

Unauthorized Digging and Groundwater Access/Use Restriction (SEAD-64D)

LUCs that restrict unauthorized excavation and access to and use of groundwater will be imposed for the:

- SEAD-64D: Garbage Disposal Area.

Results of the mini 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.

Land Use Control Performance Objectives

The land use control (LUC) performance objectives at these 17 SWMUs, which will be (or have been) incorporated into leases and/or deeds for the parcels of real property that comprise these AOCs, as appropriate, are as follows:

- Comply with the use limitations documented and imposed in the Deed used to transfer property containing SEADs 43/56/69, 44A, 44B, 52, 62 and 64C from the U.S. Government to the people of the State of New York for the construction of a correctional facility (See Seneca County Liber 612 Page 014 through 031);
- Prohibit access to or use of groundwater at SEADs 39, 40, 41, 64D, and 67 until concentrations of hazardous substances contained are reduced to levels that allow unrestricted use;
- Prohibit residential housing, elementary and secondary schools, childcare facilities, and playgrounds activities at SEADs 39, 40, 67, 122B, and 122E until levels of hazardous substances found at the former SWMUs allow for unlimited exposure and unrestricted use; and
- Prohibit unauthorized excavation at SEADs 64B and 64D.

The Army and USEPA's selected remedy for each AOC discussed in this ROD includes LUCs. To implement the Army's selected remedy at these AOCs (i.e., SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E), a LUC Remedial Design (RD) for each LUC combination identified (e.g., reversionary deed; groundwater use/access restriction only; groundwater use/access restriction and residential activities restriction; residential activities restriction only; digging restriction only; and digging and groundwater use/access restriction) will be prepared. The LUC RD Plan will include: a site description; land use restrictions; mechanism to ensure that the land use restrictions are not violated in the future; implementation and maintenance actions, including periodic inspections; and reporting/notification requirements. In addition, the Army will prepare an environmental easement for each AOC as needed, consistent with Section 27-1318(b) and Article 71, Title 36 of ECL, in favor of the State of New York and the Army, which will be recorded at the time of transfer of the AOCs from federal ownership. A schedule for completion of the draft LUC RD covering the individual AOCs will be completed within 21 days of the ROD signature, consistent with Section 14.4 of the Federal Facilities Agreement (FFA). In accordance with the FFA and CERCLA §121(c), the remedial action (including ICs) will be reviewed no less often than every 5 years. After such reviews, modifications may be implemented to the remedial program, if appropriate.

The Army shall implement, inspect, maintain, report, and enforce the ICs described in this ROD in accordance with the approved LUC RD. Although the Army may later transfer these responsibilities to another party by contract, property transfer agreement, or other means, the Army shall retain ultimate responsibility for remedy integrity.

State Concurrence

NYSDEC forwarded a letter of concurrence to the USEPA regarding the selection of a remedial action in the future. This letter of concurrence has been placed in **Appendix B**.

Declaration

CERCLA and the NCP require each selected remedy to be protective of human health, public welfare, and the environment; be cost-effective; comply with other statutory laws; and use permanent solutions, alternative treatment technologies, and resource recovery options to the maximum extent practicable. CERCLA and the NCP also state a preference for treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The selected remedies described above are consistent with CERCLA and the NCP and are protective of human health and the environment, comply with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, and are cost-effective. These remedies have been evaluated against toxicity, mobility, or volume of hazardous substances and pollutants or contaminants.

The remedies identified may result in hazardous substances and pollutants or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure for an indeterminate period. A review will be conducted within five years after initiation of the remedial action at each AOC to ensure that the remedy is, or will be, protective of human health and the environment, with consideration given to each AOC's continuing and planned future use.

The estimated cost for implementing the groundwater monitoring of the nitrate plume at SEAD-13, the Inhibited Red Fuming Nitric Acid Disposal Site, is $2,012,000 over a 20-year period. The estimated cost associated with implementing, monitoring, assessing and reporting on the continued suitability of the recommended actions at SEADs 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 122B, and 122E is $311,000 in aggregate. The total combined estimated cost of the recommended remedial actions for all sites included in this ROD is $2,323,000.

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the New York State Department of Environmental Conservation.

Concur and recommend for immediate implementation:

Stephen M Absolom 3/12/07

STEPHEN M. ABSOLOM
BRAC Environmental Coordinator

Date

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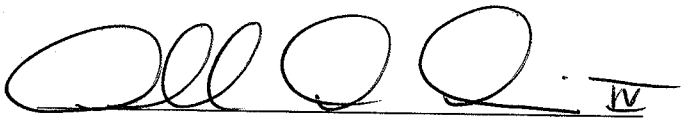
The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the New York State Department of Environmental Conservation.

Concur and recommend for immediate implementation:



1 MAY 07

ADDISON D. DAVIS, IV
Deputy Assistant Secretary of the Army
Environment, Safety and Occupational Health

Date

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The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the New York State Department of Environmental Conservation.

Concur and recommend for immediate implementation:

7/3/07

GEORGE PAVLOU
Director, Emergency and Remedial Response Division
U.S. Environmental Protection Agency, Region II

Date

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2.0 SITE NAME, LOCATION AND DESCRIPTION

SEDA previously occupied approximately 10,600 acres of land located in the Towns of Varick and Romulus in Seneca County, New York. The former military facility was owned by the U.S. Government and operated by the Army between 1941 and approximately 2000, when the SEDA military mission ceased. SEDA's historic military mission included receipt, storage, distribution, maintenance, and demilitarization of conventional ammunition, explosives and special weapons. In addition, administrative and plant operational facilities were also established in support of the Depot's mission. Waste management was integrated with the SEDA management mission. Management of waste materials produced from these operations has been completed in accordance with the requirements of the Resource Conservation and Recovery Act (RCRA). A location map for SEDA is provided as **Figure 2-1**. **Figure 2-1** also shows that SEDA is bordered by New York State Highway 96 to the east and New York State Highway 96A to the west. The center of the Town of Romulus lies to the north of the former Depot's main entrance off State Route 96, while Sampson State Park lies to the west and southwest of the Depot. Most of the remaining area surrounding the former Depot consists of sparsely populated farmland. **Figure 1-1** shows the location of the 17 SWMUs (SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B and 122E) that are discussed in this ROD, along with the current planned future land use for the areas of the former Depot.

2.1 SEAD-13: Inhibited Red-Fuming Nitric Acid (IRFNA) Disposal Site

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 2-2**). 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 feet (ft.) long, were oriented east to west, and marked by sparse vegetation, crushed shale and 1-inch (in.) 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, there was an area within SEAD-13-West that 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.

2.2 SEAD-39: Building 121 Boiler Blowdown Leach Pit

Building 121 is a boiler plant located in the administrative area (i.e., halfway along the eastern border) of the former SEDA. A Time Critical Removal Action (TCRA) was completed at SEAD-39 in August 2003, when a total of 34 tons of soil were excavated from the area to a depth of 1foot. 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.

SEAD-39 is the historic blowdown leaching area that was located exterior to, and immediately north of, Building 121 (**Figure 2-3**). 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.

2.3 SEAD-40: Building 319 Boiler Blowdown Leach Pit

SEAD-40 is a boiler plant located on 1st Street in the east-central portion of the Depot, as shown in **Figure 1-1**. A TCRA was completed at SEAD-40 in August 2003, and approximately 39 tons of soil were removed. The impacted soil was excavated in one section to a depth of 1 ft. below ground surface (bgs) and in another section to a depth of 6 ft. bgs. The excavated areas were backfilled and returned to their original grades. The excavation was limited in size by railroad tracks to the north and a parking lot to the south.

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 2-3**). 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.

2.4 SEAD-41: Building 718 Boiler Blowdown Leaching Pit

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 1-1**), on property currently occupied by the Hillside Children's Center (**Figure 2-4**). In 2000, a TCRA was conducted at SEAD-41, and approximately five cubic yards (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.

2.5 SEADs-43/56/69: Building 606 – Old Missile Propellant Test Laboratory/Herbicide and Pesticide Storage/Disposal Area

SEADs-43, 56, and 69 are located in the southeastern corner of the Depot (**Figure 1-1**) on property that is currently associated with the New York State Department of Correctional Services' Five Points Correctional Facility (see **Figure 2-5**). 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 2-5**.

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 "SWMU Classification Report, Final" (Parsons, 1994) 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 of 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.

2.6 SEAD-44A: Quality Assurance Test Laboratory

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 2-5**) 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.

2.7 SEAD-44B: Quality Assurance Test Laboratory

SEAD-44B runs along the west side of Brady Road and occupies an area that is approximately 350 ft. by 200 ft. (**Figure 2-5**) 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 (USACE, 1998) 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.

2.8 SEAD-52: Buildings 608 and 612 – Ammunition Breakdown Area

SEAD-52 is located in the southeastern portion of SEDA (**Figure 1-1**), on land currently occupied by the Five Points Correctional Facility (see **Figure 2-5**). 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.

2.9 SEAD-62: Nicotine Sulfate Disposal Area near Buildings 606 and 612

The Nicotine Sulfate Disposal Area (SEAD-62) is located in the southeastern portion of SEDA (**Figure 1-1** and **Figure 2-5**). 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 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.

2.10 SEAD-64B: Garbage Disposal Area

The Garbage Disposal Area at SEAD-64B is located immediately north of Ovid Road near Building 2086 in the southern end of SEDA (**Figure 1-1** and **Figure 2-5**). 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 truck loads 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 unit that is subject to regulation under the State of New York's Solid Waste Management Regulations (see 6 NYCRR Part 360). 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.

2.11 SEAD-64C: Garbage Disposal Area

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 1-1** and **Figure 2-5**). 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.

2.12 SEAD-64D: Garbage Disposal Area

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 (**Figures 1-1** and **2-5**). 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, 1994) 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 run-off from the SWMU.

SEAD-64D is a historic solid waste management unit subject to regulation under the State of New York's Solid Waste Management Regulations (see 6 NYCRR Part 360). 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.

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

The SEAD-67 site is located in the central eastern portion of SEDA (**Figures 1-1** and **2-3**), immediately south of West Romulus Road and east of Sewage Treatment Plant No. 4. A TCRA was performed by Weston between 2002 and 2004. Prior to the commencement of the TCRA, SEAD-67 was cleared of vegetation. Initially, the TCRA focused on the excavation and removal of approximately 250 cy of soil, which was located in five waste piles and two berms. Subsequently, the TCRA expanded to include the removal of surface soil underlying and surrounding the former piles and berms. Surface soils were excavated to a depth of 12 in. 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.

Prior to the removal action, the area was undeveloped and heavily vegetated with low brush and deciduous trees. Five waste soil piles and two berms were formerly staged at the SEAD-67 site. A grass-covered, 10-foot diameter waste soil pile and a 5-foot diameter waste soil pile were located approximately

50 ft. and 70 ft., respectively to the south of West Romulus Road. A 10-foot diameter waste soil pile and a 60-foot long brush-covered berm were located approximately 225 ft. south of the road. Continuing further south, a second, larger and irregularly-shaped berm was found. The second berm structure was located approximately 50 feet south of the first, smaller berm structure. The second berm measured approximately 110 feet in length, and was shaped roughly like a "Y" lying on its side. Two smaller waste soil piles 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.

The topography of this AOC slopes gently to the west to an unnamed stream, which is approximately 250 ft. away from the former waste piles and berm structures. 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 Kendig Creek.

2.14 SEAD-122B: Small Arms Range, Airfield Parcel

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 (**Figures 1-1** and **2-6**). 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.

2.15 SEAD-122E: Plane Deicing Area

SEAD-122E is associated with the deicing of planes at three separate aircraft refueling areas at the former SEDA Airfield (**Figures 1-1** and **2-6**). 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.

3.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

SEDA previously occupied approximately 10,600 acres of land located in the Towns of Varick and Romulus in Seneca County, New York. The former military facility was owned by the U.S. Government and operated by the Army between 1941 and approximately 2000, when the SEDA military mission ceased. SEDA's historic military mission included receipt, storage, distribution, maintenance, and demilitarization of conventional ammunition, explosives and special weapons. In addition, administrative and plant operational facilities were also established in support of the Depot's mission. Waste management was integrated with the SEDA management mission. Management of waste materials produced from these operations has been completed in accordance with the requirements of the Resource Conservation and Recovery Act (RCRA).

On July 14, 1989, the USEPA proposed SEDA for inclusion on the National Priorities List (NPL). The USEPA recommendation was approved and finalized on August 30, 1990, when SEDA was listed in Group 14 of the Federal Facilities portion of the NPL.

Once the Seneca Army Depot Activity was listed on the NPL, the Army, USEPA, and NYSDEC identified 57 SWMUs where historic data or information suggested, or evidence existed to support, that hazardous substances or hazardous wastes had been handled and may have been released into the environment. Each of these SWMUs was identified in the Federal Facilities Agreement (FFA) signed by the Army, USEPA, and NYSDEC in 1993. This list was subsequently expanded to include 72 SWMUs when the Army completed the "*SWMU Classification Report,*" Final (Parsons, 1994), which was required under the terms of the FFA. SEDA was a generator and Treatment, Storage and Disposal Facility (TSDF) and thus subject to regulation under RCRA. Under RCRA's permit system, corrective action is required at all SWMUs.

Remedial goals are the same for CERCLA and RCRA; thus when the 72 SWMUs were classified in the "*SWMU Classification Report,*" Final (Parsons, 1994), the Army recommended that they be listed either as No Action sites or Areas of Concern (AOCs). SWMUs listed as AOCs in the "*SWMU Classification Report,*" Final (Parsons, 1994) were then scheduled for further investigations based upon data and potential risks to the environment.

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, the "*Reuse Plan and Implementation Strategy for Seneca Army Depot*" (RKG Associates, 1996) was completed and adopted by the LRA on October 8, 1996. The Seneca County Board of Supervisors subsequently approved this "*Reuse Plan*" (RKG Associates, 1996) on October 22, 1996. With the SEDA's inclusion on the BRAC list, the Army's emphasis expanded from expediting necessary investigations and remedial actions at prioritized SWMUs to include the release of non-affected portions of the Depot to the surrounding community for their reuse for non-military purposes (i.e., industrial, municipal, and residential).

The designated reuse of land within the Depot was revised in 2005 by SCIDA and is reflected in **Figure 1-1**. 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. The future land uses for all other SWMUs discussed in this ROD have remained unchanged.

When the "*SWMU Classification Report,*" Final (Parsons, 1994) was issued, SEAD-13 was classified as a Moderate Priority AOC; SEADs-43/56/69, 44A, and 44B were classified as Moderately Low Priority AOCs; and SEADs-39, 40, 41, 52, 62, 64B, 64C, 64D, and 67 were classified as Low Priority AOCs. SEAD-122B and SEAD-122E were not included in the initial SWMU classification; however both SWMUs were evaluated as part of the "*Environmental Baseline Survey of Non-Evaluated Sites at the Seneca Army Depot Activity"* (Parsons, 1999).

Once all of the SWMUs were categorized, the Army implemented investigations at all SWMUs discussed in this ROD. Initially, limited Site Investigations (SIs) were conducted at some SWMUs, but when warranted based on the observations and findings of the SIs, Expanded Site Inspections (ESIs) were designed, implemented, and completed. Based on the results of investigations, TCRAs were conducted between 2000 and 2004 at SEADs 39, 40, 41, 44A, and 67, which consisted of the excavation and removal of impacted soil. A treatability study was completed at SEAD-122B in 2004, which resulted in the removal of lead impacted soil from the SAR.

SEAD-64B and SEAD-64D are 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 these units in the late 1970s. As historic solid waste landfills, both sites are 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.

The Army requested formal closure of both of these historic landfills from the NYSDEC in letters dated May 24, 2005 and August 14, 2006. Additionally, the Army notified the NYSDEC that the area designated as SEAD-64C had previously been misidentified as a historic landfill site, as no waste was ever identified during the Army's investigations. 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. In this letter, the NYSDEC also indicated that SEAD-64C is no longer considered a historic landfill and thus, not an area subject to the New York Solid Waste Regulations.

The Army has prepared this ROD for SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E under the CERCLA process required for these AOCs. Since the listing of SEDA on the NPL in 1990, the Army has worked to develop and prepare the information and data needed to support determinations relevant to what remedial action are needed at each of the identified SWMUs to

ensure that conditions there are protective of human health and the environment. These determinations comply with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practical, and are cost effective. Data and information developed and evaluated by the Army for these AOCs are summarized in this ROD and are delineated in detail in Completion Reports submitted for SEDA per requirements of the FFA listed in the Administrative Record provided as **Appendix A**. This ROD is submitted to fulfill the requirements of the FFA for the Seneca Army Depot Activity.

4.0 COMMUNITY PARTICIPATION

The Army relies on public input to ensure that community concerns are considered in selecting an effective remedy for each SWMU. To this end, the Completion Reports [e.g., Remedial Investigation/Feasibility Study (RI/FS) report, ESI report, Removal Action reports, etc.], the Proposed Plan and associated supporting documentation have been made available to the public for a public comment period, which began on June 9, 2006 and concluded on July 8, 2006. Copies of the Completion Reports, the Proposed Plan, the ROD, and supporting documentation are available at the following repository:

Seneca Army Depot Activity
Building 123
5786 State Route 96
Romulus, NY 14541
(607) 869-1309
Hours are Mon-Thurs 8:30 am to 4:30 pm

A public meeting was held during the public comment period at the Seneca County Office Building on June 20, 2006 at 7:00 p.m.. During the public meeting, the Army provided a presentation of the findings and conclusions of the site investigations and interim remedial actions performed. Further, the Army elaborated on its reasons for selecting the recommended remedial action for each of the AOCs listed. Finally, the public meeting provided the community the opportunity to ask questions and seek additional information. No comments were received during the public meeting or during the public comment period. In addition, coordination with Native American stakeholders concerning this ROD has been consistent with the programmatic agreements between the State Historic Preservation Office, recognized Native American Tribes, and the Advisory Council for Historic Preservation.

During the BRAC process, monthly presentations were given to the LRA regarding the progress of the sites included in this ROD, as well as other investigations related to the closure of SEDA. In addition, the SEDA Restoration Advisory Board (RAB) was established to facilitate the exchange of information between SEDA and the community. RAB members include the representatives from the Army, USEPA, NYSDEC, NYSDOH, and the community.

5.0 SCOPE AND ROLE

As with many facilities, the environmental issues at SEDA are complex. The preferred remedy for each of these AOCs is either No Action (NA) or No Further Action (NFA), coupled with specified land use controls (LUCs). This ROD documents the preferred remedy for the following 17 historic AOCs located within the former Depot:

- SEAD-13, Inhibited Red-Fuming Nitric Acid (IRFNA) Disposal Site – NA with LUCs;
- SEAD-39, Building 121 Boiler Blowdown Leach Pit – NFA with LUCs;
- SEAD-40, Building 319 Boiler Blowdown Leach Pit – NFA with LUCs;
- SEAD-41, Building 718 Boiler Blowdown Leaching Pit – NFA with LUCs;
- SEADs-43/56/69, Building 606 – Old Missile Propellant Test Laboratory/Herbicide and Pesticide Storage/Disposal Area – NA with LUCs;
- SEAD-44A, Quality Assurance Test Laboratory – NFA with LUCs;
- SEAD-44B, Quality Assurance Test Laboratory – NA with LUCs;
- SEAD-52, Buildings 608 and 612 – Ammunition Breakdown Area – NA with LUCs;
- SEAD-62, Nicotine Sulfate Disposal Area near Buildings 606 and 612 – NA with LUCs;
- SEAD-64B, Garbage Disposal Area – NFA with LUCs;
- SEAD-64C, Garbage Disposal Area – NA with LUCs;
- SEAD-64D, Garbage Disposal Area – NFA with LUCs;
- SEAD-67, Dump Site East of Sewage Treatment Plant No. 4 – NFA with LUCs;
- SEAD-122B, Small Arms Range, Airfield Parcel – NFA with LUCs; and
- SEAD-122E, Plane Deicing Area – NA with LUCs.

The specific LUCs that are recommended for establishment at the 17 AOCs are summarized below:

- Compliance with the existing property use limitations documented and imposed in deed containing a reversionary clause that was used to convey land in the southeastern part of the former Depot (i.e., Prison Area) to the people of the State of New York for the construction of the Five Points Correctional Facility at SEADs 43, 44A, 44B, 52, 56, 62, 64C, and 69;
- Prohibit access to and use of groundwater at SEADs 13, 39, 40, 41, 64D and 67 until groundwater standards are achieved;
- Prohibit the use of land at SEADs 39, 40, 67, 122B, and 122E for residential housing, elementary and secondary schools, childcare facilities and playgrounds activities; and
- Prohibit unauthorized excavation of the soil and vegetative cover placed over garbage disposal areas (i.e., historic solid waste landfills) at SEADs 64B and 64D.

The selected remedy for each AOC is intended to eliminate or mitigate all significant threats to public health or the environment.

Prior remedial actions have been completed at eight of the AOCs (i.e., interim removal actions at SEADs 39, 40, 41, 44A, 67 and 122B and the establishment of a soil and vegetative cover at SEADs 64B and

64D). The interim removal actions performed at SEADs 39, 40, 41, 44A, 67 and 122B were conducted to remove known sources of contamination that had been identified at these AOCs. The establishment of a soil and vegetative covering at the SEADs 64B and 64D landfills were required under New York's solid waste regulations to lessen or eliminate potential exposures to the interred wastes. Remedial actions were not performed at the other nine AOCs (SEADs 13, 43/56/69, 44B, 52, 62, 64C, and 122E) discussed in this ROD.

The LUCs selected for 12 of the AOCs are already in place, and have been documented in deeds used to transfer the Prison and the North End Barracks areas of the Depot and in a prior ROD that has been finalized for the PID Area. Part of the purpose of the present ROD is to formalize and document the Army's intention to impose the existing LUCs on the AOCs (Prison Area – SEADs 43/56/69, 44A, 44B, 52, 62, and 64C; North End Barracks Area – SEAD-41; and, PID Area – SEADs 39, 40, and 67) located within each of these parcels under CERCLA.

The LUCs prohibiting the unauthorized excavation of the soil at SEADs 64B and 64D are also already in place. These LUCs result from solid waste landfill closure requirements established in the State of New York Solid Waste Management Regulations (6 NYCRR Part 360). In compliance with the regulations, the Army installed the necessary soil covering at the time the landfills stopped receiving wastes in the late 1970s and have allowed the cover to become vegetated. The soil and vegetative covering remain in place at both AOCs. The LUCs on SEADs 64B and 64D are being formalized and documented pursuant to CERCLA by means of this ROD.

The groundwater use/access restriction identified for SEAD-13 and SEAD-64D, and the residential activities restriction defined for SEAD-122B and SEAD-122B are not yet in place, but are being formalized and documented pursuant to the requirements of CERCLA by means of this ROD.

The Army maintains ownership and control of the land within the PID Area (including SEADs 39, 40, and 67), in the Airfield Area (including SEADs 122B and 122E), and at SEAD-13, SEAD-64B and SEAD-64D. At some future date, one or all of these parcels may be leased by or transferred to other parties for reuse and reoccupation. At such time, the Army will notify the new owners/users/occupants in writing of the land use restrictions that are in place.

The Army shall implement, inspect, maintain, report, and enforce the LUCs described in this ROD in accordance with the approved LUC Remedial Design. Although the Army may later transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain ultimate responsibility for remedy integrity.

The selected remedies and LUCs are described in greater detail in **Section 8**.

6.0 SITE CHARACTERISTICS

This section provides a summary of site investigations that have been conducted at SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E. Risk assessment summaries pertinent to specific SWMUs are presented separately in **Section 7** of this ROD.

6.1 SEAD 13: Inhibited Red-Fuming Nitric Acid (IRFNA) Disposal Site

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, 2004a). A brief summary of the site investigations performed is presented below.

Surface / Subsurface Soils

Five soil borings were advanced within each of the two reported disposal areas (East and West) for a total of ten borings. Three samples were collected from each boring (one surface soil sample and two subsurface samples). Samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, cyanide, explosives, herbicides, nitrates, and fluoride.

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 Technical Administrative Guidance Memorandum (TAGM) #4046 cleanup objective level values in one sample. Analytical results for the surface and subsurface samples are summarized in **Tables 6-1** and **6-2**, respectively.

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, and twelve metals exceeded their respective TAGM values in subsurface soils, as listed in **Tables 6-1** and **6-2**, respectively.

Groundwater

Four new monitoring wells were installed in 2001 to further delineate possible groundwater contamination at SEAD-13 and to replace two wells that were consistently found to be dry during the ESI. Groundwater sampling, using a low-flow sampling technique, was performed in both 2001 and 2002, and the samples were analyzed for SVOCs, metals, cyanide, and nitrate/nitrite-nitrogen.

During the previous groundwater investigation conducted as part of the ESI in 1993 and 1994, seven monitoring wells were installed at SEAD-13: four on the east side of the Duck Pond, and three on the west side of the pond. The three wells installed on the west side were positioned to investigate rumors of a disposal area, which had not previously been identified in the geophysical investigation. The wells on the east side were installed to assess the possible groundwater contamination associated with the six or seven identified pits. Groundwater samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, metals, cyanide, herbicides, nitrate/nitrite-nitrogen, and fluoride.

During the 2001 and 2002 sampling rounds, five SVOCs 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 this AOC conditions.

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 **Table 6-3** 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, 2004a).

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 is 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. A summary of surface water and sediment results are presented in **Tables 6-4** and **6-5**, respectively.

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[6]. 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 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. The sediment results are presented in **Table 6-5**.

[6] The use of terminology J mg/L, J µg/L, J mg/Kg, etc. after a numeric value indicates that the referenced number is an estimate of the concentration of the analyte that was present in the sample at the time it was analyzed. The actual concentration contained in the sample could be higher, lower, or identical, but fully conclusive information was not obtained from the analysis of the sample.

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/nitrate-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.

6.2 SEAD 39: Building 121 Boiler Blowdown Leach Pit

Site work performed at SEAD-39 included a LSP and a TCRA, which included confirmatory sampling. The results of the investigations are summarized and presented below.

Time Critical Removal Action - 2003

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, polycyclic aromatic hydrocarbons (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 carcinogenic PAHs (cPAHs), were also identified in one or more of the confirmatory samples. Each of the carcinogenic PAH 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) 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 USEPA 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 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 **Table 6-6**. Complete analytical results for the samples collected can be found in "VOC Sites – SEADs 39 and 40 Time-Critical Removal Action" (Weston, 2004a). 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, 2002a).

6.3 SEAD-40: Building 319 Boiler Blowdown Leach Pit

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.

Time Critical Removal Action – 2003

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 (**Table 6-7**). 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 BTE 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 **Table 6-7**. Analytical results for the samples collected are reported in "VOC Sites – SEADs 39 and 40 Time-Critical Removal Action" (Weston, 2004a). 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, 2002a).

6.4 SEAD-41: Building 718 Boiler Blowdown Leaching Pit

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.

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 USEPA Method SW-846 8021 and SVOCs by USEPA Method SW-846 8270 to confirm that site cleanup goals were achieved, and the area was refilled with clean fill. **Table 6-8** 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.

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 USEPA 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.

6.5 SEADs-43, 56, and 69: Building 606 – Old Missile Propellant Test Laboratory / Herbicide and Pesticide Storage/Disposal Area

A summary of the subsurface soil, groundwater, surface water, and sediment results can be found in **Tables 6-9** through **6-12**. Complete analytical results for the samples collected can be found in "The Completion Report for Six Areas of Concern – SEADs (43, 56, 69), 44A, 44B, 52, 62 and 120B, Final" (Parsons, 2001a).

Supporting Investigations and Analysis

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**.

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. 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**. 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 maximum contaminant level (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 SEADs-43, 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 Ambient Water Quality Standards (AWQS) for Class C surface water standard of 0.6 µg/L (**Table 6-11**).

A total of 17 metals were detected in the surface water samples collected at SEADs-43, 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 SEADs-43, 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.

Sediment

Five sediment samples were collected as part of the investigation at SEADs-43, 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**). 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 USEPA 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.

6.6 SEAD-44A: Quality Assurance Test Laboratory

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.

Time Critical Removal Action – 2000/2002

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*)*.

Limited Sampling Program – 1993/1994

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 USEPA Method 8330, and nitrates by Method 353.2. Complete analytical results for the samples collected 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).

Surface/Subsurface Soil

The analytical results for the 15 soil samples collected as part of the SEAD-44A investigation are presented in **Table 6-13**. 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 at concentrations greater than two times their TAGM values. Antimony and magnesium were detected at concentrations three times greater than their TAGM value.

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.

Groundwater

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**.

Surface Water / Sediments

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**.

Two SVOCs were detected in the sediment at concentrations below their NYSDEC sediment criteria (**Table 6-16**). 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.

6.7 SEAD-44B: Quality Assurance Test Laboratory

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 in. 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 USEPA Method 353.2.

A summary of the surface soil, groundwater, surface water, and sediment are presented in **Tables 6-17** to **6-20**, 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, 2002b).

Surface/Subsurface Soil

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.

6.8 SEAD-52: Buildings 608 and 612 – Ammunition Breakdown Area

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, 2002b).

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 USEPA Method 8330.

Results of the soil samples are summarized in **Table 6-21**. 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.

6.9 SEAD-62: Nicotine Sulfate Disposal Area near Buildings 606 and 612

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, 2002b).

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 USEPA Method 8150. Summaries of the soil and groundwater results are presented in **Table 6-22** and **6-23**, 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 (**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 (**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.

6.10 SEAD-64B: Garbage Disposal Area

The field investigation at SEAD-64B included an ESI performed in 1994. Complete analytical results from the 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, 2002b).

Soil

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**. 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**.

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**.

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**.

6.11 SEAD-64C: Garbage Disposal Area

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, 2002b).

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. Summaries of the soil and groundwater results are presented in **Table 6-28 and 6-29**, respectively.

Soil

Ten soil samples were collected at SEAD-64C, and a summary of the analytical results are presented in **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 **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.

6.12 SEAD-64D: Garbage Disposal Area

The field investigation at SEAD-64D included an ESI that was performed in 1994. Complete analytical results 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, 2002b).

During the ESI conducted in 1994, 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. Summaries of the soil and groundwater results are presented in **Table 6-30** and **6-31**, respectively.

Soil

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.

Groundwater

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**. 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.

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

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.

Time Critical Removal Action – 2002/2004

A TCRA was performed at SEAD-67 beginning in November 2002, with some field work continuing until May 2004. The TCRA initially called for the excavation of approximately 250 cy of soil that was found in aboveground soil piles and berms identified at this AOC. Subsequent to the completion of the removal of the piles and berms, confirmatory soil samples were collected and analyzed for metals and PAHs. Based on the results of the confirmatory sampling and analysis, additional soil was excavated from areas beneath and immediately adjacent to the soil piles and berms in June of 2003. During this follow-up work, SEAD-67 was subdivided into two subareas, including Area 1 where piles 1 and 2 had once been located, and Area 2 which surrounded and underlay soil piles and berms designated as 3 through 7. And additional 234 cy of soil removed was removed from Area 1, while another 825 cy of soil was excavated from Area 2 (piles 3 through 7). Approximately 1,308 cy of soil was removed from SEAD-67 as a result of the removal action.

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 summarized in **Table 6-32** for Excavation Area 1 and **Table 6-33** for Excavation Area 2; these results were originally 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, a crew remobilized to SEAD-67 to remove an additional foot of soil from Area 1. The amount of soil removed was determined following the collection and analysis of a series of split spoon soil samples collected 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 from each foot. 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 USEPA and NYSDEC, the Army returned to SEAD-67 to collect final confirmatory samples from the perimeter and base of the excavations completed. 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). Based on these data, the Army believes that the potential threat to human health and the environment posed by formerly impacted soils has been eliminated.

Excavation Area 2

The five waste piles located at Area 2 were removed in December 2002, and confirmatory samples were subsequently collected from locations that would have been directly beneath each of the excavated piles. The initial samples exhibited concentrations of mercury (the constituent of concern) 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 this AOC and advanced and sampled eight soil borings that were terminated at a final depth of 4 ft. bgs. Soil samples were recovered from each 1 foot interval, and eventually 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. Based on these data, an excavation measuring 135 ft. by 165 ft. by 1 foot

in depth was performed in Area 2 at SEAD-67. The extent of the completed excavation fully surrounded the footprints of the five soil piles and berms that had previously been found in this AOC.

