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May 1, 2006

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Mr. Kuldeep K. Gupta, P.E.
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Albany, NY 12233-7015

Ms. Charlotte Bethoney
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Subject: **Submittal of Response to Regulatory Agency Comments and Insert/Replacement Pages for Final Remedial Investigation Report for two EBS Sites in the Proposed Industrial Development Area (SEADs 121C and 121I), Seneca Army Depot Activity, EPA Site ID# NY0213820830, NY Site ID# 8-50-006.**

Dear Mr. Vazquez/Mr. Gupta/Ms. Bethoney:

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit copies of the U.S. Army's responses to USEPA and NYSDEC comments on the Draft Final Remedial Investigation Report for two EBS Sites in the Proposed Industrial Development Area (SEADs 121C and 121I) at the Seneca Army Depot Activity in Romulus, New York. Additionally, based on the responses to regulatory comments, Parsons is pleased to provide copies of insert/replacement pages that we believe are needed to convert the previously submitted Draft Final Report to the Final Remedial Investigation Report for the identified sites. Furthermore, Parsons is pleased to provide instructions for inserting and replacing pages in the Draft Final Report to affect its change to the Final Report. Finally, Parsons is pleased to provide each of you with electronic copies in Adobe® Acrobat® format of the Final Remedial Investigation Report in its entirety for the aforementioned sites.

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:
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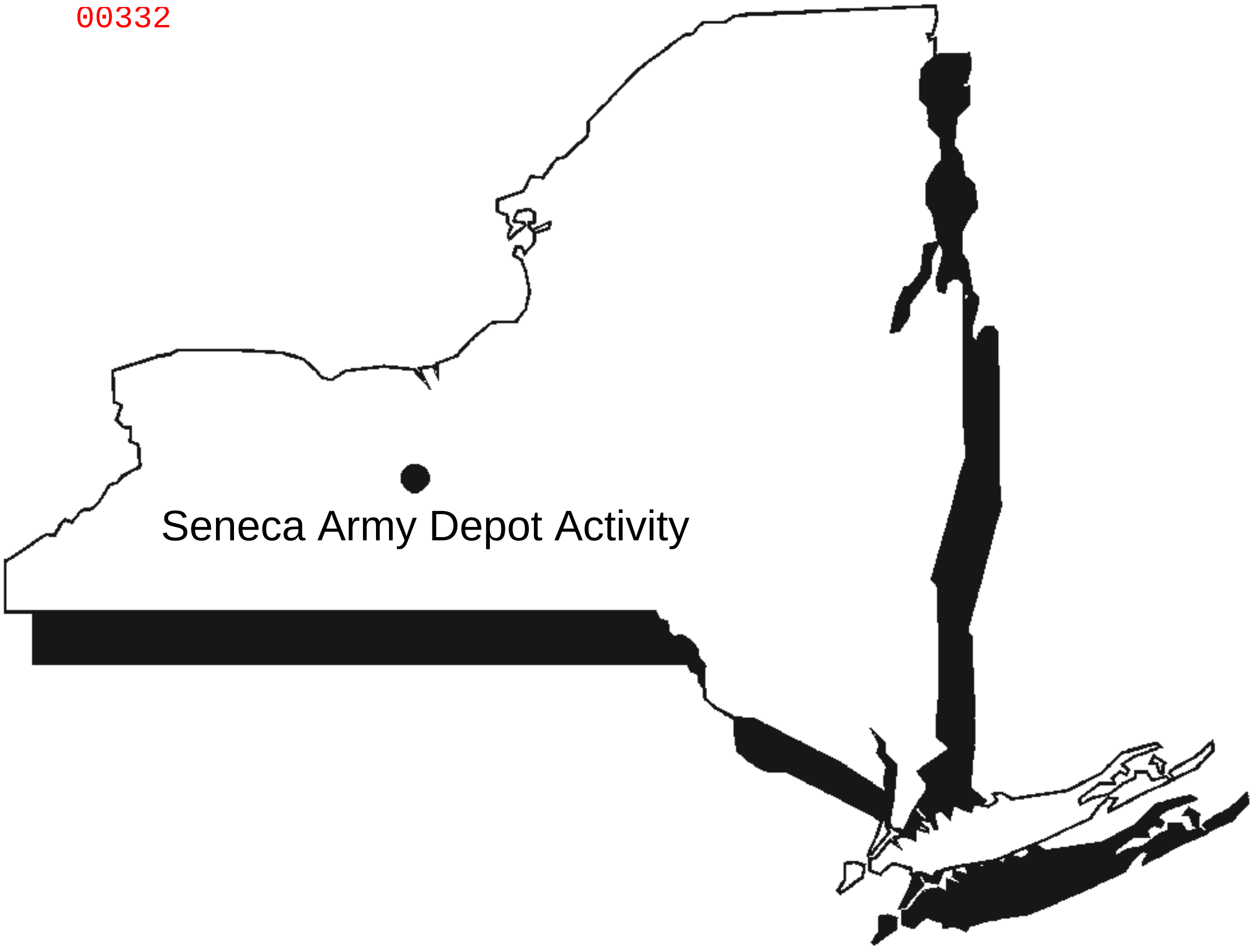

FINAL
REMEDIAL INVESTIGATION REPORT
TWO EBS SITES IN PLANNED INDUSTRIAL DEVELOPMENT AREA (SEAD-121C AND SEAD121I)

EPA Site ID# NY0213820830
NY Site ID# 8-50-006
CONTRACT NO. DACA87-95-D-0031
DELIVERY ORDER NO. 0030

APRIL 2006

FINAL

REMEDIAL INVESTIGATION REPORT
FOR TWO EBS SITES IN THE PLANNED INDUSTRIAL DEVELOPMENT AREA,
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared For:

Seneca Army Depot Activity
and
U.S. Army Corps of Engineers
Huntsville Center

Prepared By:

PARSONS
150 Federal Street
Boston, Massachusetts

Contract No. DACA87-95-D-0031
Delivery Order No. 30
USEPA Site ID: NY0213820830
NY Site ID: 8-50-006

April 2006

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LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

AQCR	Air Quality Control Region
ARAR	applicable or relevant and appropriate requirements
ASP	Analytical Services Protocol
ASTM	American Society for Testing and Materials
AT	Averaging Time
AWQS	Ambient Water Quality Standard
BAF	bioaccumulation factor
bgs	below grade surface or below ground surface
BRA	Baseline Risk Assessment
BRAC	Base Realignment and Closure
BTAG	Biological Technical Assistance Group
BTE	Benzo(a)pyrene Toxicity Equivalence
BTEX	benzene, toluene, ethylbenzene and xylene
BW	Bodyweight
CDI	Chronic Daily Intake over 70 years
CEC	cation exchange capacity
CERCLA	Comprehensive Environmental Responsibility, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CF	conversion factor
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
cm	centimeter or centimeters
COC	chemicals of concern
COPC	chemicals of potential concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSM	Conceptual Site Model
CT	central tendency
DA	Absorbed dose
DFW	Division of Fish and Wildlife
DO	dissolved oxygen content
DOA	Department of the Army
DoD	Department of Defense
DOT	Department of Transportation
DQO	Data Quality Objective
DRMO	Defense Reutilization and Marketing Office
dup or DU	duplicate sample designator
e.g.,	for example
EB	equipment blank sample designator
EBS	Environmental Baseline Survey
ED	Exposure duration
EF	Exposure frequency
ECL	Environmental Conservation Law
EPC	exposure point concentration
ERA	Ecological Risk Assessment

ERAGS	Ecological Risk Assessment Guidance for Superfund
ESI	expanded site investigation
et seq	and the following one
EV	Event frequency
FB	field blank sample designator
Fe	chemical symbol for Iron
FFA	Federal Facilities Agreement
FOIL	Freedom of Information Law
FPPA	Farmland Protection Policy Act
FSAP	Field Sampling and Analysis Plan
ft.	Feet
GI	gastrointestinal
gm	gram
gpm	gallon per minute or gallons per minute
GPS	Global Position System
H	Henry’s law constant
H	Herbicides
HEA	Health Effect Assessment
HERD	Human and Ecological Risk Division
HHRA	human health risk assessment
HI	hazard index
HQ	Hazard Quotient
hr	hour or hours
HWR	Hazardous Waste Remediation
I	Intake or Absorbed Dose
I.D.	inside diameter
i.e.,	that is
IAG	Interagency Agreement
IC	institutional controls
ICP	Inductively Coupled Plasma
IEUBK	Integrated Exposure Uptake Biokinetic Model for Lead in Children
IR	Inhalation rate
IRIS	Integrated Risk Information System
Kg/hectare	kilogram or kilograms per hectare
lb	pound
LC50	median lethal concentration
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LD50	median lethal dose
L/min	Liter(s)/minute
LOAEL	lowest observed adverse effect level
LRA	Local Redevelopment Authority
m	meter(s)
MCL	Maximum Contaminant Level

MCLG	Maximum Contaminant Level Goal
mg/L	milligram or milligrams per Liter
mL/g	milliliter or milligrams per gram
mm Hg	millimeters of mercury
mol/m^3-atm	mole or moles per cubic meter-atmosphere
m/s	meter(s)/second
MS	matrix spike sample designation
MSD	matrix spike duplicate sample designation
MSL	mean sea level
MSDS	material safety data sheet
MV	millivolt or millivolts
NCEA	National Center for Environmental Assessment
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
nm	nanometer
NOAEL	no observed adverse effect level
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NTU	Nephelometric turbidity units
NYCRR	New York State Codes, Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
OB	Open Burn
OCP	Organochlorine Pesticides
OPP	Organophosphorous Pesticides
ORP	oxidation-reduction potential
OSWER	Office of Solid Waste and Emergency Response
PAH	polycyclic aromatic hydrocarbon
PbB	blood lead
PCB	Polychlorinated biphenyl
PID	Planned Industrial/Office Development
PM	particulate matter
POTW	Publicly-Owned Treatment Works
ppm	part or parts per million
PPRTV	Provisional Peer Reviewed Toxicity Value
PR	percent recovery
PRG	preliminary remediation goal
PVC	polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
QAMS	Quality Assurance Management Staff
%R	percent recovery
RCRA	Resource Conservation and Recovery Act
RfC	reference concentration
RfD	reference dose
RFI	RCRA Facility Investigation
RI	Remedial Investigation

RI/FS	Remedial Investigation/Feasibility Study
RL	reporting limit
RPD	relative percent difference
RME	reasonable maximum exposure
SA	Skin surface area available for contact (cm^2)
SD	Sediment sample designation
SEC	Secondary Drinking Water Guidance Value
SEDA	Seneca Army Depot Activity
SEV	screening ecotoxicity value
SF	Slope Factor
SI	Site Investigation
SLERA	screening level ecological risk assessment
SMDP	scientific management decision point
SOP	standard operating procedure
SPDES	State Pollutant Discharge Elimination System
SSHP	Site-specific Safety and Health Plan
STSC	Superfund Health Risk Technical Support Center
SVOC	Semivolatile organic compound
SW	Surface Water sample designation
SWMU	solid waste management unit
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TOGS	Technical Operating Guidance
TB	trip blank sample designator
TBC	to be considered
TCE	trichloroethylene or trichloroethene
TCL	Target Compound List
TEF	toxicity equivalency factor
TIC	Tentatively Identified Compound
TOG	Technical Operating Guidance
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
TSCA	Toxic Substances Control Act
UCL	upper confidence limit
USACE	United States Army Corps of Engineers
USC	United States Code
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VC	Vinyl chloride
VOC	Volatile organic compound
W	weight
Zn	chemical symbol for Zinc

μg/cm^2	microgram or micrograms per square centimeter

REFERENCES

Alexander, Martin. 2000. Aging, bioavailability, and overestimation of risk from environmental pollutants. *Environmental Science and Technology* 34(20):4259-4265.

Agency for Toxic Substances and Disease Registry. 2003. Toxicological Profile for Zinc.

Agency for Toxic Substances and Disease Registry. 2000. Toxicological Profile for Manganese.

Agency for Toxic Substances and Disease Registry. 1999. Toxicological Profile for Cadmium.

Agency for Toxic Substances and Disease Registry. 1992. Toxicological Profile for Antimony.

Army, United States Environmental Protection Agency (USEPA) Region 2, New York State Department of Environmental Conservation (NYSDEC). 1993. Federal Facilities Agreement (FFA).

Bartlett, R.J. and B. James. 1979. Behavior of chromium in soils: III. oxidation. J. Environ. Qual. 8:31-35.

Bartlett, R.J. and J.M. Kimble. 1976. Behavior of Chromium in Soils: II. hexavalent forms. J. Environ. Qual. 5:383-386.

Biomedical and Environmental Information Analysis (BELA). 1989. The Installation Restoration Program Toxicology Guide. Volume 4. BELA Health and Safety Research Division, Oak Ridge National Laboratory. July.

Bloomfield, C. and G. Pruden. 1980. The behavior of Cr(VI) in soil under aerobic and anaerobic conditions. Environ. Pollut. Ser. A. 103-114.

Brett, C.E., Dick, V.B, Baird, G.C., 1991, Comparative Taphonamy and Paleoecology of Middle Devoniam Dark Gray and Black Shale Facies from Western New York. in eds., Landing, E.L. and Brett, C.E., Dynamic Stratigraphy and Depositional Environments of the Hamilton Group (Middle Devonian) in New York State, Part II, New York State Museum Bulletin Number 469. pp. 5-36.

Canadian Council of Ministers of the Environment. 2003. Canadian Environmental Quality Guideline. December.

Code of Federal Register. Title 40, Chapter 1, Part 143. National Secondary Drinking Water Regulations.

Cornell University, 1967. Land Use Report.

Crain, L.J. 1974. Groundwater Resources of the Western Oswego River Basin, New York. U.S. Geological Survey and State of New York Basin Planning Report ORB-5.

Dragun, James. 1988. The Soil Chemistry of Hazardous Materials. The Hazardous Materials Control Research Institute.

Efroymson, R.A. et al. 1997a. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. November.

Efroymson, R.A. et al. 1997b. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November.

Gas Research Institute. 1988. Management of Manufactured Gas Plant Sites, Volume III, Risk Assessment. GRI-87/0260.3. May.

Gray, L.M., 1991, Paleoecology, Origin, and Significance of a Shell-Rich Bed in the Lowermost Part of the Ludlowville Formation (Middle Peronian, Central New York). in eds. Landing, E.L. and Brett, C.E., Dynamic Stratigraphy and Depositional Environments of the Hamilton Group (Middle Devonian) in New York State, Part II, New York State Museum Bulletin 469, p.93-105.

Griffin, R.A. and N.F. Shimp. 1978. Attenuation of pollutants in municipal landfill leachate by clay minerals. EPA-600/2-78-157.

Hazardous Substance Data Bank (HSDB), Toxnet, National Library of Medicine: Specialized Information Services. 2005 On-line resources available at http://toxnet.nlm.nih.gov.

Hewitt, Alan D, 1999. "Storage and Preservation of Soil Samples for Volatile Compound Analysis," May 1999.

Holzworth, George C. 1972. Mixing Heights, Windspeed, and Potential for Urban Air Pollution throughout the Contiguous United States. January.

Kinniburgh, D.G. and M.L. Jackson. 1978. Adsorption of mercury (II) by iron hydrouse oxide gel. Soil Sci. Soc. Am. J. 42:45-47.

LaSala, A.M. Jr. 1968. Groundwater Resources of the Erie-Niagara Basin, New York: Basic Planning Report ENB-3, State of New York Conservation Department with Resources Commission.

Lindsay, W. L. 1979. Chemical equilibria in soils. John Wiley and Sons. New York.

Loehr, R.C. 1996. The Environmental Impact of Soil Contamination: Bioavailability, Risk Assessment, and Policy Implications. Reason Foundation (Los Angeles, CA) and National Environmental Policy Institute (Washington, D.C.). Policy Study No. 211.

Magee, B., P. Anderson, and D. Burmaster. 1996. Absorption adjustment factor (AAF) distributions for polycyclic aromatic hydrocarbons (PAHs). *Human Ecol. Risk Assessment* 2(4):841-873.

McGovern, C.E. undated. Background Concentrations of 20 Elements in Soils with Special Regard for New York State. Wildlife Pathology Unit, Wildlife Resource Center, NYSDEC.

McLean, J.E., Bledsoe, B.E. 1992. Behavior of Metals in Soils. In: EPA Ground Water Issue EPA/540/S-92/018 pp. 1-20.

Merin, Ira. S. 1992. Conceptual Model of Ground Water Flow in Fractured Siltstone Based on Analysis of Rock Cores, Borehole Geophysics, and Thin Sections. Ground Water Monitoring Review, Fall, 1992.

Metcalf & Eddy. 1989. Criteria Development Report for the Closure of Nine Burning Pads Seneca Army Depot, Seneca, New York; Vol. I.

Mozola, A.J. 1951. The Groundwater Resources of Seneca County, New York, Bulletin GW-26. Water, Power and Control Commission, Department of Conservation, State of New York, Albany, New York.

Nagy, et al. 1999. Energetics of Free-ranging Mammals, Reptiles, and Birds. *Ann. Rev. Nutr.* 19: 247-277.

Nakles, D.V., Harju, J.A. 2002. Environmentally Acceptable Endpoints in Soil: Basic Concepts and Assessment Approaches.

Netherlands Ministry of Housing, Spatial Planning and Environment. 2000 Circular on Target Values and Intervention Values for Soil Remediation.

New York State Department of Environmental Conservation (NYSDEC). 1998 with 2000 and 2004 Addendum. Ambient Water Quality Standard and Guidance Values and Groundwater Effluent Limitations.

New York State Department of Environmental Conservation (NYSDEC), 1994a. Technical and Administrative Guidance Memorandum # 4046: Determination of Soil Cleanup Objectives And Cleanup Levels", January 24, 1994.

New York State Department of Environmental Conservation (NYSDEC), 1994b, Technical and Administrative Guidance Memorandum (TAGM): Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites, October, 1994.

New York State Department of Environmental Conservation (NYSDEC), 1999. Technical Guidance for Screening Contaminated Sediments. Division of Fish, Wildlife, and Marine Resources.

Oscarson, D.W., P.M. Huang, U.T. Hammer, and W.K. Liaw. 1983. Oxidation and sorption of arsenite by manganese dioxide as influenced by surface coatings of iron and aluminum oxides and calcium carbonate. Water Air Soil Pollut. 20:233–244.

Parsons, 2004. Signed Final Record of Decision (ROD) for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas. October.

Parsons, 2002. Final Work Plan for the Remedial Investigation (RI) at Two EBS Sites in the Planned Industrial Development Area, Seneca Army Depot Activity, September 2002.

Parsons, 2001. Action Memorandum and Decision Document Removal Actions, Three VOC Sites (SEADS 38, 39, & 40)

Parsons Engineering Science, Inc, 1999. Final Investigation of Environmental Baseline Survey Non-Evaluated Sites [SEAD-119A, SEAD-122(A,B,C,D,E), SEAD-123(A,B,C,D,E,F), SEAD-46, SEAD-68, SEAD-120(A,B,C,D,E,F,G,H,I,J), and SEAD-121(A,B,C,D,E,F,G,H,I)], May 1999.

Parsons Engineering Science, Inc., 1995. Generic Installation Remedial Investigation/Feasibility Study (RI/FS) Work Plan, August 1995.

Parsons Engineering Science, Inc., 1994. SWMU Classification Report, September.

Reed, P.B., Jr., 1988. National List of Plant Species That Occur in Wetlands: Northeast (Region 1). US Department of the Interior, Fish and Wildlife Service, Research and Development, Biological Report 88(26.1), Washington, DC

RKG Associates, Inc., 1996 Reuse Plan and Implementation Strategy for the Seneca Army Depot Activity.

Rogers, R. D. 1976. Methylation of mercury in agricultural soils. J. Environ. Qual. 5:454-458.

Rogers, R. D. 1977. Abiological methylation of mercury in soil. J. Environ. Qual. 6:463-467

Ruby, M.V., R. Schoof, W. Brattin, M. Goldade, G. Post, M. Harnois, D.E. Mosby, S.W. Casteel, W. Berti, M. Carpenter, D. Edwards, D. Cragin, and W. Chappell. 1999. Advances in evaluating the oral bioavailability of inorganics in soil for use in human health risk assessment. *Environmental Science & Technology* 33(21): 3697-3705.

Sample et al. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.

Shacklette, H.T. and Boerngen, J.G. 1984. Element Concentrations in Soils at other Surficial Materials of the Contiguous United States. U.S.G.S. Prof Paper 1270, Washington

Shuman, L.M. 1991. Chemical Forms of Micronutrients in Soils. In: Mortvedt et al., J.J. (eds) Micronutrients in Agriculture, ASA, CSSA, and SSSA. Madison, WI 1991. pp113-144.

TAMS Consultants, Inc. 2000. Phase 2 Report Further Characterization and Analysis. Volume 2E - Revised Baseline Ecological Risk Assessment. Hudson River PCBs Reassessment. For USEPA Region 2 and USACE Kansas City District. November.

United States Army Corps of Engineers (USACE). 2001. Shell for Analytical Chemistry Requirements. In EM200-1-3.

United States Army Corps of Engineers, 1987. Corps of Engineers Wetlands Delineation Manual. Waterways Experiment Station.

United States Department of Defense (DoD). 2001. Base Closure and Realignment Schedules. On-line resources available at http://www.oea.gov/OEAWeb.nsf/D6457626D512D16E85256E8300447D2F/$File/BRAC%20Schedules%20Report2.pdf

United States Environmental Protection Agency (USEPA). 2005a. Integrated Risk Information System. On-line database. http://www.epa.gov/iris/

United States Environmental Protection Agency (USEPA). 2005b. The Ecological Soil Screening Level (Eco-SSL). Interim. Revised in March 2005.

United States Environmental Protection Agency (USEPA). 2004a. Risk Assessment Guidance for Superfund, Volume I: Human health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Review Draft. Office of Emergency and Remedial Response. August.

United States Environmental Protection Agency (USEPA). 2004b. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. July.

United States Environmental Protection Agency (USEPA). 2004c. ProUCL Version 3.0 User Guide. April.

United States Environmental Protection Agency (USEPA). 2003a. Human Health Toxicity Values in Superfund Risk Assessment, Memorandum to Superfund National Policy Managers, Region 1-10. Office of Solid Waste and Emergency Response. December.

United States Environmental Protection Agency (USEPA). 2003b. Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil.

United States Environmental Protection Agency (USEPA). 2003c. The Ecological Soil Screening Level (Eco-SSL). Interim. Revised in 2003.

United States Environmental Protection Agency (USEPA). 2002a. Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.

United States Environmental Protection Agency (USEPA). 2002b. Calculating Upper Confidence Limits For Exposure Point Concentrations At Hazardous Waste Sites. OSWER 9285.6-10. December.

United States Environmental Protection Agency (USEPA). 2002c. National Recommended Water Quality Criteria: 2002. EPA-822-R-02-047. November.

United States Environmental Protection Agency (USEPA). 2002d. Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites. Office of Emergency and Remedial Response. September.

United States Environmental Protection Agency (USEPA). 2002e. List of Drinking Water Contaminants & MCLs. EPA816-F-02-013. July.

United States Environmental Protection Agency (USEPA). 2001a. Eco Update. The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments. Office of Solid Waste and Emergency Response. June.

United States Environmental Protection Agency (USEPA). 2001b. Report on the Corrosion of Certain Alloys. EPA 260-R-01-002. July.

United States Environmental Protection Agency (USEPA). 2000a. Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment, Status and Needs. Office of Water and Office of Solid Waste. February.

United States Environmental Protection Agency (USEPA). 2000b. The Ecological Soil Screening Level (Eco-SSL). Interim.

United States Environmental Protection Agency (USEPA). 2000c. Data Quality Objectives Process for Hazardous Waste Site Investigations, Final January 2000

United States Environmental Protection Agency (USEPA). 1999a. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. October.

United States Environmental Protection Agency (USEPA). 1999b. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. November.

United States Environmental Protection Agency (USEPA). 1998a. Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities. August.

United States Environmental Protection Agency (USEPA). 1998b. Guidelines for Ecological Risk Assessment. Final. April.

United States Environmental Protection Agency (USEPA). 1997a. Exposure Factors Handbook. Office of Research and Development. August.

United States Environmental Protection Agency (USEPA). 1997b. Health Effects Assessment Summary Tables. Office of Solid Waste and Emergency Response. July

United States Environmental Protection Agency (USEPA). 1997c. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessment. Interim Final. Office of Solid Waste and Emergency Response. June.

United States Environmental Protection Agency (USEPA). 1996a. Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. December.

United States Environmental Protection Agency (USEPA). 1996b. Soil Screening Guidance: Technical Background Document. Office of Solid Waste and Emergency Response. May.

United States Environmental Protection Agency (USEPA). 1994. Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children. February.

United States Environmental Protection Agency (USEPA). 1993a. Environmental Protection Agency (EPA), Office of Research and Development, Washington, DC. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. EPA/600/R-93/089.

United States Environmental Protection Agency (USEPA). 1993b. Wildlife Exposure Factors Handbook.

United States Environmental Protection Agency (USEPA), 1993c. Superfund’s Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure. Preliminary Review Draft. Risk Assessment Council, Washington DC. November.

United States Environmental Protection Agency (USEPA), 1993d Data Quality Objectives Process for Superfund, Interim Final Guidance. September 1993.

United States Environmental Protection Agency (USEPA). 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors.

United States Environmental Protection Agency (USEPA). 1989. Risk Assessment Guidance for Superfund. Volume 1 – Human Health Evaluation Manual Supplement (Part A). Office of Emergency and Remedial Response. December.

United States Environmental Protection Agency (USEPA), 1988. "Guidance for Conducting Remedial Investigation and Feasibility Studies Under CERCLA". October 1988.

United States Environmental Protection Agency (USEPA), 1987. Data Quality Objectives (DQO) for Remedial Response Activities: Development Process. March 1987

United States Environmental Protection Agency (USEPA), 1985. Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites.

United States Environmental Protection Agency (USEPA) Region 2. Region 2 RCRA and CERCLA Data Validation Standard Operating Procedures (SOPs). On-line resources at http://www.epa.gov/region02/desa/hsw/sops.htm.

United States Environmental Protection Agency (USEPA) Region 2. 1998. Ground Water Sampling Procedure Low Stress (Low Flow) Purging And Sampling. March 16.

United States Environmental Protection Agency (USEPA) Region III. 2004. Risk-Based Concentration (RBC) Table. On-line database last updated October. http://www.epa.gov/reg3hwmd/risk/index.htm

United States Environmental Protection Agency (USEPA) Region III. 1995. Region III BTAG Screening Levels.

United States Environmental Protection Agency (USEPA) Region 5. 2003. Ecological Screening Levels.

United States Environmental Protection Agency (USEPA) Region 9. 2004. Preliminary Remediation Goals. On-line resources available at http://www.epa.gov/region09/waste/sfund/prg/index.htm, last updated December.

Valberg PA, Beck BD, Bowers TS, Keating JL, Bergstrom PD, Board-man PD. 1997. Issues in setting health-based cleanup levels for arsenic in soil. Regul Toxicol Pharmacol 26:219–229.

Water Information Center. 1973 Water Atlas of the United States.

Wester, R.C., H.I. Maibach, D.A. Bucks, L. Sedik, J. Melendres, C. Liao, and S, DiZio. 1990. Percutaneous absorption of [14C]DDT and [14C]Benzo(a)pyrene from soil. *Fundamental and Applied Toxicology* 15:510-516.

Whitefish Point Bird Observatory. 2005. On-line resources available at http://www.wpbo.org/featured/robin/

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

Wright, M. 2001. Dietary Reference Intakes. On-line resources available at http://www.fcs.uga.edu/pubs/PDF/FDNS-E-65.pdf.

EXECUTIVE SUMMARY

The Army has conducted site investigations at the DRMO Yard (SEAD-121C) and at the Rumored Cosmoline Oil Disposal Area (SEAD-121I) at the Seneca Army Depot Activity in Romulus, New York to assess whether there is evidence of a release of hazardous substances from historic activities conducted at the sites and if there is a threat to human health or the environment. The investigations conducted included the collection and chemical analysis of soil (surface and subsurface), surface water, groundwater (SEAD-121C only), and ditch soil samples from locations within and outside of the DRMO Yard and the Rumored Cosmoline Oil Disposal Area. Sampling and analyses were completed during two investigations: the Environmental Baseline Survey (EBS) in 1998-1999; and a remedial investigation (RI) during 2002-2003. The samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), metals, cyanide, total organic carbon (TOC), and total petroleum hydrocarbon (TPH). A baseline human health risk assessment, based on a continuing industrial usage of the sites, and a screening-level ecological risk assessment was completed for each site to evaluate potential risks to human health and the environment.

The results of the completed site investigations and the risk assessments indicate:

SEAD-121C (DRMO Yard)

There are two discrete areas where materials have been stored in the past, which have impacted the surface soil with metals. There is no indication of a wide-spread release of organic compounds across the site. The media at SEAD-121C do not pose a risk to future industrial receptors at the site. Additionally, the ecological risk assessment indicates that the residual chemicals identified at the site are not expected to significantly impact ecological receptors at the site. Therefore, a risk-based action will not be necessary at the DRMO Yard.

SEAD-121I (Rumored Cosmoline Oil Disposal Area)

There is no evidence of a release of hazardous substances or materials at SEAD-121I. The media at SEAD-121I do not pose a risk to future industrial receptors at the site. Additionally, the ecological risk assessment indicates that the residual chemicals identified at the site are not expected to significantly impact ecological receptors at the site. Therefore, a risk-based action will not be necessary at the Rumored Cosmoline Oil Disposal Area.

Institutional controls (ICs) in the form of land use restrictions have been imposed on the greater PID Area in the Final Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas (Parsons, 2004), signed on September 28, 2004 by USEPA. These restrictions are as follows:

- Prohibit the development and use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds.

- Prevent access to or use of groundwater until the Class GA Groundwater Standards are met.

The Army recommends that these restrictions remain in effect for SEAD-121C and SEAD-121I until additional data are developed and evaluated to substantiate their removal at either or both of the sites. Additional information substantiating the Army's position is summarized below and presented in additional detail in the balance of this report.

E.1 THE DRMO YARD (SEAD-121C)

E.1.1 Nature and Extent of Impacts

Surface and subsurface soil samples were collected inside and outside the DRMO Yard. Surface water and ditch soil were collected along man-made drainage ditches that exist along the border of, and within the site. Groundwater samples were obtained from wells located within, and at locations upgradient of the site.

Heavy metals including copper, lead, and zinc were found in the surface soil at concentrations above the New York State's (NYS's) recommended soil cleanup objectives. The high metal concentrations were generally isolated to two areas in the DRMO Yard: the northeastern corner and the southwestern corner. Metals detected in the other samples at the site were found at significantly lower concentrations.

An isolated elevated concentration of BTEX (~ 160 ppm) was detected in a subsurface sample located along the southern edge of the site. BTEX was not detected in any other subsurface locations at SEAD-121C. BTEX was found at other surface soil locations, but at concentrations lower than NYS's recommended cleanup objectives.

One sample contained concentrations of carcinogenic polycyclic aromatic hydrocarbons (cPAHs) at a concentration in excess of NYS's recommended cleanup level [10 mg/Kg, calculated as benzo(a)pyrene toxicity equivalents (BTE)]. This sample was collected from a location midway along the northwestern fence of the site.

Groundwater is not considered a media of concern at SEAD-121C. Several metals including aluminum, antimony, iron, manganese, and sodium were detected in the groundwater; however the highest concentrations were found in samples that had elevated levels of turbidity. Samples collected subsequently, using techniques that minimized turbidity effects, indicated levels of metals that are generally consistent with SEDA background conditions.

Data was produced that indicates that an upgradient source may exist and be responsible for an isolated chlorinated solvent plume that is flowing into the DRMO Yard. However, other SEAD-121C groundwater data indicates that the plume is not wide-spread or migrating beyond the border of the site.

One SVOC and several heavy metals were detected in surface water at the DRMO Yard. The single identified SVOC is a common laboratory contaminant, and it was found at an estimated concentration at one location. The identified heavy metals were found in samples collected inside and upgradient of the site, and the data suggest that some constituents are part of the background that exists around the site and are unrelated to historic activities at SEAD-121C.

E.1.2 Baseline Human Health Risk Assessment

Available data were incorporated into a human health risk assessment. Exposure was evaluated for a future industrial worker, construction worker, and adolescent trespasser. In accordance with the USEPA's guidance, all chemicals detected at the site were screened as a first step. Screening values were generally based on USEPA Region 9 Preliminary Remediation Goals (PRGs) residential soil values and tap water values updated in December 2004 to identify chemicals of potential concern (COPCs). The potential risks due to the exposure were evaluated via two exposure scenarios: 1) exposure to soil and groundwater, and 2) exposure to ditch soil, surface water, and groundwater.

At the DRMO Yard the total hazard indices calculated are less than 1 for all receptors, and the total cancer risks for all receptors are less than 10^{-4}. Risk due to exposure to groundwater is not expected to be significant, since no COPCs were identified during the screening process.

Lead was identified as a potential COPC in soils, ditch soils, and surface water at SEAD-121C. For the industrial worker, risk associated with lead was evaluated using the Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. The 95th percentile blood lead concentration (PbB) among fetuses of adult industrial workers exposed to soil and ditch soil are below the USEPA target PbB level of concern (i.e., 10 μg/dL). Therefore, lead in SEAD-121C soil and ditch soil is not expected to pose potential risks to industrial workers or their fetuses. Construction workers are expected to work at the sites in short-term (i.e., 1 year); therefore, risk associated with lead exposure is expected to be minor.

The IEUBK model results, based on residential child exposure assumptions, were used as a screening tool to evaluate potential risks associated with lead in SEAD-121C soil for adolescent trespassers. The 95th percentile PbBs among residential children are below the USEPA target PbB level of concern (i.e., 10 μg/dL). Therefore, lead in SEAD-121C surface soil and ditch soil does not pose a health risk to the adolescent trespasser receptor.