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). Based on these data, it is believed that the potential threat to human health and the environment posed by formerly impacted soils has been eliminated.

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 the following constituents: VOCs, SVOCs, pesticides/ PCBs, metals, and cyanide. A summary of the soil, groundwater, surface water, and sediment results presented below can be found in **Tables 6-34** through **6-37**. 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

Available results indicated that soil 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 were detected at concentrations that exceeded their respective TAGM cleanup objective values, as shown in **Table 6-34**. Five carcinogenic PAHs and five metals (calcium, lead, manganese, mercury, and potassium) exceeded their respective TAGM values. 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, shown in **Table 6-35**. 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, as shown in **Table 6-36**.

Sediment near SEAD-67 has been impacted by SVOCs (mostly PAHs), pesticides, and a few metals (copper, manganese, nickel, and silver), summarized in **Table 6-37**.

The results of the ESI served as the basis for conducting the TCRA at SEAD-67.

6.14 SEAD-122B: Small Arms Range, Airfield Parcel

The investigative work at the SAR included an EBS in 1998, an initial site investigation in 2002, and a treatability study in 2004.

Treatability Study – 2004

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**; 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, 2004b).

Initial Site Investigation – 2002

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**.

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, 2004b).

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 contaminant of concern (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**.

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 for the small arms fire. The samples were analyzed for TAL metals. A summary of the EBS soil samples is presented in **Table 6-41**.

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.

6.15 SEAD-122E: Plane Deicing Area

The investigative work at SEAD-122E included an EBS that was performed in 1998 and 1999. The Final EBS Report was issued to USEPA and NYSDEC in May 1999 (Parsons, May 1999).

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**, respectively.

Twenty SVOCs, comprised mainly of PAHs and phthalates, were found in the six soil samples collected from the three soil borings (**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 (**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.

7.0 SUMMARY OF SITE RISKS

Risk assessments were performed for several of the AOCs to evaluate the potential risks that residual levels of chemical posed to human health or the environment. At many of the SWMUs (SEADs 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 122E), a mini risk assessment was conducted to estimate the risks associated with current and future uses of these AOCs. A mini 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 mini 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 exposure point concentrations (EPCs) for the area evaluated under the mini risk approach. The mini-risk assessment approach was used for SWMUs 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 USEPA's acceptable range.

More traditional EPCs were used for the computation of risks at SEADs 13, 39, 40 and 67 where the 95th UCL of the mean was used for each chemical assessed. More traditional risk assessments were used for AOCs that had sufficient data points to allow computation of the 95th UCL, per USEPA guidelines, and where individual maximum values overstated the probable risk that was present at the location.

A risk assessment were 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 USEPA's guidance value for residential soils.

Human Health Risk Assessment

The reasonable maximum human exposure was evaluated. The human health risk assessment methodology is shown in **Figure 7-1**. A four-step process was used for assessing AOC-related human health risks for a reasonable maximum exposure scenario:

- *Hazard Identification*--identified the contaminants of concern based on several factors such as toxicity, frequency of occurrence, and concentration. Key steps performed in this part of the human health risk assessment are identified in the Data Collection and Evaluation Box displayed in **Figure 7-1**.
- *Exposure Assessment*--estimated the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed. The exposure assessment methodology is shown in **Figure 7-2.**
- *Toxicity Assessment*--determined the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response).
- *Risk Characterization*--summarized and combined the outputs of the exposure and toxicity assessments to provide a quantitative assessment of AOC-related risks (for example, one-in-a-million excess cancer risk).

The receptors used in the risk assessment depended on the intended future use at that time the risk assessment was completed. SCIDA revised the future land use for property within the SEDA in 2005, as shown in **Figure 1-1**, and the new future land uses for three AOCs that were in the Conservation/Recreation area (SEADs 13, 64B, and 64D) are currently designated as a Residential/Resort for SEAD-13 and as a Training Area for SEADs 64B and 64D. The future uses for all other AOCs evaluated in a mini risk assessment have not changed.

The receptors and exposure assumptions used under a Conservation/Recreation land use scenario are considered more conservative (i.e., risks likely to be higher) than the receptors and exposure assumptions that would be evaluated under a Training Area scenario. For instance, under a Training Area scenario, potential receptors may include child trespassers, adult trainees, adult trainers, and construction workers. The receptors for the Conservation/Recreation scenario included a recreational child visitor, a park worker, and a construction worker. The Conservation/Recreation scenario receptors can generally be used as surrogate receptors for the Training Area scenario receptors (i.e., a recreational child visitor receptor can be used as a surrogate receptor for a child trespasser; a park worker can be used as surrogate receptor for a trainer or trainee; the construction workers are equivalent). In each case, the ingestion rate and exposure duration of the Conservation/Recreation scenario surrogate receptor are greater than or equivalent to the anticipated Training scenario receptor.

At SEAD-13, in addition to evaluating receptors under a Conservation/Recreation scenario, risks to residential receptors were also evaluated. The residential receptors (resident adult and resident child) serve as the most conservative receptors that would be considered under a Residential/Resort scenario.

The potentially-exposed populations that were evaluated for the following future use scenario are as follows:

Conservation/Recreation Area (SEADs 13, 64B, and 64D):

1. Park worker;
2. Recreational visitor (child); and
3. Construction worker.

Institutional/Industrial Area (SEADs 39, 40, 67 and 122E):

1. Industrial worker;
2. Future on-site construction worker;
3. Future worker at on-site day care center; and
4. Future child at on-site day care center.

Institutional Area (SEAD 41 and 67):

1. Construction worker;
2. Adult resident;
3. Child resident; and
4. Lifetime resident (carcinogenic risk only).

Prison Area (SEADs 43, 56, 69, 44A, 44B, 52, 62, and 64C):

1. Prison inmate;
2. Prison worker;
3. Construction worker;
4. Day care center child; and
5. Day care center worker.

The mini risk assessments addressed the potential risks to human health by identifying several potential exposure pathways by which the public may be exposed to contaminant releases at the AOC under current and future land use scenarios. The exposure pathways considered for the Conservation/Recreation scenario, the Industrial Area/Airfield scenario, the Institutional scenario, and the Prison scenario are presented in **Figures 7-3**, **7-4**, **7-5**, and **7-6**, respectively. The exposure pathways presented reflect the projected future use of the each area at the time the risk assessment was completed. The following exposure pathways were considered:

1. Inhalation of particulate matter in ambient air (all future receptors);
2. Ingestion and dermal contact to on-site surface soils (all future receptors);
3. Ingestion and dermal contact to on-site surface and subsurface soils (construction worker); and
4. Ingestion of groundwater (daily) (all receptors except the construction worker).

Under current USEPA guidelines, the likelihood of carcinogenic and non-carcinogenic effects due to exposure to chemicals related to an AOC is considered separately. Non-carcinogenic risks were assessed by the calculation of a Hazard Index (HI), which is an expression of the chronic daily intake of a chemical divided by its safe or Reference Dose (RfD). An HI that exceeds 1.0 indicates the potential for non-carcinogenic effects to occur. Carcinogenic risks were evaluated using a cancer Slope Factor (SF), which is a measure of the cancer-causing potential of a chemical. Slope Factors are multiplied by daily intake estimates to generate an upper-bound estimate of excess lifetime cancer risk. For known or suspected carcinogens, USEPA has established an acceptable cancer risk range of 10^{-4} to 10^{-6} (one-in-ten thousand to one-in-one million).

Ecological Risk Assessment

The reasonable maximum environmental exposure was also evaluated. A four-step process was used for assessing site-related ecological risks for a reasonable maximum exposure scenario:

- *Characterization of the Unit and the Ecological Communities it May Affect*—Includes ecological conditions observed at the unit, site habitat characterization, wildlife resources that are present in the area, and ecological resource values to wildlife and to humans.
- *Exposure Assessment*—Discusses chemicals of potential concern (COPC), exposure point concentrations, and presents exposure assessments. Chemical distribution of COPCs, and their uptake through various pathways are also discussed in this section. Daily intakes of COPCs through environmental media are quantified as well;

- *Toxicity Assessment*—Assesses ecological effects that may result from receptor exposure to COPCs. Evaluates potential toxicity of each COPC in each medium and defines toxicity benchmark values that will be used to calculate the ecological quotient (EQ); and
- *Risk Characterization*—Integrates the results of the preceding elements of the assessment. It estimates risk with respect to the assessment endpoints, based on the predicted exposure to and toxicity of each COPC.

Ecological risk was then presented in terms of an EQ, which is derived from the results of the exposure quantification and the toxicity assessment for each COPC. EQs are based on relevant measurement endpoints and are indicative of the potential for each chemical to pose an ecological risk to receptors. In general, guidelines suggest that EQs less than or equal to 1 present no probable risk. EQs between 1 and 10 present a small potential for environmental effects; EQs between 10 and 100 present a significant potential that effects could result from greater exposure; and EQs greater than 100 indicate the highest potential for expected effects.

7.1 SEAD 13: Inhibited Red-Fuming Nitric Acid Disposal Site

Data from the AOC investigations served as the basis of a mini risk assessment that was performed to assess potential risks. As stated above, the human health risk assessment was revised in accordance with recent USEPA guidance. As a result, 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 mini risk assessment (**Table 7-1**) indicated that risks to all recreational and residential receptors were below the USEPA 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 USEPA 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), 2×10^{-4}, is greater than the USEPA acceptable limit of 1×10^{-4}; and the cancer risk for resident (child), 1×10^{-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.

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

7.2 SEAD 39: Building 121 Boiler Blowdown Leach Pit

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 it is

possible that 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 stormwater 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 reasonable maximum exposure (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 (**Table 7-2**) indicate that HIs (non-carcinogenic risks) to all industrial receptors were below the USEPA acceptable limits (i.e., HI of 1 or less). The cancer risk for the industrial worker, construction worker, and adolescent trespasser were each in USEPA's targeted cancer risk range of $10^{-4} – 10^{-6}$ or less, while the cancer risk determined for the daycare center child was 1×10^{-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 95% 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, 95% UCL of 16 point data set, central tendency exposure) are presented in **Table 7-3**. The results of this evaluation again indicate that HIs for all industrial receptors were below the USEPA 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 USEPA'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 4×10^{-4}.

7.3 SEAD-40: Building 319 Boiler Blowdown Leach Pit

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 USEPA guidelines, evaluated industrial receptors and used the 95% UCL of the mean as the EPC for each of the COCs.

The results of the mini risk assessment (**Table 7-4**) indicated that risks to all residential receptors were below the USEPA acceptable limits (i.e., HI of 1 or less and a cancer risk in the range of $10^{-4} – 10^{-6}$ or less).

7.4 SEAD-41: Building 718 Boiler Blowdown Leaching Pit

The mini 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** 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 USEPA 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.

7.5 SEAD-43, 56, and 69: Building 606 – Old Missile Propellant Test Laboratory/Herbicide and Pesticide Storage/Disposal Area

The mini 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 to be used and maintained for a correctional facility in perpetuity. **Table 7-6** 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, 2002b). The total cancer risk from all exposure routes is within or below the USEPA target range for all five receptors. Likewise, the total non-cancer HI from all exposure routes is less than 1 for all five receptors.

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

7.6 SEAD-44A: Quality Assurance Test Laboratory

The risk assessment completed for SEAD-44A indicated that total cancer risks below or within the USEPA 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** and in the "Decision Document – Mini Risk Assessment" (Parsons, 2002b).

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

7.7 SEAD-44B: Quality Assurance Test Laboratory

The mini 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** 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, 2002b). The total cancer risk from all exposure routes is within or below the USEPA target range for all five receptors. Likewise, the total non-cancer HI from all exposure routes is less than 1 for all five receptors.

7.8 SEAD-52: Buildings 608 and 612 – Ammunition Breakdown Area

The mini 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 USEPA acceptable limits for all five receptors. In addition, the total non-cancer HI from all exposure routes was less than 1, the USEPA acceptable limit for non-cancer risks, for all five receptors. A summary of the risk assessment results is presented in **Table 7-9**, and a full discussion is presented in the "Decision Document – Mini Risk Assessment" (Parsons, 2002b).

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

7.9 SEAD-62: Nicotine Sulfate Disposal Area near Buildings 606 and 612

The mini 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 USEPA 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**, and a full discussion is presented in the "Decision Document – Mini Risk Assessment" (Parsons, 2002b).

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

7.10 SEAD-64B: Garbage Disposal Area

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 mini risk assessment. The total cancer risk from all exposure routes were below the USEPA 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**, and a full discussion is included in the "Decision Document – Mini Risk Assessment" (Parsons, 2002b).

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

7.11 SEAD-64C: Garbage Disposal Area

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 mini 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 USEPA 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**, and a full discussion is included in the "Decision Document – Mini Risk Assessment" (Parsons, 2002b).

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

7.12 SEAD-64D: Garbage Disposal Area

Table 7-13 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 mini risk assessment conducted at SEAD-64D in 2001 and 2002. The total cancer risk from all exposure routes was below the USEPA 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, 2002b).

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

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

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 USEPA 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 95% UCL of the mean as the EPC for each of the SVOC COCs.

The results of the risk assessment (**Table 7-14**) indicated that risks to all industrial and residential receptors were below or within the USEPA's acceptable limits (i.e., HI of 1 or less and a cancer risk in the range of 10^{-4} – 10^{-6} or less).

7.14 SEAD-122B: Small Arms Range, Airfield Parcel

No risk assessment was performed since a treatability study and a removal action was completed at this AOC.

7.15 SEAD-122E: Plane Deicing Area

In response to a request by USEPA, the Army presented the results of a mini 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 USEPA 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**.

For comparison purposes, risk to residential receptors was evaluated. The non-cancer His were less than 1. Cancer risk values were above USEPA acceptable limits due to the presence of cPAHs in the soil.

8.0 SELECTED REMEDY

The Army's selected remedy for each of the 17 AOCs discussed in this ROD is either No Action (NA) or No Further Action (NFA) combined with the establishment, maintenance and monitoring of land use controls (LUCs). AOCs where the Army's selected remedy is NA with LUCs include:

- SEAD-13, Inhibited Red-Fuming Nitric Acid (IRFNA) Disposal Site;
- SEADs-43/56/69, Building 606 – Old Missile Propellant Test Laboratory/Herbicide and Pesticide Storage/Disposal Area;
- SEAD-44B, Quality Assurance Test Laboratory;
- SEAD-52, Buildings 608 and 612 – Ammunition Breakdown Area;
- SEAD-62, Nicotine Sulfate Disposal Area near Buildings 606 and 612;
- SEAD-64C, Garbage Disposal Area; and
- SEAD-122E, Plane Deicing Area.

AOCs where the Army's selected remedy is NFA with LUCs include:

- SEAD-39, Building 121 Boiler Blowdown Leach Pit;
- SEAD-40, Building 319 Boiler Blowdown Leach Pit;
- SEAD-41, Building 718 Boiler Blowdown Leaching Pit;
- SEAD-44A, Quality Assurance Test Laboratory;
- SEAD-64B, Garbage Disposal Area;
- SEAD-64D, Garbage Disposal Area;
- SEAD-67, Dump Site East of Sewage Treatment Plant No. 4; and,
- SEAD-122B, Small Arms Range, Airfield Parcel.

At 12 of the AOCs (i.e., SEADs 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64C, and 67), LUCs previously documented by the Army will be imposed, monitored, and maintained until the concentrations of hazardous substances remaining at each of these AOCs allow for the unlimited exposure and unrestricted use. The Army is also recommending that other LUCs previously not documented be imposed at five AOCs (i.e., SEADs 13, 64B, 64C, 122B and 122E) that are subject of this ROD.

The Army has previously documented and imposed LUCs within three portions of the former Depot: in the southeastern corner of the Depot where the Five Points Correctional Facility ("Prison Area") currently is located; in the east-central portion of the Depot where the Planned Industrial/Office Development (PID Area) and Warehousing Area is located; and, in the north-central portion (i.e., "North End Barracks" Area) of the Depot where the Hillside Children's Center is currently located. One or more of the 12 AOCs defined above (i.e., SEADs 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64C, and 67) are located within land covered by an existing LUCs imposed on land within these three parcels of the former Depot. This ROD formalizes and documents the imposition of the existing LUCs on the AOCs located within each of these parcels under CERCLA. Land within the "Prison Area" and the area currently occupied by the Hillside Children's Center have been transferred to the community (people of the State of New York and Seneca County Industrial Development Agency (SCIDA), respectively) under deeds that have been recorded by the Seneca County

Clerk. Land within the PID and Warehousing Area of the Depot has not yet been transferred to the community, but LUCs including a residential activity use restriction and a groundwater use/access restriction have been identified and documented within the "Final Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Area, Seneca Army Depot Activity" (September 2004).

New LUCs are proposed for the remaining five AOCs (SEADs 13, 64B, 64D, 122B, and 122E) discussed in this ROD. The groundwater use/access restriction proposed for SEAD-13 and SEAD-64D and the residential use/activity restriction proposed for SEAD-122E result from the Army's determination that potential risks to human health or the environment exist due to the presence of hazardous substances at these historic SWMUs. The Army further recommends that the residential use/activity restriction proposed for SEAD-122E be imposed throughout the area occupied by the former Sampson / Seneca Army Depot Airfield to facilitate its transfer to the SCIDA; this LUC would encompass the entire parcel known as the Airfield. The LUC proposed for implementation at SEAD-64B (no unauthorized excavation and maintenance of cover) results from historic requirements of New York State Solid Waste Management Regulations; this LUC will also be applied along with the groundwater access/use restriction at SEAD-64D.

The specific ICs selected for each AOC are summarized in **Table 1-1** and described more completely as follows:

"Prison Area" Land Use Controls (SEADs 43/56/69, 44A, 44B, 52, 62, and 64C):

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, which was required under the Public Benefit conveyance law, to convey land in the southeastern part of the former Depot (i.e., Prison Area, see **Figure 1-1**) 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"[7] and that "the property shall not be sold, leased, mortgaged, assigned or otherwise disposed of"[8] without the prior consent of the United States. 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,"[9] 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."[10]

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 the State of New York's Five Points Correctional Facility Parcel:

- SEAD-43: Building 606 – Old Missile Propellant Test Laboratory

[7] Seneca County Clerk, loc. cit.
[8] Ibid.
[9] Ibid.
[10] Ibid.

- 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
- 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 AOCs 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 - 031). Pursuant to the terms of the deed, the prison use restriction remains in effect for these AOCs in perpetuity, or the property legally reverts to the United States.

"PID Area" Land Use Controls (SEADs 39, 40 and 67):

Residential Use and Groundwater Access/Use Restrictions

A ROD was previously signed by the Army and USEPA in 2004 for land within the Planned Industrial/Office Development (PID) and Warehousing Area (see **Figure 1-1**) 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 LUCs are documented in the "Final, Record of Decision for Site Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Area, Seneca Army Depot Activity" (September 2004).

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. The Army and EPA has now determined that these land use restrictions will be applied to three AOCs discussed in this Record of Decision 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 AOCs 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, USEPA, 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 at these AOCs have been reduced to levels that allow for unlimited exposure and unrestricted use of the land.

"North End Barracks" Area Land Use Controls (SEAD-41):

Existing Deed with Groundwater Notification

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 1-1**) 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 be continued until the concentration of hazardous substances in groundwater beneath have been reduced to levels that allow for unrestricted use.

Land Use Controls (SEADs 13, 64B, 64D, 122B and 122E):

Groundwater Use/Access Restriction (SEAD-13)

A groundwater use/access restriction is also proposed at the following site:

- SEAD-13: Inhibited Red-Fuming Nitric Acid (IRFNA) Disposal Site.

The proposed 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 will be 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 USEPA approval.

Residential Activities Restriction (SEAD-122B and SEAD-122E)

The development and use of property for residential housing, elementary or secondary schools, child care facilities, and playgrounds will be prohibited in the following two AOCs:

- SEAD-122B: Small Arms Range, Airfield Parcel
- SEAD-122E: Plane Deicing Area

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 USEPA, to substantiate its request that the identified location is suitable for unlimited exposure and unrestricted use.

The boundary of the Airfield Area is defined as the boundary of the Airfield Special Events, Institutional, and Training area highlighted on **Figure 1-1**.

Unauthorized Digging Restriction (SEAD-64B)

A LUC that prohibits unauthorized digging and excavations within the bounds of the SWMU 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.

Unauthorized Digging and Groundwater Access/Use Restriction (SEAD-64D)

LUCs that restrict unauthorized excavation and access to and use of groundwater be imposed for the:

- SEAD-64D: Garbage Disposal Area.

Results of the mini 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.

Land Use Control Performance Objectives

The land use control (LUC) performance objectives at these 17 SWMUs, which will be (or have been) incorporated into leases and/or deeds for the parcels of real property that comprise these AOCs, as appropriate, are as follows:

- Comply with the use limitations documented and imposed in the Deed used to transfer property containing SEADs 43/56/69, 44A, 44B, 52, 62 and 64C from the U.S. Government to the people of the State of New York for the construction of a correctional facility (See Seneca County Liber 612 Page 014 through 031);
- Prohibit access to or use of groundwater at SEADs 39, 40, 41, 64D, and 67 until concentrations of hazardous substances contained are reduced to levels that allow unrestricted use;
- Prohibit residential housing, elementary and secondary schools, childcare facilities, and playgrounds activities at SEADs 39, 40, 67, 122B, and 122E until levels of hazardous substances found at the former SWMUs allow for unlimited exposure and unrestricted use; and
- Prohibit unauthorized excavation at SEADs 64B and 64D.

The Army's selected remedy for each AOC discussed in this ROD includes LUCs. To implement the Army's selected remedy at these AOCs (i.e., SEADs 13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E), a LUC Remedial Design (RD) for each LUC combination identified (e.g., reversionary deed; groundwater use/access restriction only; groundwater use/access restriction and residential activities restriction; residential activities restriction only; digging restriction only; and digging and groundwater use/access restriction) will be prepared. The LUC RD Plan will include: a Site Description; the Land Use Restrictions; the Mechanism to ensure that the land use restrictions are not

violated in the future; implementation and maintenance actions, including periodic inspections; and Reporting/Notification requirements. In addition, the Army will prepare an environmental easement for each site needed, consistent with Section 27-1318(b) and Article 71, Title 36 of ECL, in favor of the State of New York and the Army, which will be recorded at the time of transfer of the AOCs from federal ownership. A schedule for completion of the draft LUC RD covering the individual AOCs will be completed within 21 days of the ROD signature, consistent with Section 14.4 of the Federal Facilities Agreement (FFA). In accordance with the FFA and CERCLA §121(c), the remedial action (including ICs) will be reviewed no less often than every 5 years. After such reviews, modifications may be implemented to the remedial program, if appropriate.

The Army shall implement, inspect, maintain, report, and enforce the ICs described in this ROD in accordance with the approved LUC RD. Although the Army may later transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain ultimate responsibility for remedy integrity.

9.0 DOCUMENTATION OF SIGNIFICANT CHANGES

(Reserved).

10.0 STATE ROLE

(Reserved).

TABLE 1-1
Type of IC Recommended for Each SWMU
ROD for Sites Requiring ICs
Seneca Army Depot Activity

SWMU ID	Prison Deed (Reversionary)	PID Area ICs (GW and Residential Restriction)	Groundwater Use Restriction	Unauthorized Excavation Restricition	Residential Use Restriction
SEAD-13			X		
SEAD-39		X			
SEAD-40		X			
SEAD-41			X		
SEADs-43/56/69	X				
SEAD-44A	X				
SEAD-44B	X				
SEAD-52	X				
SEAD-62	X				
SEAD-64B				X	
SEAD-64C	X			X	
SEAD-64D			X	X	
SEAD-67		X			
SEAD-122B					X
SEAD-122E					X

Prison Area Deed (reversionary) - The reversionary deed limits use of the site in perpetuity to a prison.
PID Area ICs - Implementation of ICs that apply to all land within the Planned Industrial/Office Development PID area that restricts use and access to the groundwater and prohibits the use of the land for residential activities until and unless such access or use is reviewed and approved by the Army and the USEPA.
Groundwater Access/Use Restriction - Groundwater use restriction to prevent access to or use of groundwater until groundwater standards are achieved.
Unauthorized Excavation Restriction - Implementation of an IC to prevent unauthorized excavation.
Residential Use Restriction - Residential use restriction over the Airfield Parcel, prohibiting the development and use of property for residential housing, elementary and secondary schools, child care facilities, and playgrounds.

TABLE 6-1
Summary of Surface Soil Analytical Results - SEAD-13
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
Acetone	ug/Kg	86	8%	200	0	1	13
Chloroform	ug/Kg	2	8%	300	0	1	13
Methyl ethyl ketone	ug/Kg	26	8%	300	0	1	13
Toluene	ug/Kg	6	8%	1,500	0	1	13
SVOCs							
1,4-Dichlorobenzene	ug/Kg	3,300	3%	8,500	0	1	30
2,4,5-Trichlorophenol	ug/Kg	9.5	3%	100	0	1	30
2,4,6-Trichlorophenol	ug/Kg	10	7%		0	2	30
2,4-Dinitrotoluene	ug/Kg	1,600	3%	NS	0	1	30
2,6-Dinitrotoluene	ug/Kg	120	3%	1,000	0	1	30
2-Chloronaphthalene	ug/Kg	5.4	3%		0	1	30
2-Methylnaphthalene	ug/Kg	42	13%	36,400	0	4	30
4-Chlorophenyl phenyl ether	ug/Kg	5.9	3%		0	1	30
4-Methylphenol	ug/Kg	9,200	20%	900	1	6	30
Acenaphthene	ug/Kg	650	10%	50,000	0	3	30
Acenaphthylene	ug/Kg	16	7%	41,000	0	2	30
Anthracene	ug/Kg	16	7%	50,000	0	2	30
Benzo(a)anthracene	ug/Kg	100	27%	224	0	8	30
Benzo(a)pyrene	ug/Kg	110	30%	61	1	9	30
Benzo(b)fluoranthene	ug/Kg	89	30%	1,100	0	9	30
Benzo(ghi)perylene	ug/Kg	86	27%	50,000	0	8	30
Benzo(k)fluoranthene	ug/Kg	74	27%	1,100	0	8	30
Bis(2-Chloroethoxy)methane	ug/Kg	5.6	3%		0	1	30
Bis(2-Ethylhexyl)phthalate	ug/Kg	1,900	17%	50,000	0	5	30
Carbazole	ug/Kg	180	17%		0	5	30
Chrysene	ug/Kg	190	40%	400	0	12	30
Di-n-butylphthalate	ug/Kg	140	7%	8,100	0	2	30
Di-n-octylphthalate	ug/Kg	210	7%	50,000	0	2	30
Dibenz(a,h)anthracene	ug/Kg	15	7%	14	1	2	30
Dibenzofuran	ug/Kg	340	20%	6,200	0	6	30
Diethyl phthalate	ug/Kg	7	3%	7,100	0	1	30
Fluoranthene	ug/Kg	800	47%	50,000	0	14	30
Fluorene	ug/Kg	18	7%	50,000	0	2	30
Hexachlorobenzene	ug/Kg	210	7%	410	0	2	30
Indeno(1,2,3-cd)pyrene	ug/Kg	53	20%	3,200	0	6	30
N-Nitrosodiphenylamine	ug/Kg	99	3%		0	1	30
Naphthalene	ug/Kg	510	17%	13,000	0	5	30
Nitrobenzene	ug/Kg	5.7	3%	200	0	1	30
Phenanthrene	ug/Kg	1,400	40%	50,000	0	12	30
Phenol	ug/Kg	14,000	7%	30	1	2	30
Pyrene	ug/Kg	540	47%	50,000	0	14	30
PESTICIDES/PCBs							
4,4'-DDE	ug/Kg	3.6	8%	2,100	0	1	13
METALS							
Aluminum	mg/Kg	21,200	100%	19,300	2	30	30
Antimony	mg/Kg	5.1	37%	5.9	0	11	30
Arsenic	mg/Kg	10	100%	8.2	2	30	30
Barium	mg/Kg	157	100%	300	0	30	30
Beryllium	mg/Kg	1.2	100%	1.1	1	30	30
Cadmium	mg/Kg	1	57%	2.3	0	17	30
Calcium	mg/Kg	83,900	100%	121,000	0	30	30
Chromium	mg/Kg	30.5	100%	29.6	2	30	30
Cobalt	mg/Kg	19.3	100%	30	0	30	30
Copper	mg/Kg	84.2	100%	33	9	30	30
Iron	mg/Kg	33,700	100%	36,500	0	30	30
Lead	mg/Kg	75.6	83%	24.8	9	25	30
Magnesium	mg/Kg	25,600	100%	21,500	1	30	30
Manganese	mg/Kg	1150	100%	1,060	1	30	30
Mercury	mg/Kg	0.09	47%	0.1	0	14	30
Nickel	mg/Kg	71.1	100%	49	8	30	30
Potassium	mg/Kg	2,800	100%	2,380	1	30	30
Selenium	mg/Kg	1.4	70%	2	0	21	30
Silver	mg/Kg	0.35	7%	0.75	0	2	30
Sodium	mg/Kg	186	63%	172	2	19	30
Thallium	mg/Kg	0.91	20%	0.7	1	6	30
Vanadium	mg/Kg	35.8	100%	150	0	30	30
Zinc	mg/Kg	152	100%	110	3	30	30
OTHER ANALYSES							
Nitrate/Nitrite Nitrogen	mg/Kg	27.9	94%		0	16	17
Percent Solids	%	96.7	100%		0	17	17

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-2
Summary of Subsurface Soil Analytical Results - SEAD-13
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
Carbon disulfide	ug/Kg	2	5%	2,700	0	1	20
Methylene chloride	ug/Kg	4	15%	100	0	3	20
Toluene	ug/Kg	2	5%	1,500	0	1	20
SVOCs							
Benzo(b)fluoranthene	ug/Kg	4.9	4%	1,100	0	1	25
Benzo(ghi)perylene	ug/Kg	20	4%	50,000	0	1	25
Bis(2-Ethylhexyl)phthalate	ug/Kg	24	12%	50,000	0	3	25
Chrysene	ug/Kg	6.6	16%	400	0	4	25
Di-n-butylphthalate	ug/Kg	20	8%	8,100	0	2	25
Di-n-octylphthalate	ug/Kg	110	8%	50,000	0	2	25
Fluoranthene	ug/Kg	7.5	4%	50,000	0	1	25
Phenanthrene	ug/Kg	5.1	12%	50,000	0	3	25
Pyrene	ug/Kg	4.6	4%	50,000	0	1	25
METALS							
Aluminum	mg/Kg	20,400	100%	19,300	2	25	25
Antimony	mg/Kg	5.8	32%	5.9	0	8	25
Arsenic	mg/Kg	10.2	100%	8.2	2	25	25
Barium	mg/Kg	584	100%	300	1	25	25
Beryllium	mg/Kg	1	100%	1.1	0	25	25
Cadmium	mg/Kg	0.9	20%	2.3	0	5	25
Calcium	mg/Kg	98,100	100%	121,000	0	25	25
Chromium	mg/Kg	35.8	100%	29.6	3	25	25
Cobalt	mg/Kg	18.9	100%	30	0	25	25
Copper	mg/Kg	44	100%	33	2	25	25
Iron	mg/Kg	42,500	100%	36,500	4	25	25
Lead	mg/Kg	18.6	68%	24.8	0	17	25
Magnesium	mg/Kg	21,700	100%	21,500	1	25	25
Manganese	mg/Kg	708	100%	1,060	0	25	25
Mercury	mg/Kg	0.07	32%	0.1	0	8	25
Nickel	mg/Kg	57.1	100%	49	4	25	25
Potassium	mg/Kg	2,790	100%	2,380	3	25	25
Selenium	mg/Kg	0.66	80%	2	0	20	25
Silver	mg/Kg	1	12%	0.75	1	3	25
Sodium	mg/Kg	252	100%	172	9	25	25
Thallium	mg/Kg	0.78	32%	0.7	4	8	25
Vanadium	mg/Kg	30.7	100%	150	0	25	25
Zinc	mg/Kg	108	100%	110	0	25	25
OTHER ANALYSES							
Nitrate/Nitrite Nitrogen	mg/Kg	0	100%		0	5	5
Percent Solids	%	96.8	100%		0	5	5