E.1.3 Screening-Level Ecological Risk Assessment

A screening level ecological risk assessment (SLERA) was performed to evaluate potential ecological risks associated with exposure to contaminants identified in SEAD-121C soil, ditch soil, and surface water. Exposure to groundwater is considered an incomplete exposure pathway; therefore, groundwater at the sites poses no potential risks to the environment.

NOAEL toxicity values and conservative exposure assumptions were used to calculate screening level HQs. The maximum detected concentrations were compared to screening criteria to identify COPCs. Potential exposures and effects resulting from the maximum detected concentrations of COPCs were then evaluated by estimating potential direct and indirect exposures for wildlife receptors - deer mouse, American robin, short-tailed shrew, meadow vole, red fox, and great blue heron (for ditch soil only) and comparing exposures to NOAEL toxicity values. Due to the conservative nature of the assumptions identified above, additional evaluation was performed to further characterize potential ecological risks and determine if further evaluation is warranted. COC refinement was performed in accordance with the USEPA ERAGS guidance. The findings are summarized below:

1. Although preliminary COCs were identified for SEAD-121C soil, ditch soil, and surface water initially, no final COCs were identified for any medium at SEAD-121C based on the COC refinement;

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

3. The concentrations of several metals (e.g., chromium and thallium in SEAD-121C soil and antimony in SEAD-121C ditch soil) are consistent with SEDA background.

As a result, no COCs were identified for SEAD-121C soil, ditch soil, or surface water. It is the Army's position that soil, ditch soil, surface water, and groundwater at SEAD-121C are not expected to significantly impact ecological receptors at the site and no further action is warranted at SEAD-121C based on the ecological risk assessment.

E.2 RUMORED COSMOLINE OIL DISPOSAL AREA (SEAD-121I)

E.2.1 Nature and Extent of Impacts

Surface soil samples, ditch soil samples, and surface water samples were collected inside, and in the immediate vicinity surrounding SEAD-121I. Additional surface water and ditch soil samples were collected at a downgradient location.

Elevated levels of cPAHs were detected in the soils. The concentrations of cPAHs exceeded NYS's 10 mg/Kg BTE guidance level in three samples. The locations where elevated concentrations of cPAHs were detected were outside the boundary of SEAD-121I or close to the edge of the site along the road. Carcinogenic PAHs are not identified constituents of Cosmoline oil; thus, other sources such as vehicular and rail traffic or roofing/reproofing operations at surrounding warehouse buildings are considered the primary sources of these observed contaminants.

Metals including iron, manganese, arsenic, chromium, thallium, and zinc were found at levels greater than the NYS guidance values in soils at SEAD-121I, focused specifically in the areas surrounding the two ferrous-manganese ore piles. The ore piles are strategic stockpile materials that are being stored at the Depot. The analytical results indicate that elevated levels of the other metals (arsenic, chromium, thallium, and zinc) identified in the soils at SEAD-121I are collocated with the elevated iron and manganese concentrations.

Four metals (aluminum, iron, lead, and zinc) were detected in the surface water at SEAD-121I above their NYS Ambient Water Quality Standards (AWQS) Class C standard. The elevated metal concentrations were clustered in two samples, each of which is located in a small drainage ditch to the north of each ore pile.

The metal concentrations found in the ditch soil samples collected from the downgradient location along Avenue A were lower than the metals concentrations found in the surface soils at SEAD-121I.

E.2.2 Baseline Human Health Risk Assessment

Available surface soil, ditch soil, and surface water data were incorporated into a human health risk assessment. Exposure was evaluated for a future industrial worker, construction worker, and adolescent trespasser. Like the process employed at SEAD-121C, all chemicals that were detected at the site were screened as a first step to identify COPCs. The potential risks due to the exposure were evaluated via two exposure scenarios: 1) exposure to soil, and 2) exposure to ditch soil and surface water.

At SEAD-121I, the total non-cancer risks for the industrial worker and the construction worker are above the USEPA limit of 1, while the cancer risks for all receptor are less than the USEPA upper limit of 10^{-4}.

The hazard indices for the industrial worker exceed 1 due to inhalation of dust in ambient air caused by soil or ditch soil and ingestion of soil. The hazard indices for the construction worker exceed 1 due to inhalation of dust in ambient air caused by soil or ditch soil, ingestion of soil, dermal contact to soil, and ingestion of ditch soil. The total non-cancer risks and total cancer risks for the adolescent trespasser are within the USEPA limits. The significant contributing factor to the non-cancer risk for all receptors and exposure pathways is manganese. Arsenic also contributed to 27% of the non-cancer risk to the construction worker from ingestion of ditch soil.

As previously stated, the location of SEAD-121I is currently being used as a staging site for strategic stockpiles of ferrous-manganese ore. The manganese detected is associated with these ore piles. Any risks associated with the presence of manganese at SEAD-121I do not result from actions or activities that are associated with the ongoing CERCLA investigations.

At SEAD-121I, lead was a COPC in surface water. A quantitative evaluation of dermal exposure to lead in surface water was not conducted as a reliable model is not available at this time. The exposure to surface water is expected to be infrequent and therefore potential risks are expected to be minor.

E.2.3 Screening-Level Ecological Risk Assessment

A screening level ecological risk assessment was performed to evaluate potential ecological risks associated with exposure to contaminants in SEAD-121I soil, ditch soil, and surface water. Exposure to groundwater is considered an incomplete exposure pathway; therefore, groundwater at the sites poses no potential risks to the environment. The SLERA was completed in the same manner as employed at SEAD-121C. The findings are summarized below:

1. No preliminary COCs were identified for surface water. Although preliminary COCs were identified for soil and ditch soil, no final COCs were identified for any medium based on COC refinement.

2. The planned future land use for SEAD-121I is industrial development. The site is not expected to support, sustain, or attract ecological receptors and therefore is not expected to be a wildlife habitat. The presence of ecological receptors is expected to be generally curtailed in these areas where habitat conditions are poor and human activity levels are sufficiently disruptive to discourage wildlife use.

3. The concentrations of several metals (e.g., antimony, cadmium, cyanide, lead, and vanadium in SEAD-121I soil and vanadium level in SEAD-121I ditch soil) are consistent with SEDA background.

4. The source of the metal contamination at SEAD-121I is the strategic stockpiles of ferrous-manganese ore stored at the site.

As a result, no COCs were identified for SEAD-121I soil, ditch soil, or surface water. It is the Army’s position that soil, ditch soil, and surface water at SEAD-121I are not expected to significantly impact ecological receptors at the site and no further action is warranted at SEAD-121I based on the ecological risk assessment.

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

This report describes the field investigations that have been conducted at SEAD-121C [i.e., the Defense Reutilization and Marketing Office (DRMO) Yard] and SEAD-121I (i.e., the Rumored Cosmoline Oil Disposal Area) at the Seneca Army Depot Activity (SEDA or the Depot) in Romulus, New York. The purpose of this report is to:

- Describe the investigation procedures used;
- Present and discuss the physical characteristics of the two sites;
- Present and interpret the analytical results from the investigation programs completed to date;
- Present and interpret the results of the human health and ecological risk assessment for the two sites; and
- Provide conclusions and recommendations based on the sites' current condition and future uses.

SEDA was proposed for listing as a federal facility on the National Priorities List (NPL) on July 14, 1989; this listing was finalized on August 30, 1990.

Parsons was retained by the United States Army Corps of Engineers (USACE) as part of their remedial response activities under the Comprehensive Environmental Responsibility, Compensation and Liability Act (CERCLA) to perform these activities.

1.2 GENERAL DESCRIPTION OF SEDA

SEDA is located approximately 40 miles south of Lake Ontario, near Romulus, New York (**Figure 1-1**). The Depot lies immediately west of the village of Romulus, NY, 12 miles south of the villages of Waterloo and Seneca Falls, and 2.5 miles north of the village of Ovid, NY. The two closest major cities are Rochester, NY, which is located approximately 60 miles northwest, and Syracuse, NY, which is located approximately 60 miles northeast.

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

The 10,587-acre SEDA facility has been owned by the United States Government since 1941 and was operated by the Department of the Army (DOA) until 2000. From its inception in 1941 until 1995, SEDA's primary mission was the receipt, storage, maintenance, and supply of military items, including munitions and equipment. The Depot's mission changed in early 1995 when the Department of Defense (DoD) recommended closure of the SEDA under the Base Realignment and Closure (BRAC) process. This recommendation was approved by Congress on September 28, 1995, and the installation closure date was September 30, 2000.

1.3 SITE BACKGROUND

1.1.1 The Defense Reutilization and Marketing Office (DRMO) Yard – SEAD-121C

SEAD-121C is comprised of a triangularly-shaped gravel lot located in the east-central portion of the Depot (**Figure 1-3**), roughly 4,000 ft. (0.75 miles) southwest of the Depot's main entrance off of State Route 96. Several buildings (Buildings 360, 316, and 317) are located adjacent and east of the site, and one building (Building T-355) is located within the site boundaries. Building T-355 is located in the central part of the DRMO Yard and is used for storage. The DRMO Yard is surrounded by a chain-linked fence and access into the site is limited by a single gate that is normally locked and that is located south of Building 360. The surface of the DRMO Yard is graded to allow surface water to drain toward the man-made ditches that bound the site on the north and south sides. The major pathway of surface water flow out of SEAD-121C is to these drainage ditches, which then flow to the west towards a wetland area and the headwaters of Kendaia Creek in the former munitions storage area.

In addition to Building T-355, several other man-made features are prominent within the DRMO Yard; these features include: a ladled-shaped, earthen bottomed, storage cell in the southwest corner of the site; a rectangular shaped, earthen bottomed, storage cell immediately adjacent to, and located halfway along the northwest perimeter fence of the site; and a multi-chambered, concrete bottomed, storage cell adjacent to the east perimeter fence, near the northern-most point of the DRMO Yard. Each of the storage cells is bounded horizontally on three sides by concrete (jersey) barriers. Common debris, including scrap metal, wood debris, ordnance components, batteries, tiles, oil filters, auto parts, paint cans, tires, and other miscellanies were found in the concrete bottomed, multi-chambered storage cell. During site visits in 2002, 2003, and 2004, Parsons observed that scrap metal, military items, and old machines were stored in the earthen bottomed storage cell located along the northwest fence, while the ladle-shaped earthen bottomed cell was empty, except for small quantities of metal shavings. Interviews with Depot personnel indicate a history of rapid turnaround of material and vehicles stored in this area, and it was common for vehicles including military trailers, trucks, and heavy equipment to be parked along the south and northwest fences and in the central area. A silo-like structure was also found inside the fence of the DRMO Yard, adjacent to the northern edge of Building 360. Furthermore, a large crane was located in the northern portion of the Yard, north of the silo-like structure and Buildings 360 and 316. East of the DRMO Yard, a dielectric transformer box was observed between Building 317 and 1st

Street. Train tracks were also observed to approach the DRMO Yard from the north, with one spur ending at Building 317, a second ending at Building 316, while a third spur extended to the area between Building 316 and Building 360.

1.3.2 The Rumored Cosmoline Oil Disposal Area – SEAD-121I

SEAD-121I, shown in **Figure 1-4**, consists of four rectangular grassy areas that are bounded by 3rd and 7th Streets (north and south ends, respectively) and Avenues C and D (west and east sides, respectively). SEAD-68, the Old Pest Shop site, is located north of the northern end of SEAD-121I, across 3rd Street. Buried reinforced concrete storm drains run east to west through the site along 3rd St., 4th St., 5th St., 6th St., and 7th St. To the east and west of the four rectangular plots are two rows of buildings that are actively used for warehousing. Buildings 331 and 329 located to the west and across Avenue C receive frequent truck deliveries. A railroad spur line enters SEAD-121I from the south and extends to the northern end of the site where it terminates near the intersection of 3rd Street and Avenue C. Two sidings branch off the main spur line; one terminates in the first (north to south) block and the other terminates in the third (north to south) block. There are concrete loading docks located in the first and third blocks next to the railroad lines.

Information provided by the Army indicates that the rail spur and sidings were used for delivery of equipment and machinery that was frequently packed in Cosmoline (oil). Cosmoline oil is a substance that prevents corrosion and is commonly used to store materials. During delivery and unpacking of the equipment and machinery, oil from the packing may have been released to the ground. According to a material safety data sheet (MSDS) prepared by Goodson Shop Supplies, Cosmoline is composed of a complex mixture of petroleum hydrocarbons, severely hydrotreated heavy naphthenic distillate, Stoddard solvent, wool grease, and butyl stearate. No adverse chronic health effects have been reported due to exposure to Cosmoline. Acute health effects are generally limited to irritation, depending on the duration of the contact. An MSDS for Cosmoline Oil has been included as **Appendix A**.

1.4 ENVIRONMENTAL SETTING

1.4.1 Geology

SEDA is located within one distinct unit of glacial till that covers the entire area between the western shore of Lake Cayuga and the eastern shore of Lake Seneca. The till is consistent across the entire Depot although it varies in thickness from less than 2 feet to as much as 15 feet; the average thickness is a few feet. This till is generally characterized by brown to gray-brown silt, clay, and fine sand with few fine to coarse gravel-sized inclusions of weathered shale. Larger diameter weathered shale clasts (as large as 6-inches in diameter) are more prevalent in basal portions of the till and are probably rip-up clasts removed by the active glacier during the late Pleistocene era. The general Unified Soil Classification System (USCS) description of the till on-site is as follows: Clay-silt, brown; slightly plastic, small percentage of fine to medium sand, small percentage of fine to coarse gravel-sized gray shale clasts, dense and mostly dry in place, till, (ML). Grain size analyses performed by Metcalf & Eddy (1989) on glacial till samples collected during the installation of monitoring wells at SEDA show a wide distribution of grain sizes. The glacial tills in this area have a high percentage of silt and clay with trace amounts of fine gravel. A zone of gray weathered shale of variable thickness is present below the till in almost all locations at SEDA. This zone is characterized by fissile shale with a large amount of brown interstitial silt and clay.

This underlying bedrock below weathered shale is a member of the Ludlowville Formation of the Devonian age Hamilton Group. The Hamilton Group, 600 to 1,500 feet thick, is divided into four formations. They are, from oldest to youngest, the Marcellus, Skaneateles, Ludlowville, and Moscow formations. The western portion of SEDA is generally located in the Ludlowville Formation while the eastern portion is located in the younger Moscow Formation. The Ludlowville and Moscow formations are characterized by gray, calcareous shales, mudstones and thin limestones with numerous zones of abundant invertebrate fossils. The Ludlowville Formation is known to contain brachiopods, bivalves, trilobites, corals, and bryozoans (Gray, 1991). In contrast, the lower two formations (Skaneateles and Marcellus) consist largely of black and dark gray sparsely fossiliferous shales (Brett et al., 1991). Locally, the shale is soft, gray, and fissile. **Figure 1-5** displays the stratigraphic section of Paleozoic rocks of Central New York. Three known predominant joint directions, N60^{o}E, N30^{o}W, and N20^{o}E are present within this unit (Mozola, 1951).

1.4.2 Hydrogeology

Available geologic information indicates that the upper portions of the shale formation would be expected to yield small, yet adequate, supplies of water for domestic use. Regionally, four distinct hydrologic water-bearing units have been identified (Mozola, 1951). These include two distinct shale formations, a series of limestone units, and unconsolidated beds of Pleistocene glacial drift.

For mid-Devonian shales such as those of the Hamilton Group, the average yields [which are less than 15 gallons per minute (gpm)] are consistent with what would be expected for shales (LaSala, 1968). The deeper portions of the bedrock (at depths greater than 235 feet) have provided yields of up to 150 gpm. At these depths, the high well yields may be attributed to the effect of solution on the Onondaga limestone that is at the base of the Hamilton Group. Based on well yield data, the degree of solution is affected by the type and thickness of overlying material (Mozola, 1951). Geologic cross-sections from Seneca Lake and Cayuga Lake have been constructed by the State of New York, (Mozola, 1951, and Crain, 1974). This information suggests that a groundwater divide trending north-south exists approximately halfway between the two Finger Lakes. SEDA is located on the western slope of this divide and therefore, regional groundwater flow is expected to be primarily westward towards Seneca Lake.

Surface drainage from SEDA flows to five primary creeks. In the southern portion of the Depot, the surface drainage flows through man-made drainage ditches and streams into Indian and Silver Creeks. These creeks then merge and flow into Seneca Lake just south of the SEDA airfield. The central part and administration area of the SEDA drain into Kendaia Creek. Kendaia Creek flows in a predominant westerly direction, and discharges into Seneca Lake at a location north of Pontius Point and the SEDA's Lake Shore Housing Area. This is the major pathway of surface water flow out of the areas of SEAD-121C (DRMO Yard) and SEAD-121I (Rumored Cosmoline Oil Disposal Area). SEAD-121C is surrounded by man-made drainage ditches that flow west. Near SEAD-121I, surface water runoff collects in a man-made drainage ditch west of the site, which runs in a northwesterly direction to meet up with the ditches to the west of SEAD-121C. In addition, a portion of the flow from SEAD-121I may move easterly toward Cayuga Lake. The majority of the northwestern and north-central portion of the SEDA drains into Reeder Creek. Reeder Creek flows predominantly northwesterly and leaves the Depot at a point that is north of the Open Detonation Area (i.e., SEAD-45) and west of the former Weapons Storage Area or the "Q" (i.e., SEAD-12) before it turns to the west and flows into Seneca Lake. The northeastern portion of the Depot, which includes a marshy area called the Duck Pond, drains into Kendig Creek and then flows north into the Cayuga-Seneca Canal and to Cayuga Lake. Other minor creeks are also present and drain portions of the Depot.