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-3
Summary of Groundwater Analytical Results - SEAD-13
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	Criteria Level [2]		Number of Exceedances	Number of Detects	Number of Analyses
SVOCs								
2-Methylnaphthalene	ug/L	0.069	5%			0	1	22
Bis(2-Ethylhexyl)phthalate	ug/L	23	18%	5		2	4	22
Butylbenzylphthalate	ug/L	0.1	18%			0	4	22
Diethyl phthalate	ug/L	0.16	41%			0	9	22
Pyrene	ug/L	0.06	5%			0	1	22
METALS								
Aluminum	ug/L	70,900	82%	50	(a)	16	18	22
Antimony	ug/L	52.7	32%	3		5	7	22
Arsenic	ug/L	15.1	32%	10	(b)	1	7	22
Barium	ug/L	459	100%	1,000		0	22	22
Beryllium	ug/L	3.6	23%	4	(c)	0	5	22
Cadmium	ug/L	0.57	5%	5		0	1	22
Calcium	ug/L	1,140,000	100%			0	22	22
Chromium	ug/L	109	41%	50		3	9	22
Cobalt	ug/L	47.7	50%			0	11	22
Copper	ug/L	35	50%	200		0	11	22
Cyanide	ug/L	124	27%			0	6	22
Iron	ug/L	97,900	86%	300		13	19	22
Lead	ug/L	34.8	45%	15	(c)	3	10	22
Magnesium	ug/L	314,000	100%	35,000		19	22	22
Manganese	ug/L	3,210	100%	300		13	22	22
Mercury	ug/L	0.05	5%	0.7		0	1	22
Nickel	ug/L	134	77%	100		1	17	22
Potassium	ug/L	42,000	100%			0	22	22
Selenium	ug/L	17.8	41%	10		1	9	22
Silver	ug/L	1.6	5%	50		0	1	22
Sodium	ug/L	52,700	100%	20,000		8	22	22
Vanadium	ug/L	115	32%			0	7	22
Zinc	ug/L	223	86%	5,000	(a)	0	19	22
OTHER ANALYSES								
NITRATE	mg/L	731	100%	10		5	10	10
NITRITE	mg/L	2.1	50%	1		2	5	10
Nitrate/Nitrite Nitrogen	mg/L	731	100%			0	21	22
Fluoride	mg/L	0.45	100%	1.5		0	6	6
Turbidity	NTU	999	100%			0	21	21

NOTES:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater, except as noted below.

a) USEPA Secondary Drinking Water Regulation, non-enforceable (EPA 822-B-00-001, Summer 2000)

b) USEPA Maximum Contaminant Limit announced 10/31/01. Source http://www.epa.gov/safewater/arsenic.html

c) USEPA National Primary Drinking Water Standards, EPA 816-F-01-007 March 2001

NTU = nephelometric turbidity units

TABLE 6-4
Summary of Surface Water Analytical Results - SEAD-13
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC AWQS Class C [2]	Number of Exceedances	Number of Detects	Number of Analyses
SVOCs							
4-Methylphenol	ug/L	23	33%		0	3	9
Isophorone	ug/L	0.057	11%		0	1	9
Phenol	ug/L	9.3	22%	5	1	2	9
METALS							
Aluminum	ug/L	3,830	88%	100	8	14	16
Antimony	ug/L	3	11%		0	1	9
Arsenic	ug/L	6.7	56%	150	0	5	9
Barium	ug/L	91.6	100%		0	9	9
Calcium	ug/L	75,300	100%		0	9	9
Chromium	ug/L	5.4	11%	139	0	1	9
Cobalt	ug/L	1.6	11%	5	0	1	9
Copper	ug/L	6.6	78%	17	0	7	9
Iron	ug/L	5,870	100%	300	9	9	9
Lead	ug/L	7.5	56%	223	0	5	9
Magnesium	ug/L	14,200	100%		0	9	9
Manganese	ug/L	1,850	100%		0	9	9
Mercury	ug/L	0.11	11%	1.4	0	1	9
Nickel	ug/L	7.1	56%	100	0	5	9
Potassium	ug/L	7,200	89%		0	8	9
Sodium	ug/L	70,000	100%		0	9	9
Vanadium	ug/L	6.2	33%	14	0	3	9
Zinc	ug/L	27.7	89%	159	0	8	9
OTHER ANALYSES							
Nitrate/Nitrite Nitrogen	mg/L	0.11	67%		0	6	9
Fluoride	mg/Kg	0.39	100%		0	3	3
Turbidity	NTU	5.7	100%		0	6	6

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class C Surface Water.
Hardness dependent values assumed a hardness of 217 mg/L.
NTU = nephelometric turbidity units

TABLE 6-5
Summary of Sediment Analytical Results - SEAD-13
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYS Benthic Aquatic Life Chronic Toxicity [2]	NYS Lowest Effect Level [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs								
Acetone	ug/Kg	380	100%			0	4	4
Methyl ethyl ketone	ug/Kg	140	25%			0	1	4
SVOCs								
2-Methylnaphthalene	ug/Kg	10	10%	1,330		0	1	10
4-Methylphenol	ug/Kg	58	50%	19.6		1	5	10
Acenaphthylene	ug/Kg	8.8	10%			0	1	10
Anthracene	ug/Kg	8.3	20%	4,184		0	2	10
Benzo(a)anthracene	ug/Kg	90	20%	469		0	2	10
Benzo(a)pyrene	ug/Kg	88	20%			0	2	10
Benzo(b)fluoranthene	ug/Kg	86	20%			0	2	10
Benzo(ghi)perylene	ug/Kg	57	20%			0	2	10
Benzo(k)fluoranthene	ug/Kg	55	20%			0	2	10
Chrysene	ug/Kg	190	20%			0	2	10
Di-n-octylphthalate	ug/Kg	9.9	10%			0	1	10
Dibenz(a,h)anthracene	ug/Kg	16	20%			0	2	10
Dibenzofuran	ug/Kg	4.3	10%			0	1	10
Fluoranthene	ug/Kg	120	40%	39,887		0	4	10
Fluorene	ug/Kg	6.4	10%	313		0	1	10
Indeno(1,2,3-cd)pyrene	ug/Kg	44	20%			0	2	10
Naphthalene	ug/Kg	6.8	10%	1,173		0	1	10
Phenanthrene	ug/Kg	160	30%	4,693		0	3	10
Pyrene	ug/Kg	270	40%	37,580		0	4	10
NITROAROMATICS								
Tetryl	ug/Kg	200	25%			0	1	4
METALS								
Aluminum	mg/Kg	18,400	100%			0	10	10
Antimony	mg/Kg	0.65	10%		2	0	1	10
Arsenic	mg/Kg	4.8	60%		6	0	6	10
Barium	mg/Kg	164	100%			0	10	10
Beryllium	mg/Kg	1	100%			0	10	10
Cadmium	mg/Kg	0.96	60%		0.6	5	6	10
Calcium	mg/Kg	42,200	100%			0	10	10
Chromium	mg/Kg	27.7	100%		26	3	10	10
Cobalt	mg/Kg	13.5	100%			0	10	10
Copper	mg/Kg	20.7	100%		16	10	10	10
Iron	mg/Kg	29,400	100%		20,000	9	10	10
Lead	mg/Kg	33.3	100%		31	1	10	10
Magnesium	mg/Kg	7,110	100%			0	10	10
Manganese	mg/Kg	778	100%		460	3	10	10
Mercury	mg/Kg	0.09	40%		0.15	0	4	10
Nickel	mg/Kg	35.4	100%		16	10	10	10
Potassium	mg/Kg	2,830	100%			0	10	10
Selenium	mg/Kg	0.49	30%			0	3	10
Silver	mg/Kg	3.2	10%			0	1	10
Sodium	mg/Kg	326	40%		1	4	4	10
Vanadium	mg/Kg	33.6	100%			0	10	10
Zinc	mg/Kg	114	60%		120	0	6	10
OTHER ANALYSES								
Nitrate/Nitrite Nitrogen	mg/Kg	6.4	70%			0	7	10
Percent Solids	%	90.3	100%			0	10	10
Fluoride	mg/Kg	270	100%			0	4	4

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Technical Guidance for Screening Contaminated Sediments - January 1999
All organic criteria values derived based on assumed Total Organic Carbon content of 39,105 mg/Kg (SEDA average value).

TABLE 6-6
Summary of TCRA Soil Analytical Results - SEAD-39
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
1,2,4-Trimethylbenzene	ug/Kg	46	8%	NS	0	1	13
Ethylbenzene	ug/Kg	20	8%	5,500	0	1	13
Isopropylbenzene	ug/Kg	23	8%	NS	0	1	13
m,p-Xylene	ug/Kg	61	8%	NS	0	1	13
Methylene chloride	ug/Kg	43	8%	100	0	1	13
Naphthalene	ug/Kg	990	100%	3,700	0	13	13
n-Propylbenzene	ug/Kg	46	8%	NS	0	1	13
o-Xylene	ug/Kg	70	8%	NS	0	1	13
sec-Butylbenzene	ug/Kg	18	8%	NS	0	1	13
Toluene	ug/Kg	40	8%	1,500	0	1	13
Polyaromatic Hydrocarbons							
2-Methylnaphthalene	ug/Kg	14,000	100%	36,400	0	10	10
Acenaphthene	ug/Kg	35,000	100%	50,000	0	14	14
Acenaphthylene	ug/Kg	1,200	100%	41,000	0	10	10
Anthracene	ug/Kg	50,000	100%	50,000	0	16	16
Benz(a)anthracene	ug/Kg	110,000	100%	224	16	16	16
Benzo(a)pyrene	ug/Kg	79,000	100%	61	16	16	16
Benzo(b)fluoranthene	ug/Kg	110,000	100%	1,100	11	16	16
Benzo(g,h,I)perylene	ug/Kg	37,000	100%	50,000	0	16	16
Benzo(k)fluoranthene	ug/Kg	46,000	100%	1,100	3	16	16
Chrysene	ug/Kg	100,000	100%	400	14	16	16
Dibenzo(a,h)anthracene	ug/Kg	14,000	100%	14	14	14	14
Flouranthene	ug/Kg	250,000	100%	50,000	1	16	16
Flourene	ug/Kg	38,000	100%	50,000	0	14	14
Indeo(1,2,3-cd)pyrene	ug/Kg	47,000	100%	3,200	3	16	16
Naphthalene	ug/Kg	30,000	100%	3,700	2	15	15
Phenanthrene	ug/Kg	240,000	100%	50,000	1	16	16
Pyrene	ug/Kg	190,000	100%	50,000	1	16	16
ICP Metals							
Arsenic	mg/Kg	11	100%	7.5	8	16	16
Barium	mg/Kg	330	100%	300	1	16	16
Cadmium	mg/Kg	1.6	100%	2.3	0	15	15
Chromium	mg/Kg	23	100%	29	0	16	16
Lead	mg/Kg	44	100%	400[3]	0	16	16
Mercury	mg/Kg	0.77	100%	0.13[4]	2	16	16
Selenium	mg/Kg	0.73	100%	2	0	13	13
Silver	mg/Kg	1.8	100%	0.763	1	2	2

Note:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.
NS = No standard

(3) USEPA Risk Based Residential Cleanup Goal for lead.

(4) Site-specific cleanup goal for mercury is 0.13 mg/Kg.

TABLE 6-7
Summary of TCRA Soil Analytical Results - SEAD-40
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
1,1,1-Trichloroethane	ug/Kg	22	3%	800	0	1	38
1,2,4-Trimethylbenzene	ug/Kg	31	11%	NS	0	4	38
1,2-Dichlorobenzene	ug/Kg	53	3%	7,900	0	1	38
1,3,5-Trimethylbenzene	ug/Kg	24	8%		0	3	38
1,4-Dichlorobenzene	ug/Kg	28	3%	8,500	0	1	38
4-Isopropyltoluene	ug/Kg	15	3%		0	1	38
Ethylbenzene	ug/Kg	160	5%	5,500	0	2	38
m,p-Xylene	ug/Kg	860	16%		0	6	38
Methylene chloride	ug/Kg	130	8%	100	1	3	38
Naphthalene	ug/Kg	280	45%	3,700	0	17	38
o-Xylene	ug/Kg	290	8%		0	3	38
Toluene	ug/Kg	110	16%	1,500	0	6	38
Polyaromatic Hydrocarbons							
2-Methylnaphthalene	ug/Kg	370	32%	36,400	0	15	47
Acenaphthene	ug/Kg	4,200	55%	50,000	0	26	47
Acenaphthylene	ug/Kg	22,000	87%	41,000	0	41	47
Anthracene	ug/Kg	13,000	85%	50,000	0	40	47
Benz(a)anthracene	ug/Kg	22,000	87%	224	10	41	47
Benzo(a)pyrene	ug/Kg	33,000	89%	61	11	42	47
Benzo(b)fluoranthene	ug/Kg	36,000	89%	1,100	10	42	47
Benzo(g,h,I)perylene	ug/Kg	30,000	87%	50,000	0	41	47
Benzo(k)fluoranthene	ug/Kg	13,000	83%	1,100	10	39	47
Chrysene	ug/Kg	21,000	87%	400	10	41	47
Dibenzo(a,h)anthracene	ug/Kg	6,500	74%	14	10	35	47
Flouranthene	ug/Kg	30,000	89%	50,000	0	42	47
Flourene	ug/Kg	1,900	68%	50,000	0	32	47
Indeo(1,2,3-cd)pyrene	ug/Kg	28,000	87%	3,200	5	41	47
Naphthalene	ug/Kg	390	40%	13,000	0	19	47
Phenanthrene	ug/Kg	12,000	85%	50,000	0	40	47
Pyrene	ug/Kg	45,000	89%	50,000	0	42	47
ICP Metals							
Arsenic	mg/Kg	29	100%	7.5	9	47	47
Barium	mg/Kg	400	100%	300	0	47	47
Cadmium	mg/Kg	1.4	79%	2.3	0	37	47
Chromium	mg/Kg	140	100%	29	1	47	47
Lead	mg/Kg	180	100%	400[3]	0	47	47
Mercury	mg/Kg	0.093	19%	0.13[4]	0	9	47
Selenium	mg/Kg	0.72	4%	2	0	2	47
Silver	mg/Kg	0.5	15%	0.763	0	7	47

Note:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

(3) USEPA Risk Based Residential Cleanup Goal for lead.

(4) Site-specific cleanup goal for mercury is 0.13 mg/Kg.

TABLE 6-8
Summary of TCRA Soil Analytical Results - SEAD-41
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Unit	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
1,2,4-Trimethylbenzene	ug/Kg	0.41	40%		0	2	5
Benzene	ug/Kg	1.50	100%	60	0	5	5
m-Xylene	ug/Kg	0.98	100%		0	5	5
p-Cymene	ug/Kg	0.24	20%		0	1	5
Toluene	ug/Kg	1.80	100%	1,500	0	5	5
Total Xylenes	ug/Kg	0.98	100%	1,200	0	5	5
SVOCs							
Acenaphthene	mg/Kg	0.26	20%	50	0	1	5
Anthracene	mg/Kg	0.29	20%	50	0	1	5
Benzo(a)anthracene	mg/Kg	0.84	80%	0.224	1	4	5
Benzo(a)pyrene	mg/Kg	0.71	20%	0.061	1	1	5
Benzo(b)fluoranthene	mg/Kg	1.40	80%	1.1	1	4	5
Benzo(ghi)perylene	mg/Kg	0.26	20%	50	0	1	5
Chrysene	mg/Kg	0.66	60%	0.4	1	3	5
Dibenzo(a,h)anthracene	mg/Kg	0.06	20%	0.014	1	1	5
Fluoranthene	mg/Kg	2.00	80%	50	0	4	5
Fluorene	mg/Kg	0.17	20%	50	0	1	5
Indeno(1,2,3-cd)pyrene	mg/Kg	0.27	20%	3.2	0	1	5
Naphthalene	mg/Kg	0.06	20%	13	0	1	5
Phenanthrene	mg/Kg	1.40	80%	50	0	4	5
Pyrene	mg/Kg	1.30	80%	50	0	4	5

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-9
Summary of Soil Analytical Results - SEADs-43/ 56/ 69
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
MethyleneChloride	ug/Kg	11	26%	100	0	7	27
Acetone	ug/Kg	16	23%	200	0	6	26
Chloroform	ug/Kg	11	23%	300	0	6	26
Toluene	ug/Kg	27	32%	1500	0	9	28
Xylene(total)	ug/Kg	12	27%	1200	0	7	26
HERBICIDES							
2,4,5-T	ug/Kg	12	3%	1900	0	1	30
Dicamba	ug/Kg	11	3%		0	1	30
Dichloroprop	ug/Kg	72	3%		0	1	30
MCPP	ug/Kg	7,700	10%		0	3	30
SVOCs							
4-Methylphenol	ug/Kg	580	3%	900	0	1	30
Naphthalene	ug/Kg	200	7%	13,000	0	2	30
2-Methylnaphthalene	ug/Kg	88	7%	36,400	0	2	30
Acenaphthene	ug/Kg	570	7%	50,000	0	2	30
Dibenzofuran	ug/Kg	310	7%	6,200	0	2	30
Fluorene	ug/Kg	610	7%	50,000	0	2	30
Phenanthrene	ug/Kg	5,200	13%	50,000	0	4	30
Anthracene	ug/Kg	1,300	10%	50,000	0	3	30
Carbazole	ug/Kg	620	10%	50,000	0	3	30
Di-n-butylphthalate	ug/Kg	62	10%	8,100	0	3	30
Fluoranthene	ug/Kg	6,300	13%	50,000	0	4	30
Pyrene	ug/Kg	4,700	13%	50,000	0	4	30
Benzo(a)anthracene	ug/Kg	2,400	13%	224	2	4	30
Chrysene	ug/Kg	2,400	13%	400	2	4	30
bis(2-Ethylhexyl)phthalate	ug/Kg	2,700	70%	50,000	0	21	30
Benzo(b)fluoranthene	ug/Kg	1,600	10%	1,100	1	3	30
Benzo(k)fluoranthene	ug/Kg	2,000	10%	1,100	1	3	30
Benzo(a)pyrene	ug/Kg	2,000	10%	61	3	3	30
Indeno(1,2,3-cd)pyrene	ug/Kg	1,200	10%	3,200	0	3	30
Dibenz(a,h)anthracene	ug/Kg	520	10%	14	3	3	30
Benzo(g,h,i)perylene	ug/Kg	1,300	10%	50,000	0	3	30
PESTICIDES/PCBs							
Endosulfan I	ug/Kg	1.2	3%	900	0	1	30
alpha-Chlordane	ug/Kg	2.4	3%	540	0	1	30
METALS							
Aluminum	mg/Kg	27,000	100%	19,300	2	30	30
Antimony	mg/Kg	7.2	30%	6	1	9	30
Arsenic	mg/Kg	7.1	100%	8	0	30	30
Barium	mg/Kg	175	100%	300	0	30	30
Beryllium	mg/Kg	1.2	100%	1	1	30	30
Cadmium	mg/Kg	1.5	87%	2	0	26	30
Calcium	mg/Kg	141,000	100%	121,000	1	30	30
Chromium	mg/Kg	30.7	100%	30	2	30	30
Cobalt	mg/Kg	20.9	100%	30	0	30	30
Copper	mg/Kg	28.1	100%	33	0	30	30
Iron	mg/Kg	40,300	100%	36,500	1	30	30
Lead	mg/Kg	30.2	100%	25	2	30	30
Magnesium	mg/Kg	47,500	100%	21,500	3	30	30
Manganese	mg/Kg	782	87%	1,060	0	26	30
Mercury	mg/Kg	0.08	80%	0	0	24	30
Nickel	mg/Kg	57.2	100%	49	2	30	30
Potassium	mg/Kg	3560	100%	2,380	5	30	30
Selenium	mg/Kg	1.8	63%	2	0	19	30
Sodium	mg/Kg	151	87%	172	0	26	30
Vanadium	mg/Kg	41.8	100%	150	0	30	30
Zinc	mg/Kg	338	100%	110	10	30	30
Cyanide	mg/Kg	1.7	3%	0.35	1	1	30
OTHERANALYSES							
Nitrate/Nitrite-Nitrogen	mg/Kg	9.7	83%		0	25	30

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-10
Summary of Groundwater Analytical Results - SEAD-43/56/69
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	Criteria Level [2]		Number of Exceedances	Number of Detects	Number of Analyses
HERBICIDES								
2,4,5-TP (Silvex)	ug/L	0.44	25%	0.26		1	1	4
METALS								
Aluminum	ug/L	2,870	100%	50	(a)	4	4	4
Antimony	ug/L	1.5	25%	3		0	1	4
Arsenic	ug/L	1.5	25%	10	(b)	0	1	4
Barium	ug/L	113	100%	1,000		0	4	4
Calcium	ug/L	138,000	100%			0	4	4
Chromium	ug/L	5.3	75%	50		0	3	4
Cobalt	ug/L	4.2	75%			0	3	4
Copper	ug/L	4	75%	200		0	3	4
Iron	ug/L	7,170	100%	300		4	4	4
Lead	ug/L	2.4	25%	25		0	1	4
Magnesium	ug/L	46,800	100%			0	4	4
Manganese	ug/L	297	100%	50	(a)	4	4	4
Mercury	ug/L	0.04	25%	0.7		0	1	4
Nickel	ug/L	9.4	75%	100		0	3	4
Potassium	ug/L	3,280	100%			0	4	4
Silver	ug/L	0.7	25%	50		0	1	4
Sodium	ug/L	13,400	100%	20,000		0	4	4
Thallium	ug/L	2.2	25%	2	(b)	1	1	4
Vanadium	ug/L	5.2	75%			0	3	4
Zinc	ug/L	22.5	100%	5,000	(a)	0	4	4
OTHER ANALYSES								
Nitrate/Nitrite-Nitrogen	mg/L	0.06	75%			0	3	4
Turbidity	NTU	431	100%			0	4	4

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater, except as noted below.

a) USEPA Secondary Drinking Water Regulation, non-enforceable (EPA 822-B-00-001, Summer 2000)

b) USEPA Maximum Contaminant Limit announced 10/31/01. Source http://www.epa.gov/safewater/arsenic.html

NTU = nephelometric turbidity units

TABLE 6-11
Summary of Surface Water Analytical Results - SEAD 43/56/69
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC AWQS Class C [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
Acetone	ug/L	5	17%	NS	0	1	6
SVOCs							
4-Methylphenol	ug/L	1	17%	NS	0	1	6
bis(2-Ethylhexyl)phthalate	ug/L	150	17%	0.6	1	1	6
METALS							
Aluminum	ug/L	1,190	100%	100	4	6	6
Barium	ug/L	55.2	100%	NS	0	6	6
Beryllium	ug/L	0.1	17%	1,100	0	1	6
Cadmium	ug/L	0.34	33%	3.85	0	2	6
Calcium	ug/L	92,900	100%	NS	0	6	6
Chromium	ug/L	3.3	83%	140	0	5	6
Copper	ug/L	2.5	100%	17.36	0	6	6
Iron	ug/L	1,750	100%	300	3	6	6
Lead	ug/L	1.4	17%	8.7	0	1	6
Magnesium	ug/L	15,900	100%	NS	0	6	6
Manganese	ug/L	94.6	100%	NS	0	6	6
Mercury	ug/L	0.06	100%	0.77	0	6	6
Nickel	ug/L	277	100%	100.16	1	6	6
Potassium	ug/L	2,660	100%	NS	0	6	6
Sodium	ug/L	5,180	100%	NS	0	6	6
Vanadium	ug/L	2.1	33%	14	0	2	6
Zinc	ug/L	1,040	100%	159.6	1	6	6
OTHER ANALYSES							
Nitrite/Nirate-Nitrogen	mg/L	1.42	100%	10	0	5	5
Turbidity	NTU	31.2	100%	NS	0	6	6

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class C Surface Water. Hardness dependent values assumed a hardness of 217 mg/L.

NTU = Nephelometric turbidity unit

TABLE 6-12
Summary of Sediment Analytical Results - SEAD-43/56/69
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC Sediment Criteria [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
Acetone	ug/Kg	220	14%		0	1	5
2-Butanone	ug/Kg	49	29%		0	2	5
HERBICIDES							
2,4-DB	ug/Kg	110	14%		0	1	5
2,4,5-T	ug/Kg	23	57%		0	4	5
MCPP	ug/Kg	17,000	29%		0	2	5
NITROAROMATICS							
HMX	ug/Kg	110	29%		0	2	5
METALS							
Aluminum	mg/Kg	19,600	71%		0	5	5
Antimony	mg/Kg	0.37	167%	2	0	5	5
Arsenic	mg/Kg	9	71%	6	2	5	5
Barium	mg/Kg	158	71%		0	5	5
Beryllium	mg/Kg	0.99	71%		0	5	5
Cadmium	mg/Kg	0.63	71%	0.6	1	5	5
Calcium	mg/Kg	68,900	71%		0	5	5
Chromium	mg/Kg	27.4	71%	26	1	5	5
Cobalt	mg/Kg	19.7	71%		0	5	5
Copper	mg/Kg	30.1	71%	16	5	5	5
Iron	mg/Kg	37,100	71%	20,000	5	5	5
Lead	mg/Kg	28.7	71%	31	0	5	5
Magnesium	mg/Kg	10,500	71%		0	5	5
Manganese	mg/Kg	1,480	71%	460	3	5	5
Mercury	mg/Kg	0.07	71%	0.15	0	5	5
Nickel	mg/Kg	44.3	71%	16	5	5	5
Potassium	mg/Kg	2,440	71%		0	5	5
Selenium	mg/Kg	1	14%		0	1	5
Sodium	mg/Kg	50	14%		0	1	5
Thallium	mg/Kg	0.75	43%		0	3	5
Vanadium	mg/Kg	37.4	71%		0	5	5
Zinc	mg/Kg	178	71%	120	3	5	5
OTHER ANALYSES							
Nitrate/Nitrite-Nitrogen	mg/Kg	0.15	80%				

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) Lowest Effect Level, NYSDEC Technical Guidance for Screening Contaminated Sediments - January 1999

TABLE 6-13
Summary of Soil Analytical Results - SEAD-44A
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
1,1,2,2-Tetrachloroethane	ug/Kg	2	7%	600	0	1	15
2-Butanone	ug/Kg	28	7%	300	0	1	15
2-Hexanone	ug/Kg	4	7%		0	1	15
4-Methyl-2-Pentanone	ug/Kg	4	7%	1,000	0	1	15
Acetone	ug/Kg	200	40%	200	0	6	15
Toluene	ug/Kg	1	7%	1,500	0	1	15
NITROAROMATIC							
2,4,6-Trinitrotoluene	ug/Kg	110	7%		0	1	15
SVOCs							
2-Methylnaphthalene	ug/Kg	150	7%	36,400	0	1	15
4-Methylphenol	ug/Kg	250	13%	900	0	2	15
Acenaphthene	ug/Kg	380	40%	50,000	0	6	15
Acenaphthylene	ug/Kg	72	20%	41,000	0	3	15
Anthracene	ug/Kg	640	47%	50,000	0	7	15
Benzo(a)anthracene	ug/Kg	990	67%	224	4	10	15
Benzo(a)pyrene	ug/Kg	1,100	67%	61	9	10	15
Benzo(b)fluoranthene	ug/Kg	1,100	67%	1,100	0	10	15
Benzo(g,h,i)perylene	ug/Kg	510	60%	50,000	0	9	15
Benzo(k)fluoranthene	ug/Kg	1,100	67%	1,100	0	10	15
bis(2-Ethylhexyl)phthalate	ug/Kg	940	67%	50,000	0	10	15
Carbazole	ug/Kg	370	40%		0	6	15
Chrysene	ug/Kg	1,200	67%	400	4	10	15
Dibenz(a,h)anthracene	ug/Kg	160	27%	14	4	4	15
Dibenzofuran	ug/Kg	280	7%	6,200	0	1	15
Di-n-butylphthalate	ug/Kg	53	13%	8,100	0	2	15
Fluoranthene	ug/Kg	2,400	73%	50,000	0	11	15
Fluorene	ug/Kg	410	40%	50,000	0	6	15
Hexachlorobenzene	ug/Kg	36	13%	410	0	2	15
Indeno(1,2,3-cd)pyrene	ug/Kg	490	67%	3,200	0	10	15
Naphthalene	ug/Kg	330	13%	13,000	0	2	15
Phenanthrene	ug/Kg	2,100	67%	50,000	0	10	15
Pyrene	ug/Kg	2,000	73%	50,000	0	11	15
PESTICIDES/PCBs							
4,4'-DDE	ug/Kg	3.1	20%	2,100	0	3	15
4,4'-DDT	ug/Kg	5.6	20%	2,100	0	3	15
Dieldrin	ug/Kg	70	47%	44	2	7	15
Endosulfan I	ug/Kg	5.4	27%	900	0	4	15
Endosulfan II	ug/Kg	2.8	13%	900	0	2	15
Endrin	ug/Kg	3.5	7%	100	0	1	15
Endrin aldehyde	ug/Kg	4.5	13%		0	2	15
Endrin ketone	ug/Kg	5.2	7%		0	1	15
Heptachlor epoxide	ug/Kg	1.2	7%	20	0	1	15
METALS							
Aluminum	mg/Kg	17,500	100%	19,300	0	15	15
Antimony	mg/Kg	10.8	60%	5.9	2	9	15
Arsenic	mg/Kg	7.7	100%	8.2	0	15	15
Barium	mg/Kg	164	100%	300	0	15	15
Beryllium	mg/Kg	0.91	100%	1.1	0	15	15
Cadmium	mg/Kg	0.48	87%	2.3	0	13	15
Calcium	mg/Kg	77,400	100%	121,000	0	15	15
Chromium	mg/Kg	27.1	100%	29.6	0	15	15
Cobalt	mg/Kg	14.5	100%	30	0	15	15
Copper	mg/Kg	29	100%	33	0	15	15
Iron	mg/Kg	34,900	100%	36,500	0	15	15
Lead	mg/Kg	24.9	100%	24.8	1	15	15
Magnesium	mg/Kg	40,200	100%	21,500	1	15	15
Manganese	mg/Kg	956	87%	1,060	0	13	15
Mercury	mg/Kg	0.17	93%	0.1	2	14	15
Nickel	mg/Kg	41.8	100%	49	0	15	15
Potassium	mg/Kg	2,530	100%	2,380	1	15	15
Selenium	mg/Kg	1.7	100%	2	0	15	15
Sodium	mg/Kg	142	60%	172	0	9	15
Vanadium	mg/Kg	30.2	100%	150	0	15	15
Zinc	mg/Kg	115	100%	110	1	15	15
OTHER ANALYSES							
Nitrate/Nitrite-Nitrogen	mg/Kg	13	100%		0	15	15
Total Solids	%W/W	85.1	100%		0	15	15

Notes:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-14
Summary of Groundwater Analytical Results - SEAD-44A
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	Criteria Level [2]		Number of Exceedances	Number of Detects	Number of Analyses
VOCs								
1,1,2,2-Tetrachloroethane	ug/L	3	33%	5		0	1	3
Acetone	ug/L	8	33%	50		0	1	3
METALS								
Aluminum	ug/L	2,240	100%	50	(a)	3	3	3
Arsenic	ug/L	4.1	33%	10	(b)	0	1	3
Barium	ug/L	104	100%	1,000		0	3	3
Beryllium	ug/L	0.23	33%	4	(b)	0	1	3
Calcium	ug/L	132,000	100%			0	3	3
Chromium	ug/L	4.8	67%	50		0	2	3
Cobalt	ug/L	4	67%			0	2	3
Copper	ug/L	4.5	67%	200		0	2	3
Iron	ug/L	4,810	100%	300		2	3	3
Lead	ug/L	4.1	33%	25		0	1	3
Magnesium	ug/L	75,600	100%			0	3	3
Manganese	ug/L	217	100%	50	(a)	2	3	3
Mercury	ug/L	0.06	67%	0.7		0	2	3
Nickel	ug/L	12.3	67%	100		0	2	3
Potassium	ug/L	6,160	100%			0	3	3
Silver	ug/L	0.63	33%	50		0	1	3
Sodium	ug/L	18,900	100%	20,000		0	3	3
Vanadium	ug/L	4.7	100%			0	3	3
Zinc	ug/L	12.8	100%	5,000	(a)	0	3	3
OTHER ANALYSES								
Nitrate/Nitrite-Nitrogen	mg/L	0.10	67%	10		0	2	3
Turbidity	NTU	693	100%			0	3	3

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater, except as noted below.

a) USEPA Secondary Drinking Water Regulation, non-enforceable (EPA 822-B-00-001, Summer 2000)

b) USEPA Maximum Contaminant Limit announced 10/31/01. Source http://www.epa.gov/safewater/arsenic.html

NTU = Nephelometric turbidity unit

TABLE 6-15
Summary of Surface Water Analytical Results - SEAD-44A
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC AWQS Class C [2]	Number of Exceedances	Number of Detects	Number of Analyses
METALS							
Aluminum	ug/L	476	100%	100	4	4	4
Barium	ug/L	50.4	100%		0	4	4
Cadmium	ug/L	0.23	25%	3.85	0	1	4
Calcium	ug/L	156,000	100%		0	4	4
Chromium	ug/L	1	100%	140	0	4	4
Cobalt	ug/L	1.1	25%	5	0	1	4
Copper	ug/L	4.7	100%	17.36	0	4	4
Iron	ug/L	632	100%	300	4	4	4
Lead	ug/L	2.2	50%	8.7	0	2	4
Magnesium	ug/L	22,500	100%		0	4	4
Manganese	ug/L	165	100%		0	4	4
Mercury	ug/L	0.05	75%	0.77	0	3	4
Nickel	ug/L	174	100%	100.16	1	4	4
Potassium	ug/L	3,600	100%		0	4	4
Sodium	ug/L	3,420	100%		0	4	4
Vanadium	ug/L	1	50%	14	0	2	4
Zinc	ug/L	1,050	100%	159.6	1	4	4
OTHER ANALYSES							
Nitrate/Nitrite-Nitrogen	mg/L	0.06	100%		0	4	4
Turbidity	NTU	14.2	100%		0	4	4

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class C Surface Water.

Hardness dependent values assumed a hardness of 217 mg/L.

NTU = Nephelometric turbidity unit

TABLE 6-16
Summary of Sediment Analytical Results - SEAD-44A
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC Sediment Criteria [2]	Number of Exceedances	Number of Detects	Number of Analyses
SVOCs							
bis(2-Ethylhexyl)phthalate	ug/Kg	34	25%	7,300	0	1	4
Di-n-butylphthalate	ug/Kg	72	25%		0	1	4
METALS							
Aluminum	mg/Kg	14,000	100%		0	4	4
Antimony	mg/Kg	0.4	50%	2	0	2	4
Arsenic	mg/Kg	5.4	100%	6	0	4	4
Barium	mg/Kg	121	100%		0	4	4
Beryllium	mg/Kg	0.71	100%		0	4	4
Cadmium	mg/Kg	0.41	100%	0.6	0	4	4
Calcium	mg/Kg	79,400	100%		0	4	4
Chromium	mg/Kg	20.7	100%	26	0	4	4
Cobalt	mg/Kg	11	100%		0	4	4
Copper	mg/Kg	25.6	100%	16	4	4	4
Iron	mg/Kg	26,300	100%	20,000	3	4	4
Lead	mg/Kg	13.6	100%	31	0	4	4
Magnesium	mg/Kg	12,900	100%		0	4	4
Manganese	mg/Kg	510	100%	460	2	4	4
Mercury	mg/Kg	0.07	100%	0.15	0	4	4
Nickel	mg/Kg	31.9	100%	16	4	4	4
Potassium	mg/Kg	2,760	100%		0	4	4
Sodium	mg/Kg	69.7	50%		0	2	4
Thallium	mg/Kg	0.53	25%		0	1	4
Vanadium	mg/Kg	24	100%		0	4	4
Zinc	mg/Kg	83.9	100%	120	0	4	4
OTHER ANALYSES							
Nitrate/Nitrite-Nitrogen	mg/Kg	1.39	100%		0	4	4
Total Solids	%W/W	71.1	100%		0	4	4

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical Guidance for Screening Contaminated Sediments - January 1999
(based on average organic carbon level of 3.65% in sediment determined in Seneca SEAD 16/17 RI Report, Parsons ES, 1998)
Chronic toxicity sediment criteria for benthic aquatic life.

TABLE 6-17
Summary of Soil Analytical Results - SEAD-44B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
Acetone	ug/Kg	47	100%	200	0	3	3
2-Butanone	ug/Kg	10	33%	300	0	1	3
SVOCs							
Anthracene	ug/Kg	35	33%	50,000	0	1	3
Benzo(a)anthracene	ug/Kg	130	67%	224	0	2	3
Benzo(a)pyrene	ug/Kg	98	67%	61	1	2	3
Benzo(b)fluoranthene	ug/Kg	99	67%	1,100	0	2	3
Benzo(g,h,i)perylene	ug/Kg	56	33%	50,000	0	1	3
Benzo(k)fluoranthene	ug/Kg	110	67%	1,100	0	2	3
bis(2-Ethylhexyl)phthalate	ug/Kg	42	67%	50,000	0	2	3
Chrysene	ug/Kg	150	67%	400	0	2	3
Dibenz(a,h)anthracene	ug/Kg	28	33%	14	1	1	3
Fluoranthene	ug/Kg	350	67%	50,000	0	2	3
Indeno(1,2,3-cd)pyrene	ug/Kg	64	67%	3,200	0	2	3
Phenanthrene	ug/Kg	330	67%	50,000	0	2	3
Pyrene	ug/Kg	380	67%	50,000	0	2	3
PESTICIDES/PCBs							
4,4'-DDD	ug/Kg	28	33%	2,900	0	1	3
4,4'-DDE	ug/Kg	48	33%	2,100	0	1	3
4,4'-DDT	ug/Kg	27	33%	2,100	0	1	3
Dieldrin	ug/Kg	57	33%	44	1	1	3
Endosulfan I	ug/Kg	2	33%	900	0	1	3
METALS							
Aluminum	mg/Kg	16,400	100%	19,300	0	3	3
Arsenic	mg/Kg	13.1	100%	8.2	1	3	3
Barium	mg/Kg	136	100%	300	0	3	3
Beryllium	mg/Kg	0.77	100%	1.1	0	3	3
Cadmium	mg/Kg	0.34	100%	2.3	0	3	3
Calcium	mg/Kg	33,300	100%	121,000	0	3	3
Chromium	mg/Kg	20.7	100%	29.6	0	3	3
Cobalt	mg/Kg	10.8	100%	30	0	3	3
Copper	mg/Kg	26.2	100%	33	0	3	3
Iron	mg/Kg	24,100	100%	36,500	0	3	3
Lead	mg/Kg	39.5	100%	24.8	1	3	3
Magnesium	mg/Kg	9,660	100%	21,500	0	3	3
Manganese	mg/Kg	372	100%	1,060	0	3	3
Mercury	mg/Kg	0.04	100%	0.1	0	3	3
Nickel	mg/Kg	34.8	100%	49	0	3	3
Potassium	mg/Kg	1,880	100%	2,380	0	3	3
Selenium	mg/Kg	1.2	100%	2	0	3	3
Sodium	mg/Kg	43.2	33%	172	0	1	3
Vanadium	mg/Kg	28	100%	150	0	3	3
Zinc	mg/Kg	145	100%	110	1	3	3
OTHER ANALYSES							
Nitrate/Nitrite-Nitrogen	mg/Kg	0.47	100%		0	3	3

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-18
Summary of Groundwater Analytical Results - SEAD-44B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	Criteria Level [2]		Number of Exceedances	Number of Detects	Number of Analyses
METALS								
Aluminum	ug/L	1,230	100%	50	(a)	3	3	3
Barium	ug/L	77.7	100%	1,000		0	3	3
Calcium	ug/L	120,000	100%			0	3	3
Chromium	ug/L	2.5	33%	50		0	1	3
Cobalt	ug/L	1.8	67%			0	2	3
Copper	ug/L	2.4	33%	200		0	1	3
Iron	ug/L	2,340	100%	300		2	3	3
Magnesium	ug/L	32,900	100%			0	3	3
Manganese	ug/L	219	100%	50	(a)	2	3	3
Nickel	ug/L	4.4	67%	100		0	2	3
Potassium	ug/L	2,910	100%			0	3	3
Silver	ug/L	0.7	67%	50		0	2	3
Sodium	ug/L	8,350	100%	20,000		0	3	3
Thallium	ug/L	4.7	33%	2	(b)	1	1	3
Vanadium	ug/L	2.7	67%			0	2	3
Zinc	ug/L	10.4	67%	5,000	(a)	0	2	3
OTHER ANALYSES								
Nitrate/Nitrite-Nitrogen	mg/L	0.13	100%	10		0	3	3
Turbidity	NTU	67.0	100%			0	3	3

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater, except as noted below.

a) USEPA Secondary Drinking Water Regulation, non-enforceable (EPA 822-B-00-001, Summer 2000)

b) USEPA Maximum Contaminant Limit announced 10/31/01. Source http://www.epa.gov/safewater/arsenic.html

NTU = Nephelometric turbidity unit

TABLE 6-19
Summary of Surface Water Analytical Results - SEAD-44B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC AWQS Class C [2]	Number of Exceedances	Number of Detects	Number of Analyses
METALS							
Aluminum	ug/L	76.5	100%	100	0	2	2
Arsenic	ug/L	11.6	100%	150	0	2	2
Barium	ug/L	34	100%		0	2	2
Calcium	ug/L	93,000	100%		0	2	2
Copper	ug/L	2.2	100%	17.36	0	2	2
Iron	ug/L	79.8	100%	300	0	2	2
Magnesium	ug/L	9,070	100%		0	2	2
Manganese	ug/L	5.3	100%		0	2	2
Mercury	ug/L	0.05	100%	0.77	0	2	2
Nickel	ug/L	0.68	100%	100.16	0	2	2
Potassium	ug/L	3,290	100%		0	2	2
Sodium	ug/L	73,200	100%		0	2	2
Zinc	ug/L	2.2	100%	159.6	0	2	2
OTHER ANALYSES							
Nitrate/Nitrite-Nitrogen	mg/L	0.01	50%		0	1	2
Turbidity	NTU	2.9	100%		0	2	2

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class C Surface Water.

Hardness dependent values assumed a hardness of 217 mg/L.

NTU = Nephelometric turbidity unit

TABLE 6-20
Summary of Sediment Anlaytical Results - SEAD-44B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC Sediment Criteria [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
2-Butanone	ug/Kg	12	50%		0	1	2
SVOCs							
Di-n-butylphthalate	ug/Kg	110	100%		0	2	2
METALS							
Aluminum	mg/Kg	13,000	100%		0	2	2
Antimony	mg/Kg	0.37	50%	2	0	1	2
Arsenic	mg/Kg	58.3	100%	6	2	2	2
Barium	mg/Kg	93.8	100%		0	2	2
Beryllium	mg/Kg	0.66	100%		0	2	2
Cadmium	mg/Kg	0.38	100%	0.6	0	2	2
Calcium	mg/Kg	8,780	100%		0	2	2
Chromium	mg/Kg	19.8	100%	26	0	2	2
Cobalt	mg/Kg	11.9	100%		0	2	2
Copper	mg/Kg	19.1	100%	16	1	2	2
Iron	mg/Kg	28,400	100%	20,000	1	2	2
Lead	mg/Kg	17.7	100%	31	0	2	2
Magnesium	mg/Kg	4,880	100%		0	2	2
Manganese	mg/Kg	679	100%	460	1	2	2
Mercury	mg/Kg	0.06	100%	0.15	0	2	2
Nickel	mg/Kg	28.4	100%	16	2	2	2
Potassium	mg/Kg	1,500	100%		0	2	2
Sodium	mg/Kg	378	100%		0	2	2
Vanadium	mg/Kg	23.8	100%		0	2	2
Zinc	mg/Kg	76.3	100%	120	0	2	2
OTHER ANALYSES							
Nitrate/Nitrite-Nitrogen	mg/Kg	0.06	100%		0	2	2

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) Lowest Effect Level, NYSDEC Technical Guidance for Screening Contaminated Sediments - January 1999

TABLE 6-21
Summary of Soil Analytical Results - SEAD-52
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
NITROAROMATICS							
Tetryl	ug/Kg	150	5%		0	1	19
2,4,6-Trinitrotoluene	ug/Kg	410	11%		0	2	19
2,4-Dinitrotoluene	ug/Kg	2,100	53%		0	10	19

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-22
Summary of Soil Analytical Results - SEAD-62
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
SVOCs							
Fluoranthene	ug/Kg	46	33%	50,000	0	1	3
Pyrene	ug/Kg	47	33%	50,000	0	1	3
Herbicides							
2,4,5-T	ug/Kg	10	67%	1,900	0	2	3
Dicamba	ug/Kg	9.3	33%		0	1	3
Metals							
Aluminum	mg/Kg	16,100	100%	19,300	0	3	3
Antimony	mg/Kg	0.21	33%	5.9	0	1	3
Arsenic	mg/Kg	8.4	100%	8.2	1	3	3
Barium	mg/Kg	202	100%	300	0	3	3
Beryllium	mg/Kg	0.74	100%	1.1	0	3	3
Cadmium	mg/Kg	0.68	100%	2.3	0	3	3
Calcium	mg/Kg	67,900	100%	121,000	0	3	3
Chromium	mg/Kg	28.8	100%	29.6	0	3	3
Cobalt	mg/Kg	12.6	100%	30	0	3	3
Copper	mg/Kg	28.7	100%	33	0	3	3
Iron	mg/Kg	30,300	100%	36,500	0	3	3
Magnesium	mg/Kg	20,500	100%	21,500	0	3	3
Manganese	mg/Kg	778	100%	1,060	0	3	3
Mercury	mg/Kg	0.11	100%	0.1	1	3	3
Nickel	mg/Kg	29.6	100%	49	0	3	3
Potassium	mg/Kg	2,970	100%	2,380	1	3	3
Selenium	mg/Kg	1.3	67%	2	0	2	3
Sodium	mg/Kg	164	100%	172	0	3	3
Vanadium	mg/Kg	33.1	100%	150	0	3	3
Zinc	mg/Kg	218	100%	110	2	3	3

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-23
Summary of Groundwater Analytical Results - SEAD-62
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	Criteria Level [2]		Number of Exceedances	Number of Detects	Number of Analyses
VOCs								
Benzene	ug/L	2	67%	1		2	2	3
Herbicides								
2,4,5-T	ug/L	0.12	33%	35		0	1	3
Metals								
Aluminum	ug/L	499	100%	50	(a)	3	3	3
Barium	ug/L	68.1	100%	1,000		0	3	3
Calcium	ug/L	104,000	100%			0	3	3
Chromium	ug/L	1.4	67%	50		0	2	3
Cobalt	ug/L	2.5	100%			0	3	3
Copper	ug/L	0.54	33%	200		0	1	3
Iron	ug/L	1,160	100%	300		3	3	3
Magnesium	ug/L	58,200	100%			0	3	3
Manganese	ug/L	271	100%	50	(a)	3	3	3
Mercury	ug/L	0.05	100%	0.7		0	3	3
Nickel	ug/L	3.9	67%	100		0	2	3
Potassium	ug/L	7,470	100%			0	3	3
Sodium	ug/L	18,100	100%	20,000		0	3	3
Thallium	ug/L	2.4	33%	2	(b)	1	1	3
Vanadium	ug/L	1.8	100%			0	3	3
Zinc	ug/L	6.2	100%	5000	(a)	0	3	3

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater, except as noted below.

a) USEPA Secondary Drinking Water Regulation, non-enforceable (EPA 822-B-00-001, Summer 2000)

b) USEPA Maximum Contaminant Limit announced 10/31/01. Source http://www.epa.gov/safewater/arsenic.html

ug/L = micrograms per liter

TABLE 6-24
Summary of Soil Analytical Results - SEAD-64B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
Acetone	ug/Kg	57	17%	200	0	2	12
Carbon disulfide	ug/Kg	1	8%	2,700	0	1	12
Methyl ethyl ketone	ug/Kg	22	8%	300	0	1	12
Methylene chloride	ug/Kg	1	8%	100	0	1	12
SVOCs							
Benzo(a)anthracene	ug/Kg	38	17%	224	0	2	12
Benzo(a)pyrene	ug/Kg	34	25%	61	0	3	12
Benzo(b)fluoranthene	ug/Kg	28	25%	1,100	0	3	12
Benzo(ghi)perylene	ug/Kg	20	17%	50,000	0	2	12
Benzo(k)fluoranthene	ug/Kg	36	25%	1,100	0	3	12
Bis(2-Ethylhexyl)phthalate	ug/Kg	96	42%	50,000	0	5	12
Chrysene	ug/Kg	40	25%	400	0	3	12
Di-n-butylphthalate	ug/Kg	120	58%	8,100	0	7	12
Indeno(1,2,3-cd)pyrene	ug/Kg	29	8%	3200	0	1	12
Fluoranthene	ug/Kg	35	42%	50,000	0	5	12
Phenanthrene	ug/Kg	30	17%	50,000	0	2	12
Pyrene	ug/Kg	36	25%	50,000	0	3	12
PESTICIDES/PCBs							
4,4'-DDE	ug/Kg	2.6	8%	2,100	0	1	12
4,4'-DDT	ug/Kg	2.6	8%	2,100	0	1	12
Aldrin	ug/Kg	1.6	8%	41	0	1	12
Heptachlor epoxide	ug/Kg	1.4	8%	20	0	1	12
METALS							
Aluminum	mg/Kg	13,400	100%	19,300	0	12	12
Antimony	mg/Kg	0.3	25%	5.9	0	3	12
Arsenic	mg/Kg	5.8	100%	8.2	0	12	12
Barium	mg/Kg	75.9	100%	300	0	12	12
Beryllium	mg/Kg	0.56	100%	1.1	0	12	12
Cadmium	mg/Kg	0.63	100%	2.3	0	12	12
Calcium	mg/Kg	54,800	100%	121,000	0	12	12
Chromium	mg/Kg	17.5	100%	29.6	0	12	12
Cobalt	mg/Kg	8.9	100%	30	0	12	12
Copper	mg/Kg	21.5	100%	33	0	12	12
Iron	mg/Kg	20,900	100%	36,500	0	12	12
Lead	mg/Kg	21.4	100%	24.8	0	12	12
Magnesium	mg/Kg	22,100	100%	21,500	1	12	12
Manganese	mg/Kg	414	100%	1,060	0	12	12
Mercury	mg/Kg	0.05	75%	0.1	0	9	12
Nickel	mg/Kg	26.2	100%	49	0	12	12
Potassium	mg/Kg	2,160	100%	2,380	0	12	12
Selenium	mg/Kg	0.99	42%	2	0	5	12
Sodium	mg/Kg	65.8	92%	172	0	11	12
Thallium	mg/Kg	0.41	17%	0.7	0	2	12
Vanadium	mg/Kg	23.3	100%	150	0	12	12
Zinc	mg/Kg	78.8	100%	110	0	12	12

NOTES:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-25
Summary of Groundwater Analytical Results - SEAD-64B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	Criteria Level [2]		Number of Exceedances	Number of Detects	Number of Analyses
METALS								
Aluminum	ug/L	1,530	100%	50	(a)	3	3	3
Arsenic	ug/L	2.2	33%	3		0	1	3
Barium	ug/L	124	100%	1,000		0	3	3
Calcium	ug/L	200,000	100%			0	3	3
Chromium	ug/L	3.1	67%	50		0	2	3
Cobalt	ug/L	4.4	100%			0	3	3
Copper	ug/L	3.1	100%	200		0	3	3
Iron	ug/L	5,090	100%	300		2	3	3
Magnesium	ug/L	76,000	100%			0	3	3
Manganese	ug/L	559	100%	50	(a)	3	3	3
Nickel	ug/L	7	100%	100		0	3	3
Potassium	ug/L	4,780	100%			0	3	3
Selenium	ug/L	2.7	33%	10		0	1	3
Sodium	ug/L	17,800	100%	20,000		0	3	3
Vanadium	ug/L	2.9	100%			0	3	3
Zinc	ug/L	16.6	100%	5,000	(a)	0	3	3

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater, except as noted below.
a) USEPA Secondary Drinking Water Regulation, non-enforceable (EPA 822-B-00-001, Summer 2000)

TABLE 6-26
Summary of Surface Water Analytical Results-SEAD-64B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC AWQS Class C [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
Carbon Disulfide	ug/L	2	33%		0	1	3
METALS							
Aluminum	ug/L	141	67%	100	1	2	3
Barium	ug/L	37.8	100%		0	3	3
Calcium	ug/L	61,200	100%		0	3	3
Chromium	ug/L	0.42	67%	140	0	2	3
Copper	ug/L	1.5	100%	17.36	0	3	3
Iron	ug/L	331	100%	300	1	3	3
Magnesium	ug/L	10,900	100%		0	3	3
Manganese	ug/L	39.2	100%		0	3	3
Nickel	ug/L	1.2	67%	100.16	0	2	3
Potassium	ug/L	1,180	100%		0	3	3
Sodium	ug/L	3,050	100%		0	3	3
Zinc	ug/L	7.7	100%	159.6	0	3	3
OTHER ANALYSES							
pH	Standard Units	7.9	100%		0	3	3
Conductivity	umhos/cm	293	100%		0	3	3
Temperature	°C	16	100%		0	3	3
Turbidity	NTU	0.6	100%		0	3	3

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class C Surface Water.
Hardness dependent values assumed a hardness of 217 mg/L.
NTU = nephelometric turbidity units.

TABLE 6-27
Summary of Sediment Analytical Results-SEAD-64B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC Sediment Criteria [2]		Number of Exceedances	Number of Detects	Number of Analyses
VOCs								
Methylene chloride	ug/Kg	6	100%			0	3	3
SVOCs								
Benzo(a)pyrene	ug/Kg	29	33%	50.8	(a)	0	1	3
Benzo(b)fluoranthene	ug/Kg	39	33%	50.8	(a)	0	1	3
Benzo(k)fluoranthene	ug/Kg	30	33%	50.8	(a)	0	1	3
Bis(2-Ethylhexyl)phthalate	ug/Kg	79	67%	7,801	(a)	0	2	3
Fluoranthene	ug/Kg	55	33%	39,887	(a)	0	1	3
Phenanthrene	ug/Kg	31	33%	4,692	(a)	0	1	3
Pyrene	ug/Kg	32	33%	37,580	(a)	0	1	3
PESTICIDES/PCBs								
4,4'-DDE	ug/Kg	3.3	33%	0.39	(a)	1	1	3
Endosulfan I	ug/Kg	2.4	33%	1.17	(a)	1	1	3
Heptachlor	ug/Kg	1.1	33%	0.031	(a)	1	1	3
METALS								
Aluminum	mg/Kg	12,800	100%			0	3	3
Antimony	mg/Kg	0.25	33%	2	(b)	0	1	3
Arsenic	mg/Kg	7.5	100%	6	(b)	1	3	3
Barium	mg/Kg	102	100%			0	3	3
Beryllium	mg/Kg	0.67	100%			0	3	3
Cadmium	mg/Kg	0.45	100%	0.6	(b)	0	3	3
Calcium	mg/Kg	75,900	100%			0	3	3
Chromium	mg/Kg	19.3	100%	26	(b)	0	3	3
Cobalt	mg/Kg	11.8	100%			0	3	3
Copper	mg/Kg	27	100%	16	(b)	2	3	3
Iron	mg/Kg	28,100	100%	20,000	(b)	1	3	3
Lead	mg/Kg	16.5	100%	31	(b)	0	3	3
Magnesium	mg/Kg	14,100	100%			0	3	3
Manganese	mg/Kg	684	100%	460	(b)	1	3	3
Mercury	mg/Kg	0.19	100%	0.15	(b)	1	3	3
Nickel	mg/Kg	32	100%	16	(b)	3	3	3
Potassium	mg/Kg	2,190	100%			0	3	3
Sodium	mg/Kg	35.5	33%			0	1	3
Vanadium	mg/Kg	25.9	100%			0	3	3
Zinc	mg/Kg	82.2	100%	120	(b)	0	3	3

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Technical Guidance for Screening Contaminated Sediments - January 1999
a) Benthic Aquatic Life Chronic Toxicity Criteria
b) Lowest Effect Level
All organic criteria values derived based on assumed Total Organic Carbon content of 39,105 mg/Kg (SEDA average value).

TABLE 6-28
Summary of Soil Analytical Results - SEAD-64C
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Unit	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
SVOCs							
Bis(2-Ethylhexyl)phthalate	ug/Kg	1,100	80%	50,000	0	8	10
Di-n-butylphthalate	ug/Kg	39	40%	8,100	0	4	10
Pesticides/PCBs							
Dieldrin	ug/Kg	4.7	10%	44	0	1	10
Heptachlor	ug/Kg	2.6	10%	100	0	1	10
Metals							
Aluminum	mg/Kg	18,700	100%	19,300	0	10	10
Antimony	mg/Kg	0.43	20%	5.9	0	2	10
Arsenic	mg/Kg	6.6	100%	8.2	0	10	10
Barium	mg/Kg	243	100%	300	0	10	10
Beryllium	mg/Kg	0.86	100%	1.1	0	10	10
Cadmium	mg/Kg	1	100%	2.3	0	10	10
Calcium	mg/Kg	129,000	100%	121,000	1	10	10
Chromium	mg/Kg	25.9	100%	29.6	0	10	10
Cobalt	mg/Kg	13.9	100%	30	0	10	10
Copper	mg/Kg	28.7	100%	33	0	10	10
Iron	mg/Kg	29,000	100%	36,500	0	10	10
Lead	mg/Kg	23.3	100%	24.8	0	10	10
Magnesium	mg/Kg	29,700	100%	21,500	2	10	10
Manganese	mg/Kg	2,220	100%	1,060	2	10	10
Mercury	mg/Kg	0.05	100%	0.1	0	10	10
Nickel	mg/Kg	41.1	100%	49	0	10	10
Potassium	mg/Kg	2,690	100%	2,380	1	10	10
Selenium	mg/Kg	1.9	50%	2	0	5	10
Sodium	mg/Kg	93.8	80%	172	0	8	10
Vanadium	mg/Kg	32.5	100%	150	0	10	10
Zinc	mg/Kg	110	100%	110	0	10	10

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-29
Summary of Groundwater Analytical Results - SEAD-64C
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Unit	Maximum Value	Frequency of Detection	Criteria Level [2]		Number of Exceedances	Number of Detects	Number of Analyses
SVOCs								
Diethyl phthalate	ug/L	0.7	20%			0	1	5
Phenol	ug/L	2	40%	1		2	2	5
Metals								
Aluminum	ug/L	811	100%	50	(a)	3	5	5
Barium	ug/L	106	100%	1,000		0	5	5
Calcium	ug/L	121,000	100%			0	5	5
Chromium	ug/L	2.5	60%	50		0	3	5
Cobalt	ug/L	5.5	60%			0	3	5
Copper	ug/L	1.7	100%	200		0	5	5
Iron	ug/L	2,640	100%	300		4	5	5
Lead	ug/L	6.4	20%	25		0	1	5
Magnesium	ug/L	49,400	100%			0	5	5
Manganese	ug/L	149	100%	50	(a)	3	5	5
Mercury	ug/L	0.14	60%	0.7		0	3	5
Nickel	ug/L	2.3	60%	100		0	3	5
Potassium	ug/L	3,830	100%			0	5	5
Sodium	ug/L	30,400	100%	20,000		1	5	5
Thallium	ug/L	2.1	20%	2	(b)	1	1	5
Vanadium	ug/L	2	100%			0	5	5
Zinc	ug/L	6	100%	5,000	(a)	0	5	5

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater, except as noted below.

a) USEPA Secondary Drinking Water Regulation, non-enforceable (EPA 822-B-00-001, Summer 2000)

b) USEPA Maximum Contaminant Limit announced 10/31/01. Source http://www.epa.gov/safewater/arsenic.html

ug/L = micrograms per liter

TABLE 6-30
Summary of Soil Analytical Results - SEAD-64D
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Unit	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
VOCs							
Methyl ethyl ketone	ug/Kg	8	3%	300	0	1	36
Methylene chloride	ug/Kg	3	22%	100	0	8	36
Toluene	ug/Kg	1	3%	1,500	0	1	36
SVOCs							
2-Methylnaphthalene	ug/Kg	49	14%	36,400	0	5	36
Benzo(a)anthracene	ug/Kg	86	22%	224	0	8	36
Benzo(a)pyrene	ug/Kg	77	25%	61	3	9	36
Benzo(b)fluoranthene	ug/Kg	160	25%	1,100	0	9	36
Benzo(ghi)perylene	ug/Kg	68	17%	50,000	0	6	36
Benzo(k)fluoranthene	ug/Kg	110	19%	1,100	0	7	36
Bis(2-Ethylhexyl)phthalate	ug/Kg	1,100	42%	50,000	0	15	36
Chrysene	ug/Kg	110	28%	400	0	10	36
Di-n-butylphthalate	ug/Kg	77	44%	8,100	0	16	36
Di-n-octylphthalate	ug/Kg	75	3%	50,000	0	1	36
Dibenz(a,h)anthracene	ug/Kg	40	14%	14	5	5	36
Fluoranthene	ug/Kg	240	44%	50,000	0	16	36
Indeno(1,2,3-cd)pyrene	ug/Kg	61	17%	3,200	0	6	36
Naphthalene	ug/Kg	31	6%	13,000	0	2	36
Phenanthrene	ug/Kg	100	33%	50,000	0	12	36
Phenol	ug/Kg	42	3%	30	1	1	36
Pyrene	ug/Kg	160	42%	50,000	0	15	36
Metals							
Aluminum	mg/Kg	20,800	100%	19,300	3	36	36
Antimony	mg/Kg	0.49	25%	5.9	0	9	36
Arsenic	mg/Kg	7.8	100%	8.2	0	36	36
Barium	mg/Kg	152	100%	300	0	36	36
Beryllium	mg/Kg	0.99	100%	1.1	0	36	36
Cadmium	mg/Kg	0.97	100%	2.3	0	36	36
Calcium	mg/Kg	162,000	100%	121,000	3	36	36
Chromium	mg/Kg	29.6	100%	29.6	0	36	36
Cobalt	mg/Kg	18.6	100%	30	0	36	36
Copper	mg/Kg	32.7	100%	33	0	36	36
Iron	mg/Kg	36,600	100%	36,500	1	36	36
Lead	mg/Kg	60.7	100%	24.8	3	36	36
Magnesium	mg/Kg	16,300	100%	21,500	0	36	36
Manganese	mg/Kg	1790	100%	1,060	2	36	36
Mercury	mg/Kg	0.08	69%	0.1	0	25	36
Nickel	mg/Kg	41.8	100%	49	0	36	36
Potassium	mg/Kg	3,240	100%	2,380	3	36	36
Selenium	mg/Kg	2	81%	2	0	29	36
Sodium	mg/Kg	266	86%	172	1	31	36
Thallium	mg/Kg	0.76	44%	0.7	2	16	36
Vanadium	mg/Kg	35.3	100%	150	0	36	36
Zinc	mg/Kg	111	100%	110	1	36	36

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-31
Summary of Groundwater Analytical Results - SEAD-64D
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Unit	Maximum Value	Frequency of Detection	Criteria Level [2]		Number of Exceedances	Number of Detects	Number of Analyses
Metals								
Aluminum	ug/L	30,100	100%	50	(a)	5	5	5
Antimony	ug/L	1.5	20%	3		0	1	5
Arsenic	ug/L	10	20%	10	(b)	0	1	5
Barium	ug/L	693	100%	1,000		0	5	5
Beryllium	ug/L	3.1	20%	4	(b)	0	1	5
Cadmium	ug/L	1.3	40%	5		0	2	5
Calcium	ug/L	902,000	100%			0	5	5
Chromium	ug/L	47.1	80%	50		0	4	5
Cobalt	ug/L	82.3	100%			0	5	5
Copper	ug/L	41.3	80%	200		0	4	5
Iron	ug/L	65,800	100%	300		5	5	5
Lead	ug/L	71.6	40%	25		1	2	5
Magnesium	ug/L	35,900	100%			0	5	5
Manganese	ug/L	8,250	100%	50	(a)	5	5	5
Mercury	ug/L	0.05	40%	0.7		0	2	5
Nickel	ug/L	108	100%	100		1	5	5
Potassium	ug/L	7,080	100%			0	5	5
Sodium	ug/L	12,300	100%	20,000		0	5	5
Thallium	ug/L	3.2	60%	2	(b)	3	3	5
Vanadium	ug/L	42.9	100%			0	5	5
Zinc	ug/L	305	100%	5,000	(a)	0	5	5