Data from various SEDA site quarterly groundwater monitoring programs indicate that the saturated thickness of the till/weathered shale overburden aquifer is variable, ranging between 1 and 8.5 feet. However, the aquifer's thickness appears to be influenced by the hydrologic cycle and some monitoring wells dry up completely during portions of the year. Based upon a review of two years of data, the variations of the water table elevations are likely a seasonal phenomenon. The overburden aquifer is thickest during the spring recharge months and thinnest during the summer and early fall. During late fall and early winter, the saturated thickness typically increases. Although rainfall is fairly consistent at SEDA, averaging approximately 3 inches per month, evapo-transpiration is a likely reason for the large fluctuations observed in the saturated thickness of the over-burden aquifer.

1.4.3 Regional/Local Land Use

Historically, Varick and Romulus Townships within Seneca County developed as agricultural centers supporting a rural population; however, there was a significant increase in the populations of these two centers in 1941 when SEDA was first opened.

Land use in the region surrounding SEDA is largely agricultural, with some forestry and public land uses (i.e., school, recreation, and state parks) (**Figure 1-6**). Agricultural land uses are categorized as inactive or active use. Inactive agricultural land consists of land committed to eventual forest regeneration, land waiting to be developed, or land presently under construction. Active agricultural land surrounding SEDA consists largely of cropland and cropland pasture. Forested land adjacent to SEDA is primarily under regeneration although there are sporadic occurrences of mature forest. Public and semi-public land use surrounding and within the vicinity of SEDA include Sampson State Park, Willard Psychiatric Center, and Central School (at the Town of Romulus, New York). Sampson State Park encompasses approximately 1,853 acres of land and includes a boat ramp on Seneca Lake.

SEAD-121C and SEAD-121I are both located in the east-central portion of SEDA, on land that is proposed as either classified for use as warehousing or for Planned Industrial/Office Development (PID Area). More detailed descriptions of both of these SEADs are provided below.

In accordance with the requirements of the BRAC process, 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 plan and oversee the redevelopment of the Depot. The Reuse Plan and Implementation Strategy for Seneca Army Depot was adopted by the LRA and approved by the Seneca County Board of Supervisors on October 22, 1996. Under this plan and subsequent amendment, areas within the Depot were classified as to their most likely future use. These areas included: housing, institutional, industrial, an area for the existing navigational LORAN transmitter, recreational/conservation, and an area designated for a prison. **Figure 1-7** shows the distribution of the planned future land use at SEDA and the location of SEAD-121C and SEAD-121I. These sites are more than 1200 feet from the nearest residential receptor (the housing area east of the PID Area).

1.4.4 Regional Topography

SEDA lies on the western side of a series of north-to-south trending rock terraces that separate Cayuga Lake on the east and Seneca Lake on the west. The rock terraces range in elevation from 490 feet above mean sea level (MSL) in northern Seneca County to as much as 1,600 feet above MSL at the southern end of the lakes. Elevations on SEDA range from 450 feet (NGVD 1929) on the western boundary to 760 feet (NGVD 1929) in the southeast corner. The Depot's land surface generally slopes downward to the west and upward to the north.

1.4.5 Regional Climate

Table 1-1 summarizes climatic data for the SEDA area. The data shown in **Table 1-1** have been compiled from numerous sources. The nearest source of climatic data is the Aurora Research Farm in Aurora, New York, which is located approximately ten miles east of SEDA on the east side of Cayuga Lake. The Research Farm is administered by the Northeast Regional Climate Center located at Cornell University in Ithaca, New York. Precipitation and temperature measurement data covering the period from November 1956 to the present day are available from this location. The other data reported in **Table 1-1** were taken either from isopleth drawings from a climatic atlas, or from data collected at Syracuse, New York, which is 40 miles northeast of SEDA. Meteorological data collected at Seneca Army Depot Activity and Ithaca, New York were used to prepare the wind roses presented in **Figure 1-8**.

A cool climate exists at SEDA with temperatures ranging from an average of 23^{o} F in January to 69^{o} F in July. Marked temperature differences are found between daytime highs and nighttime lows during the summer and portions of spring and autumn. Precipitation is unusually well distributed throughout the year, averaging approximately 3 inches per month. This precipitation is derived principally from cyclonic storms that pass from the interior of the country through the St. Lawrence Valley. Lakes Seneca, Cayuga, and Ontario provide a significant amount of the winter precipitation and moderate the local climate. The annual average snowfall is approximately 100 inches. Wind velocities are moderate, but during the winter months, there are numerous days with sufficient winds to cause blowing and drifting snow. The most frequently occurring wind directions are westerly and west southwesterly (**Figure 1-9)**.

Daily precipitation data measured at the Aurora Research Farm in Aurora, New York for the period (1957-1991) were obtained from the Northeast Regional Climate Center at Cornell University. The average monthly precipitation during this 35-year period of record is summarized in **Figure 1-10**. The maximum 24-hour precipitation measured at this station during this period was 3.9 inches on September 26, 1975. Values of 35 inches mean annual pan evaporation and 28 inches for annual lake evaporation were previously reported in **Table 1-1**. An independent value of 27 inches for mean annual evaporation from open water surfaces was estimated from a figure in "Water Atlas of the United States" (Water Information Center, 1973).

In general, climatic conditions that tend to promote good dispersions are high ambient temperatures, high wind speeds, low precipitation amounts, and a preponderance of clear skies. As **Table 1-1** shows, temperatures tend to be highest from June through September. Precipitation and relative humidity tend to be rather high throughout the year. The months with the maximum amount of sunshine are June through September. Mixing heights tend to be lowest in the summer and during the morning hours. Wind speeds also tend to be lower during the morning, which suggests that dispersion will often be reduced at those times, particularly during the summer. However, no episode-days are expected to occur with low mixing heights (less than 500 m) and light wind speeds (less than or equal to 2 m/s). Information on the frequency of inversion episodes for a number of National Weather Service stations is summarized in "Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States" (George C. Holzworth, 1972). The closest stations at which inversion information is available are Albany, New York and Buffalo, New York. The Buffalo station is nearer to SEDA but almost certainly exhibits influences from Lake Erie. These influences would not be expected to be as noticeable at SEDA. SEDA is located in the Genesee-Finger Lakes Air Quality Control Region (AQCR). The AQCR is designated as "non-attainment" for ozone and "attainment" or "unclassified" for all other criteria pollutants. Data for existing air quality in the immediate area surrounding the SEAD, however, cannot be obtained since the nearest state air quality stations are 40 to 50 miles away from the Depot (Rochester of Monroe County or Syracuse of Onondaga County). A review of the data for Rochester, which is in the same AQCR as SEDA, indicates that all monitored pollutants (sulfur dioxide, particulates, carbon monoxide, lead, ozone) are below state and federal limits, with the exception of ozone. In 1987, the maximum ozone concentration observed in Rochester was 0.127 ppm. However, this value may not be representative of the SEDA area, which is in a more rural area.

1.5 OFF-SITE WELL INVENTORY

This section identifies private drinking water wells near SEAD-121C and SEAD-121I. Knowledge of off-site wells is required when assessing any potential threats to drinking water supplies from releases at the site being investigated. Three private homes with private drinking water wells were identified within a one-mile radius of both SEAD-121C and SEAD-121I (**Figure 1-11**). Two wells are located on Yerkes Road east of Route 96, and one well is located along Route 414 (Main Street) just north of Bromka Road. These are the only domestic wells within one mile of SEAD-121C and SEAD-121I, and there are no public water supply wells within a one-mile radius of SEAD-121C and SEAD-121I.

1.6 REPORT ORGANIZATION

The remaining sections of this report describe investigation programs conducted, procedures followed, review of the analytical results, discussion of the human health and ecological risk assessment, and recommendations for any further action at SEAD-121C and SEAD-121I. The first part of **Section 2.0** (Study Area Investigation) presents the methodologies used during the field investigations. This is followed by a discussion of the technical approach of the sampling program and the rationale for choosing the locations investigated during the field program. This section relates the investigation programs (i.e., geophysical, surface water, soils, and groundwater) to the important site features and characteristics, and sources of contamination. **Section 3.0** discusses the results of the investigation programs, specifically, surface features, surface water hydrology, geology and hydrogeology. The nature and extent of contamination on and off-site is discussed in **Section 4.0**. The fate and transport properties of contaminants found at SEAD-121C and SEAD-121I are discussed in **Section 5.0**. The human health baseline risk assessment is discussed in **Section 6.0**. The ecological risk assessment is discussed in **Section 7.0**. Conclusions and recommendations are presented in **Section 8.0**.

2.0 STUDY AREA INVESTIGATION

2.1 INTRODUCTION

The Seneca Army Depot Activity (SEDA or the Depot) was nominated by the Department of Defense (DoD) for closure under the Base Realignment and Closure (BRAC) process in 1995. Congress approved this nomination, and SEDA was officially listed under BRAC in October of 1995. The mission closure date for SEDA was September 30, 1999, and the installation closure date was September 30, 2000.

In accordance with requirements of the BRAC, Woodward-Clyde Federal Services was retained by the Army to conduct and present the findings of an Environmental Baseline Survey (EBS) for SEDA. As part of this process, Woodward-Clyde was required to assess all property and facilities at the Depot and classify each into one of seven standard environmental condition definitions of property area types consistent with the Community Environmental Response Facilitation Act (CERFA – Public Law 102-426), which amends Section 120 of Comprehensive Environmental Responsibility, Compensation, and Liability Act (CERCLA). Parcels of land that are classified as Level 1 through 4 are suitable for transfer or lease, while parcels that are designated as Level 5 through 7 are not considered suitable for transfer, pending the initiation and completion of necessary remedial actions or the completion of further or additional site evaluations and investigations. The results of Woodward-Clyde's effort were documented in the U.S. Army Base Realignment and Closure 95 Program Report that was issued on October 30, 1996. This report served as part of the basis for subsequent decisions made regarding possible future land use of the areas within the Depot.

Pursuant to another requirement of the BRAC process, 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 plan and oversee the redevelopment of the Depot. The Reuse Plan and Implementation Strategy for Seneca Army Depot was adopted by the LRA and approved by the Seneca County Board of Supervisors on October 22, 1996. Under this plan and subsequent amendment, areas within the Depot were classified according to their most likely future use. The areas identified by the LRA and approved by the Board of Supervisors include:

- Housing;
- Institutional;
- Industrial/Office development;
- Warehousing;
- Conservation/Recreation land;

- Prison;
- Airfield, special events, institutional, and training; and
- An area to be transferred from one federal entity to another (i.e., the area of the existing navigational LORAN transmitter).

As a result of these two actions, parcels of land located within the Defense Reutilization and Marketing Office Yard (DRMO Yard – SEAD-121C) were designated as category 5 and 6 areas under the EBS, while land within the Rumored Cosmoline Oil Disposal Area (SEAD-121I) was classified as a category 6 area. Furthermore, the land comprising the DRMO Yard were designated as an area for planned industrial/office development, while the area encompassing the Rumored Cosmoline Oil Disposal Area was designated as warehousing space.

As part of its overall response to the Woodward-Clyde EBS Report, the Army commissioned limited site investigations (SIs) at the category 5, 6 and 7 sites, including the DRMO Yard and the Rumored Cosmoline Oil Disposal Area. The purpose of the SIs was to describe and evaluate sites for potential contaminants of concern. Preliminary exploratory information was collected regarding each of the two sites during the EBS. The results of the EBS investigations at the DRMO Yard and the Rumored Cosmoline Oil Disposal Area provided insufficient information to close the sites and allow them to be transferred or leased for redevelopment (Parsons, 1999).

Based on this information, the Army commissioned Remedial Investigations (RIs) at the DRMO Yard and the Rumored Cosmoline Oil Disposal Area to further refine and expand the information and data that are available for each site.

Data and information collected during the EBS and the RI at the DRMO Yard (SEAD-121C) and at the Rumored Cosmoline Oil Disposal Area (SEAD-121I) are presented and summarized in this report. The combination of data and results collected during these investigations provides sufficient data and information to qualify and quantify the environmental conditions found at the two sites.

The first work conducted for both sites was completed as part of the EBS conducted in 1999. These results were previously reported in the document entitled “Final Investigation of Environmental Baseline Survey Non-Evaluated Sites” (Parsons ES, 1999). The next component of the investigation at both sites was the RI, which began in the late fall of 2002 with fieldwork continuing until the spring of 2003. The proposed scope of the field investigations conducted at SEAD-121C and SEAD-121I is defined in the document entitled “Final Work Plan for the Remedial Investigation (RI) at Two EBS sites in the Planned Industrial Development Area” (Parsons, 2002). Both of these plans are supplemented by information provided in the document “Generic Installation Remedial Investigation/Feasibility Study (RI/FS) Work Plan (Parsons ES, 1995),” hereafter referred to as the Generic Work Plan. United States Environmental Protection Agency (USEPA) Region 2 and New

York State Department of Environmental Conservation (NYSDEC) approved the Generic Work Plan at the time of its submission.

As part of the EBS and RI conducted at the two sites, the following tasks were completed to develop information and data to describe the conditions that are present at the sites:

- Surveying;
- Soil sampling and characterization;
- Surface water sampling;
- Ditch soil sampling;
- Installation of monitoring wells;
- Groundwater sampling; and
- Chemical and physical characterization of samples.

2.2 METHODS AND MATERIALS

2.2.1 Site Survey Program

Prior to the initiation of field investigations at each site, pre-sampling site field reconnaissance programs were conducted to characterize and locate general (i.e., terrain, drainage swales, creeks, ponds, land cover and/or vegetation, etc.) and significant features (i.e., debris pits, monitoring wells, access roads, etc.) present at each site. Potential sampling locations were marked prior to sampling and documented on site maps.

During the RI sampling event, after completion of the field tasks, the coordinates of the soil, ditch soil, and surface water sample locations were obtained using a Global Position System (GPS). A licensed surveyor surveyed the permanent monitoring wells installed at the DRMO Yard during the RI program in order to acquire the elevation data. This survey procedure was not employed during the EBS sampling program because the wells installed during this investigation were temporary. The location, identification, coordinates, and elevations of all control points and all of the environmental sampling points were plotted on the site base maps to show their location with respect to surface features within the project area. A site plan for SEAD-121C and the vicinity is presented as **Figure 1-3** while a comparable map for SEAD-121I and vicinity is presented as **Figure 1-4**.

2.2.2 Soil Investigation

Soil investigations conducted at the DRMO Yard (SEAD-121C) included the collection of shallow surface soils and deeper subsurface soil samples. Soil investigations at SEAD-121I included collection of shallow surface soils and the collection of ditch soils. Subsurface soil samples were not collected at SEAD-121I since the split spoon sampler encountered the weathered bedrock at depths of between 6 inches and 2 feet (ft.) below ground surface (bgs). The objectives of the soil investigation programs for the site investigations were to:

- Determine the nature and extent of contamination;
- Develop a database for use during potential future risk assessments and feasibility studies at each site; and
- Provide data describing the background soil quality.

Results generated in the soil sampling program were used to define the lateral and vertical extent of potential impacts to the soil in the SEAD-121C and SEAD-121I areas. A summary of the sample analyses completed on collected soil samples is provided in **Section 2.2.5.1**.

2.2.2.1 Soil Borings (Surface and Subsurface)

Soil borings at SEAD-121C were performed using either an Acker AD II or CME-75 drilling rig, equipped with 4.25-inch inside diameter (I.D.) hollow stem augers. Borings were advanced to “refusal” which was represented by the depth of the competent bedrock. The determination of auger “refusal” in competent shale is subjective as hollow stem augers can penetrate through the shale at a very slow rate. For the purpose of these investigations, auger "refusal" in "competent" shale was defined as the depth, after penetrating the weathered shale, when augering became significantly more difficult and auger advancement slowed substantially.

During drilling, surface soil samples were collected using decontaminated standard three-inch diameter, two-foot long carbon steel split-spoon samplers. Subsurface soil samples were collected continuously using decontaminated standard two-inch diameter, two-foot long carbon steel split-spoon samplers. Both surface and subsurface samples were collected in accordance with American Society for Testing and Materials (ASTM) Method D: 1586-84. Sampling involved driving the split-spoon sampler two feet in advance of the augers into the undisturbed soil with a rig-mounted 140-lb hammer falling 30 inches to advance the spoon. Once the sampler was recovered, the augers were advanced to the top of the next sample interval and the sampling process repeated.

Soil recovered within the split-spoon samplers were classified according to the Unified Soil Classification System (USCS), with lithologic descriptions provided according to the Burmister

Classification System. The description of the recovered soils were recorded and logged on standardized field forms.