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater, except as noted below.

a) USEPA Secondary Drinking Water Regulation, non-enforceable (EPA 822-B-00-001, Summer 2000)

b) USEPA Maximum Contaminant Limit announced 10/31/01. Source http://www.epa.gov/safewater/arsenic.html

TABLE 6-32
Summary of TCRA Confirmatory Samples, Area 1 - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Compound	Cleanup Goal[1]	SEAD67-FX-A1-SS-001-FS	SEAD67-FX-A1-SS-002-FS	SEAD67-FX-A1-SS-003-FS	SEAD67-FX-A1-SS-004-FS	SEAD67-FX-A1-SS-005-FS	SEAD67-FX-A1-SS-006-FS	SEAD67-FX-A1-SS-007-FS	SEAD67-PX-P1-SS-003-FS	SEAD67-PX-A1-SS-001-FS	SEAD67-PX-A1-SS-002-FS	SEAD67-PX-A1-SS-003-FS	SEAD67-PX-A1-SS-004-FS	SEAD67-PX-A1-SS-005-FS
Depth (inches)		0	0	0	0	0	0	0	0	0	0	0	0	0
Metals		(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Aluminum	19,200					12100			13200					9220
Antimony	5.9					0.56 U			13.6 u					0.62 U
Arsenic	8.24	5.6	5.3	4.4	4.9	4.1	5.7	5.8	4.9 J	4.9	4.7 B	3.5 B	4.4	3.7 B
Barium	300					53.7			71.8					99.5
Beryllium	1.1					0.65 B			0.69 J					0.55 B
Cadmium	2.3					0.49 U			3.5 u					0.55 U
Calcium	120,500					1770			3080					3160
Chromium	29					18.1			19.8					13.3
Cobalt	30					10.8			11					5.2
Copper	29.6					15.9			19.5					16
Iron	35,550					24500			24100					16100
Lead[2]	400					11.6			19.3					25.8
Magnesium	21,500					3810			3890					2410
Manganese	1,056					445			438					320
Mercury	0.1	0.038 B	0.047 B	0.079 B	0.056 B	0.039 B	0.032 B	0.032 B		0.055 B	0.079 B	0.064 B	0.064 B	0.075 B
Nickel	48.9					26.3			26					15.2
Potassium	2,343					649			1250					720
Selenium	2					0.79 U			18.6 u					0.87 U
Silver	0.763					0.16 U			0.41 J					0.17 U
Sodium	170.3					56.4			82.8 J					41.8 B
Thallium	0.67					0.98 U			25.5 u					1.1 U
Vanadium	150					18.5			20.1					17
Zinc	108.9	64.7	72.8	51.7	68.1	55	69.9	61.7	66.3	64.6	54.6	44.1	49.2	49.6
PAHs[3]		(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
2-Methylnaphthalene	36,400					34 U			420 u					83 U
Acenaphthene	50,000					18 U			420 u					44 U
Acenaphthylene	41,000					13 U			27 J					130 J
Anthracene	50,000					21 J			40 J					200 J
Benzo(a)anthracene	224					57 J			160 J					440 J
Benzo(a)pyrene	61					53								420
Benzo(b)fluoranthene	1,100					47 U			130 J					460 J
Benzo(ghi)perylene	50,000					30 J								280 J
Benzo(k)fluoranthene	1,100					51 J			160 J					460 J
Chrysene	400					60 J			190 J					540 J
Dibenzo(a,h)anthracene	14					11 M			37 J					96 M
Fluoranthene	50,000					110 J			340 J					1100
Fluorene	50,000					24 U			420 u					59 U
Indeno(1,2,3-cd)pyrene	3,200					29 J			97 J					260 J
Naphthalene	13,000					39 U			420 u					94 U
Phenanthrene	50,000					87 J			260 J					870 J
Pyrene	50,000					110 J			400 J					900 J

TABLE 6-32
Summary of TCRA Confirmatory Samples, Area 1 - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Compound	Cleanup Goal[1]	SEAD67-PX-A1-SS-006-FS	SEAD67-PX-A1-SS-007-FS	SEAD67-PX-A1-SS-008-FS	SEAD67-PX-A1-SS-009-FS	SEAD67-PX-A1-SS-010-FS	SEAD67-PX-A1-SS-011-FS	SEAD67-PX-A1-SS-012-FS	SEAD67-PX-A1-SS-013-FS	SEAD67-PX-A1-SS-014-FS	SEAD67-PX-A1-SS-015-FS
Depth (inches)		0	0	0	0	0	0	0	0	0	0
Metals		(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Aluminum	19,200					16000					13800
Antimony	5.9					0.52 U					0.68 U
Arsenic	8.24	4 B	4.6	5.4	4.1 B	7.1	4 B	5.1	5.2	5.1	5.8
Barium	300					79.2					67.6
Beryllium	1.1					1.2					0.68 B
Cadmium	2.3					0.46 U					0.59 U
Calcium	120,500					2160					3440
Chromium	29					25.6					20.1
Cobalt	30					15.7					12
Copper	29.6					36.6					20.1
Iron	35,550					35300					25500
Lead[2]	400					18					24.2
Magnesium	21,500					5200					4150
Manganese	1,056					959					436
Mercury	0.1	0.082 B	0.095 B	0.32	0.2	0.046 B	0.061 B	0.056 B	0.067 B	0.11	0.063 B
Nickel	48.9					41.9					27.4
Potassium	2,343					1080					1290
Selenium	2					0.73 U					1 B
Silver	0.763					0.15 U					0.19 U
Sodium	170.3					34.7 B					58
Thallium	0.67					0.91 U					1.2 U
Vanadium	150					24.9					21.9
Zinc	108.9	60.6	78.4	67.2	66.5	85.1	47.9	63.9	69.9	64	70.6
PAHs[3]		(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
2-Methylnaphthalene	36,400					34 U					160 U
Acenaphthene	50,000					18 U					90 J
Acenaphthylene	41,000					32 J					380 J
Anthracene	50,000					46 J					500 J
Benzo(a)anthracene	224					110 J					1100 J
Benzo(a)pyrene	61					110					1100
Benzo(b)fluoranthene	1,100					100					910 J
Benzo(ghi)perylene	50,000					60					630 J
Benzo(k)fluoranthene	1,100					110					1300 J
Chrysene	400					130 J					1400 J
Dibenzo(a,h)anthracene	14					21 M					220
Fluoranthene	50,000					250 J					2700
Fluorene	50,000					25 U					190 J
Indeno(1,2,3-cd)pyrene	3,200					58 J					620 J
Naphthalene	13,000					39 U					180 U
Phenanthrene	50,000					210 J					2200
Pyrene	50,000					220					2300

Table Notes

1. The Cleanup goal is based on the New York Technical Administrative Guidance Memorandum (TAGM) No.4046
Recommended Soil Cleanup Objectives. Values denoted as Site Background ("SB") in TAGM 4046 were compared with the highlighted values (95th percentile of Seneca Army Depot (SEDA) Site Background) in lieu of the TAGM "SB" since no background cleanup objectives exist for certain parameters.

2. U.S. Environmental Protection Agency Risk Based Residential Cleanup Goal for lead

3. Where exceedances for individual PAHs exist, evaluation of the Benzo(a)pyrene Toxicity Equivalent for total carcinogenic PAHs (cPAHs) would not exceed the 10,000 µg/kg limit for total cPAHs for any sample collected. The cPAHs include: benzo(a)pyrene; dibenzo(a,h)anthracene; benzo(a,h)anthracene; benzo(b)fluoranthene; indeno(1,2,3-cd)pyrene; benzo(k)fluouranthene; and chrysene.

mg/kg= milligram per kilogram

µg/kg= microgram per kilogram

B= Result is less than the CRDL/Reporting Limit (RL), but >/= to the Instrument Detection Limit/method detection limit (MDL).

H= Alternate peak selection upon analytical review

J= Result is less than the RL, but greater than or equal to the MDL.

M= Manually integrated compound.

N= Matrix spike/matrix spike duplicate (MS/MSD): Spike recovery exceeds the upper or lower control limits.

E = Result exceeded calibration range, secondary dilution required.

A = Concentration exceeds the instrument calibration range or below the RL.

U= Analyte was not detected at or above the RL.

95th percentile of SEDA Site Background

Result Exceeds Cleanup Criteria

TABLE 6-33
Summary of TCRA Confirmatory Samples, Area 2 - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Compound	Cleanup Goal[1]	SEAD67-FX-P3-SS-001-FS	SEAD67-PX-P4-SS-001-FS	SEAD67-FX-P5-SS-003-FS	SEAD67-FX-P5-SS-004-FS	SEAD67-FX-P5-SS-007-FS	SEAD67-PX-P5-SS-003-FS	SEAD67-PX-P6-SS-003-FS	SEAD67-PX-P7-SS-002-FS	SEAD67-PX-P7-SS-003-FS	SEAD67-PX-P7-SS-004-FS	SEAD67-PX-A2-SS-001-FS	SEAD67-PX-A2-SS-002-FS
Depth (inches)		0	0	0	0	0	0	0	0	0	0	0	0
Metals		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	19,200	13700	13700	12700		12300	13800	13700		12400			
Antimony	5.9	16.9 u	15.6 u	1.6 u		14.5 u	14.6 u	14.8 u		17.2 u			
Arsenic	8.24	6.7 J	5.3 J	5.8		4.8 J	8.7 j	6 J		5.6 J		5.2	4.4
Barium	300	145	140	102		91.2	111	104		118			
Beryllium	1.1	0.84 J	0.79 J	0.7		0.74 J	0.83 j	0.81 J		2.9 u			
Cadmium	2.3	4.3 u	4 u	1.3 u		3.7 u	3.7 u	3.8 u		4.4 u			
Calcium	120,500	7520	3860	6310		9750	11000	5970		4630			
Chromium	29	21.3	20.4	21.3		19.9	24	23.5		17.9			
Cobalt	30	10.9	8.5	11.7		10.2	12.9	12.9		7.9			
Copper	29.6	23.9	19.6	52.5		22.6	78.8	44.5		20.3			
Iron	35,550	25600	23300	25100		23000	32800	28000		20700			
Lead[2]	400	34.5	20.6	24.1		17.7	36.2	22		24			
Magnesium	21,500	4400	3760	4760		4710	6540	5330		3230			
Manganese	1,056	799	456	632		379	510	403		475			
Mercury	0.1		0.08		0.082	0.071 J			0.1		0.098 J	0.091 B	0.094 B
Nickel	48.9	30	24	31.1		28.8	35.9	35.4		20.4			
Potassium	2,343	2330	1660	1680		1750	1720	1710		1770			
Selenium	2	23.1 u	21.3 u	2.1 u		19.9 u	20 u	20.2 u		23.6 u			
Silver	0.763	4.3 u	4 u	3.4		3.7 u	2.2 j	4.7		4.4 u			
Sodium	170.3	99.1 J	72.1 J	83.9		89.2 J	97.1 j	76.3 J		72.8 J			
Thallium	0.67	31.8 u	29.3 u	4 u		27.3 u	27.4 u	27.8 u		32.4 u			
Vanadium	150	23.3	23	19		18	21.6	20.4		21.6			
Zinc	108.9	106	77.6	107		86	127	118		68.3		72.2	76.2
PAHs[3]		(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
2-Methylnaphthalene	36,400	470 u	450 u	37 u		430 u	450 u	440 u		500 u			
Acenaphthene	50,000	25 J	450 u	20 u		430 u	450 u	32 J		500 u			
Acenaphthylene	41,000	110 J	25 J	15 u		430 u	450 u	440 u		500 u			
Anthracene	50,000	130 J	26 J	25 J		430 u	41 j	43 J		500 u			
Benzo(a)anthracene	224		97 J	90 J		33 J	200 J	180 J		32 J			
Benzo(a)pyrene	61					34 J				35 J			
Benzo(b)fluoranthene	1,100	330 J	91 J	76 J		430 u	200 J	130 J		500 u			
Benzo(ghi)perylene	50,000	170 J	50 J	49 J		430 u	47 J	75 J		500 u			
Benzo(k)fluoranthene	1,100	460 J	93 J	82 J		430 u	200 J	210 J		500 u			
Chrysene	400		120 J	100 J		39 J	230 J	210 J		43 J			
Dibenzo(a,h)anthracene	14												
Fluoranthene	50,000	890	190 J	150 J		57 J	270 J	340 J		67 J			
Fluorene	50,000	57 J	450 u	27 u		36 J	450 u	440 u		500 u			
Indeno(1,2,3-cd)pyrene	3,200	180 J	56 J	52 J		430 u	59 J	84 J		500 u			
Naphthalene	13,000	470 u	450 u	43 u		430 u	450 u	440 u		500 u			
Phenanthrene	50,000	720	150 J	120 J		38 J	150 J	250 J		45 J			
Pyrene	50,000	1300	250 J	210 J		78 J	340 J	420 J		77 J			

TABLE 6-33
Summary of TCRA Confirmatory Samples, Area 2 - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Compound	Cleanup Goal[1]	SEAD67-PX-A2-SS-003-FS	SEAD67-PX-A2-SS-004-FS	SEAD67-PX-A2-SS-005-FS	SEAD67-PX-A2-SS-006-FS	SEAD67-PX-A2-SS-007-FS	SEAD67-PX-A2-SS-008-FS	SEAD67-PX-A2-SS-009-FS	SEAD67-PX-A2-SS-010-FS	SEAD67-PX-A2-SS-011-FS	SEAD67-PX-A2-SS-012-FS	SEAD67-PX-A2-SS-013-FS	SEAD67-PX-A2-SS-014-FS	SEAD67-PX-A2-SS-015-FS
Depth (inches)		0	0	0	0	0	0	0	0	0	0	0	0	0
Metals		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	19,200			11500					11700					8720
Antimony	5.9			0.69 U					0.65 U					0.69 U
Arsenic	8.24	5.2	5.6	4.1 B	4.3 B	4.3	5	5	4.4 B	4.3 B	4.1 B	3.7 B	4.8 B	3.8 B
Barium	300			121					164					72.3
Beryllium	1.1			0.72 B					0.81 B					0.51 B
Cadmium	2.3			0.61 U					0.57 U					0.61 U
Calcium	120,500			5260					4520					3860
Chromium	29			16.2					17					12.6
Cobalt	30			7.3					7.4					7
Copper	29.6			25.1					19.7					15.2
Iron	35,550			19300					21100					16700
Lead[2]	400			29.9					18.4					21.7
Magnesium	21,500			3410					3110					2590
Manganese	1,056			450					485					530
Mercury	0.1	0.082 B	0.11 B	0.1 B	0.13	0.13 B	0.1 B	0.093 B	0.093 B	0.072 B	0.071 B	0.099 B	0.089 B	0.069 B
Nickel	48.9			21.1					20.4					15.9
Potassium	2,343			914					735					807
Selenium	2			1 B					0.91 U					0.97 U
Silver	0.763			0.19 U					0.18 U					0.19 U
Sodium	170.3			45.3 B					36.8 B					26 B
Thallium	0.67			1.2 U					1.1 U					1.2 U
Vanadium	150			18.7					19.8					15.6
Zinc	108.9	78.3	76.9	76.6	71.4	69.7	76.9	68.6	57.8	57.2	59.5	56.5	98.3	53.5
PAHs[3]		(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
2-Methylnaphthalene	36,400			42 U					41 U					85 U
Acenaphthene	50,000			22 U					22 U					46 U
Acenaphthylene	41,000			16 U					16 U					33 U
Anthracene	50,000			23					17 U					36 U
Benzo(a)anthracene	224			62					29					58 J
Benzo(a)pyrene	61			63					29					66
Benzo(b)fluoranthene	1,100			57 U					55 U					120 U
Benzo(ghi)perylene	50,000			38					25 U					52 U
Benzo(k)fluoranthene	1,100			75					57 U					120 U
Chrysene	400			79					35					80 J
Dibenzo(a,h)anthracene	14			12 UM					12 UM					25 UM
Fluoranthene	50,000			140					61					130 J
Fluorene	50,000			30 U					29 U					61 U
Indeno(1,2,3-cd)pyrene	3,200			35					26 U					55 U
Naphthalene	13,000			48 U					47 U					97 U
Phenanthrene	50,000			110					43					100 J
Pyrene	50,000			130					55					130 J

TABLE 6-33
Summary of TCRA Confirmatory Samples, Area 2 - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Compound	Cleanup Goal[1]	SEAD67-PX-A2-SS-016-FS	SEAD67-PX-A2-SS-017-FS	SEAD67-PX-A2-SS-018-FS	SEAD67-PX-A2-SS-019-FS	SEAD67-PX-A2-SS-020-FS	SEAD67-PX-A2-SS-021-FS	SEAD67-FX-A2-SS-001-FS	SEAD67-FX-A2-SS-002-FS	SEAD67-FX-A2-SS-003-FS	SEAD67-FX-A2-SS-004-FS	SEAD67-FX-A2-SS-005-FS	SEAD67-FX-A2-SS-006-FS	SEAD67-FX-A2-SS-007-FS
Depth (inches)		0	0	0	0	0	0	0	0	0	0	0	0	0
Metals		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	19,200					9900						11900		
Antimony	5.9					0.62 U						0.52 U		
Arsenic	8.24	4.8 B	5.4	6.2	5.2 B	4.8	5.5	4.4	4.6	5.7	6.3	4.9	5.1	4.2 B
Barium	300					240						122		
Beryllium	1.1					0.67 B						0.79 B		
Cadmium	2.3					0.54 U						0.46 U		
Calcium	120,500					6020						2400		
Chromium	29					15.4						18.1		
Cobalt	30					9						12.6		
Copper	29.6					20.8						19.5		
Iron	35,550					20100						25500		
Lead[2]	400					56.9						13.4		
Magnesium	21,500					3370						3900		
Manganese	1,056					775						928		
Mercury	0.1	0.098 B	0.071 B	0.093 B	0.092 B	0.16	0.1 B	0.041 B	0.028 B	0.042 B	0.044 B	0.067 B	0.12	0.077 B
Nickel	48.9					22.5						28.5		
Potassium	2,343					1340						727		
Selenium	2					0.86 U						0.73 U		
Silver	0.763					0.17 U						0.15 U		
Sodium	170.3					29.7 B						24.4 B		
Thallium	0.67					1.1 U						0.9 U		
Vanadium	150					17.4						20		
Zinc	108.9	68.9	75	106	91.7	91.7	78.7	57.6	58.6	76.2	55.2	62.7	68.9	81.4
PAHs[3]		(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
2-Methylnaphthalene	36,400					78 U						34 U		
Acenaphthene	50,000					42 U						18 U		
Acenaphthylene	41,000					47 J						13 U		
Anthracene	50,000					50 J						15 U		
Benzo(a)anthracene	224					120 J						18 U		
Benzo(a)pyrene	61					120						10 U		
Benzo(b)fluoranthene	1,100					120 J						47 U		
Benzo(ghi)perylene	50,000					75 J						21 U		
Benzo(k)fluoranthene	1,100					140 J						48 U		
Chrysene	400					150 J						21 U		
Dibenzo(a,h)anthracene	14					27 M						10 U		
Fluoranthene	50,000					240 J						27 U		
Fluorene	50,000					56 U						25 U		
Indeno(1,2,3-cd)pyrene	3,200					73 J						22 U		
Naphthalene	13,000					89 U						39 U		
Phenanthrene	50,000					190 J						29 U		
Pyrene	50,000					230 J						23 U		

TABLE 6-33
Summary of TCRA Confirmatory Samples, Area 2 - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Compound	Cleanup Goal[1]	SEAD67-FX-A2-SS-008-FS	SEAD67-FX-A2-SS-009-FS	SEAD67-FX-A2-SS-010-FS	SEAD67-FX-A2-SS-011-FS	SEAD67-FX-A2-SS-012-FS	SEAD67-FX-A2-SS-013-FS	SEAD67-FX-A2-SS-014-FS	SEAD67-FX-A2-SS-015-FS	SEAD67-FX-A2-SS-016-FS	SEAD67-FX-A2-SS-017-FS	SEAD67-FX-A2-SS-018-FS	SEAD67-FX-A2-SS-019-FS	SEAD67-FX-A2-SS-020-FS
Depth (inches)		0	0	0	0	0	0	0	0	0	0	0	0	0
Metals		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	19,200			12000					13600					11700
Antimony	5.9			0.5 U					0.55 U					0.54 U
Arsenic	8.24	5.1	3.3 B	5.3	5.5	6.8	4.6	5.9	6	6.2	4.4 B	6.1	4.7	5.1
Barium	300			146					113					76.3
Beryllium	1.1			0.7 B					0.89 B					0.73 B
Cadmium	2.3			0.44 U					0.48 U					0.48 U
Calcium	120,500			3190					3550					2440
Chromium	29			18.8					22					19.3
Cobalt	30			11.6					11.4					10.3
Copper	29.6			23.6					26.5					19.8
Iron	35,550			26200					29800					25300
Lead[2]	400			11.6					13.2					11.5
Magnesium	21,500			4620					4790					4290
Manganese	1,056			729					645					433
Mercury	0.1	0.055 B	0.099 B	0.036 B	0.058 B	0.099 B	0.081 B	0.027 B	0.065 B	0.046 B	0.042 B	0.036 B	0.046 B	0.038 B
Nickel	48.9			33					35.6					29
Potassium	2,343			687					748					587
Selenium	2			0.7 U					0.77 U					0.76 U
Silver	0.763			0.14 U					0.15 U					0.15 U
Sodium	170.3			32.4 B					29.9 B					27.9 B
Thallium	0.67			0.87 U					0.95 U					0.94 U
Vanadium	150			20.4					23.7					20
Zinc	108.9	66.7	47.9	60.4	64.2	79.2	71.4	59.4	71.7	77.7	61.3	66.3	65.2	59.7
PAHs[3]		(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
2-Methylnaphthalene	36,400			34 U					76 U					34 U
Acenaphthene	50,000			18 U					41 U					18 U
Acenaphthylene	41,000			13 U					30 U					13 U
Anthracene	50,000			15 U					41 J					14 U
Benzo(a)anthracene	224			18 U					86 J					18 U
Benzo(a)pyrene	61			10 U					87					10 U
Benzo(b)fluoranthene	1,100			46 U					100 U					45 U
Benzo(ghi)perylene	50,000			21 U					51 J					20 U
Benzo(k)fluoranthene	1,100			47 U					110 U					47 U
Chrysene	400			21 U					95 J					20 U
Dibenzo(a,h)anthracene	14			10 U					23 UM					10 U
Fluoranthene	50,000			27 U					190 J					26 U
Fluorene	50,000			24 U					54 U					24 U
Indeno(1,2,3-cd)pyrene	3,200			22 U					49 U					22 U
Naphthalene	13,000			39 U					87 U					38 U
Phenanthrene	50,000			29 U					170 J					29 U
Pyrene	50,000			23 U					170 J					23 U

TABLE 6-33
Summary of TCRA Confirmatory Samples, Area 2 - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Compound	Cleanup Goal[1]	SEAD67-FX-A2-SS-021-FS	SEAD67-FX-A2-SS-022-FS	SEAD67-FX-A2-SS-023-FS	SEAD67-FX-A2-SS-024-FS	SEAD67-FX-A2-SS-025-FS
Depth (inches)		0	0	0	0	0
Metals		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	19,200					10300
Antimony	5.9					0.57 U
Arsenic	8.24	5.5	6.7	5.8	4.5 B	5
Barium	300					96.1
Beryllium	1.1					0.71 B
Cadmium	2.3					0.5 U
Calcium	120,500					2530
Chromium	29					17.1
Cobalt	30					12.3
Copper	29.6					19.8
Iron	35,550					24700
Lead[2]	400					14.6
Magnesium	21,500					3420
Manganese	1,056					577
Mercury	0.1	0.036 B	0.091 B	0.033 B	0.053 B	0.044 B
Nickel	48.9					25.7
Potassium	2,343					529
Selenium	2					0.8 U
Silver	0.763					0.16 U
Sodium	170.3					25.4 B
Thallium	0.67					0.99 U
Vanadium	150					19.5
Zinc	108.9	50.9	82.6	64.3	59.3	52
PAHs[3]		(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
2-Methylnaphthalene	36,400					35 U
Acenaphthene	50,000					19 U
Acenaphthylene	41,000					14 U
Anthracene	50,000					15 U
Benzo(a)anthracene	224					19 U
Benzo(a)pyrene	61					10 U
Benzo(b)fluoranthene	1,100					48 U
Benzo(ghi)perylene	50,000					21 U
Benzo(k)fluoranthene	1,100					49 U
Chrysene	400					21 U
Dibenzo(a,h)anthracene	14					10 U
Fluoranthene	50,000					28 U
Fluorene	50,000					25 U
Indeno(1,2,3-cd)pyrene	3,200					23 U
Naphthalene	13,000					40 U
Phenanthrene	50,000					30 U
Pyrene	50,000					24 U

Table Notes

1. The Cleanup goal is based on the New York Technical Administrative Guidance Memorandum (TAGM) No.4046
Recommended Soil Cleanup Objectives. Values denoted as Site Background ("SB") in TAGM 4046 were compared with the highlighted values (95th percentile of Seneca Army Depot (SEDA) Site Background) in lieu of the TAGM "SB" since no background cleanup objectives exist for certain parameters.

2. U.S. Environmental Protection Agency Risk Based Residential Cleanup Goal for lead

3. Where exceedances for individual PAHs exist, evaluation of the Benzo(a)pyrene Toxicity Equivalent for total carcinogenic PAHs (cPAHs) would not exceed the 10,000 µg/kg limit for total cPAHs for any sample collected. The cPAHs include: benzo(a)pyrene; dibenzo(a,h)anthracene; benzo(a,h)anthracene; benzo(b)fluoranthene; indeno(1,2,3-cd)pyrene; benzo(k)fluouranthene; and chrysene.

mg/kg= milligram per kilogram

µg/kg= microgram per kilogram

B= Result is less than the CRDL/Reporting Limit (RL), but >/= to the Instrument Detection Limit/method detection limit (MDL).

H= Alternate peak selection upon analytical review

J= Result is less than the RL, but greater than or equal to the MDL.

M= Manually integrated compound.

N= Matrix spike/matrix spike duplicate (MS/MSD): Spike recovery exceeds the upper or lower control limits.

E = Result exceeded calibration range, secondary dilution required.

A = Concentration exceeds the instrument calibration range or below the RL.

U= Analyte was not detected at or above the RL.

95th percentile of SEDA Site Background

Result Exceeds Cleanup Criteria

TABLE 6-34
Summary of ESI Soil Analytical Results - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
SVOCs							
2-Methylnaphthalene	ug/Kg	44	25%	36,400	0	2	8
Acenaphthene	ug/Kg	50	13%	50,000	0	1	8
Acenaphthylene	ug/Kg	210	50%	41,000	0	4	8
Anthracene	ug/Kg	140	50%	50,000	0	4	8
Benzo(a)anthracene	ug/Kg	610	63%	220	4	5	8
Benzo(a)pyrene	ug/Kg	830	63%	61	4	5	8
Benzo(b)fluoranthene	ug/Kg	1,300	63%	1,100	1	5	8
Benzo(g,h,i)perylene	ug/Kg	620	63%	50,000	0	5	8
Benzo(k)fluoranthene	ug/Kg	28	13%	1,100	0	1	8
bis(2-Ethylhexyl)phthalate	ug/Kg	250	38%	50,000	0	3	8
Carbazole	ug/Kg	80	38%	50,000	0	3	8
Chrysene	ug/Kg	690	63%	400	1	5	8
Dibenz(a,h)anthracene	ug/Kg	310	50%	14	4	4	8
Dibenzofuran	ug/Kg	50	13%	6,200	0	1	8
Di-n-butylphthalate	ug/Kg	47	13%	8,100	0	1	8
Fluoranthene	ug/Kg	860	75%	50,000	0	6	8
Fluorene	ug/Kg	110	38%	50,000	0	3	8
Indeno(1,2,3-cd)pyrene	ug/Kg	620	63%	3,200	0	5	8
Naphthalene	ug/Kg	34	25%	13,000	0	2	8
Phenanthrene	ug/Kg	740	63%	50,000	0	5	8
Pyrene	ug/Kg	950	75%	50,000	0	6	8
Pesticides/PCBs							
4,4'-DDE	ug/Kg	4.8	50%	2,100	0	4	8
4,4'-DDT	ug/Kg	9.4	38%	2,100	0	3	8
alpha-Chlordane	ug/Kg	2.1	38%	540	0	3	8
Aroclor-1254	ug/Kg	72	13%	1,000	0	1	8
Endosulfan I	ug/Kg	25	75%	900	0	6	8
Endosulfan sulfate	ug/Kg	2.1	13%	1,000	0	1	8
Heptachlor epoxide	ug/Kg	5.5	25%	20	0	2	8
Metals							
Aluminum	mg/Kg	19,100	100%	19,300	0	8	8
Antimony	mg/Kg	0.44	63%	5.9	0	5	8
Arsenic	mg/Kg	6	100%	8.2	0	8	8
Barium	mg/Kg	182	100%	300	0	8	8
Beryllium	mg/Kg	0.87	100%	1.1	0	8	8
Cadmium	mg/Kg	0.73	100%	2.3	0	8	8
Calcium	mg/Kg	139,000	100%	121,000	1	8	8
Chromium	mg/Kg	24.8	100%	29.6	0	8	8
Cobalt	mg/Kg	12.8	100%	30	0	8	8
Copper	mg/Kg	29.7	100%	33	0	8	8
Iron	mg/Kg	27,300	100%	36,500	0	8	8
Lead	mg/Kg	40.9	100%	24.8	1	8	8
Magnesium	mg/Kg	20,900	100%	21,500	0	8	8
Manganese	mg/Kg	1,380	100%	1,060	1	8	8
Mercury	mg/Kg	4	100%	0.1	3	8	8
Nickel	mg/Kg	32.3	100%	49	0	8	8
Potassium	mg/Kg	3,160	100%	2,380	2	8	8
Selenium	mg/Kg	2	75%	2	0	6	8
Sodium	mg/Kg	112	75%	172	0	6	8
Thallium	mg/Kg	0.48	13%	0.7	0	1	8
Vanadium	mg/Kg	31.8	100%	150	0	8	8
Zinc	mg/Kg	100	100%	110	0	8	8
Other Analyses							
Total Solids	%W/W	90.2	100%		0	8	8

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-35
Summary of ESI Groundwater Analytical Results - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	Criteria Level [2]		Number of Exceedances	Number of Detects	Number of Analyses
METALS								
Aluminum	ug/L	5,790	100%	50	(a)	3	3	3
Arsenic	ug/L	2.5	33%	10	(b)	0	1	3
Barium	ug/L	203	100%	1,000		0	3	3
Beryllium	ug/L	0.72	33%	4	(c)	0	1	3
Calcium	ug/L	351,000	100%			0	3	3
Chromium	ug/L	10	100%	50		0	3	3
Cobalt	ug/L	12.3	100%			0	3	3
Copper	ug/L	13.1	100%	200		0	3	3
Iron	ug/L	10,800	100%	300		3	3	3
Lead	ug/L	8.3	33%	15	(c)	0	1	3
Magnesium	ug/L	51,800	100%			0	3	3
Manganese	ug/L	1,710	100%	50	(a)	3	3	3
Mercury	ug/L	0.09	67%	0.7		0	2	3
Nickel	ug/L	15.9	100%	100		0	3	3
Potassium	ug/L	5,740	100%			0	3	3
Sodium	ug/L	13,700	100%	20,000		0	3	3
Thallium	ug/L	2	33%	2	(c)	0	1	3
Vanadium	ug/L	9.2	100%			0	3	3
Zinc	ug/L	29.6	100%	5,000	(a)	0	3	3
OTHER ANALYSES								
Turbidity	NTU	>1000	67%			0	2	2

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater, except as noted below.

a) USEPA Secondary Drinking Water Regulation, non-enforceable (EPA 822-B-00-001, Summer 2000)

b) USEPA Maximum Contaminant Limit announced 10/31/01. Source http://www.epa.gov/safewater/arsenic.html

c) USEPA National Primary Drinking Water Standards, EPA 816-F-01-007 March 2001

NTU = Nephelometric turbidity unit

TABLE 6-36
Summary of ESI Surface Water Analytical Results - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC AWQS Class C [2]	Number of Exceedances	Number of Detects	Number of Analyses
METALS							
Aluminum	ug/L	129	100%	100	1	2	2
Barium	ug/L	45.8	100%		0	2	2
Calcium	ug/L	77,100	100%		0	2	2
Copper	ug/L	1.1	100%	17.3	0	2	2
Iron	ug/L	369	100%	300	1	2	2
Magnesium	ug/L	14,700	100%		0	2	2
Manganese	ug/L	161	100%		0	2	2
Potassium	ug/L	1,160	100%		0	2	2
Sodium	ug/L	7,860	100%		0	2	2
Thallium	ug/L	2.1	50%	8	0	1	2
Zinc	ug/L	3.3	100%	159.2	0	2	2
OTHER ANALYSES							
pH	Standard Units	7.9	100%	6.5 - 9	0	2	2
Conductivity	umhos/cm	445	100%		0	2	2
Temperature	°C	22.7	100%		0	2	2
Turbidity	NTU	1.6	100%		0	2	2

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class C Surface Water.

Hardness dependent values assume a hardness of 216.4 mg/L (SEDA site-wide average).

NTU = Nephelometric turbidity unit

TABLE 6-37
Summary of ESI Sediment Analytical Results - SEAD-67
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC Sediment Criteria [2]		Number of Exceedances	Number of Detects	Number of Analyses
VOCs								
2-Butanone	ug/Kg	53	50%			0	1	2
Acetone	ug/Kg	21	50%			0	1	2
SVOCs								
Acenaphthene	ug/Kg	120	50%	5,474	(a)	0	1	2
Acenaphthylene	ug/Kg	54	50%			0	1	2
Anthracene	ug/Kg	600	50%	4,184	(a)	0	1	2
Benzo(a)anthracene	ug/Kg	1400	100%	50.83	(b)	2	2	2
Benzo(a)pyrene	ug/Kg	970	100%	50.83	(b)	2	2	2
Benzo(b)fluoranthene	ug/Kg	880	100%	50.83	(b)	2	2	2
Benzo(g,h,i)perylene	ug/Kg	370	100%			0	2	2
Benzo(k)fluoranthene	ug/Kg	930	100%	50.83	(b)	2	2	2
Carbazole	ug/Kg	78	50%			0	1	2
Chrysene	ug/Kg	1300	100%	50.83	(b)	2	2	2
Dibenz(a,h)anthracene	ug/Kg	230	50%			0	1	2
Dibenzofuran	ug/Kg	83	50%			0	1	2
Fluoranthene	ug/Kg	3400	100%	39,887	(a)	0	2	2
Fluorene	ug/Kg	270	50%	312.8	(a)	0	1	2
Indeno(1,2,3-cd)pyrene	ug/Kg	460	100%	50.83	(b)	2	2	2
Phenanthrene	ug/Kg	2400	100%	4,692	(a)	0	2	2
Pyrene	ug/Kg	3000	100%	37,580	(a)	0	2	2
PESTICIDES/PCBs								
4,4'-DDT	ug/Kg	4.1	50%	0.39	(b)	1	1	2
alpha-Chlordane	ug/Kg	4.8	100%	0.039	(b)	2	2	2
Endosulfan I	ug/Kg	4.1	50%	1.17	(a)	1	1	2
METALS								
Aluminum	mg/Kg	12000	100%			0	2	2
Arsenic	mg/Kg	4.2	100%	6	(c)	0	2	2
Barium	mg/Kg	95.8	100%			0	2	2
Beryllium	mg/Kg	0.58	100%			0	2	2
Cadmium	mg/Kg	0.37	100%	0.6	(c)	0	2	2
Calcium	mg/Kg	13200	100%			0	2	2
Chromium	mg/Kg	18	100%	26	(c)	0	2	2
Cobalt	mg/Kg	8.3	100%			0	2	2
Copper	mg/Kg	37.7	100%	16	(c)	2	2	2
Iron	mg/Kg	19800	100%	20,000	(c)	0	2	2
Lead	mg/Kg	17.8	100%	31	(c)	0	2	2
Magnesium	mg/Kg	5030	100%			0	2	2
Manganese	mg/Kg	731	100%	460	(c)	1	2	2
Nickel	mg/Kg	23.2	100%	16	(c)	2	2	2
Potassium	mg/Kg	1650	100%			0	2	2
Silver	mg/Kg	1.7	100%	1	(c)	2	2	2
Sodium	mg/Kg	107	100%			0	2	2
Vanadium	mg/Kg	20.4	100%			0	2	2
Zinc	mg/Kg	85.4	100%	120	(c)	0	2	2

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical Guidance for Screening Contaminated Sediments - January 1999

a) Benthic Aquatic Life Chronic Toxicity Criteria

b) Human Health Bioaccumulation Criteria

c) Lowest Effect Level

All organic criteria values derived based on assumed Total Organic Carbon content of 39,105 mg/Kg (SEDA average value).

TABLE 6-38
Summary of Lead Results in Soil After the Treatability Study - SEAD-122B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	Criteria Value [2]	Number of Exceedances	Number of Detects	Number of Analyses
Metals							
Lead	mg/Kg	299	100%	400	0	85	85

NOTES:
(1) Only lead results were analyszed in the Treatability Study.
(2) USEPA Risk Based Residential Cleanup Goal for lead.

TABLE 6-39
Summary of 2002 Soil Analytical Results - SEAD-122B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
Aluminum	mg/Kg	15,100	100%	19,300	0	26	26
Antimony	mg/Kg	670	50%	5.9	2	13	26
Arsenic	mg/Kg	84.6	100%	8.2	2	26	26
Barium	mg/Kg	129	100%	300	0	26	26
Beryllium	mg/Kg	0.81	100%	1.1	0	26	26
Cadmium	mg/Kg	0.9	65%	2.3	0	17	26
Calcium	mg/Kg	191,000	100%	121,000	1	26	26
Chromium	mg/Kg	26.8	100%	29.6	0	26	26
Cobalt	mg/Kg	13.2	100%	30	0	26	26
Copper	mg/Kg	5,690	100%	33	5	26	26
Iron	mg/Kg	28,700	100%	36,500	0	26	26
Lead	mg/Kg	88,700	100%	400	6	85	85
Magnesium	mg/Kg	24,100	100%	21,500	1	26	26
Manganese	mg/Kg	789	100%	1,060	0	26	26
Mercury	mg/Kg	0.078	8%	0.1	0	2	26
Nickel	mg/Kg	40.4	100%	49	0	26	26
Potassium	mg/Kg	2,350	100%	2,380	0	26	26
Selenium	mg/Kg	1.7	35%	2	0	9	26
Silver	mg/Kg	3.4	8%	0.75	1	2	26
Sodium	mg/Kg	388	35%	172	3	9	26
Thallium	mg/Kg	1.7	15%	0.7	2	4	26
Vanadium	mg/Kg	25.3	100%	150	0	26	26
Zinc	mg/Kg	630	100%	110	1	26	26
Total Organic Carbon	mg/Kg	56,500	100%	NS	0	43	43

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-40
Summary of 2002 Groundwater Analytical Results - SEAD-122B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	Criteria Level [2]	Number of Exceedances	Number of Detects	Number of Analyses
METALS							
Aluminum	ug/L	508	100%		0	4	4
Antimony	ug/L	19.7	100%	3	4	4	4
Arsenic	ug/L	4.6	50%	25	0	2	4
Barium	ug/L	49.8	100%	1,000	0	4	4
Beryllium	ug/L	0.32	75%	3	0	3	4
Cadmium	ug/L	2.3	75%	5	0	3	4
Calcium	ug/L	118,000	100%		0	4	4
Chromium	ug/L	12.5	100%	50	0	4	4
Copper	ug/L	8.8	100%	200	0	4	4
Iron	ug/L	580	100%	300	2	4	4
Magnesium	ug/L	35,800	100%		0	4	4
Manganese	ug/L	293	100%	300	0	4	4
Nickel	ug/L	3.7	25%	100	0	1	4
Potassium	ug/L	9,920	100%		0	4	4
Sodium	ug/L	18,400	100%		0	4	4
Vanadium	ug/L	14.0	100%		0	4	4
Zinc	ug/L	7.0	100%	2,000 (GV)	0	4	4

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater.
GV = Guidance value

TABLE 6-41
Summary of EBS Soil Analytical Results - SEAD-122B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Units	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
Metals							
Aluminum	mg/Kg	6,910	100%	19,520	0	6	6
Antimony	mg/Kg	393	100%	6	3	6	6
Arsenic	mg/Kg	117	100%	8.9	2	6	6
Barium	mg/Kg	107	100%	300	0	6	6
Beryllium	mg/Kg	0.2	100%	1.13	0	6	6
Cadmium	mg/Kg	1.1	33%	2.46	0	2	6
Calcium	mg/Kg	54,800	100%	125,300	0	6	6
Chromium	mg/Kg	69.8	100%	30	1	6	6
Cobalt	mg/Kg	6.6	100%	30	0	6	6
Copper	mg/Kg	380	100%	33	6	6	6
Cyanide	mg/Kg	0.8	17%	0.35	1	1	6
Iron	mg/Kg	12,900	100%	37,410	0	6	6
Lead	mg/Kg	42,900	100%	24.4	6	6	6
Magnesium	mg/Kg	15,100	100%	21,700	0	6	6
Manganese	mg/Kg	379	100%	1,100	0	6	6
Nickel	mg/Kg	15.3	100%	50	0	6	6
Potassium	mg/Kg	1,180	100%	2,623	0	6	6
Silver	mg/Kg	1.4	33%	0.8	2	2	6
Vanadium	mg/Kg	12	100%	150	0	6	6
Zinc	mg/Kg	96.5	100%	115	0	6	6

NOTES:
(1) Only compounds that were detected were included in this list of parameters.
(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-42
Summary of Soil Analytical Results - SEAD-122E
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Unit	Maximum Value	Frequency of Detection	NYSDEC TAGM 4046 [2]	Number of Exceedances	Number of Detects	Number of Analyses
SVOCs							
Acenaphthene	ug/Kg	340	33%	50,000	0	2	6
Anthracene	ug/Kg	890	67%	50,000	0	4	6
Benzo(a)anthracene	ug/Kg	6,600	83%	224	2	5	6
Benzo(a)pyrene	ug/Kg	8,400	83%	61	2	5	6
Benzo(b)fluoranthene	ug/Kg	11,000	83%	1,100	1	5	6
Benzo(ghi)perylene	ug/Kg	5,500	83%	50,000	0	5	6
Benzo(k)fluoranthene	ug/Kg	11,000	83%	1,100	1	5	6
Bis(2-Ethylhexyl)phthalate	ug/Kg	11	83%	50,000	0	5	6
Butylbenzylphthalate	ug/Kg	5.8	17%	50,000	0	1	6
Carbazole	ug/Kg	2,000	83%		0	5	6
Chrysene	ug/Kg	10,000	83%	400	2	5	6
Di-n-octylphthalate	ug/Kg	6.4	17%	50,000	0	1	6
Dibenz(a,h)anthracene	ug/Kg	1,900	83%	14	5	5	6
Dibenzofuran	ug/Kg	240	33%	6,200	0	2	6
Diethyl phthalate	ug/Kg	36	83%	7,100	0	5	6
Fluoranthene	ug/Kg	22,000	100%	50,000	0	6	6
Fluorene	ug/Kg	440	33%	50,000	0	2	6
Indeno(1,2,3-cd)pyrene	ug/Kg	5,300	83%	3,200	1	5	6
Phenanthrene	ug/Kg	10,000	83%	50,000	0	5	6
Pyrene	ug/Kg	18,000	83%	50,000	0	5	6

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994, which are a To Be Considered (TBC) criteria.

TABLE 6-43
Summary of Groundwater Analytical Results - SEAD-122E
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

Parameter [1]	Unit	Maximum Value	Frequency of Detection	Criteria Level [2]	Number of Exceedances	Number of Detects	Number of Analyses
SVOCs							
Bis(2-Ethylhexyl)phthalate	ug/L	1.2	100%	50	0	4	4
Fluoranthene	ug/L	0.26	25%		0	1	4
Hexachlorobutadiene	ug/L	0.31	25%	0.5	0	1	4
Phenanthrene	ug/L	0.16	25%		0	1	4
Pyrene	ug/L	0.23	25%		0	1	4

Notes:

(1) Only compounds that were detected were included in this list of parameters.

(2) NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1, Revised June 2004), Class GA Groundwater, except as noted below.

TABLE 7-1
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-13
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
PARK WORKER	**Inhalation of Dust in Ambient Air**	**NQ**	**7E-08**
	Ingestion of Soil	**8E-02**	**2E-06**
	Dermal Contact to Soil	**3E-03**	**4E-07**
	Ingestion of Groundwater	**7E+00**	**8E-07**
	Dermal Contact to Surface Water	**3E-03**	**4E-09**
	Dermal Contact to Sediment	**7E-04**	**2E-07**
	TOTAL RECEPTOR RISK (Nc & Car)	***7E+00***	***4E-06***
RECREATIONAL VISITOR (CHILD)	**Inhalation of Dust Ambient Air**	**NQ**	**3E-09**
	Ingestion of Soil	**6E-02**	**3E-07**
	Dermal Contact to Soil	**8E-04**	**3E-08**
	Inhalation of Groundwater	**NQ**	**NQ**
	Ingestion of Groundwater	**3E+00**	**6E-08**
	Dermal Contact to Groundwater	**1E-01**	**3E-08**
	Dermal Contact to Surface Water	**7E-03**	**2E-09**
	Dermal Contact to Sediment	**2E-03**	**9E-08**
	TOTAL RECEPTOR RISK (Nc & Car)	***3E+00***	***5E-07***
CONSTRUCTION WORKER	**Inhalation of Dust in Ambient Air**	**NQ**	**3E-08**
	Ingestion of Soil	**4E-01**	**4E-07**
	Dermal Contact to Soil	**4E-03**	**2E-08**
	TOTAL RECEPTOR RISK (Nc & Car)	***4E-01***	***5E-07***

NQ= Not Quantified due to lack of toxicity data.
Note: Risk assessment was revised in February 2005 and submitted to NYSDEC and USEPA in a technical memorandum.

TABLE 7-1
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-13
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
RESIDENT (ADULT)	Inhalation of Dust in Ambient Air	NQ	1E-07
	Ingestion of Soil	2E-01	4E-06
	Dermal Contact to Soil	3E-03	5E-07
	Inhalation of Groundwater	NQ	NQ
	Ingestion of Groundwater	4E+01	2E-04
	Dermal Contact to Groundwater	2E+00	2E-06
	TOTAL RECEPTOR RISK (Nc & Car)	*4E+01*	*2E-04*
RESIDENT (CHILD)	Inhalation of Dust Ambient Air	NQ	1E-07
	Ingestion of Soil	1E+00	1E-05
	Dermal Contact to Soil	2E-02	8E-07
	Inhalation of Groundwater	NQ	NQ
	Ingestion of Groundwater	8E+01	1E-04
	Dermal Contact to Groundwater	3E+00	8E-07
	TOTAL RECEPTOR RISK (Nc & Car)	*9E+01*	*1E-04*
TOTAL LIFETIME CANCER RISK	Inhalation of Dust in Ambient Air		2E-07
	Ingestion of Soil		1E-05
	Dermal Contact to Soil		1E-06
	Inhalation of Ground Water		NQ
	Ingestion of Ground Water		3E-04
	Dermal Contact to Ground Water		3E-06
	TOTAL RECEPTOR RISK (Nc & Car)		*4E-04*

NQ= Not Quantified due to lack of toxicity data.
Note: Risk assessment was revised in February 2005 and submitted to NYSDEC and USEPA in a technical memorandum.

TABLE 7-2
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS - SEAD-39
REASONABLE MAXIMUM EXPOSURE (RME)
SEAD-39 - UCL without SEAD39-PX-SS-003FS
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	REASONABLE MAXIMUM EXPOSURE (RME)			
		HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
INDUSTRIAL WORKER	Inhalation of Dust in Ambient Air	2E-05	0%	2E-07	0%
	Ingestion of Soil	3E-02	82%	3E-05	56%
	Dermal Contact to Soil	6E-03	18%	3E-05	43%
	TOTAL RECEPTOR RISK (Nc & Car)	*4E-02*	100%	*6E-05*	100%
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	5E-04	0%	1E-07	2%
	Ingestion of Soil	1E-01	91%	5E-06	72%
	Dermal Contact to Soil	1E-02	9%	2E-06	25%
	TOTAL RECEPTOR RISK (Nc & Car)	*1E-01*	100%	*6E-06*	100%
ADOLESCENT TRESPASSER	Inhalation of Dust in Ambient Air	2E-07	0%	2E-10	0%
	Ingestion of Soil	2E-03	88%	5E-07	68%
	Dermal Contact to Soil	3E-04	12%	3E-07	32%
	TOTAL RECEPTOR RISK (Nc & Car)	*3E-03*	100%	*8E-07*	100%
DAY CARE CENTER CHILD	Inhalation of Dust in Ambient Air	1E-05	0%	2E-08	0%
	Ingestion of Soil	3E-01	91%	8E-05	75%
	Dermal Contact to Soil	3E-02	9%	3E-05	25%
	TOTAL RECEPTOR RISK (Nc & Car)	*3E-01*	100%	*1.0E-04*	100%

UCL of the data without the maximum hit used as EPC.

TABLE 7-3
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-39
Central Tendency Exposure (CTE)
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	CENTRAL TENDENCY EXPOSURE (CTE)			
		HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
INDUSTRIAL WORKER	Inhalation of Dust in Ambient Air	5E-05	0%	8E-08	0%
	Ingestion of Soil	2E-02	94%	5E-05	85%
	Dermal Contact to Soil	1E-03	6%	8E-06	14%
	TOTAL RECEPTOR RISK (Nc & Car)	*2E-02*	100%	*6E-05*	100%
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	2E-03	3%	3E-07	1%
	Ingestion of Soil	4E-02	66%	1E-05	43%
	Dermal Contact to Soil	2E-02	31%	1E-05	55%
	TOTAL RECEPTOR RISK (Nc & Car)	*6E-02*	100%	*3E-05*	100%
ADOLESCENT TRESPASSER	Inhalation of Dust in Ambient Air	7E-07	0%	6E-10	0%
	Ingestion of Soil	2E-03	95%	2E-06	87%
	Dermal Contact to Soil	9E-05	5%	4E-07	13%
	TOTAL RECEPTOR RISK (Nc & Car)	*2E-03*	100%	*3E-06*	100%
DAY CARE CENTER CHILD	Inhalation of Dust in Ambient Air	6E-05	0%	6E-08	0%
	Ingestion of Soil	2E-01	95%	3E-04	87%
	Dermal Contact to Soil	1E-02	5%	4E-05	13%
	TOTAL RECEPTOR RISK (Nc & Car)	*2E-01*	100%	*4E-04*	100%

UCL used as EPC

TABLE 7-4
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS - SEAD-40
REASONABLE MAXIMUM EXPOSURE (RME)
SEAD-40 Mini-Risk Assessment
Record of Decision for Sites Requiring Ics
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	REASONABLE MAXIMUM EXPOSURE (RME)			
		HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
INDUSTRIAL WORKER	Inhalation of Dust in Ambient Air	0E+00	0%	2E-07	0%
	Ingestion of Soil	4E-02	83%	3E-05	57%
	Dermal Contact to Soil	8E-03	17%	2E-05	42%
	TOTAL RECEPTOR RISK (Nc & Car)	*5E-02*	100%	*6E-05*	100%
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	0E+00	0%	1E-08	0%
	Ingestion of Soil	1E-01	92%	4E-06	75%
	Dermal Contact to Soil	1E-02	8%	1E-06	25%
	TOTAL RECEPTOR RISK (Nc & Car)	*1E-01*	100%	*6E-06*	100%
ADOLESCENT TRESPASSER	Inhalation of Dust in Ambient Air	0E+00	0%	3E-10	0%
	Ingestion of Soil	3E-03	89%	5E-07	69%
	Dermal Contact to Soil	4E-04	11%	2E-07	31%
	TOTAL RECEPTOR RISK (Nc & Car)	*3E-03*	100%	*7E-07*	100%
DAY CARE CENTER CHILD	Inhalation of Dust in Ambient Air	0E+00	0%	3E-08	0%
	Ingestion of Soil	4E-01	92%	7E-05	76%
	Dermal Contact to Soil	3E-02	8%	2E-05	24%
	TOTAL RECEPTOR RISK (Nc & Car)	*4E-01*	100%	*9.6E-05*	100%

Note: UCLs were used as EPCs.

TABLE 7-5
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS - SEAD-41
REASONABLE MAXIMUM EXPOSURE (RME)
SEAD-41 MiniRisk Assessment
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

		REASONABLE MAXIMUM EXPOSURE (RME)			
RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	0E+00		2E-10	0%
	Ingestion of Soil	0E+00		3E-07	72%
	Dermal Contact to Soil	0E+00		1E-07	28%
	TOTAL RECEPTOR RISK (Nc & Car)	*0E+00*		*5E-07*	100%
ADULT RESIDENT	Inhalation of Dust in Ambient Air	0E+00		4E-09	0%
	Ingestion of Soil	0E+00		4E-06	66%
	Dermal Contact to Soil	0E+00		2E-06	34%
	TOTAL RECEPTOR RISK (Nc & Car)	*0E+00*		*5E-06*	100%
CHILD RESIDENT	Inhalation of Dust in Ambient Air	0E+00		1E-09	0%
	Ingestion of Soil	0E+00		8E-06	73%
	Dermal Contact to Soil	0E+00		3E-06	27%
	TOTAL RECEPTOR RISK (Nc & Car)	*0E+00*		*1E-05*	100%
RESIDENT (TOTAL)	Inhalation of Dust in Ambient Air			5E-09	0%
	Ingestion of Soil			1E-05	71%
	Dermal Contact to Soil			5E-06	29%
	TOTAL RECEPTOR RISK (Nc & Car)			*2E-05*	100%

TABLE 7-6
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-43/56/69
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
PRISON INMATE	Inhalation of Dust in Ambient Air	6E-07	1E-08
	Ingestion of Onsite Soils	2E-02	6E-06
	Dermal Contact to Onsite Soils	2E-02	NQ
	Ingestion of Groundwater	2E-03	NQ
	Inhalation of Groundwater	NQ	NQ
	Dermal Contact to Groundwater	6E-04	NQ
	TOTAL RECEPTOR RISK (Nc & Car)	*5E-02*	*6E-06*
PRISON WORKER	Inhalation of Dust Ambient Air	2E-07	4E-09
	Ingestion of Onsite Soils	1E-02	5E-06
	Dermal Contact to Onsite Soils	2E-02	NQ
	Ingestion of Groundwater	1E-03	NQ
	Inhalation of Groundwater	NQ	NQ
	Dermal Contact to Groundwater	4E-04	NQ
	TOTAL RECEPTOR RISK (Nc & Car)	*3E-02*	*5E-06*
ON-SITE CONSTRUCTION WORKERS	Inhalation of Dust in Ambient Air	8E-07	5E-10
	Ingestion of Onsite Soils	6E-03	1E-07
	Dermal Contact to Onsite Soils	2E-03	NQ
	TOTAL RECEPTOR RISK (Nc & Car)	*8E-03*	*1E-07*
DAY CARE CENTER CHILD	Inhalation of Dust in Ambient Air	5E-07	3E-09
	Ingestion of Onsite Soils	1E-01	1E-05
	Dermal Contact to Onsite Soils	3E-02	NQ
	Ingestion of Groundwater	3E-03	NQ
	TOTAL RECEPTOR RISK (Nc & Car)	*1E-01*	*1E-05*
DAY CARE CENTER WORKER	Inhalation of Dust in Ambient Air	2E-07	4E-09
	Ingestion of Onsite Soils	1E-02	5E-06
	Dermal Contact to Onsite Soils	2E-02	NQ
	Ingestion of Groundwater	1E-03	NQ
	TOTAL RECEPTOR RISK (Nc & Car)	*3E-02*	*5E-06*

NQ = Not Quantified

TABLE 7-7
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-44A
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
PRISON INMATE	Inhalation of Dust in Ambient Air	0E+00	5E-09
	Ingestion of Onsite Soils	5E-03	8E-07
	Dermal Contact to Onsite Soils	8E-03	NQ
	Ingestion of Groundwater	2E-03	6E-06
	Dermal Contact to Groundwater	9E-06	8E-07
	Inhalation of Groundwater	NQ	1E-07
	TOTAL RECEPTOR RISK (Nc & Car)	*2E-02*	*8E-06*
PRISON WORKER	Inhalation of Dust Ambient Air	1E-10	2E-09
	Ingestion of Onsite Soils	4E-03	6E-07
	Dermal Contact to Onsite Soils	5E-03	NQ
	Ingestion of Groundwater	2E-03	4E-06
	Dermal Contact to Groundwater	6E-06	6E-07
	Inhalation of Groundwater	NQ	9E-08
	TOTAL RECEPTOR RISK (Nc & Car)	*1E-02*	*5E-06*
ON-SITE CONSTRUCTION WORKERS	Inhalation of Dust in Ambient Air	2E-06	3E-10
	Ingestion of Onsite Soils	3E-03	1E-07
	Dermal Contact to Onsite Soils	7E-04	NQ
	TOTAL RECEPTOR RISK (Nc & Car)	*3E-03*	*1E-07*
DAY CARE CENTER CHILD	Inhalation of Dust in Ambient Air	3E-10	1E-09
	Ingestion of Onsite Soils	3E-02	1E-06
	Dermal Contact to Onsite Soils	1E-02	NQ
	Ingestion of Groundwater	4E-03	2E-06
	TOTAL RECEPTOR RISK (Nc & Car)	*5E-02*	*4E-06*
DAY CARE CENTER WORKER	Inhalation of Dust in Ambient Air	1E-10	2E-09
	Ingestion of Onsite Soils	4E-03	6E-07
	Dermal Contact to Onsite Soils	5E-03	NQ
	Ingestion of Groundwater	2E-03	4E-06
	TOTAL RECEPTOR RISK (Nc & Car)	*1E-02*	*5E-06*

NQ= Not Quantified due to lack of toxicity data.

TABLE 7-8
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-44B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
PRISON INMATE	**Inhalation of Dust in Ambient Air**	**6E-10**	**4E-09**
	Ingestion of Onsite Soils	**5E-03**	**1E-06**
	Dermal Contact to Onsite Soils	**6E-03**	**NQ**
	Ingestion of Groundwater	**NQ**	**NQ**
	Dermal Contact to Groundwater	**NQ**	**NQ**
	TOTAL RECEPTOR RISK (Nc & Car)	***1E-02***	***1E-06***
PRISON WORKER	**Inhalation of Dust Ambient Air**	**2E-10**	**1E-09**
	Ingestion of Onsite Soils	**3E-03**	**7E-07**
	Dermal Contact to Onsite Soils	**4E-03**	**NQ**
	Ingestion of Groundwater	**NQ**	**NQ**
	Dermal Contact to Groundwater	**NQ**	**NQ**
	TOTAL RECEPTOR RISK (Nc & Car)	***7E-03***	***7E-07***
ON-SITE CONSTRUCTION WORKERS	**Inhalation of Dust in Ambient Air**	**7E-11**	**2E-11**
	Ingestion of Onsite Soils	**2E-04**	**2E-09**
	Dermal Contact to Onsite Soils	**5E-05**	**NQ**
	TOTAL RECEPTOR RISK (Nc & Car)	***3E-04***	***2E-09***
DAY CARE CENTER CHILD	**Inhalation of Dust in Ambient Air**	**5E-10**	**8E-10**
	Ingestion of Onsite Soils	**3E-02**	**2E-06**
	Dermal Contact to Onsite Soils	**7E-03**	**NQ**
	Ingestion of Groundwater	**NQ**	**NQ**
	TOTAL RECEPTOR RISK (Nc & Car)	***4E-02***	***2E-06***
DAY CARE CENTER WORKER	**Inhalation of Dust in Ambient Air**	**2E-10**	**1E-09**
	Ingestion of Onsite Soils	**3E-03**	**7E-07**
	Dermal Contact to Onsite Soils	**4E-03**	**NQ**
	Ingestion of Groundwater	**NQ**	**NQ**
	TOTAL RECEPTOR RISK (Nc & Car)	***7E-03***	***7E-07***

NQ= Not Quantified due to lack of toxicity data.

TABLE 7-9
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-52
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
PRISON INMATE	Inhalation of Dust in Ambient Air	NQ	NQ
	Ingestion of Soil	3E-03	7E-07
	Dermal Contact to Soil	NQ	NQ
	TOTAL RECEPTOR RISK	*3E-03*	*7E-07*
PRISON WORKER	Inhalation of Dust in Ambient Air	NQ	NQ
	Ingestion of Soil	2E-03	5E-07
	Dermal Contact to Soil	NQ	NQ
	TOTAL RECEPTOR RISK	*2E-03*	*5E-07*
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	NQ	NQ
	Ingestion of Soil	4E-04	5E-09
	Dermal Contact to Soil	NQ	NQ
	TOTAL RECEPTOR RISK	*4E-04*	*5E-09*
DAY CARE CENTER CHILD	Inhalation of Dust in Ambient Air	NQ	NQ
	Ingestion of Soil	2E-02	1E-06
	Dermal Contact to Soil	NQ	NQ
	TOTAL RECEPTOR RISK	2E-02	1E-06
DAY CARE CENTER WORKER	Inhalation of Dust in Ambient Air	NQ	NQ
	Ingestion of Soil	2E-03	5E-07
	Dermal Contact to Soil	NQ	NQ
	TOTAL RECEPTOR RISK	2E-03	5E-07

NQ - Not quanitfied due to lack of toxicity data.

TABLE 7-10
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-62
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
PRISON INMATE	Inhalation of Dust in Ambient Air	NQ	3E-09
	Ingestion of Onsite Soils	3E-03	NQ
	Dermal Contact to Onsite Soils	7E-03	NQ
	Ingestion of Groundwater	2E-02	6E-07
	Inhalation of Groundwater	2E-02	3E-07
	Dermal Contact to Groundwater	3E-03	8E-08
	TOTAL RECEPTOR RISK	*5E-02*	*9E-07*
PRISON WORKER	Inhalation of Dust in Ambient Air	NQ	1E-09
	Ingestion of Onsite Soils	2E-03	NQ
	Dermal Contact to Onsite Soils	5E-03	NQ
	Ingestion of Groundwater	7E-03	2E-07
	Inhalation of Groundwater	1E-02	2E-07
	Dermal Contact to Groundwater	2E-03	5E-08
	TOTAL RECEPTOR RISK	*3E-02*	*4E-07*
ON-SITE CONSTRUCTION WORKERS	Inhalation of Dust in Ambient Air	NQ	1E-09
	Ingestion of Onsite Soils	1E-02	NQ
	Dermal Contact to Onsite Soils	5E-03	NQ
	TOTAL RECEPTOR RISK	*2E-02*	*1E-09*
DAY CARE CENTER CHILD	Inhalation of Dust in Ambient Air	NQ	7E-10
	Ingestion of Onsite Soils	2E-02	NQ
	Dermal Contact to Onsite Soils	9E-03	NQ
	Ingestion of Groundwater	3E-02	2E-07
	TOTAL RECEPTOR RISK	*6E-02*	*2E-07*
DAY CARE CENTER WORKER	Inhalation of Dust in Ambient Air	NQ	1E-09
	Ingestion of Onsite Soils	2E-03	NQ
	Dermal Contact to Onsite Soils	5E-03	NQ
	Ingestion of Groundwater	7E-03	2E-07
	TOTAL RECEPTOR RISK	*1E-02*	*2E-07*

NQ - Not quanitfied due to lack of toxicity data.

TABLE 7-11
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-64B
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
PARK WORKER	Inhalation of Dust in Ambient Air	7E-11	5E-12
	Ingestion of Soil	8E-05	8E-08
	Dermal Contact to Soil	NQ	NQ
	Dermal Contact to Surface Water	7E-05	NQ
	Dermal Contact to Sediment	6E-04	7E-08
	TOTAL RECEPTOR RISK	*7E-04*	*1E-07*
RECREATIONAL VISITOR (CHILD)	Inhalation of Dust in Ambient Air	3E-11	4E-13
	Ingestion of Soil	6E-05	1E-08
	Dermal Contact to Soil	NQ	NQ
	Dermal Contact to Surface Water	3E-04	NQ
	Dermal Contact to Sediment	2E-03	6E-08
	TOTAL RECEPTOR RISK	*3E-03*	*7E-08*
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	1E-09	9E-12
	Ingestion of Soil	9E-04	3E-08
	Dermal Contact to Soil	NQ	NQ
	TOTAL RECEPTOR RISK	*9E-04*	*3E-08*

NQ - Not quanitfied due to lack of toxicity data.