During sample collection, recovery and logging operations, soil samples were screened for volatile organic compounds (VOCs) using a calibrated OVM Thermo Model 580B. The OVM was calibrated daily, before drilling operations commenced and the calibration was checked at 15-minute intervals throughout the day.

Typically, two soil samples were collected and submitted for chemical analysis from each soil boring. Deviations in this plan are noted in **Section 3.0** of this report. These samples generally included:

- 0 to 2 ft. below grade.
- 2 to 6 ft. below grade.

Soil samples recovered for analysis of VOCs during the EBS report were collected directly from the split-spoon immediately after it was opened using a stainless steel trowel or scoop and placed into the sample container. The sample container was completely filled and the cover was immediately sealed to minimize volatilization. The additional analysis collected during the EBS investigation were collected and homogenized in a decontaminated stainless steel bowl, and then transferred to the appropriate sample containers.

Soil samples recovered for analysis of VOCs during the RI report were collected using the USEPA sample collection guidance (Method SW846 5035). Three separate sample aliquots were collected for each VOC analysis; one, required for determination of high concentration VOCs, was preserved with methanol; and two, required for determination of low level VOCs, were preserved with sodium bisulfate. For each sample aliquot, approximately 5 grams (gms) of soil were recovered by plunging the open-end of a pre-tared and calibrated syringe barrel and plunger assembly into the undisturbed contents of the split-spoon sampler. The weight of soil in the syringe was determined using a balance. Once the sample soil was packed in the barrel of the syringe and weighed, it was transferred into an open, pre-labeled 40-mL screw-capped vial that contained the specified preservative. The screw-capped vials were then closed and immediately sealed.

The remaining soil from the spoon was then mixed (homogenized) in a decontaminated stainless steel bowl with a decontaminated stainless steel utensil and then divided into the remainder of the sample containers. An additional 4-oz soil jar was recovered and used for percent moisture determinations for the VOC analysis. These remaining non-VOC samples were collected the same way for both the EBS and RI investigations. In several locations, more than one spoon had to be collected and homogenized to provide sufficient sample volume for all analyses.

Upon completion of sampling, soil borings were grouted to the ground surface. Monitoring wells that were installed during the RI were not sampled for soil. Split spoons were collected for boring log purposes but were not analyzed. Drilling spoils brought to the surface by the augers were recovered and placed into Department of Transportation (DOT) approved, 55-gallon drums, which were labeled with the date, location, and description of wastes. All drums were then moved to a centralized drum storage area for temporary storage pending chemical characterization. All augers and split spoons were steam cleaned between borings at the decontamination pad.

2.2.2.2 Ditch Soils

The proposed sediment samples have been reclassified as ditch soil. The ditch soil samples are located in man-made drainage ditches. The material at the bottom of these ditches is competent shale, and any soil in the ditch is the result of erosion due to surface water runoff and is not naturally present in the ditch. The drainage ditches were constructed for drainage purposes when the Depot was first established, and the ditches have not been maintained since the base was decommissioned. It is presumed that a maintenance program would be reinstated by the future user to control stormwater runoff from the site.

Samples of ditch soil were collected at locations in and near the DRMO Yard and within and near the Rumored Cosmoline Oil Disposal Area. The data resulting from the analyses of recovered samples were used to determine the background ditch soil chemical concentrations (i.e., the ditch soil concentrations in areas that have not been impacted by site activities) present in the area of the SEADs, confirm the extent of contamination found at the sites, and identify whether contaminants may have migrated via run-off away from the sites.

In the vicinity of the DRMO Yard, the selected ditch soil sampling locations were outside the site in the open drainage culvert surrounding the study area with the exception of SDDRMO-9, which was located within the DRMO Yard.

Ditch soils were collected at SEAD-121I at depths between zero and two inches bgs (or below the overlying tar, grass, or vegetative covering). At SEAD-121I, the ditch soil samples were collected from drainage basins located in the corners of the four blocks that comprise SEAD-121I. Samples SD121I-1, SD121I-2, and SD121I-3 were collected from a downgradient location along Avenue A. As much vegetative (e.g., roots, leaves, grass, etc.) and animal matter (e.g., worms, insect lava, etc.) as possible was removed from each sample during sample collection operations.

Ditch soil samples collected during the RI investigation were collected with a syringe barrel sampler and a decontaminated stainless steel trowel and bowl, as described above. The VOC samples were taken prior to the collection using the syringe barrel sampler method described in **Section 2.2.2.1**. Once the VOC samples were collected, the bowl was filled with additional ditch soil and thoroughly mixed (homogenized). The remaining analysis bottles were filled and all the field data were recorded on the soil/sediment Sampling Record form. Sampling information such as sample location, number, depth, time, Burmister description, and laboratory Quality Assurance/Quality Control (QA/QC) sample numbers were recorded on the Sampling Record Form. The sampling hole was then filled with the surrounding soil and the location stake replaced and checked for proper labeling.

2.2.3 Surface Water Investigations

During the fall of 2002, samples of surface water were collected at locations in and near the DRMO Yard and within and near the Rumored Cosmoline Oil Disposal Area. The data resulting from the analysis of recovered samples were used to determine the background surface water chemical concentrations (i.e., the surface water concentrations in areas that have not been impacted by site activities) present in the area of the SEADs, confirm the extent of contamination found at the sites, and identify whether contaminants may have migrated via run-off away from the sites. Surface water sampling occurred during or immediately after rainstorms/snowstorms to maximize the probability that there would be surface water present for sampling.

The ten surface water locations selected for sampling at SEAD-121I during the RI sampling program included three locations in the open drainage culvert along the west side of the study area, two blocks away. These locations are downgradient from SEAD-121I, SEAD-26, SEAD-64A, and other industrial portions of the Depot.

In the vicinity of the DRMO Yard, the selected surface water sampling locations were outside the site in the open drainage culvert surrounding the study area with the exception of SWDRMO-9, which was located within the DRMO Yard.

If standing water was not present at the time of sampling, only ditch soil samples were collected from that designated location. Standing water was not present at four of the designated surface water sample locations at the Rumored Cosmoline Oil Disposal Area. All the sample locations at the DRMO Yard had surface water present at the time of sampling.

Samples of surface water, if it was present, were collected first at each location. Prior to sampling, measurements of the breathing zone air were taken to establish the concentration of VOCs directly above the surface of the water body with an OVM Model 580B. Once a sampling location was deemed safe, samples were collected from the surface water body.

Typically, the water depth found at each location was relatively shallow; therefore, sample containers were generally inserted into the water body at a 45-degree angle with the opening of the bottle pointed in an upstream direction to allow the bottle to fill without the collection of surface debris. For parameters not requiring chemical preservatives, clean sample containers were submerged directly into the standing water to collect the sample. For parameters requiring chemical preservatives, the preserved sample containers were filled by decanting water collected first in a clean, decontaminated glass beaker or a clean, un-preserved sample bottle. Sample aliquots for VOC determinations were collected first. Each of these bottles was filled so that no headspace or bubbles remained in the sample bottle once it was filled and sealed. The remaining analysis bottles were filled and all the field data was recorded on the surface water Sampling Record form.

A summary listing of all the sample analyses completed on surface water samples is provided in **Section 2.2.5.2**.

2.2.4 Groundwater Investigation

Groundwater investigations were conducted as part of the EBS and RI programs at the DRMO Yard. The monitoring wells installed as part of the EBS program were temporary, while the wells installed during the RI program were permanent. Investigations conducted included the installation, development, and sampling of monitoring wells. Monitoring wells were installed through the till/weathered shale aquifer that allowed for the collection of representative samples of groundwater at the DRMO Yard. Groundwater samples collected from monitoring wells were used to obtain water quality data within the DRMO Yard, determine the groundwater flow direction, and evaluate the vertical and lateral extent of contaminant migration within the groundwater near the SEAD-121C. A summary listing of groundwater sample analyses completed is provided in **Section 2.2.5.4**.

2.2.4.1 Monitoring Well Installation

The two wells sampled during the EBS program were temporary wells. During well installation, weathered bedrock was encountered at a depth of approximately 2.9 ft. bgs at temporary well location MW121C-1. The boring was then advanced to a final depth of 10.1 ft. bgs, and a temporary well was installed. The temporary well was screened over the interval of 2.1 to 9.7 ft. bgs. At temporary well location MW121C-2, weathered bedrock was encountered at a depth of 4 ft. bgs. The boring was then advanced to a final depth of 7.2 ft. bgs, and a temporary well was installed. The temporary well was screened over the interval of 1.6 to 5.9 ft. bgs. Once installed, each well was developed, allowed to stabilize, sampled, and then the temporary well was removed and the boring was grouted closed.

Proper design, construction, and installation of the monitoring wells were essential for accurate interpretation of the groundwater data. The installation procedures for the permanent wells installed during the RI program were consistent with the USEPA Region 2 CERCLA QA Manual and the NYSDEC Technical Administrative Guidance Memorandum (TAGM) #HWR-88-4015 regarding design, installation, development and collection of groundwater samples. Further, the RI program was in compliance with all requirements described in the NYSDEC, 6 New York State Codes, Rules and Regulations (NYCRR) Part 360, Solid Waste Management Facilities Regulations, Section 360-2.11, which details groundwater monitoring well requirements.

The overburden monitoring wells were installed using 4.25-inch I.D. hollow stem augers. The borings were advanced to auger refusal, which for the purposes of these investigations is defined as the contact between weathered shale and competent shale. During drilling, split spoon samples were collected continuously until spoon refusal was encountered. Monitoring wells were constructed of

ASTM-approved Schedule 40 polyvinyl chloride (PVC) casing and a 5-foot PVC well screen with a slot size of 0.010-inch, with threaded, flush joints that contained a rubber gasket. A silt sump "point" was installed at the bottom of each well. No solvents or other adhesives were used to connect the PVC casing. Prior to installation, well components were inspected to ensure that a proper working condition would exist upon completion. All monitoring well components were inspected prior to use to ensure that they were clean, uncontaminated, and free of any defects in workmanship.

A sand pack was placed by pouring sand from the surface into the annular space between the well screen and the hollow stem auger. The sand pack was not extended more than two feet (but not less than six inches) above the top, or six inches below the bottom of the screen. A layer of bentonite chips measuring between one and two feet thick was poured within the annular space and extended from the top of the sand pack to the ground surface.

Wells were screened from 3 ft. above the water table (if space allowed) to the top of the competent shale. Water table variations, site stratigraphy, and expected contaminant flow and behavior were also considered in determining the screen length and position. The overburden monitoring wells installed had a maximum screen length of five feet and were screened through the till/weathered shale aquifer.

For the permanent wells installed during the RI program, wells were protected with a steel casing, four inches in diameter and 5 ft. in length. This protective steel casing extended 2.5 ft. bgs to prevent heaving by frost. The protective casing had a locking cap with a weather-resistant padlock. A weep hole was drilled at the base of the protective steel casing above the cement collar to allow drainage of water. A locking expandable cap was also placed in the top of the PVC well casing. A cement collar was placed around each well and a permanent well identification number was marked on the steel protective casing.

2.2.4.2 Monitoring Well Development

Following well installation, each monitoring well was developed to assure that a proper hydraulic connection existed between the well and the surrounding aquifer. The development of monitoring wells was performed two to seven days after well installation and at least seven days prior to well sampling. During development, every effort was made to attain the lowest turbidity, preferably less than 50 Nephelometric Turbidity Units (NTUs).

Well development consisted of light purging with a bailer until two to four gallons of water were removed. After purging, the water in the well was removed using a peristaltic pump set to maintain a flow rate between 1.5 and 3 liters per minute (L/min). Near the end of the development process, the flow rate was lowered to a minimal level of 0.1 L/min. This low flow allowed the well and the surrounding formation to be developed while not creating a large influx of silt and clay, which are major constituents of the surrounding till.

The criteria used to determine if the well had been properly developed were based upon the guidance provided by NYSDEC TAGM #HWR-88-4015. Measurements of temperature, specific conductivity and pH were collected and recorded for each well volume using field instrumentation (i.e., a Hydac Model 910 field meter for the RI sampling program). A Hach® portable field turbidimeter with full-scale ranges of 1.0, 10, and 100 NTUs was used to measure turbidity during RI development activities, while an Engineered Systems Model 800 (full scale ranges of 20 and 200 NTUs) was used during the EBS at the DRMO Yard. Development operations continued until three consecutive readings of water quality indicator parameters met the criteria listed in **Table 2-1**.

In addition to meeting the primary conditions, at least three well volumes of water were removed from each well during development whenever it was possible. If less than three well volumes were removed due to low groundwater recharge rates, sufficient water was removed to ensure that the primary conditions were achieved prior to sampling. In all instances, at least one well volume was removed from each well prior to sampling.

2.2.4.3 Groundwater Sampling

Groundwater sampling completed during the EBS in March 1998 was conducted using bailers.

Groundwater sampling completed during the RI was conducted in accordance with procedures specified in the EPA standard operating procedure (SOP) titled *Groundwater Sampling Procedure, Low Flow Pump Purging and Sampling* (USEPA, 1998).

Prior to sampling the permanent wells, the static level of water present in the well was measured. Then, the bladder pump was installed in the well and the water level was measured again. Permanent wells were purged prior to sampling using a Marschalk bladder pump constructed of stainless steel and containing a Teflon® bladder. The purging process began with the inlet of the pump being set at the bottom of the well screen (or at least six inches from the bottom of the well). A flow rate of between 0.5 and 1.0 L/min was then established and the standing water contained in the well was purged and captured in a graduated five-gallon bucket. During the purging process, the water level in the well was continuously monitored with an electronic water level meter and the level was periodically recorded. Water quality indicator parameters including turbidity, temperature, specific conductivity, pH, dissolved oxygen content (DO), and oxidation-reduction potential (ORP) were monitored and recorded every two to four minutes using a YSI 600 XL Water Quality Meter. Well purging and monitoring continued until the quality of the sampled groundwater indicated that the well had stabilized. The well was considered stabilized and ready for sample collection once the indicator parameter values remained within the criteria listed in **Table 2-1** for three consecutive readings.

Groundwater sampling commenced once the well had stabilized, or once the water level in the well had recovered sufficiently to permit collection of samples. In some very low-yielding formations, it was not possible to sample with minimal drawdown even using the lowest pumping rates.

Once the indicator parameters had stabilized, samples were collected at flow rates between 100 to 250 milliliters per minute to minimize the amount of water level drawdown found in the well (less than 0.3 ft. with the water level stabilized). The water level was monitored every three to five minutes (or as appropriate) during pumping. Pumping rates were reduced as needed to the minimum capabilities of the pump to avoid pumping the well dry. If the well's recharge rate was very low, purging and sampling was interrupted to ensure that the well's static water level did not drop below the level of the pump. A steady purge/sample flow rate was maintained to the maximum extent practicable.

Samples were collected by allowing the discharge flow from the sampling pump to flow slowly down the inside of the container. The order used for sample collection was: 1) VOCs, 2) semivolatile organic compounds (SVOCs), 3) Metals, 4) Pesticides/polychlorinated biphenyls (PCBs), 5) Cyanide, and 6) Total Recoverable Petroleum Hydrocarbons (TRPH). The collection of metals samples was placed early in the collection sequence to minimize the amount of turbidity degradation that could occur.

Gauging, purging, sampling, and monitoring equipment were decontaminated by standard procedures listed in the Generic Work Plan prior to being used at each well. Water level indicators and pumps were placed into polyethylene bags to prevent contamination during storage or transit.

2.2.5 Sample Analyses

Chemical analyses were completed by contract laboratories certified in the state of New York and by the US Army Corp of Engineers (USACE), Omaha District (formerly Missouri River District).

2.2.5.1 Soil Samples

Soil sample analyses completed as part of the EBS and the RI were submitted for the physical and chemical analyses listed in **Table 2-2**.

2.2.5.2 Surface Water Samples

Surface water sample analyses completed as part of the EBS (SEAD-121I) and RI were submitted for the physical and chemical analyses listed in **Table 2-3**.

2.2.5.3 Ditch Soil Samples

Ditch soil sample analyses completed as part of the EBS (SEAD-121I) and RI were submitted for the physical and chemical analyses listed in **Table 2-4**.

2.2.5.4 Groundwater Samples

Groundwater sample analyses completed at the DRMO Yard as part of the EBS and the RI were submitted for the physical and chemical analyses listed in **Table 2-5.**

3.0 DETAILED SITE INVESTIGATION

3.1 SEAD-121C: DEFENSE REUTILIZATION AND MARKETING OFFICE YARD (DRMO)

3.1.1 Previous Investigations

Results obtained from the 1998 Environmental Baseline Survey (EBS) at the DRMO Yard, otherwise known as SEAD-121C, have been combined with the results of the 2002 Remedial Investigation (RI) conducted at this site to yield a single, cohesive and comprehensive discussion of the site's conditions. This discussion is provided in the following text and in **Section 4.0**.

3.1.2 Components of the EBS and RI at the DRMO Yard - SEAD-121C

The following field investigations were performed to complete the EBS and RI characterization of the DRMO Yard:

- Site Survey;
- Soil Investigation;
- Ditch Soil Investigation;
- Surface Water Investigation; and
- Groundwater Investigation.