TABLE 7-12
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-64C
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
PRISON INMATE	Inhalation of Dust in Ambient Air	NQ	1E-10
	Ingestion of Soil	8E-04	5E-08
	Dermal Contact to Soil	NQ	NQ
	Ingestion of Groundwater	1E-04	NQ
	Inhalation of Groundwater	NQ	NQ
	Dermal Contact to Groundwater	8E-06	NQ
	TOTAL RECEPTOR RISK	*9E-04*	*5E-08*
PRISON WORKER	Inhalation of Dust in Ambient Air	NQ	4E-11
	Ingestion of Soil	5E-04	4E-08
	Dermal Contact to Soil	NQ	NQ
	Ingestion of Groundwater	4E-05	NQ
	Inhalation of Groundwater	NQ	NQ
	Dermal Contact to Groundwater	5E-06	NQ
	TOTAL RECEPTOR RISK	*6E-04*	*4E-08*
ON-SITE CONSTRUCTION WORKERS	Inhalation of Dust in Ambient Air	NQ	2E-11
	Ingestion of Soil	3E-03	7E-09
	Dermal Contact to Soil	NQ	NQ
	TOTAL RECEPTOR RISK	*3E-03*	*7E-09*
WORKER AT ON-SITE DAY CARE CENTER	Inhalation of Dust in Ambient Air	NQ	4E-11
	Ingestion of Soil	5E-04	4E-08
	Dermal Contact to Soil	NQ	NQ
	Ingestion of Groundwater	4E-05	NQ
	TOTAL RECEPTOR RISK	*6E-04*	*4E-08*
CHILD AT ON-SITE DAY CARE CENTER	Inhalation of Dust in Ambient Air	NQ	2E-11
	Ingestion of Soil	5E-03	8E-08
	Dermal Contact to Soil	NQ	NQ
	Ingestion of Groundwater	2E-04	NQ
	TOTAL RECEPTOR RISK	*5E-03*	*8E-08*

NQ - Not quanitfied due to lack of toxicity data.

TABLE 7-13
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-64D
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
PARK WORKER	Inhalation of Dust in Ambient Air	3E-08	2E-15
	Ingestion of Soil	5E-05	3E-07
	Dermal Contact to Soil	NQ	NQ
	Ingestion of Groundwater	**3E+00**	NQ
	TOTAL RECEPTOR RISK	***3E+00***	*3E-07*
RECREATIONAL VISITOR (CHILD)	Inhalation of Dust in Ambient Air	1E-08	1E-16
	Ingestion of Soil	4E-05	4E-08
	Dermal Contact to Soil	NQ	NQ
	Inhalation of Groundwater	NQ	NQ
	Ingestion of Groundwater	**1E+00**	NQ
	Dermal Contact to Groundwater	4E-02	NQ
	TOTAL RECEPTOR RISK	***1E+00***	*4E-08*
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	5E-07	1E-15
	Ingestion of Soil	3E-04	7E-08
	Dermal Contact to Soil	NQ	NQ
	TOTAL RECEPTOR RISK	*3E-04*	*7E-08*

NQ - Not quanitfied due to lack of toxicity data.
Bold values for the risk assessment indicate a value greater than the acceptable risk.

TABLE 7-14
Calculation of Non-Carcinogenic and Carcinogenic Risks - SEAD-122E
Record of Decision for Sites Requiring ICs
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK	LIFETIME CANCER RISK
INDUSTRIAL WORKER	Inhalation of Dust in Ambient Air	0E+00	2E-08	NA
	Ingestion of Soil	1E-03	3E-05	NA
	Dermal Contact to Soil	1E-03	4E-05	NA
	Ingestion of Groundwater	NQ	NQ	NA
	TOTAL RECEPTOR RISK	*2E-03*	*7E-05*	NA
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	0E+00	8E-09	NA
	Ingestion of Soil	4E-03	4E-06	NA
	Dermal Contact to Soil	1E-03	1E-06	NA
	TOTAL RECEPTOR RISK	*5E-03*	*6E-06*	NA
WORKER AT ON-SITE DAY CARE CENTER	Inhalation of Dust in Ambient Air	0E+00	2E-08	NA
	Ingestion of Soil	1E-03	3E-05	NA
	Dermal Contact to Soil	5E-03	2E-04	NA
	Ingestion of Groundwater	NQ	NQ	NA
	TOTAL RECEPTOR RISK	*6E-03*	*2E-04*	NA
CHILD AT ON-SITE DAY CARE CENTER	Inhalation of Dust in Ambient Air	0E+00	1E-08	NA
	Ingestion of Soil	1E-02	7E-05	NA
	Dermal Contact to Soil	4E-03	3E-05	NA
	Ingestion of Groundwater	NQ	NQ	NA
	TOTAL RECEPTOR RISK	*1E-02*	*1E-04*	NA
CHILD RESIDENT	Inhalation of Dust in Ambient Air	0E+00	3E-08	NA
	Ingestion of Soil	2E-02	1E-04	NA
	Dermal Contact to Soil	2E-02	2E-04	NA
	Ingestion of Groundwater	NQ	NQ	NA
	TOTAL RECEPTOR RISK	*4E-02*	*3E-04*	NA
ADULT RESIDENT	Inhalation of Dust in Ambient Air	0E+00	6E-08	9E-08
	Ingestion of Soil	2E-03	4E-05	1E-04
	Dermal Contact to Soil	1E-02	4E-04	6E-04
	Ingestion of Groundwater	NQ	NQ	NQ
	TOTAL RECEPTOR RISK	*1E-02*	*5E-04*	*8E-04*

NQ - Not quanitfied due to lack of toxicity data.

INSTITUTIONAL

SEAD 41

INSTITUTIONAL TRAINING

CONSERVATION

GREEN ENERGY

SEAD 13

RESIDENTIAL RESORT

DEVELOPMENT RESERVE (Large User)

SEAD 67

PLANNED INDUSTRIAL/ OFFICE DEVELOPMENT AREA

SEAD 39

HOUSING

SEAD 40

SEAD 64D

TRAINING AREA

UTILITY

FED TO FED TRANSFER

WAREHOUSE

SEAD 44B

SEAD 64B

SEAD 52

SEAD 122E

SEAD 122B

SEAD 44A

SEAD 43, 56, 69

SEAD 62

AIRFIELD SPECIAL EVENTS, INSTITUTIONAL, AND TRAINING

PRISON

SEAD 64C

LEGEND

4000 0 4000 8000 Feet

N

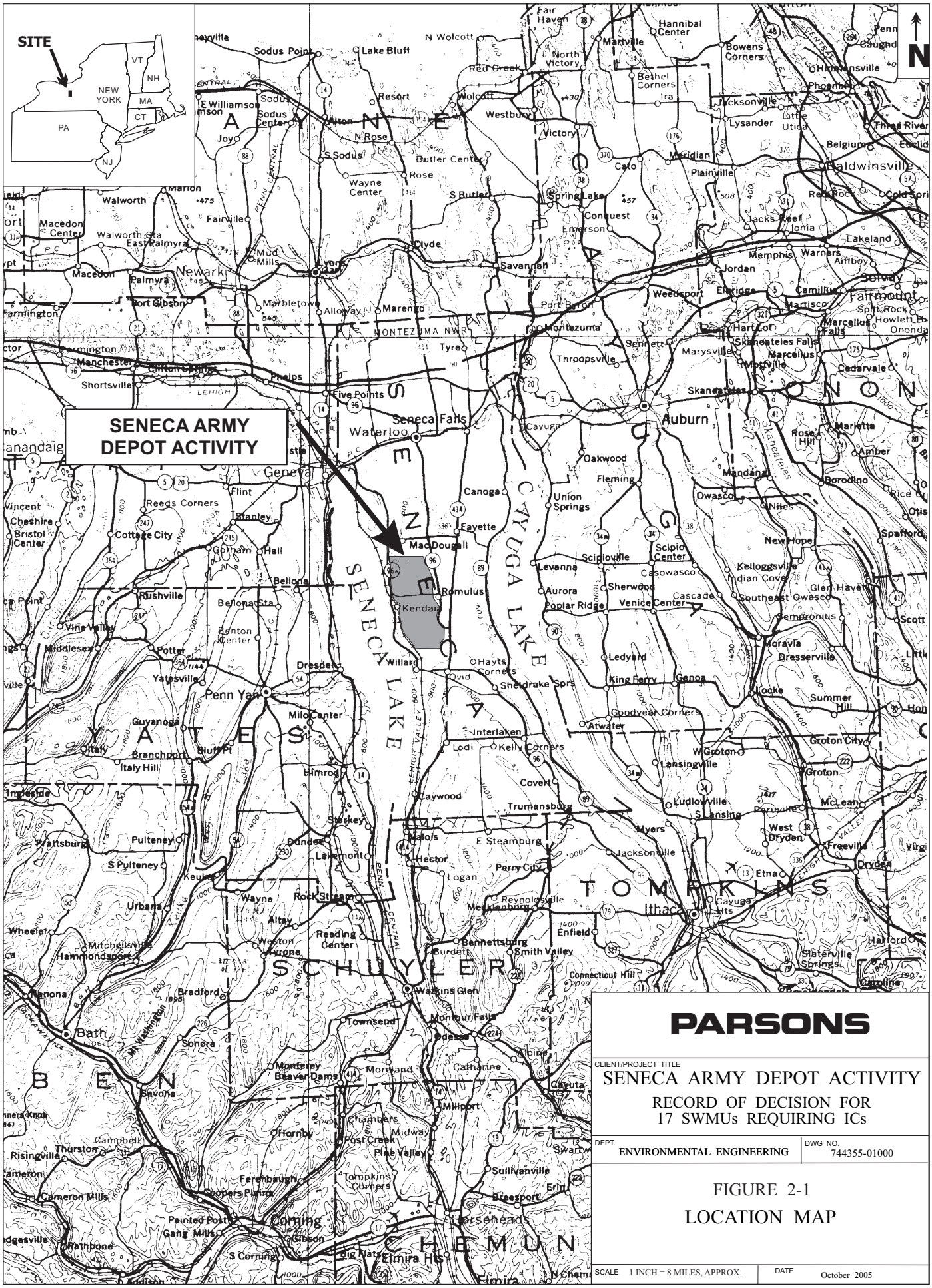
PARSONS

SENECA ARMY DEPOT
RECORD OF DECISION FOR 17 SWMUs REQUIRING ICs

Figure 1-1
Future Land Use and Location of IC SWMUs

Scale - 1:3400 | AUGUST 2006

O:\SENECA\NOACT\PRAP-ROD-IC-NEWLANDUSE. APR\Figure 1 - Future Land Use Layout



PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY

RECORD OF DECISION FOR
17 SWMUs REQUIRING ICs

DEPT.	DWG NO.
ENVIRONMENTAL ENGINEERING	744355-01000

FIGURE 2-1

LOCATION MAP

SCALE	DATE
1 INCH = 8 MILES, APPROX.	October 2005

P:\PIT\Projects\Huntsville HTW\TO #26 Decision Docs for Completed Removals (67, 39, 40 & 122B)\ROD ICs\Figures\LOCMAP.CDR

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

SEADs subject of this ROD

SEADs prompting PID-wide LUCs

Army Retained Property - No Unauthorized Access

ROD in-place, Remedial Action ongoing

1000 0 1000 2000 Feet

SEAD-67 - SEADs subject of this ROD

SEAD-27 - Land Use Restriction Site

SEAD-25 - ROD in-place, Remedial Action ongoing

SEAD-121I- Army Retained Site

SEAD-55 - No Action Site

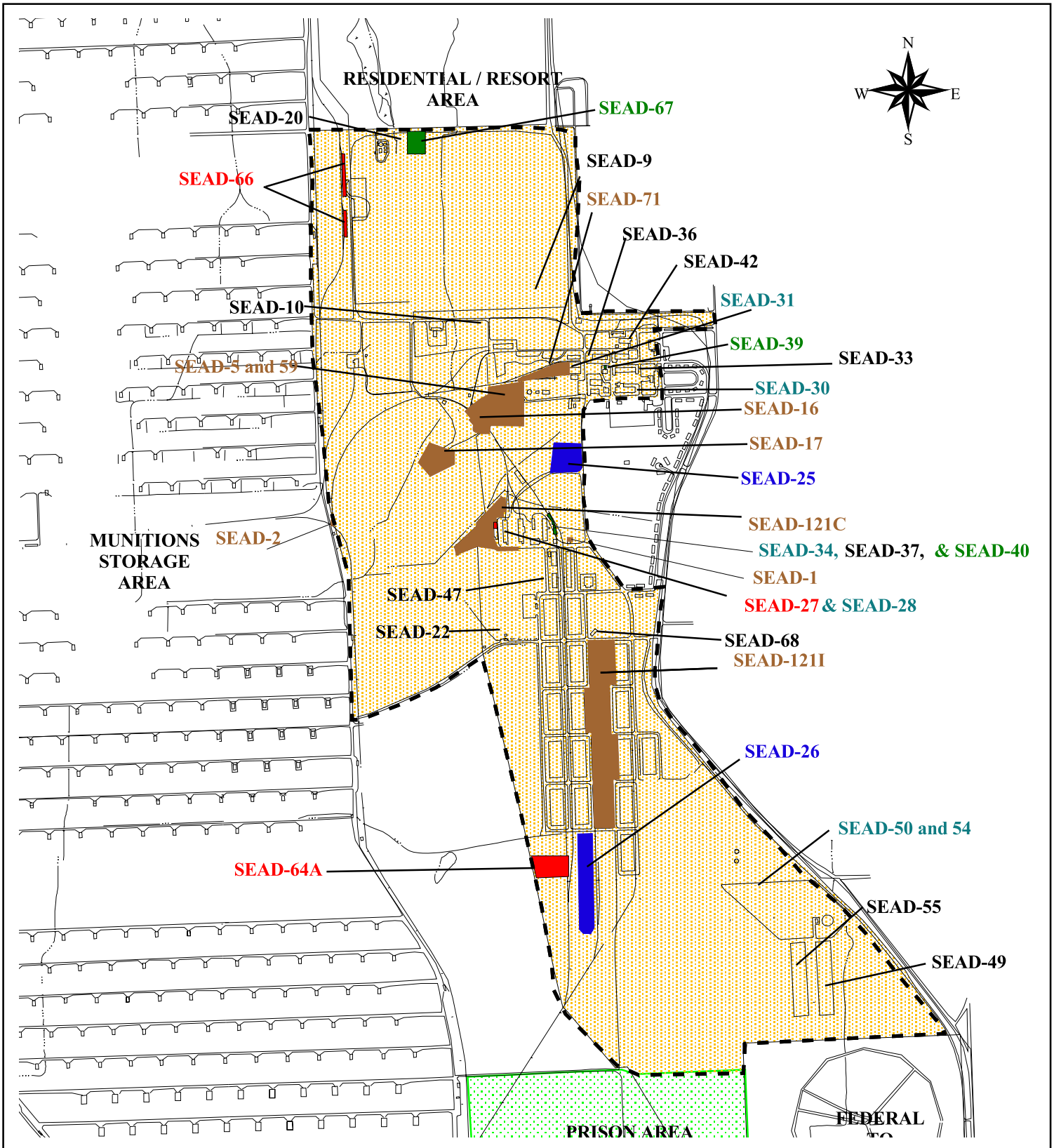
SEAD-28 - No Further Action Site

PARSONS

SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
17 Sites Requiring ICs

FIGURE 2-2
LOCATION OF SEAD-13
AT SENECA ARMY DEPOT ACTIVITY

o:\seneca\pid luc\seneca depot survey rod sept 2006.apr\S 16 17 ROD Figure 2-2.



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

SEADs subject of this ROD

SEADs prompting PID-wide LUCs

Army Retained Property - No Unauthorized Access

ROD in-place, Remedial Action ongoing

1000 0 1000 2000 Feet

SEAD-67 - SEADs subject of this ROD

SEAD-27 - Land Use Restriction Site

SEAD-25 - ROD in-place, Remedial Action ongoing

SEAD-121I- Army Retained Site

SEAD-55 - No Action Site

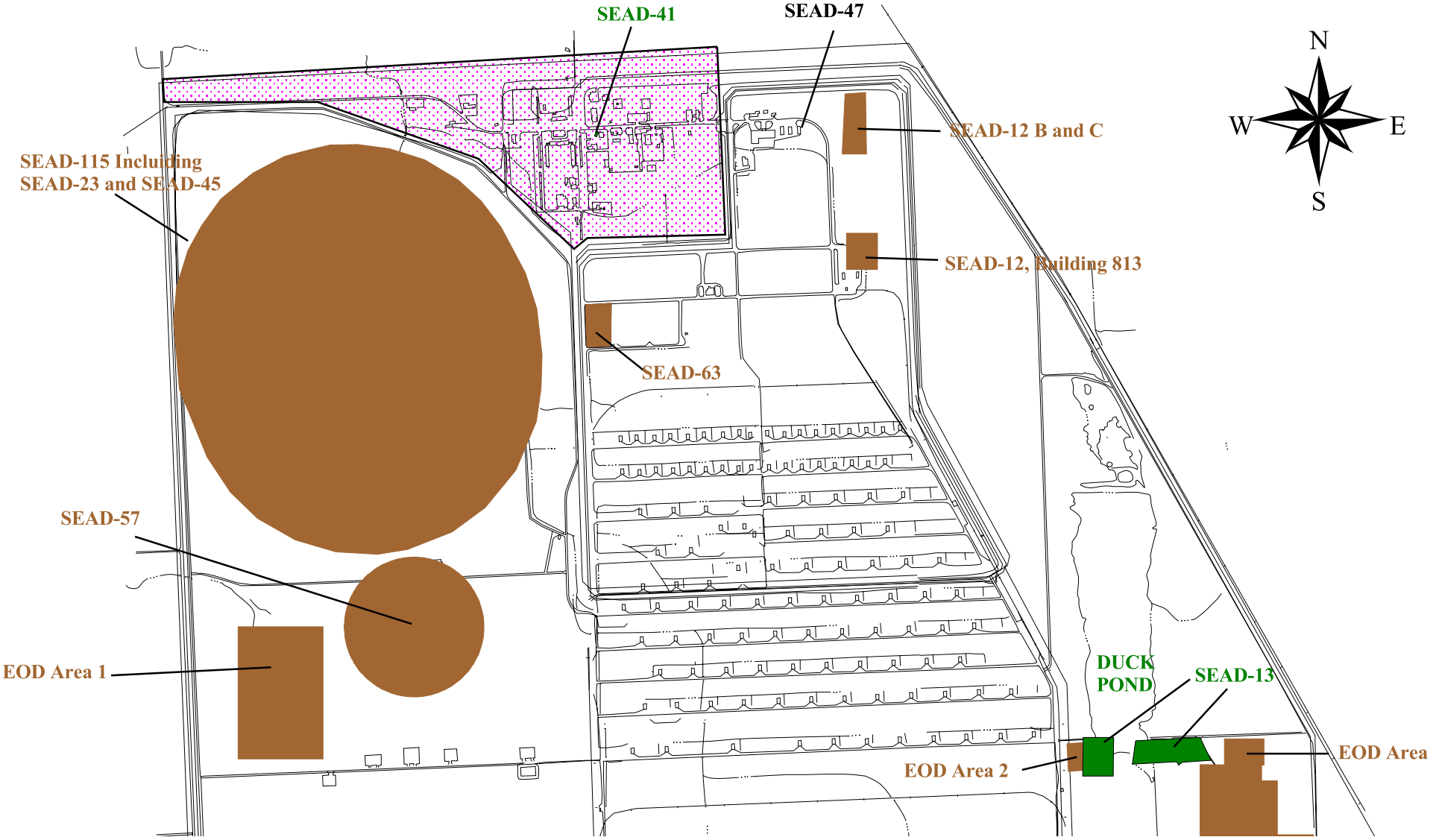
SEAD-28 - No Further Action Site

PARSONS

SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
17 Sites Requiring ICs

FIGURE 2-3
LOCATION OF SEADs 39, 40, and 67
AT SENECA ARMY DEPOT ACTIVITY

o:\seneca\pid luc\seneca depot survey rod sept 2006.apr\S 16 17 ROD Figure 2-2.



North End Institutional Area covered by deed notification indicating that groundwater quality in the vicinity of SEAD-41 has been impacted by unspecified organic contaminants in excess of State of New York's standard of 100 ppb.

SEADs subject of this ROD

Army Retained Property - No Unauthorized Access

700 0 700 1400 Feet

SEAD-67 - SEADs subject of this ROD

SEAD-27 - Land Use Restriction Site

SEAD-25 - ROD in-place, Remedial Action ongoing

SEAD-121I- Army Retained Site

SEAD-55 - No Action Site

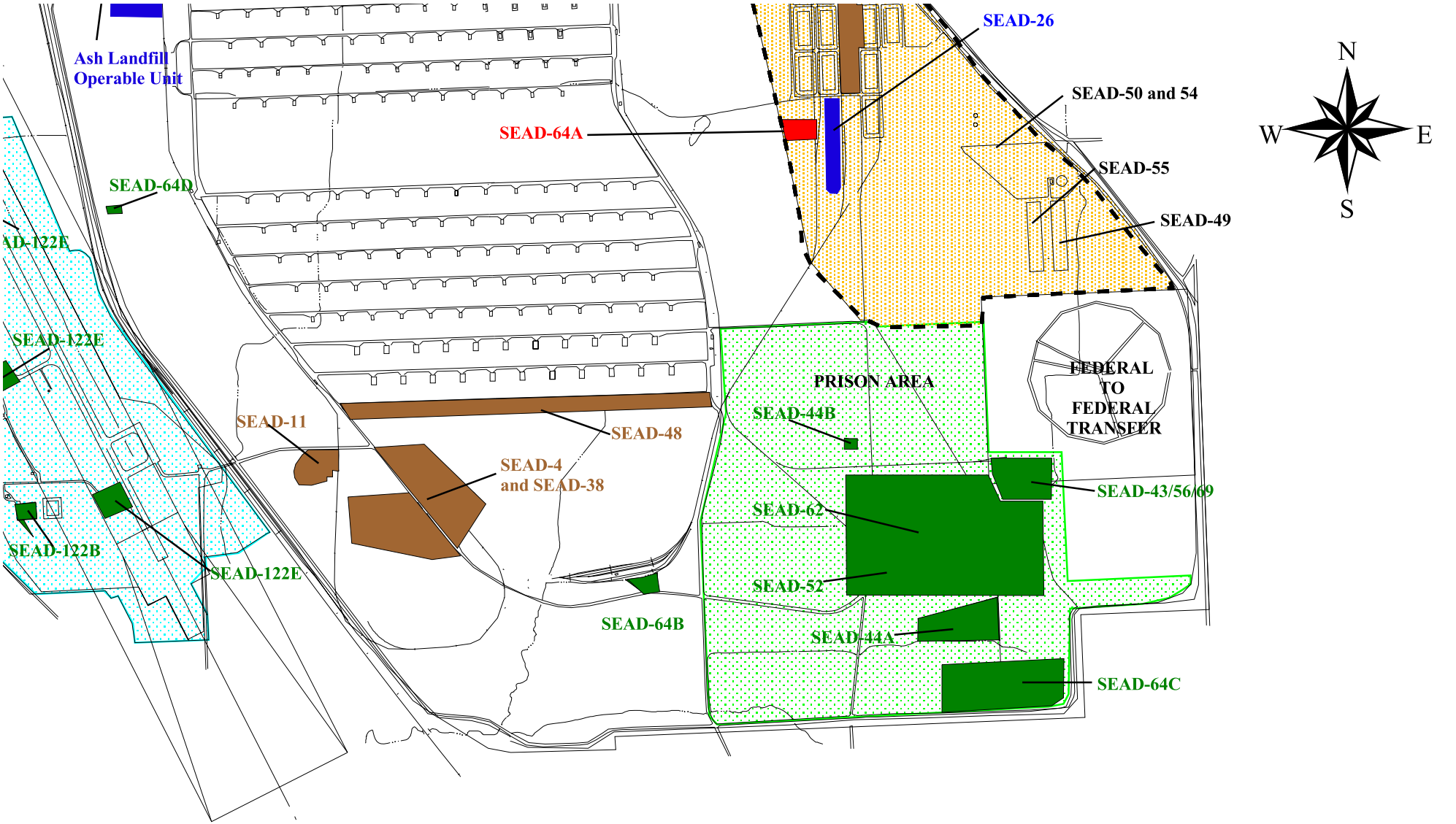
SEAD-28 - No Further Action Site

PARSONS

SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
17 Sites Requiring ICs

FIGURE 2-4
LOCATION OF SEAD-41
AT SENECA ARMY DEPOT ACTIVITY

O:\SENECA\17 Sites Requiring ICs\17 Sites Requiring ICs sept 2006\Figure 2-4



Area Covered by Prison Parcel Reversionary Deed.

Area Covered by PID-wide Land Use Restrictions:
- Prohibit the development and use of preperty 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.

Area Covered by Airfield Parcel Land Use Restrictions:
- Prohibit the development and use of preperty 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.

SEADs subject of this ROD

Army Retained Property - No Unauthorized Access

PID-wide Land Use Restrcition Site

ROD in-place, Remedial Action ongoing

1000 0 1000 2000 Feet

SEAD-44A - SEADs subject of this ROD

SEAD-27 - Land Use Restriction Site

SEAD-25 - ROD in-place, Remedial Action ongoing

SEAD-121I - Army Retained Site

SEAD-55 - No Action Site

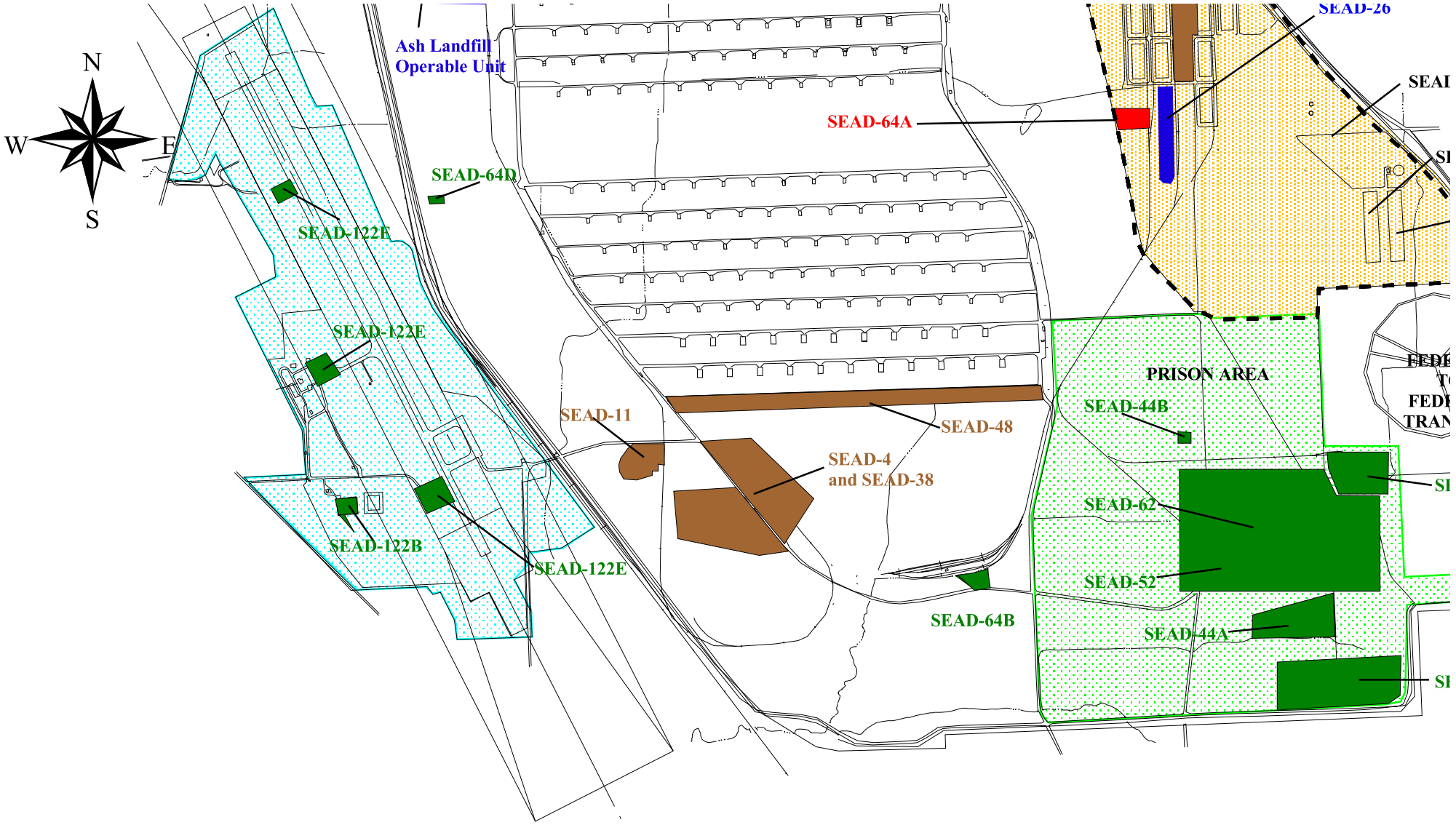
SEAD-28 - No Further Action Site

PARSONS

SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
17 Sites Requiring ICs

FIGURE 2-5
LOCATION OF SEADs 43/56/69, 44A, 44B, 52, 62, 64B, and 64C
AT SENECA ARMY DEPOT ACTIVITY

O:\SENECA\17 Sites Requiring ICs\17 Sites Requiring ICs sept 2006\Figure 2-5



Area Covered by Airfield Parcel Land Use Restrictions:
- Prohibit the development and use of preperty 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.

Area Covered by Prison Parcel Reversionary Deed.

Area Covered by PID-wide Land Use Restrictions:
- Prohibit the development and use of preperty 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.

SEADs subject of this ROD

Army Retained Property - No Unauthorized Access

PID-wide Land Use Restrcition Site

ROD in-place, Remedial Action ongoing

1000 0 1000 2000

SEAD-44A - SEADs subject of this ROD

SEAD-27 - Land Use Restriction Site

SEAD-25 - ROD in-place, Remedial Action ongoing

SEAD-121I - Army Retained Site

SEAD-55 - No Action Site

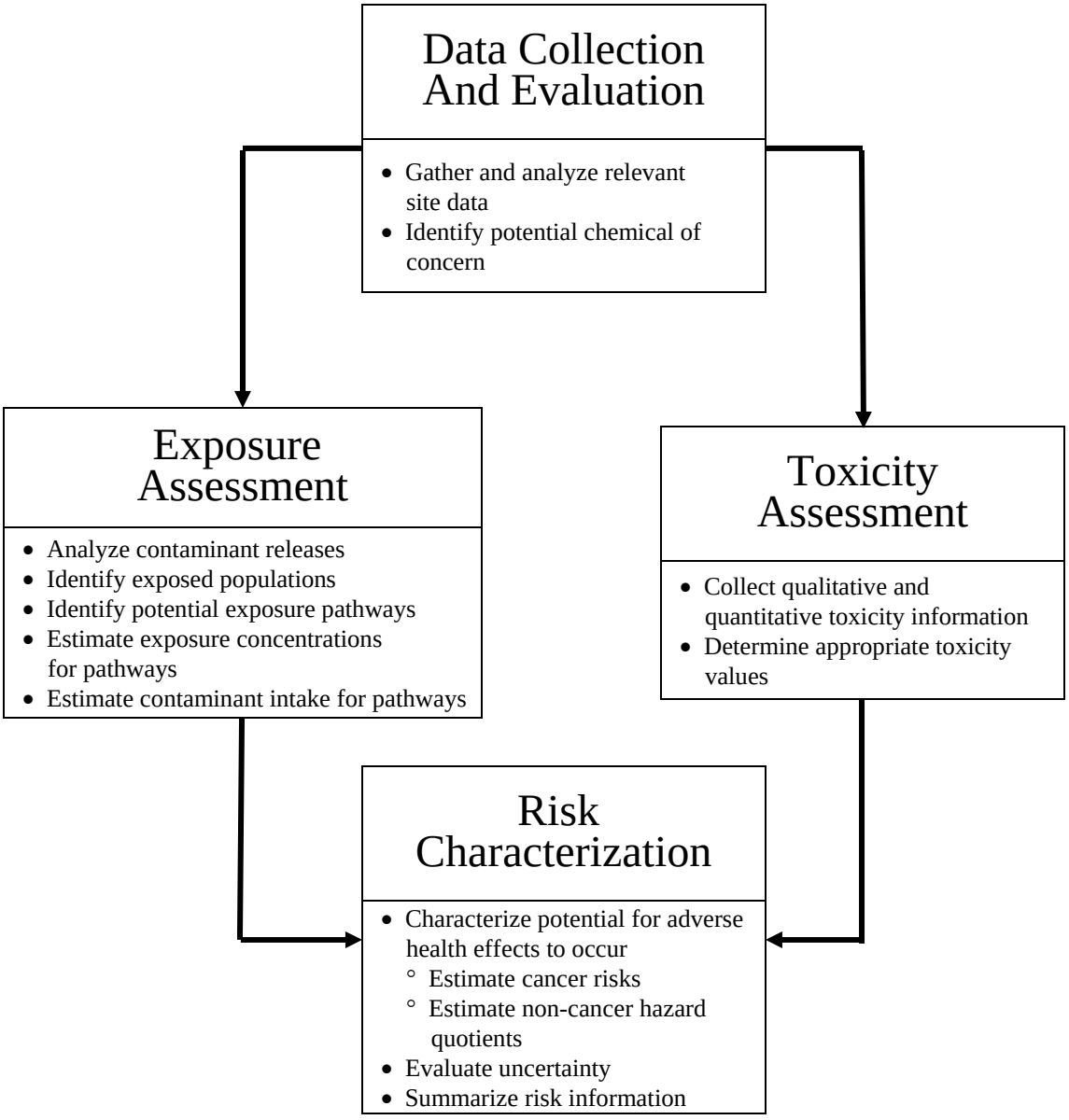
SEAD-28 - No Further Action Site

PARSONS

SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
17 Sites Requiring ICs

FIGURE 2-6
LOCATION OF SEADs 64D, 122B and 122E
AT SENECA ARMY DEPOT ACTIVITY

O:\SENECA\17 Sites Requiring ICs\17 Sites Requiring ICs sept 2006\Figure 2-6



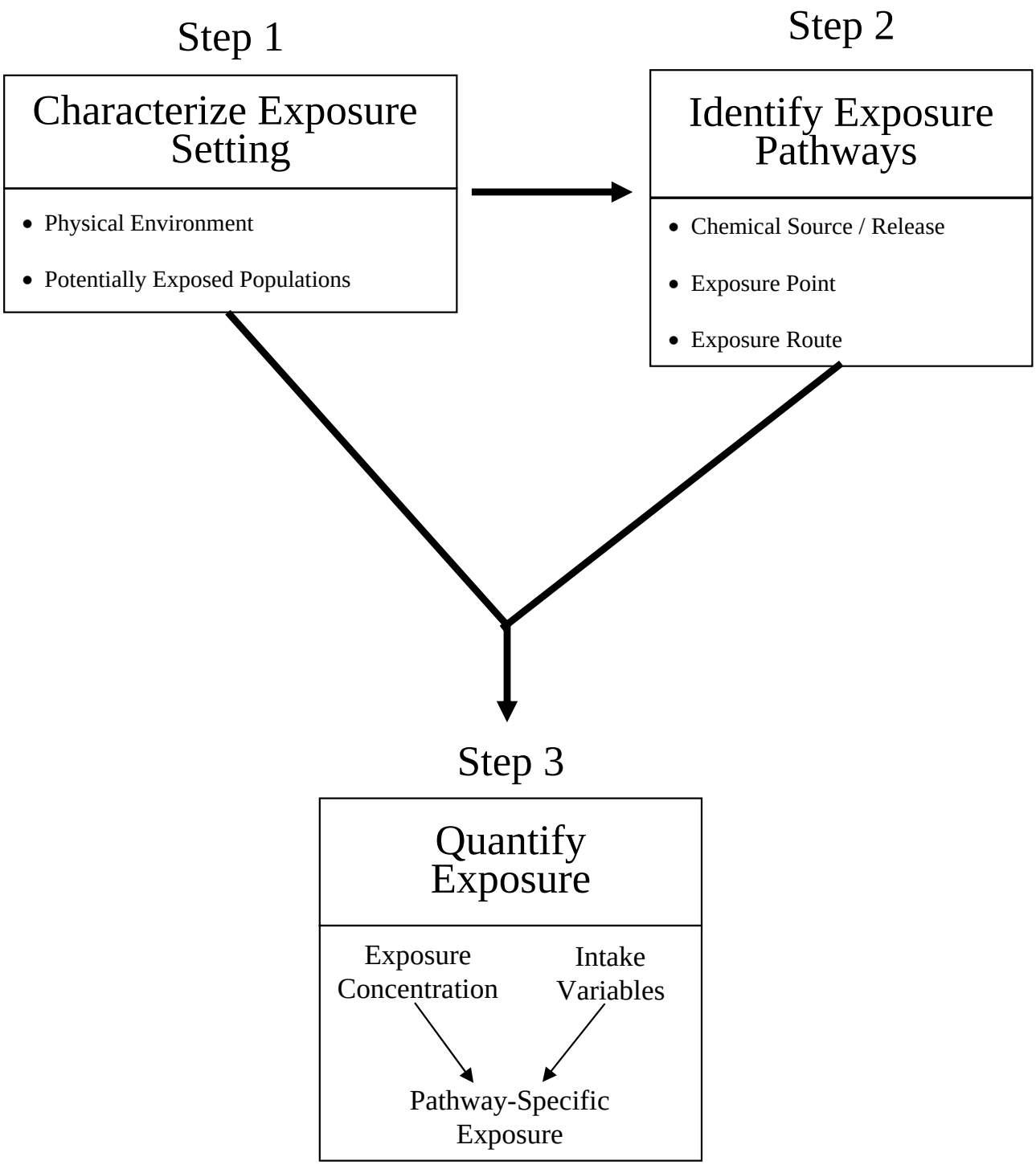
Source: US EPA 1989a

PARSONS

Seneca Army Depot Activity

Record of Decision
17 SWMUs Requiring ICs

Figure 7-1
HUMAN HEALTH RISK ASSESSMENT METHODOLOGY



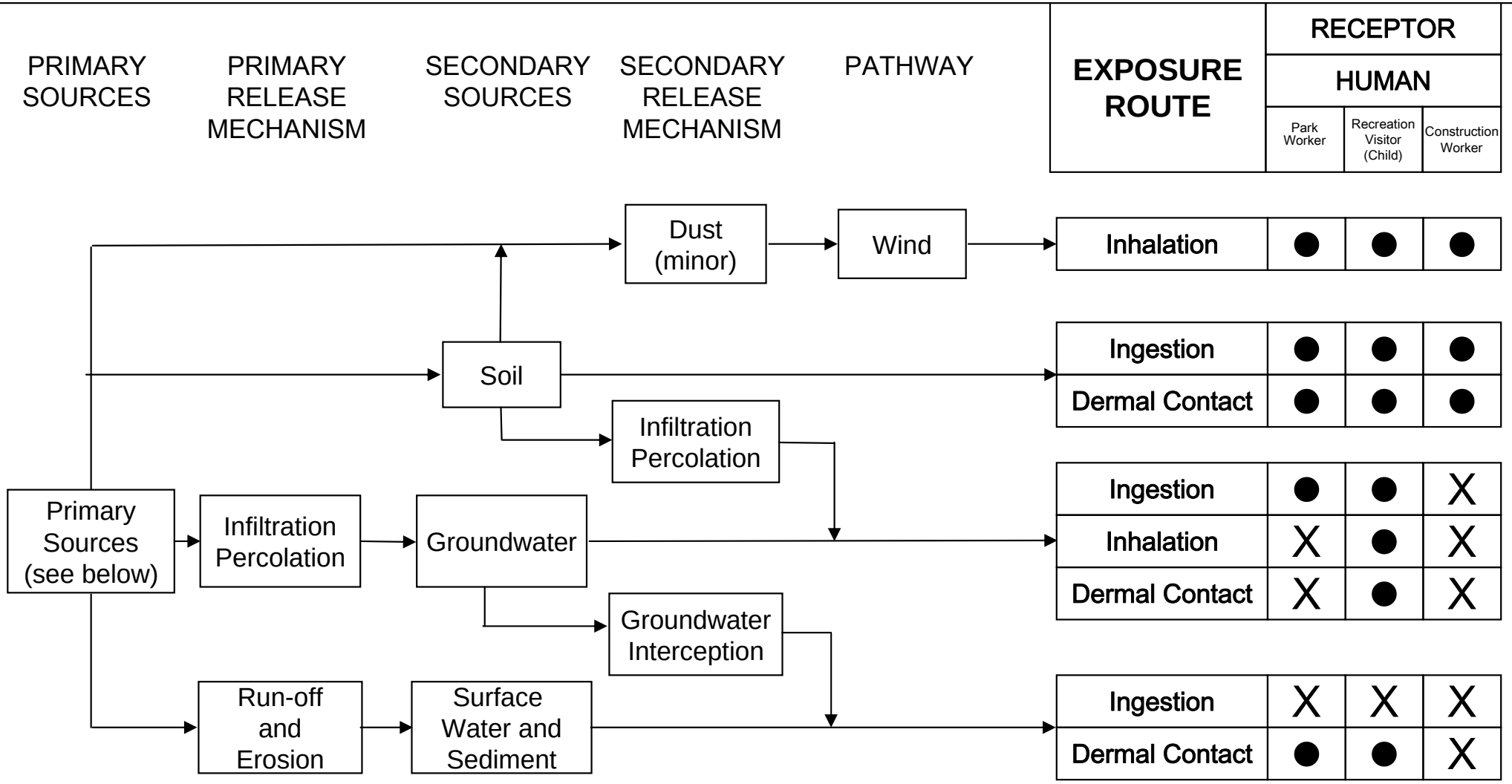
Source: US EPA 1989a

PARSONS

Seneca Army Depot Activity

Record of Decision
17 SWMUs Requiring ICs

Figure 7-2
EXPOSURE ASSESSMENT PROCESS



Note: Exposure routes applicable based on presence of media at site as shown below.

SEAD	Primary Source	Soil	GW	SW	SED
13	IRFNA Disposal Area	√	√	√	√
64B	Garbage Disposal Area	√	√	√	√
64D	Garbage Disposal Area	√	√	NA	NA

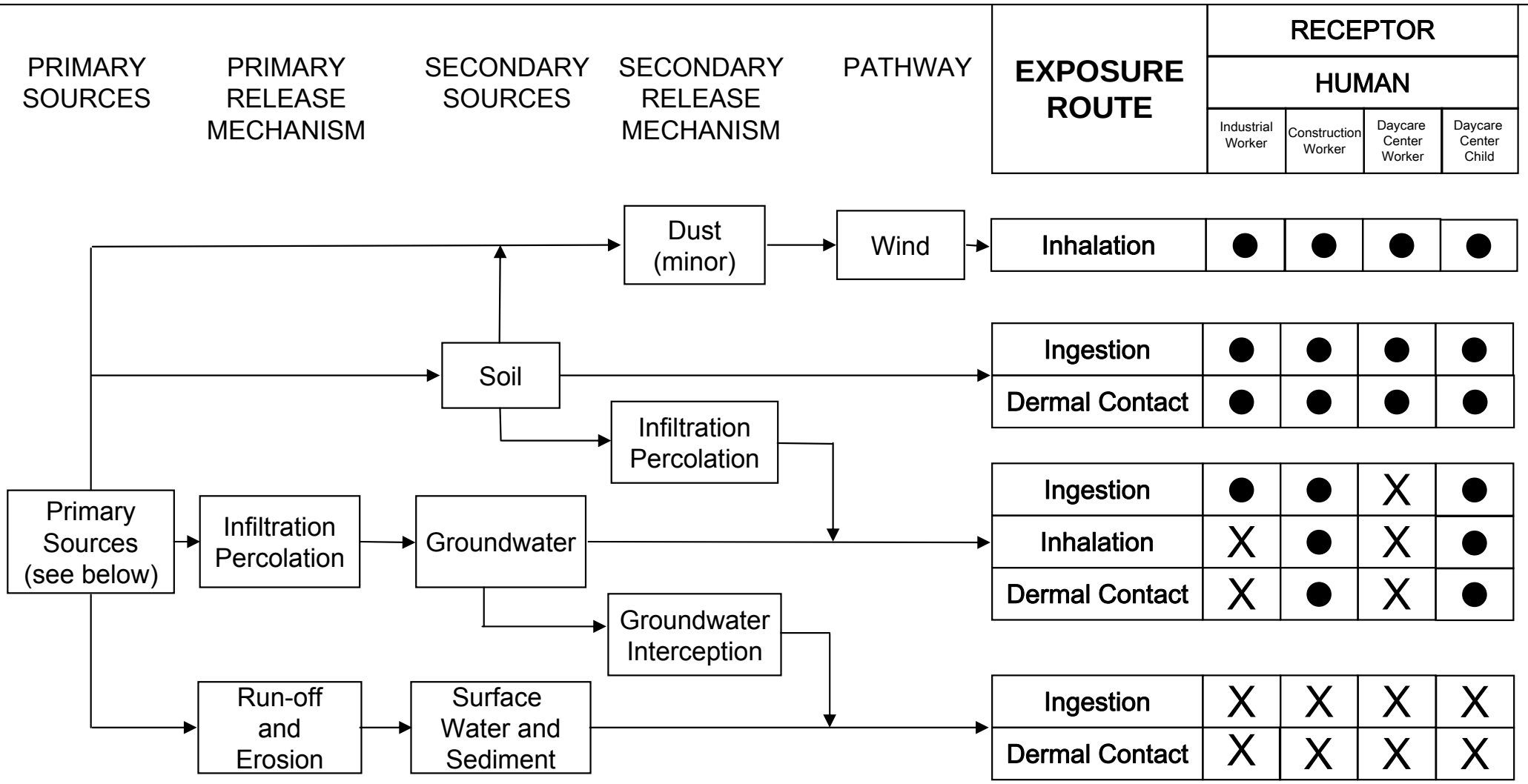
●	Pathway considered to Pose Potential Risk
X	Pathway Considered Incomplete
NA	Not Applicable Receptor (i.e., Media not sampled or Media not present at site.)
√	Applicable Receptor

PARSONS

Seneca Army Depot Activity

Record of Decision
17 SWMUs Requiring ICs

Figure 7-3
EXPOSURE PATHWAY SUMMARY
FOR CONSERVATION AND
RECREATIONAL SCENARIO



Note: Exposure routes applicable based on presence of media at site as shown below.

SEAD	Primary Source	Soil	GW	SW	SED
39	Building 121 Boiler Blowdown	√	NA	NA	NA
40	Building 319 Boiler Blowdown	√	NA	NA	NA
122E	Plane Deicing Area	√	√	NA	NA

● Pathway considered to Pose Potential Risk

X Pathway Considered Incomplete

√ Applicable Receptor

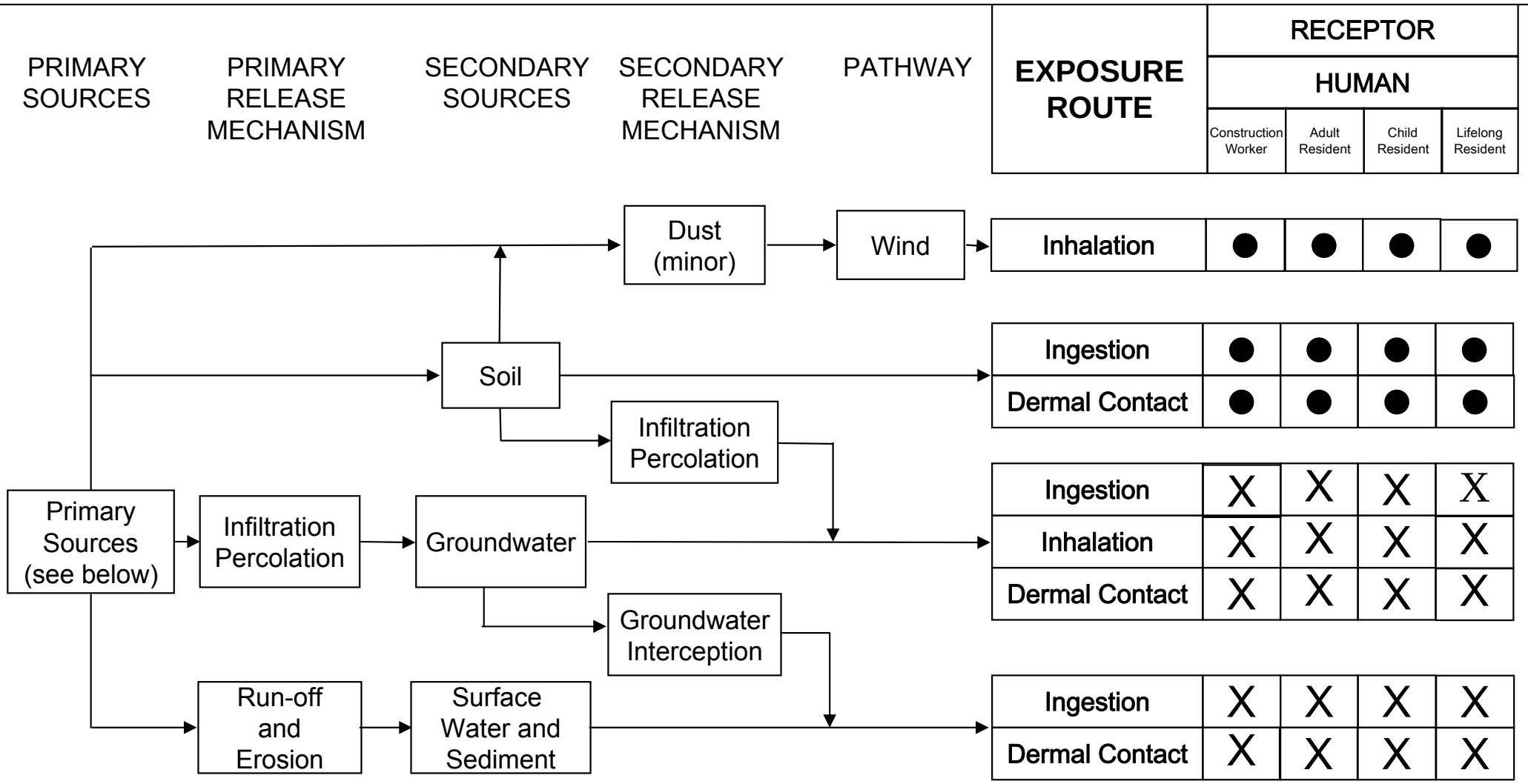
NA Not Applicable Receptor (i.e., Media not sampled or Media not present at site.)

PARSONS

Seneca Army Depot Activity

Record of Decision
17 SWMUs Requiring ICs

Figure 7-4
EXPOSURE PATHWAY SUMMARY
FOR INDUSTRIAL/WAREHOUSE AND
AIRFIELD/SPECIAL EVENT SCENARIO



Note: Exposure routes applicable based on presence of media at site as shown below.

SEAD	Primary Source	Soil	GW	SW	SED
41	Building 718 Boiler Blowdown	√	NA	NA	NA

● Pathway considered to Pose Potential Risk

X Pathway Considered Incomplete

√ Applicable Receptor

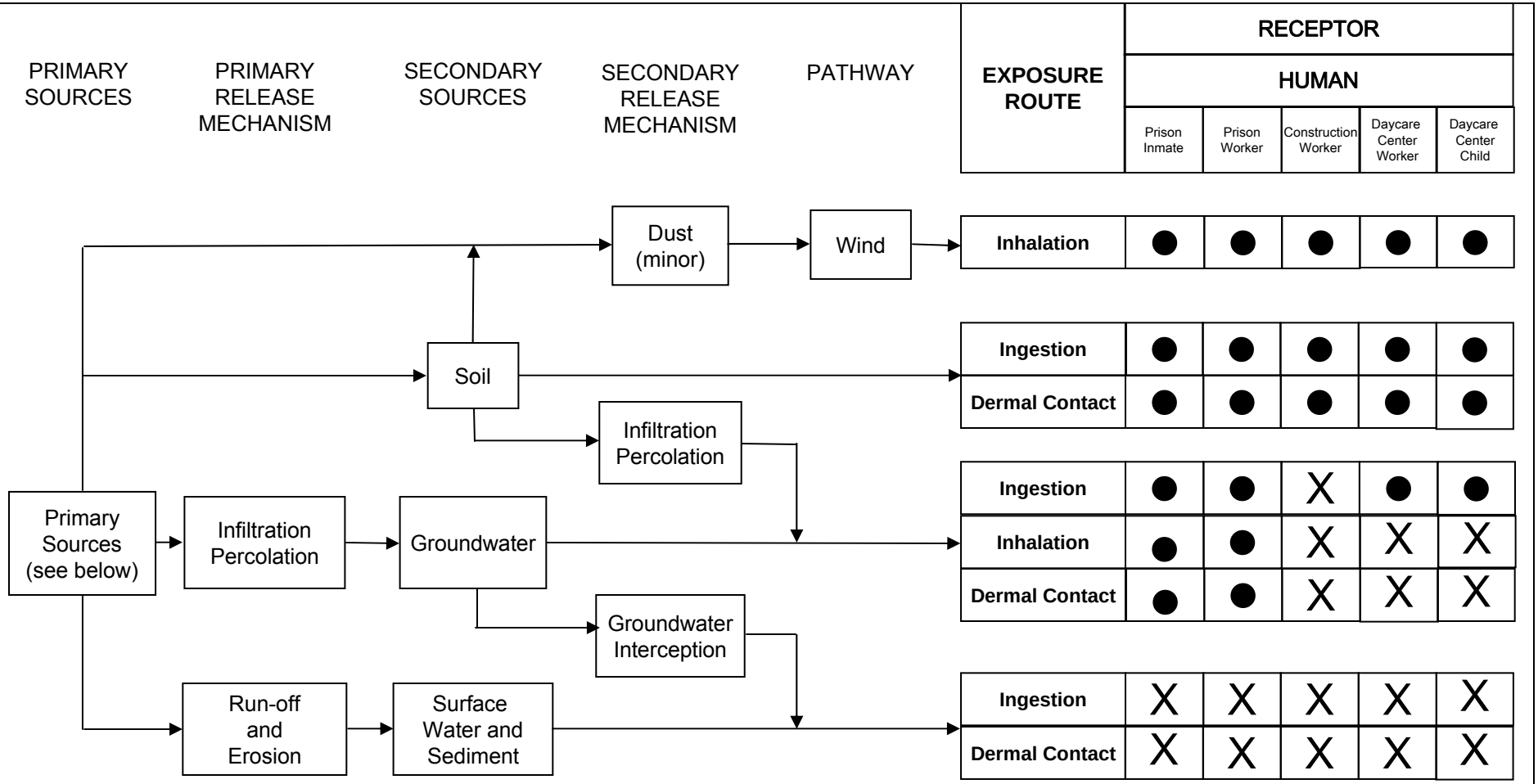
NA Not Applicable Receptor (i.e., Media not sampled or Media not present at site.)

PARSONS

Seneca Army Depot Activity

Record of Decision
17 SWMUs Requiring ICs

Figure 7-5
EXPOSURE PATHWAY SUMMARY
FOR INSTITUTIONAL SCENARIO



SEAD	Primary Source	Soil	GW	SW	SED
43/56/69	Missile Propellant Test Lab & Pesticide Storage Area	√	√	√	√
44A	Quality Assurance Test Laboratory	√	√	√	√
44B	Quality Assurance Test Laboratory	√	√	√	√
52	Ammunition Breakdown Area	√	NA	NA	NA
62	Nicotine Sulfate Disposal Area	√	√	NA	NA
64C	Garbage Disposal Area	√	√	NA	NA

Note: Exposure routes applicable based on presence of media at site as shown to the left.

● Pathway considered to Pose Potential Risk

X Pathway Considered Incomplete

√ Applicable Receptor

NA Not Applicable Receptor (i.e., Media not sampled or Media not present at site.)

PARSONS

Seneca Army Depot Activity

Record of Decision
17 SWMUs Requiring ICs

Figure 7-6
EXPOSURE PATHWAY SUMMARY
FOR PRISON SCENARIO

APPENDIX A

ADMINISTRATIVE RECORD INDEX

APPENDIX A: ADMINISTRATIVE RECORD

NYSDEC, 2004 - 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, April 2000, and June 2004.

NYSDEC, 1999 - Technical Guidance for Screening Contaminated Sediments, November 1993, as amended July 1994, March 1998, and January 1999.

NYSDEC, 1994 - Technical and Administrative Guidance Memorandum #4046, Determination of Soil Cleanup Objectives and Cleanup Levels, Jan 24, 1994.

Parsons, 2004a –Decision Document – Mini Risk Assessment SEAD-13 Inhibited Red Fuming Nitric Acid (IRFNA) Disposal Site, Final, July 2004.

Parsons, 2004b - Ordnance and Explosives Engineering Evaluation and Cost Assessment Seneca Army Depot Activity, Final, January 2004.

Parsons, 2004c – Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas, Final, September 2004.

Parsons, 2004d - Characterization Report, Small Arms Range – Airfield (SEAD-122B), Revised Final, October 2004.

Parsons, 2002a – 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, 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 – 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, 72, and 120B) Seneca Army Depot Activity, Final, May 2002.

Parsons, 2001a - Low Temperature Thermal Desorption Cost and Performance Test Report, Draft, September 2001.

Parsons, 2001b – Completion Report for Six Areas of Concern SEADs (43, 56, 69, 44A, 44B, 52, 62, and 120B, Seneca Army Depot Activity, Final, May 2001.

Parsons, 1999 - Environmental Baseline Survey for Non-Evaluated Sites, Final, May 1999.

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, 1995b – Expanded Site Inspection Seven Low Priority AOCs SEADs 60, 62, 63, 64 (A, B, C, and D), 67, 70, and 71, Seneca Army Depot Activity, April 1995.

Parsons, 1994 – SWMU Classification Report, Final, September 1994

Seneca County Clerk, 2000 – Quitclaim Deed for the Five Point's Correctional Facility – Liber 612 Page 014 through Page 031, September 2000.

Title 40, Code of Federal Regulations, Part 261, Identification and Listing of Hazardous Waste.

Title 40 Code of Federal Regulations, Part 300, National Oil and Hazardous Substances Pollution Contingency Plan.

Title 42 US Code Chapter 103, Comprehensive Environmental Response, Compensation, and Liability, Section 9620.

USACE, 1998 – U.S. Department of Defense, Base Realignment and Closure, Ordnance and Explosives, Archives Search Report, Findings, Seneca Army Depot, Romulus, Seneca County, New York, prepared by US Army Corps of Engineers (USACE) , St. Louis District, December 1998.

USATHAMA, 1988 - Update of the Initial Installation Assessment of Seneca Army Depot, NY, prepared by Environmental Science and Engineering Inc. (ESE), Report No. AMXTH-IR-A-157(U), August 1988.

USATHAMA, 1980 - Installation Assessment of Seneca Army Depot, Report No. 157, Aberdeen Proving Grounds, MD, January 1980.

USEPA, Army, and NYSDEC, 1993 - Federal Facility Agreement Under CERCLA Section 120, Docket Number: II-CERCLA-FFA-00202, January 1993.

USEPA, 2002 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Integrated Manual, NTIS-PB2002105715, EPA SW-846, 2002.

USEPA, 2001 - National Primary Drinking Water Standards, EPA 816-F-01-007, March 2001

USEPA, 1999 - A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents, EPA 540-R-98-031, OSWER 9200.1-23P, PB98-963241, July 1999.

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, 2005 – Seneca Army Depot Activity Time-Critical Removal Action Metal Sites – SEAD 67, Seneca County, Romulus, New York, February, 2005.

Woodward-Clyde Federal Services, 1997 – Environmental Baseline Survey Report. Final, U.S. Army Base Realignment and Closure 95 Program, March 1997.

APPENDIX B

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DECLARATION OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, 12th Floor
625 Broadway, Albany, New York 12233-7011
Phone: (518) 402-9706 • **FAX:** (518) 402-9020
Website: www.dec.state.ny.us

JAN 2 2 2007

Mr. George Pavlou
Director
Emergency & Remedial Response Division
US Environmental Protection Agency
Floor 19- #E38
290 Broadway
New York, New York 10007-1866

Re: Seneca Army Depot Activity
Site #850006
Draft Record Of Decision-Seventeen SWMUs Requiring Institutional Controls (SEADs 13, 39,40,41,43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B and 122E

Dear Mr. Pavlou:

The New York State Department of Environmental Conservation and the New York State Department of Health have reviewed the above referenced ROD. The State concurs with the selected remedy as stated in the final ROD, dated December, 2006.

If you have any questions, please contact Dr. Chittibabu Vasudevan at (518)402-9625.

Sincerely

Dale A. Desnoyers
Director
Division of Environmental Remediation

cc: J. Vasquez, USEPA
S. Absolom, SEAD

APPENDIX C

RESPONSIVENESS SUMMARY AND PUBLIC COMMENTS

APPENDIX C

PUBLIC COMMENTS AND RESPONSIVENESS SUMMARY

Seventeen SWMUs Requiring Institutional Controls (SEADs-13, 39, 40, 41, 43/56/69, 44A, 44B, 52, 62, 64B, 64C, 64D, 67, 122B, and 122E) SENECA ARMY DEPOT SUPERFUND SITE

INTRODUCTION

A responsiveness summary is required by Superfund policy. It provides a summary of citizen's comments and concerns received during the public comment period, and the Army's responses to those comments and concerns.

OVERVIEW

Since the inception of this project, the Army has implemented an active policy of involvement with the local community. This involvement has occurred through the public forum provided by regular meetings of the Base Cleanup Team (BCT). During these meetings, representatives of the community, the Army and the regulators are brought together in a forum where ideas and concerns are voiced and addressed. The BCT has been routinely briefed by the Army in regards to the progress and the results obtained during both the investigation and remedial alternative selection process. In addition to regular project specific briefings, the Army has provided experts in various fields related to the CERCLA program that have provided lectures intended to educate the general public in the various technical aspects of the CERCLA program at SEDA. Lectures have been conducted on risk assessments, both human health and ecological, remedial alternatives, such as bioventing and natural attenuation, institutional controls, and the feasibility study process.

BACKGROUND ON COMMUNITY INVOLVEMENT

Initially, during the years from 1991 through 1995 the Army formed and solicited community involvement through quarterly meetings with the Technical Review Committee (TRC). The TRC was comprised of community leaders with an active interest in the on-goings of the CERCLA process at the depot. These meetings were open to the public and were announced in the local newspaper and the radio. Following inclusion of the depot on the final BRAC closure list in late 1995, the Army transitioned from the TRC and formed the BCT. The BCT was comprised of several of the TRC members with the addition of additional Army and regulatory representatives. The BCT increased the frequency of the meetings to a monthly basis. Since the formation of the TRC and the BCT, the Army has met with the local community members on a regular basis and has discussed the findings of completion reports (i.e. Expanded Site Investigations, Decision

Documents, Engineering Evaluation/Cost Analysis). In addition, the proposed plan has been presented to the BCT.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The related Decision Documents and the Proposed Plan for the sites have been released to the public for comment. These documents were made available to the public in the administrative record file at the information repositories at Building 123 within the Seneca Army Depot Activity, 5786 State Route 96, Romulus, New York, 14541-0009. The notice of availability for the above-referenced documents was published in the Finger Lake Times on June 11, 2006. The public comment period on these documents was held from June 9, 2006 to July 8, 2006.

On June 20, 2006, the Army, the USEPA and the NYSDEC conducted a public meeting at the Seneca County Board of Supervisors Room, located at the Seneca County Office Building in Waterloo, NY to inform local officials and interested citizens about the Superfund process, to review current and planned remedial activities at the site, and to respond to any questions from area residents and other attendees. The meeting included poster board presentations and provided an opportunity for the public to speak to Army, USEPA and NYSDEC representatives involved in the process. The public was given the opportunity to provide formal comments that would be documented and become part of the official record for the selected remedy.

SUMMARY OF COMMENTS AND RESPONSES

No formal comments were received from the community during the public meeting at this time.