3.1.3 Site Survey

All sampling locations established during the RI at SEAD-121C were surveyed. Monitoring well and survey monuments were surveyed by a New York State licensed surveyor. All other sampling locations were surveyed using a Global Position System (GPS) system. Coordinates for all sampling locations are summarized in **Table 3-1**.

3.1.4 Soil Investigation

As the exact operating practices used at the DRMO Yard are unknown, the soil investigation was designed to cover the entire site and to extend beyond the defined site to identify areas of impacted soil. Therefore, soil samples were collected from locations inside the DRMO Yard, as well as from locations exterior to the site. The entire area within the fence at the DRMO Yard was utilized as a storage yard.

In accordance with the work plan, a comprehensive soils investigation program was completed at SEAD-121C. The objectives of this soil investigation program were to determine the nature and extent of contamination at and in the vicinity of SEAD-121C, and establish the extent of impacts to soils. In addition, soil samples were collected for analysis of grain size and moisture content to provide data to be used in determining remedial alternatives for the site.

During the EBS, a total of four surface soil samples and four subsurface soil samples were collected. During the RI, 56 soil samples were collected from 40 sample locations. These samples consisted of 20 surface soil samples and 36 subsurface soil samples collected from 20 locations. Sample locations for the EBS and RI are shown on **Figure 3-1.** All sampling was conducted in accordance with the procedures outlined in **Section 2.2.2**. A listing of all soil samples collected and submitted for analyses is provided in **Table 3-2**.

3.1.4.1 Soil Borings

EBS Program

Four soil borings were advanced and sampled for physical characterizations to a depth of approximately 8 feet (ft.) during the EBS. These sampling locations are shown in blue labels on **Figure 3-1**. One soil boring was placed within the fenceline of the DRMO Yard along the northwest fence, at a location where evidence suggests that site runoff from the Yard flows into an adjacent drainage ditch, which forms the headwaters of Kendaia Creek. The second soil boring was placed near the storage cells that are located in the northeast portion of the SEAD, approximately 200 ft. north of Buildings T-355 and 360. The third soil boring was placed southwest of the corner of Building T-355, where historic spills were suspected to have occurred. The fourth soil boring was placed downgradient of the storage area that is located in the extreme southwestern corner of the SEAD. At each soil boring location, two samples were collected. One sample was collected from the top 2 inches of soil, and the second sample was collected in the depth range of 2 to 3 ft. Each of the soil borings was advanced to a depth of auger refusal, which varied from 4.3 ft. below ground surface (bgs) at location SB121C-1 to 7.7 ft. bgs at location SB121C-3. Weathered bedrock was typically encountered at a depth of 4 to 5 ft. bgs at each soil boring location.

RI Program

Sixteen soil borings were advanced and sampled for physical characterizations to a depth of 8 ft. during the RI. These sampling locations are shown in black labels on **Figure 3-1**. Four soil borings (SBDRMO-16, SBDRMO-21, SBDRMO-22, and SBDRMO-23) are located exterior to the DRMO Yard. The remaining twelve soil borings were advanced within the boundary of the site. Each boring location was sampled at a depth of approximately 0 to 2 ft. bgs and 2 to 6 ft. bgs. The sample collected from the 0 to 2 ft. bgs interval of the split spoon was collected from the top 2 inches of the spoon, where vegetative root material, asphalt, or cover materials were not found. The sample interval from 6 to 8 ft. was generally classified as fractured bedrock and could not be collected and sampled. During the RI, four soil borings (SB121C-2, 8, 15, and 19) had large amounts of rock and rock fragments. At these four soil borings, a substantial sample could not be collected from the deeper sampling interval; thus the interval from 0 to 2 ft. was the only one collected for analysis. At the other twelve soil borings, the sampling interval from 2-4 ft. bgs and 4-6 ft. bgs were composited at each location as a result of the high rock content and collected as one sample for all analysis except for VOCs. Both intervals were sampled together in order to compile a more comprehensive sample. Samples collected for VOC analysis were collected first, directly from the spoons from the 0 to 2 ft. interval. Multiple spoons were needed to fill each VOC jar to the proper weight. The remaining soil from all spoons was homogenized into the stainless steel bowl.

Samples from these locations were analyzed for grain size determinations, density, and moisture content. A listing of the sample analyses performed on subsurface soil samples collected from the soil boring locations is provided in **Table 3-2**. The individual boring logs are included in **Appendix B**.

3.1.4.2 Surface Soils

EBS Program

A total of 4 surface soil samples were collected from the top of the 2 inches (i.e., 0-2 inches bgs) of the soil borings described in the previous section from the DRMO Yard during the EBS. These soil samples were collected at locations downgradient of the storage areas and near the storage cells.

RI Program

A total of 20 surface soil samples were collected at a depth range of 0 to 2 inches at the DRMO Yard during the RI (**Figure 3-1**). Eight samples were located outside the fence bounding the Yard, and twelve sample locations were located inside the site. All sampling inside the fence was conducted using a split spoon sampler pounded with a hollow stem auger rig according to the procedures listed in **Section 2.2.2.1** and analyzed for the parameters listed in **Section 2.2.5**. The surface soil samples collected outside the fence, in the area of the ditches, were collected with a 2-foot long stainless steel split spoon sampler using a sledge hammer and analyzed for the same parameters as those samples collected inside the fence. The hollow stem auger rig could not fit in the areas outside the fence near the ditches and was not utilized during the collection. A listing of the sample analyses performed on surface soil samples collected from the DRMO Yard is provided in **Table 3-2**.

These surface soil samples (collected 0 to 2 inches bgs) were combined with the soils samples from the top interval of the soil borings (collected 0 to 2 ft. bgs).

3.1.5 Ditch Soil

The proposed sediment samples have been reclassified as ditch soil. The ditch soil samples are located in man-made drainage ditches. The material at the bottom of these ditches is competent shale, and any soil in the ditch is the result of erosion due to surface water runoff and is not naturally present in the ditch. The drainage ditches were constructed for drainage purposes when the Depot was first established, and the ditches have not been maintained since the base was decommissioned. It is presumed that a maintenance program would be reinstated by the future user to control stormwater runoff from the site.

EBS Program

No ditch soil samples were collected from the DRMO Yard during the EBS field program.

RI Program

Ditch soil samples were collected in and around the DRMO Yard from ten sampling locations. The data resulting from the analysis of recovered samples were used to determine the background ditch soil chemical concentrations present in the area of SEAD-121C, confirm the extent of contamination found at the sites, and identify whether contaminates may have migrated via run-off away from the sites.

Ditch soil samples were collected from nine locations outside the perimeter of the fence in the drainage ditches that surround the DRMO Yard. A ditch soil sample was collected from a drainage ditch northeast of the site, identified as Drainage Ditch #1 for the purposes of this discussion. Three ditch soil locations are situated south of the site along a drainage ditch, identified as Drainage Ditch #2. Four collection locations for ditch soil samples were collected outside the northwest boundary of the site in a ditch identified in this discussion as Drainage Ditch #3. One ditch sample location is located southwest of the site where Drainage Ditch #3 and Drainage Ditch #2 converge. SDDRMO-9 was the only location not collected in the drainage ditches surrounding the DRMO Yard. This ditch soil location was sampled within the DRMO Yard near a standing body of water. There was no obvious drainage route from the standing body of water to the drainage ditches surrounding the site. The approximate locations of these ditch soil samples are shown in **Figure 3-1**. All samples were collected according to the procedures described in **Section 2.2.2.2**. A listing of the analyses completed on ditch soil samples is provided in **Table 3-3**. Data defining ditch soil sample characteristics at the time of sample collection are provided in **Table 3-4**.

3.1.6 Surface Water

EBS Program

There were no surface water samples collected from the DRMO Yard during the EBS field program.

RI Program

Surface water samples were collected in and around the DRMO Yard from ten sampling locations. The data resulting from the analysis of recovered samples were used to determine the background surface water chemical concentrations present in the area of SEAD-121C, confirm the extent of contamination found at the site, and identify whether contaminates may have migrated via run-off away from the site.

Surface water samples were collected from nine locations outside the perimeter of the fence in the drainage ditches that surround the DRMO Yard. A surface water sample was collected from a drainage ditch northeast of the site, identified as Drainage Ditch #1 for the purposes of this discussion. Three surface water locations are situated south of the site along a drainage ditch, identified as Drainage Ditch #2. Four collection locations for surface water samples were collected outside the northwest boundary of the site in a ditch identified in this discussion as Drainage Ditch #3. One surface water sample location is located southwest of the site where Drainage Ditch #3 and Drainage Ditch #2 converge. SWDRMO-9 was the only location not collected in the drainage ditches surrounding the DRMO Yard. This surface water location was sampled within the DRMO Yard in a standing body of water. There was no obvious drainage route from the standing body of water to the drainage ditches surrounding the site. The approximate locations of these surface water samples are shown in **Figure 3-1**. All samples were collected according to the procedures described in **Section 2.2.2.2**. A listing of the analyses completed on surface water samples is provided in **Table 3-5**.

3.1.7 Groundwater Investigation

The purpose of the groundwater monitoring program at the DRMO Yard was to determine whether past use of the site has impacted the groundwater underlying and migrating away from the site.

3.1.7.1 Monitoring Well Installation

Two temporary monitoring wells were installed at SEAD-121C during the EBS and an additional four monitoring wells were installed during the RI. The locations of the wells are shown on **Figure 3-1**.

EBS Program

One of the temporary monitoring wells, MW121C-2, was located upgradient of the drainage ditches along the northwestern and southern borders and downgradient of the concrete storage area that is located in the southwestern corner of the SEAD. The other temporary monitoring well, MW121C-1, was placed south of Building T-355. At temporary well location MW121C-1, weathered bedrock was encountered at a depth of approximately 2.9 ft. bgs. The boring was then advanced to a final depth of 10.1 ft. bgs, and a temporary well was installed. The temporary well was screened over the interval of 2.1 to 9.7 ft. bgs.

At temporary well location MW121C-2, weathered bedrock was encountered at a depth of 4 ft. bgs. The boring was then advanced to a final depth of 7.2 ft. bgs, and a temporary well was installed. The temporary well was screened over the interval of 1.6 to 5.9 ft. bgs. Once installed, each well was developed, allowed to stabilize, sampled, and then the temporary well was removed and the boring was grouted closed. Temporary well construction and available groundwater elevation data for both of the temporary wells are summarized in **Table 3-6**. It should be noted that the temporary wells installed during the EBS investigation were not present during the RI.

RI Program

Monitoring wells MW121C-3, MW121C-4, and MW121C-5 were installed at the approximate location of each of the three corners inside the triangular-shaped DRMO Yard. The fourth well, MW121C-6, was installed towards the center of the rumored location of the former concrete storage pad. The locations of the wells were selected to monitor the migration of possible contamination out of the DRMO Yard and into the surrounding drainage ditches. All wells were screened in the saturated overburden overlying the shale bedrock as described in **Section 2.2.4.1**.

Monitoring well construction details for the permanent wells at SEAD-121C are presented in **Table 3-7**. All construction details were completed in accordance with the procedure outlined in **Section 2.2.4.1**.

3.1.7.2 Monitoring Well Development

Following the well installation, each monitoring well was developed to insure that a proper hydraulic connection existed between the well and the surrounding aquifer. The development details for the EBS and the RI are summarized in **Section 2.2.4.2**. Monitoring well development data for the DRMO Yard wells are summarized in **Table 3-8**.

3.1.7.3 Groundwater Sampling

Groundwater from five monitoring wells (MW121C-1, MW121C-2, MW121C-3, MW121C-4, and MW121C-6) at SEAD-121C was sampled and analyzed for the parameters listed in **Section 2.2.4.3**. MWDRMO-5 was dry and was not sampled. The first round of sampling for the EBS was completed at wells MW121C-1 and MW121C-2 in March 1998. The first round of groundwater sampling for the RI was conducted February 2003, and the second round of groundwater sampling for the RI was completed in May 2003. Sampling during the RI was completed in accordance with the latest version of the EPA groundwater sampling guidance as is discussed in **Section 2.2.4.3**. A summary of groundwater samples collected during the two rounds of sampling during the RI field program is provided in **Table 3-9**. A listing of groundwater quality indicator parameter data at the time of sample collection is provided in **Table 3-10**.

3.1.8 Aquifer Testing

Three rounds of water levels were collected at each of the permanent monitoring wells at the DRMO Yard to determine groundwater elevation and to define the groundwater flow direction at the site. The first round of elevation data was collected on the day of well development, October 29, 2002. The second round of measurements was taken on February 2, 2003, immediately before the first round of groundwater sampling. The final round of elevation measurements was obtained on May 7, 2003 before the last sampling round. All of the collected groundwater elevation data is presented in **Table 3-11**.

3.2 SEAD 121I: RUMORED COSMOLINE OIL DISPOSAL AREA

3.2.1 Results of Previous Investigations

Results obtained during the EBS at the Rumored Cosmoline Oil Disposal Area, otherwise known as SEAD-121I, have been combined with the results of the RI conducted at this SEAD to yield a single, cohesive and comprehensive discussion of the site's conditions. This discussion is provided in the following text and in **Section 4.0**.

3.2.2 Components of the EBS and RI at SEAD-121I

The following field investigations were performed to complete the EBS and RI characterization of SEAD-121I:

- Surveying;
- Soil Investigation; and
- Surface Water Investigations.

3.2.3 Site Survey

All sampling locations established during the RI at SEAD-121I were surveyed using a GPS system. Coordinates for all sampling locations are summarized in **Table 3-12**.

3.2.4 Soil Investigation

3.2.4.1 Introduction

The objectives of the soil investigation program conducted at SEAD-121I were to determine the nature and extent of contamination present at or in the vicinity of the site and to establish the extent of impacts to soils. In addition, soil samples were collected for analysis of grain size and moisture content to provide data to be used in determining remedial alternatives for the site. All sampling was conducted in accordance with the procedure outlined in **Section 2.2.2**.

3.2.4.2 Subsurface Soils

RI Program

During the RI, five soil borings were advanced using a hollow stem auger at SEAD-121I. These soil borings were advanced at specific locations described in the Final Work Plan for the Remedial Investigation (RI) at Two EBS Sites in the Planned Industrial Development Area (Parsons, 2002) and are shown in black labels on **Figure 3-2**. All five borings had boring refusal at 2 to 4 ft. bgs. Fractured bedrock was encountered in all five locations, which resulted in auger refusal. In most cases, fractured bedrock could be seen at the surface when sampling was being conducted at the site. A soil sample was collected from each of the five borings at a depth interval of 0 to 2 ft. Because these 5 samples did not seem to vary in character from the surface soil samples (collected from 0 to 2 inches), these 5 samples (collected from the top interval of the boring) were grouped as surface soil for the purpose of discussion.

3.2.4.3 Surface Soils

EBS Program

During the EBS, four surface soil samples were collected at a depth range of 0 to 2 inches at SEAD-121I. Each surface soil sample was collected from a depressed area found within each of the four rectangles (formed from the intersection of roadways and locations of warehouses at the site).

RI Program

During the RI, 30 surface soil samples were collected at a depth range of 0 to 2 inches. As stated, SEAD-121I is comprised of four grassy rectangular areas between Avenue C and D. Twenty samples were collected within the four blocks that comprise SEAD-121I. Sample locations were placed on each of the four corners of each rectangle, as well as roughly one in the center of each block. The remaining ten surface soil samples were collected outside the boundary of SEAD-121I: five surface soil samples were collected from the four blocks to the west of SEAD-121I, across Avenue C; and five surface soil samples were collected from the four blocks east of the site, across Avenue D. All sampling locations are shown in black labels on **Figure 3-2**.

Surface soil samples (collected 0 to 2 inches bgs) were collected at all 30 sample locations (SS121I-5 to SS121I-34), as presented in **Table 3-13**. Sampling was conducted in accordance with the procedure outlined in **Section 2.2.2.1**.

3.2.4.4 Ditch Soils

The proposed sediment samples have been reclassified as ditch soil. Nine of the ditch soil samples located inside SEAD-121I or upgradient of the site are located in small drainage culverts, and these locations are not considered to be sediment since they are not perennially wet and do not support benthic organisms or normal wetland vegetation. The three ditch soil samples located downgradient of the site are located in man-made drainage ditches. The material at the bottom of these ditches is competent shale, and any soil in the ditch is the result of erosion due to surface water runoff and is not naturally present in the ditch. The drainage ditches were constructed for drainage purposes when the Depot was first established, and the ditches have not been maintained since the base was decommissioned. It is presumed that a maintenance program would be reinstated by the future user to control stormwater runoff from the site.

EBS Program

Two ditch soil samples were collected during the EBS program. One sample was collected from a drainage culvert downgradient of the materials staging area between Building 343 and Building 331. The second ditch soil sample was collected from a drainage culvert downgradient of the staging area between Buildings 341 and 329. Locations are shown in blue labels on **Figure 3-2**.

RI Program

Ten ditch soil samples were collected at SEAD-121I during the RI program. The ditch soil samples were collected in the drainage basins, culverts, channels, and swales surrounding the site, which run parallel to the streets, in order to catch possible site migration. Four ditch soil samples were collected within the boundary of SEAD-121I. Three ditch soil sample locations were located across Avenue D, east of the site, and three ditch soil samples were collected downgradient of the site, to the west. The location of the ditch soil samples is shown in black labels on **Figure 3-2**.

The three ditch soil samples located downgradient of the site were collected in the main drainage ditch running parallel to Avenue A, located downgradient of SEAD-121I, SEAD-26, SEAD-64A, and other industrial portions of the Depot and acting as a point of conversion of all the catch basins located throughout the site in a series of three outlet pipes. The area immediately next to the discharge point of the outlet pipes was the site of collection of the ditch soil samples. Ditch soil samples SD121I-3 and SD121I-2 were collected directly from the discharge pipes, prior to converging with existing water in the ditch. Ditch soil sample SD121I-1 was collected downgradient of the outlet pipe and is classified as the furthest downgradient ditch soil sample collected for the site.

All sampling was conducted in accordance with the procedure outlined in **Section 2.2.2.2**. **Table 3-14** summarizes the sampling program for SEAD-121I. Data defining ditch soil sample characteristics at the time of sample collection are provided in **Table 3-15**.

3.2.5 Surface Water

The objectives of the surface water sampling proposed at SEAD-121I were to determine the background surface water chemical concentrations (i.e., the surface water concentrations in areas that have not been impacted by site activities) present in the area of the site, to delineate the extent of contamination on site, and to establish the potential exposure pathways for offsite transport in the drainage basins. However, no continuous source of surface water exits within the bounds of SEAD-121I. All surface water located at this site is temporal, generally associated with either storm or snowmelt events.

EBS Program

No surface water was collected as part of the EBS program.

RI Program

The work plan for the investigation at the Rumored Cosmoline Oil Disposal Area specified that ten surface water samples were to be collected at the study area. Three designated locations (SW121I-4, SW121I-8 and SW121I-9) did not contain surface water at the time of collection, even following periods of rain and snow, thus they were not collected. Four surface water samples were collected from standing water locations around SEAD-121I, typically near the catch basins along the side of the streets. These samples were collected following a precipitation event to ensure sufficient water was available for collection. Standing water does not accumulate at these locations during dry periods. It is assumed that the standing water either drains into the nearby catch basins or is slowly absorbed and infiltrated into the soil.

The remaining three surface water samples were collected in the main drainage ditch running parallel to Avenue A, located downgradient of SEAD-121I, SEAD-26, SEAD-64A, and other industrial portions of the Depot and acting as a point of conversion of all the catch basins located throughout the site in a series of three outlet pipes. Surface water samples SW121I-3 and SW121I-2 were collected directly from the discharge pipes, prior to converging with existing water in the ditch. Sample SW121I-1 was collected downgradient of the outlet pipe and was the furthest downgradient surface water sample collected for the site. The locations of surface water samples are shown in black labels on **Figure 3-2**. All sampling was conducted in accordance with the procedure outlined in **Section 2.2.3**. **Table 3-16** summarizes the sampling program for SEAD-121I.

3.2.6 Groundwater Investigation

The purpose of the groundwater monitoring program at SEAD-121I was to define the horizontal and vertical extent of impacted groundwater, determine the direction of groundwater flow in the area of the site, determine the hydrogeologic properties of the aquifer to assess contaminant migration and potential remedial actions, and determine the background groundwater quality.

The monitoring wells were originally to be located and installed within the soil borings (SB121I-1 to SB121I-5). Upon drilling the soil borings to a refusal point of 4 ft., the holes were left open to monitor the potential collection of groundwater. Water did not collect at any of the five holes, and therefore it was concluded that if wells were installed in the borings, the wells would not produce noticeable groundwater. Consequently, the wells were not installed.

SEAD-121I (as well as the neighboring Solid Waste Management Unit (SWMU), SEAD-68) is located on the top of the apparent groundwater divide. Therefore, there are no groundwater results that are applicable to SEAD-121I. There are wells at downgradient locations at SEAD-121C, SEAD-26, SEAD-50/54, and SEAD-25. All of these wells are managed as part of investigations for different SWMUs at SEDA.

4.0 NATURE AND EXTENT OF IMPACTS

Data quality objectives for this investigation follow the guidance described in Data Quality Objectives (DQO) for Remedial Response Activities: Development Process (USEPA, 1987) that is described in the approved Generic Installation RI/FS Work Plan for SEDA. This DQO document has been replaced by the Data Quality Objectives Process for Hazardous Waste Site Investigations, Final (USEPA, 2000c). Although the work plans for this site referenced the earlier DQO document (USEPA, 1987), a review of the Interim Final Guidance (USEPA, 1993d) indicates that the development of the field investigation program for SEAD-121C and SEAD-121I essentially followed the steps outlined in the Interim Final Guidance. These steps include development of a conceptual site model, defining the exposure scenarios, determining the regulatory objectives, defining the boundaries of the operable units, and developing a judgmental sampling plan for the field investigation program. The non-probabilistic approach to developing a sampling program was used because the objective of the program was to establish that a threat exists in a complete exposure pathway by confirming the presence of a hazardous chemical substance associated with the sites, based on visual and historical information on the chemical sources. The specific locations of chemical impacts were identified during the Investigation of Environmental Baseline Survey (EBS) Non-Evaluated Sites (Parsons, 1999) and from historical information about activities conducted at the sites. In order to maintain consistency between the Generic Installation RI/FS Work Plan, the Planned Industrial/Office Development (PID) Work Plan, and the reports prepared for SEDA, this report will continue to reference the earlier DQO document.

Validation of analytical data resulting from analytical determinations in soil, ditch soil, surface water, and groundwater will be performed in a manner that is generally consistent with procedures defined in the United States Environmental Protection Agency's (USEPA) "National Functional Guidelines for Organic Data Review" and consistent with USEPA Region 2's Standard Operating Procedures (SOP). Specific data validation procedures that will be followed include:

- Training Course For CLP Organic Data Validation 2001, Revision 2;
- HW-24, Validating Volatile Organic Compounds by SW-846 Method 8260B, Revision 1, June 1999;
- HW-29, Measurement of Purgeable Organic Compounds in Water by Gas Chromatography/Mass Spectrometry (GC/MS): Capillary Column, Acquired Using Method 524.2 (Revision 4.1, 1995), Revision 1, October 2001;
- HW-22, Validating Semivolatile Organic Compounds by SW-846 Method 8270, Revision 2, June 2001;
- HW-23B, Validating Pesticides/PCB Compounds by SW-846 Method 8082, Revision 1.0, May 2002; and

- HW-2, Evaluation of Metals Data for the CLP Program, Revision 11, January 1992.

4.1 INTRODUCTION

This section presents the analytical results for all media sampled at and surrounding SEAD-121C and SEAD-121I. Data from the EBS Investigation collected in 1998 and data collected during the 2002 Remedial Investigation (RI) field sampling events have been merged individually for each site to yield a single data set for the site, and the combined data set for each site is discussed separately for each area in this report.

The investigation activities performed for the EBS and RI generated Level I and Level IV analytical data. These data categories are described in the earlier DQO document (USEPA, 1987). The Interim Final Guidance (USEPA, 1993d) describes two data categories, screening data with definitive confirmation, and definitive data. These two categories are associated with specific quality assurance and quality control elements. The Level I and IV data meet the applicable QA/QC requirements for screening and definitive data, which are presented in the Interim Final Guidance. To maintain consistency between the work plans and reports prepared for SEDA, the data categories will continue to be referred to using “Level” terminology.

The types of media investigated at SEAD-121C and SEAD-121I are as follows:

- Surface Soil (both SEADs);
- Subsurface Soil (SEAD-121C only);
- Groundwater (SEAD-121C only);
- Surface Water (both SEADs); and
- Ditch Soil (both SEADs).

Classes of parameters analyzed for media during the two site investigations (i.e., the EBS and RI) are summarized in **Tables 2-2** through **2-5** for soil, groundwater, surface water, and ditch soil, respectively. Detailed chemical analyses performed include determinations of:

- Volatile organic compounds (VOCs);
- Semivolatile organic compounds (SVOCs);
- Chlorinated pesticides (Pesticides);
- Polychlorinated biphenyls (PCBs);
- Metals and cyanide;

- Total organic carbon (TOC); and
- Total Petroleum Hydrocarbons (TPH).

The VOC and SVOC analyses also included the identification and quantification of tentatively identified compounds (TICs). The analytical results are discussed first by media and then by constituent group. The analytical results are summarized on data tables and, where appropriate, maps are used to show the horizontal and vertical distribution of constituents of concern found at the sites. Complete analytical data tables are provided in **Appendix C**.

Field duplicates were collected for each media during the EBS and the RI field investigations. In the data presentation in this report, the analytical results of each pair of sample and field duplicate samples were averaged to produce a single result used to represent the sample location during a specific sampling event. The following procedures were used to average the results of a sample and its field duplicate:

- If an analyte was detected in both the sample and duplicate sample, then the detected values were averaged.
- If an analyte was not detected in the sample and the duplicate sample, then the reporting limits (RLs) were averaged.
- If an analyte was detected in only one member of a sample/duplicate pair; then the analyte was considered present at a level equal to the average of the detected value and one-half of the RL for the non-detect member.

Table C-1A in **Appendix C** presents the method used for selecting qualifiers assigned to averaged sample/duplicate paired results. The sample and its field duplicate were treated as one entry and the average concentration was used to represent the result detected at the sampling location. This protocol is reflected in all the summary statistics (i.e., number of detections or exceedances and the maximum concentration) presented in this report and in the risk assessment. For completeness, the raw data presented in tables in **Appendix C** include all samples results (i.e., results for the sample and its field duplicate); however, the statistics on the left side of the tables were calculated by counting the sample and its duplicate as one sample and evaluating its average value. It should be noted that a maximum reported value could be generated from the average of a sample/duplicate pair.

4.2 QUALITY CONTROL

This section presents and summarizes quality control results computed sample and sample duplicate pairs collected during the investigation of SEAD-121C (DRMO Yard) and SEAD-121I (Rumored Cosmoline Oil Disposal Area). Sample and sample duplicates were collected at a frequency of no less than one pair per every 18 field samples. The number of sample and sample duplicate pairs collected during the PID site investigation is summarized below.

Site	Media	Number of Sample/Duplicate Pairs
SEAD-121C	Surface Soil	5
SEAD-121C	Ditch Soil	1
SEAD-121C	Groundwater	2
SEAD-121C	Surface Water	1
Building 360 (SEAD-27)	Groundwater	2
SEAD-121I	Surface Soil	3
SEAD-121I	Ditch Soil	1
SEAD-121I	Surface Water	1

The level of agreement between sample and sample duplicate results is determined and documented by calculating the Relative Percent Difference (RPD) that exists between a parameter reported in the sample and in its duplicate. Generally, RPD values of 50% or less suggest that sampling and analyses processes are in control; RPD values above 50% warrant additional evaluation and consideration, before the results are accepted or rejected. Such consideration should include review of all data reported for the sample/duplicate pair to determine if the noted variability is limited to a single analyte or is wide-spread across the sample or across a group of analytes. Factors also considered include evaluation of the data to assess whether that particular analyte is detected at a concentration near, or below the detection limit (i.e., estimated or “J” flagged), in one member of the sample/duplicate pair while the analyte was not detected at all in the second member of the pair.

4.2.1 Discussion of RPD Results

Comparisons of reported sample and sample duplicate results were done for sample/duplicate pairs collected from SEAD-121C and SEAD-121I for each media sampled (i.e., soil, ditch soil, surface water, and groundwater). **Table 4-1A** presents a summary of the analytes found with RPDs greater than 50% in each of the sampled media. In general, the RPD results were acceptable and did not identify any significant errors in the dataset as a whole. Matrix influences are believed to be a contributing factor, mainly influencing the results of SVOCs and more specifically the Polycyclic Aromatic Hydrocarbons (PAHs). Matrix interference is believed to affect SEAD-121C surface soil.

The other major factors affecting the RPD results were laboratory contamination and laboratory instrument performance. SEAD-121I ditch soil and surface soil both reported SVOCs with Percent Difference greater than 20% and data validation noted Matrix Spike (MS) /Matrix Spike Duplicate (MSD) recovery problems for several PAHs in the ditch soil. VOCs such as acetone, carbon disulfide, chloroform, methyl ethyl ketone, and methylene chloride were reported by the laboratory, however based on a Parsons’ review of the dataset, data validation, and professional judgment, these results are “false positives” and may result from contamination in the laboratory or sample preservation process.

Another factor that affects RPD results was turbidity found in groundwater sample/duplicate pairs collected from temporary wells. Groundwater samples from SEAD-121C temporary wells detected several pesticides at concentrations just above or below (i.e., estimated) the detection limits for the specific analyte. This problem was limited to the sample/duplicate groundwater pair (EB153/EB023) collected during the EBS in 1998, where bailers and temporary wells were used. Additionally, turbidity in groundwater samples also impacted the results reported for antimony, arsenic, cadmium, chromium, cobalt, copper, iron, nickel, and vanadium in one of the two sample/duplicate pairs from SEAD-121C. These detections were general below or slightly above the detection limit of the individual metal.

4.2.2 Summary of RPD Results by Site and Media

4.2.2.1 SEAD-121C

Surface Soil

Five sample/duplicate pairs were collected during the EBS (1998) and the RI (2003). **Table 4-1B** summarized analytes that have a RPD greater than 50% and presents the results for the samples, its corresponding duplicate, and the calculated RPD value. **Table C-1B** presents the complete results of the samples, its duplicate, and RPD value. **Table 4-1B** identifies PAHs as the chemical group with most frequently having RPDs greater than 50%. Three sample/duplicate pairs (EB231/EB014, DRMO-1074/DRMO-1080, and DRMO-1002/DRMO-1003) had at least seven of the sixteen PAHs with RPDs greater than 50%.

Sample/duplicate pair EB231/EB014 was collected during the EBS; what is significant about this pair is that the duplicate (EB014) shows that a majority of the SVOCs are present at the site, while the sample (EB231) shows non-detects for all the SVOCs except for bis(2-ethylhexyl)phthalate. Looking at results from other samples (i.e., SS121C-4 and SBDRMO-5, in order of proximity) collected in close proximity to sample/duplicate pair EB231/EB014, indicates that at least 11 of the 16 PAHs are present in the area and they typically exist at concentration greater than found in EB014. While the two comparison samples were collected 5 years after the EBS sample was, and therefore could be impacted by events not reflected in the 1998 event, the frequent detections of PAHs at elevated concentration in this area suggests that the results posted for EB014 are more reflective of conditions likely to exist in the area. Similar findings are observed for the pesticide, delta-BHC, and metals in these samples. The sample/duplicate pair EB229/EB020 was collected during the EBS. There were no significant RPD issues for this sample/duplicate pair. Common sources for RPD above 50% were: detection below, at, or slightly above the detection limit in one of the members; different detection limits for each member, or detection in both members below the detection limit.

Sample/duplicate pair DRMO-1074/DRMO-1080 was collected during the RI; note that several PAHs were detected at different concentration between the members. The variation in detected concentrations can be attributed to matrix interference, sampling technique (i.e. non-homogenous mixing of soil sample) or laboratory instrument problems, such as failure to clean equipment or laboratory controls outside of limits. Two pesticides and TPH were also potentially impacted by sampling technique. In addition, low concentrations were a significant influence on the RPD values (i.e. differences between low concentrations producer higher RPD values) for the pesticides and TPH.

Sample/duplicate pair DRMO-1043/DRMO-1044 was collected during the RI. There were no significant RPD issues for this sample/duplicate pair. Common sources for RPD above 50% were: detection below, at, or slightly above the detection limit in one of the members; different detection limits for each member, or detection in both members below the detection limit.

The sample/duplicate pair DRMO-1002/DRMO-1003 was collected during the RI; note again that several PAHs were detected at different concentrations between the members. The variation in detected concentrations can be attributed to matrix interference, sampling technique (i.e. non-homogenous mixing of soil sample) or laboratory instrument problems, such as failure to clean equipment or laboratory controls outside of limits. In addition, antimony, magnesium, and TPH also had RPD above 50%, which could potentially be attributed to sample technique.

Ditch Soil

A single sample/duplicate pair DRMO-4005/DRMO-4008 was collected during the RI from sample location SDDRMO-8, see **Table 4-1C**. **Table C-1C** presents the full RPD results for the ditch soil sample and the sample duplicate. The majority of the analytes were not detected, but had RPD above 50% due to different detention limits for the members. The exceptions were acetone, arsenic, barium, cobalt, iron, manganese, and sodium. Acetone is a common laboratory contaminant; and the data validation indicated acetone was detected below the contract required quantitative limit (CRQL) in a method blank. The metals (previously mentioned) variation in detected concentrations was potentially influenced by the sampling technique.

Groundwater

One sample/duplicate pair of groundwater was collected during the EBS and the RI (EB153/EB023 and 121C-2002/121C-2004, respectively), see **Table 4-1D**. **Table C-1D** presents the full RPD results for the groundwater sample and the sample duplicate.

As mentioned previously, the EBS sample/duplicate pair EB153/EB023 was collected from temporary monitoring wells. Samples from temporary wells generally have elevated turbidity from sediment entering the well; in addition the sampling technique used bailers (a non-low flow method), which increases the turbidity in the water column within the well. These two factors are believed to be the source of the pesticides detected in the EBS groundwater samples, and the variation in detected concentration of pesticides and metals between the members (EB153/EB023).

Sample/duplicate pair 121C-2002/121C-2004 was collected from permanent monitoring well MW121C-4 during the RI. Metals (aluminum, chromium, cobalt, iron, and zinc) had RPD above 50%; chromium, cobalt, and iron were detected in one member but not the other generating a high RPD value; and aluminum and zinc were detected in both members but at low/high concentrations, once again producing a high RPD value.

Surface Water

Sample/duplicate pair DRMO-3008/DRMO-3005 was collected from sample location SWDRMO-8 during the RI. **Table 4-1E** summarizes the analytes with RPDs greater than 50%; and **Table C-1E** presents the full RPD results for the surface water sample and the sample duplicate. Iron and manganese had RPDs above 50%. The variation in iron and manganese concentrations could be attributed to the surface water sampling technique.

Groundwater at Building 360 (SEAD-27)

Data from groundwater monitoring wells at Building 360 (MW-1 and MW-2) and a sump pump (T-sump), located in a storage tank within Building 360, were included in this report to provide background information on contaminants unrelated to SEAD-121C. One sample/duplicate pair was collected from each sampling round (April 2003 - DRMO-2005/DRMO-2008 and May 2003 - DRMO-2013/121C-2019, respectively). Both sample/duplicate pairs were obtained from MW-1. **Table 4-1F** summarizes the analytes with RPDs greater than 50%; and **Table C-1F** presents the full RPD results for Building 360 (SEAD-27) sample/duplicate pairs.

Sample/duplicate pair DRMO-2005/DRMO-2008 had aluminum with a RPD of 137%, which was attributed to a non-detect in DRMO-2005 and an estimated detection below the detection limit in DRMO-2008. Detection in a single member and low concentrations has significant influences on the RPD values.

Sample/duplicate pair DRMO-2013/121C-2019 had selenium with a RPD of 84%, which was attributed at a non-detect in DRMO-2013 and an estimated detection slightly above the detection limit in 121C-2019. Detection in a single member and low concentrations has significant influences on the RPD values.

4.2.2.2 SEAD-121I

Surface Soil

Three sample/duplicate pairs (121I-1043/121I-1044, 121I-1006/121I-1031, and 121I-1025/121I-1030) were collected during the RI. **Table 4-1G** summarizes the analytes with RPDs greater than 50% and **Table C-1G** presents the full RPD results for the sample/duplicate pairs.

Sample/duplicate pair 121I-1043/121I-1044 had RPD above 50% in VOCs, SVOCs, and metals. Acetone was detected in the field blank associated with the sample/duplicate pair, suggesting acetone detection was due to laboratory contamination. Ethyl benzene and ortho xylene were both detected at low concentrations below or slightly above their respective detection limits; small differences at low concentrations can produce a large RPD value. Bis (2-ethylhexyl)phthalate was detected in one member below the detention limit and not detected in the other member. The metals (antimony, arsenic, chromium, cobalt, manganese, selenium, silver, and thallium) were detected at varying concentrations that could be attributed to sampling technique (i.e. non-homogenous mixing of soil sample).

Sample/duplicate pair 121I-1006/121I-1031 reported acetone with a RPD above 50%. The detection of acetone at a low concentration, slightly above the detention limit, in addition, the field blank for the SDG detected acetone, which suggest a ‘false positive’ due to laboratory contamination.

Sample/duplicate pair 121I-1025/121I-1030 reported several VOCs, SVOCs, metals, and TPH with RPDs above 50%. The holding time for the VOC samples was 11 days, which was slightly beyond the 10 day holding time for VOCs but within the holding time limits for SVOCs, metals, and TPH. Methyl ethyl ketone and SVOCs (anthracene, bis(2-ethylhexyl)phthalate, and carbazole) were detected in one member but not the other, thus producing a higher RPD value. The remaining SVOCs, metals, and TPH were detected in both members but at different concentrations, which could be attributed to sampling technique or laboratory instrument performance.

Ditch Soil

A single sample/duplicate pair 121I-4007/121I-4005 was collected during the RI. **Table 4-1H** summarizes the analytes with RPDs above 50% and **Table C-1H** presents the full results of the RPD calculations for the sample/duplicate pair 121I-4007/121I-4005. Acetone was detected in a field blank suggesting the detection in the sample/duplicate pair was due to laboratory contamination. The SVOCs (2-Methylnapthalene, 3,3’-dichlorobenzidine, and acenaphthylene), 4,4’-DDE, and thallium were detected at or below the detection limit in one member but not the other. The remaining SVOCs (the majority being PAHs) were detected at two different concentrations; the variation in the detected concentrations might be attributed to non-homogenous mixing of soil sample) or laboratory instrument problems, such as failure to clean equipment or laboratory controls outside of limits.

Surface Water

A single sample/ duplicate pair 121I-3007/121I-3005 was collected during the RI. **Table 4-1I** summarizes the analytes with RPDs greater than 50% and **Table C-1I** presents the full RPD results for the sample/duplicate pair. Manganese and selenium had RPDs slightly over 50% due to the low detected concentrations. Low concentrations can cause a larger RPD values.

4.3 DRMO YARD (SEAD-121C)

4.3.1 Surface Soils

Soil data have been evaluated relative to recommended New York State (NYS) soil cleanup objectives, listed in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. However, the discussion in the sections below focuses on the presentation of analytes that the Army believes may have particular significance.

The discussion of soils in this section is divided into surface soils and ditch soil within each chemical class. Surface soil is defined as soil that exists at depths extending from 0 to 2 inches below the ground surface (bgs), beneath the root ball associated with overlying vegetative cover, or beneath the base of any overlying road (shale, asphalt, concrete) surface. Subsurface soil, which occurs at depths greater than 2 inches bgs or overlying material, is discussed on **Section 4.3.2**.

As discussed in **Section 3.0**, samples collected from drainage ditches adjacent to the DRMO Yard and Rumored Cosmoline Oil Disposal Area previously identified as “sediment” samples have been reclassified and reviewed as “ditch soil.” When the SEDA was first constructed, drainage ditches were constructed throughout the Depot to promote storm-water drainage and flow. When first constructed, the ditches were excavated down to competent shale, and during the active life of the Depot, maintenance activities were performed (i.e., re-excavated and graded) to remove accumulated soil, debris, and vegetation that appeared. Since the mission of the Depot terminated, ditch maintenance has ceased and the ditches have again partially filled with soil, debris, and vegetation. However, the historic drainage ditches found in the Administration and Warehouse areas of the Depot still do not support aquatic life, as they are only wet after storm events and continue to provide stormwater runoff infiltration and runoff control. When the Administration and Warehouse area and land turns over to the future user, maintenance of the drainage ditches would resume to control site runoff.

Summary statistics for the surface soil and ditch soil analyses are shown in **Tables 4-2,** and **4-3**. The complete analytical results for surface and ditch soils are presented in **Appendix C-2** and **C-3**, respectively.

4.3.1.1 Volatile Organic Compounds

Surface Soils

Nine VOCs (identified below) were detected in the 48 surface soil samples collected in SEAD-121C. **Table 4-2** presents summary statistics (e.g., frequency of detection, maximum concentration, etc.) developed for the samples.

VOCs Detected in SEAD-121C Surface Soil		
Acetone	Chloroform	Methylene chloride
Benzene	Ethyl benzene	Ortho Xylene
Carbon disulfide	Meta/Para Xylene	Toluene

Each of the nine VOCs was detected in fewer than 28% of the samples collected. Three of the identified VOCs (i.e., acetone, methylene chloride, and toluene) are common laboratory contaminants. Within "Risk Assessment Guidance for Superfund" (RAGS), Volume I (USEPA, 1989), USEPA has indicated that common laboratory contaminants are only to be considered if the concentration of the analyte found in the sample exceeds ten times the level found in the blank. The table below compares the maximum detected concentration for these three VOCs to the maximum blank concentration.

	Max Sample Concentration (μg/Kg)	**Max. Blank Concentration (μg/Kg)**	**10 Times Blank Concentration (μg/Kg)**	**Is the sample greater than 10 times blank?**
Acetone	13	16	160	No
Methylene chloride	2.6	2.5	25	No
Toluene	28	2.5	25	Yes

Based on this evaluation, sample results for acetone and methylene chloride are consistent or less than blank levels and the data need no longer be considered. Toluene was detected in nine samples, and the maximum concentration found was 28 μg/Kg, which is slightly greater than ten times half the detection limit found in the blanks (25 μg/Kg). Concentrations measured in the other eight samples are less than ten times the value of half the detection limit.

Carbon disulfide (4.7 μg/Kg) and chloroform (4.8 μg/Kg) were each detected in two samples at levels just above their respective detection limits. Benzene was detected in a single sample collected from SBDRMO-9 at a level of 41 μg/Kg. This same sample also contained elevated concentrations of ethyl benzene (3,300 J µg/Kg), meta/para xylenes (4,400 J µg/Kg) and ortho xylene (16 µg/Kg). The total concentration of benzene, toluene, ethyl benzene, and total xylenes (BTEX) in surface soil sample SBDRMO-9 is 7,762 µg/Kg. SBDRMO-9 is located inside the DRMO Yard in the southeastern corner.

Ethyl benzene was also detected at a concentration of 1.0 J µg/Kg in SBDRMO-6. Meta/para xylene was detected in two other samples at estimated values of 2 J µg/Kg at SBDRMO-21, and 2.7 J µg/Kg in SBDRMO-6.

<u>Ditch Soil</u>

Three VOCs (identified below) were detected in the ditch soil at the DRMO Yard (**Table 4-3**).

VOCs Detected in SEAD-121C Ditch Soil		
Acetone	Carbon disulfide	Methyl ethyl ketone

Acetone was detected in seven of ten ditch soil samples collected, with a maximum concentration of 150 J µg/Kg at sample location SDDRMO-3. The ditch soil samples collected for VOC analysis were preserved with sodium bisulfate. According to research conducted by USACE and published in a paper *Storage and Preservation of Soil Samples for Volatile Compound Analysis* (Hewitt, 1999), "greater concentrations of acetone in laboratory soils and its appearance in field soils was found to be associated with both lowering the pH and presence of sodium [bisulfate]."

Carbon disulfide was detected twice, with a maximum concentration of 12 J µg/Kg detected at SDDRMO-6. Methyl ethyl ketone was detected in three samples with a maximum concentration of 130 J µg/Kg found at sample location SDDRMO-4.

4.3.1.2 Semivolatile Organic Compounds

<u>Surface Soils</u>

Twenty-seven SVOCs (listed below), mainly including PAHs, were detected in the surface soil samples collected from the area of SEAD-121C (**Table 4-2**).

SVOCs Detected in SEAD-121C Surface Soil		
2,4-Dinitrotoluene	Benzo(k)fluoranthene	Diethyl phthalate
2-Methylnaphthalene	Bis(2-Ethylhexyl)phthalate	Fluoranthene
Acenaphthene	Butylbenzylphthalate	Fluorene
Acenaphthylene	Carbazole	Hexachlorobenzene
Anthracene	Chrysene	Indeno(1,2,3-cd)pyrene
Benzo(a)anthracene	Di-n-butylphthalate	N-Nitrosodiphenylamine
Benzo(a)pyrene	Di-n-octylphthalate	Naphthalene
Benzo(b)fluoranthene	Dibenz(a,h)anthracene	Phenanthrene
Benzo(ghi)perylene	Dibenzofuran	Pyrene

2,4-Dinitrotoluene and n-nitrosodiphenylamine were detected in a single sample (SB121C-2) during the EBS. Di-n-butylphthalate, di-n-octylphthalate, and hexachlorobenzene were detected at low frequency (10%, 4%, and 2%, respectively) and at low concentrations.

Seven of the detected PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] are known carcinogenic PAHs (cPAHs). The concentration of cPAHs detected in soils at SEAD-121C computed for each individual sample, and the results were compared to NYSDEC's recommended screening level of 10 mg/Kg benzo(a)pyrene toxicity equivalent (BTE). The BTE value calculation is based on the relative toxicity of the individual cPAHs, as cited by USEPA Integrated Risk Information System (IRIS) Database. The BTE value is calculated by multiplying the concentration of the individual cPAHs in each sample by the following factors (based on IRIS) and summing the results:

Analyte	**Toxicity Factor**
Benzo(a)pyrene	1
Dibenz(a,h)anthracene	1
Benzo(a)anthracene	0.1
Benzo(b)fluoranthene	0.1
Indeno(1,2,3-cd)pyrene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.01

A higher multiplier represents a greater carcinogenic health risk.

Only a single concentration of BTE (11.5 mg/Kg at location SSDRMO-12) exceeded NYSDEC's 10 mg/Kg BTE screening value; all of the other BTE values were lower than NYSDEC's screening level, and the site-wide average was 1.1 mg/Kg. The distribution of BTE values found at the DRMO Yard is shown in **Figure 4-1**. The BTE data is also graphically summarized in the bar graph displayed in **Figure 4-2**.

This bar graph shows that elevated levels of benzo(a)pyrene, the greatest contributor to carcinogenic risk based on oral carcinogenic slope factors, are collocated with elevated levels of the other six cPAHs. In addition, **Figure 4-2** further illustrates that benzo(a)pyrene alone never exceeds the 10 ppm benchmark value. The figure illustrates that elevated PAHs are limited to four discrete locations, and are not pervasive across the site or surrounding areas.

Three of the four locations where the highest BTE levels were found are located in the vicinity of Building 316. North of Building 316, BTE were detected at a level of 7.9 mg/Kg at SBDRMO-24, which is within the fenced area identified as the DRMO Yard and situated between two railroad spurs. Two locations on the south side of Building 316, which are both outside of the fenced area comprising the DRMO Yard, measured BTE at levels of 5.0 mg/Kg and 8.4 mg/Kg at SBDRMO-16 and SSDRMO-7, respectively. Both of the southern locations are close to access/egress roadways in the area, and thus, it is possible that grease and grime from vehicular traffic or material from the roadway surface itself has contributed to the levels of contamination found. In addition, a dielectric box and transformer are located immediately south of Building 317, which is next to sample location SSDRMO-7. Benzo(a)pyrene and benzo(b)fluoranthene were the greatest contributors to the BTE values at each of the four locations.

Ditch Soil

Twelve SVOCs, again comprised mainly of PAHs, were detected in the ditch soil, as shown on **Table 4-3** and summarize in the table below.

SVOCs Detected in SEAD-121C Ditch Soil		
3 or 4-Methylphenol	Benzo(b)fluoranthene	Fluoranthene
Anthracene	Benzo(ghi)perylene	Indeno(1,2,3-cd)pyrene
Benzo(a)anthracene	Benzo(k)fluoranthene	Phenanthrene
Benzo(a)pyrene	Chrysene	Pyrene

The compounds 3 or 4-Methylphenol, benzo(ghi)perylene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene were detected in one sample each; however 3 or 4-methylphenol (790 μg/Kg) was a low concentration and a single detect out of 10 ditch soil samples; in addition, surface soil samples did not report any detection. This all suggests 3 or 4-methylphenol was an isolated detection and not a pervasive contaminant at SEAD-121C. Benzo(ghi)perylene (290 μg/Kg), benzo(k)fluoranthene (580 μg/Kg), and indeno(1,2,3-cd)pyrene (270 μg/Kg) were levels were compared to TAGM values, and none were in exceedance of the comparison TAGM values. Anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene were each detected in two samples. The maximum detection of each of these compounds was found in one sample, SDDRMO-2, shown in **Figure 4-3**, which is upgradient of the DRMO Yard in Drainage Ditch #2. The maximum BTE value for ditch soil, located at SDDRMO-2, was 2.0 mg/Kg.

4.3.1.3 Pesticides and PCBs

Surface Soil

Fourteen pesticides and three PCBs (identified below) were detected in the surface soil in or near the DRMO Yard (**Table 4-2**).

Pesticides/PCBs Detected in SEAD-121C Surface Soil		
4,4'-DDD	Dieldrin	Heptachlor
4,4'-DDE	Endosulfan I	Heptachlor epoxide
4,4'-DDT	Endosulfan II	Aroclor-1242
Aldrin	Endrin	Aroclor-1254
Alpha-Chlordane	Endrin ketone	Aroclor-1260
Delta-BHC	Gamma-Chlordane	

Each compound was detected in less than 38% of the samples collected. The maximum pesticide concentration detected was 185 J µg/Kg of endosulfan I detected at SSDRMO-7, which is outside the boundary of SEAD-121C, upgradient of the site and along the road near Building 316 and 317. The majority of pesticide detections were detected in the northern corner of the Yard. The highest detection of any PCB was 930 µg/Kg of Aroclor-1254 at SBDRMO-18. The detections of PCBs are scattered across the site.

Ditch Soil

No pesticides or PCBs were detected in the ditch soil at the DRMO Yard.

4.3.1.4 Metals

Surface Soils

Twenty-three metals were detected in one or more of the 48 surface soil samples collected from SEAD-121C (**Table 4-2**). Sixteen metals (aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, vanadium, and zinc) were detected in all samples. The frequency of detection in samples for the remaining eight metals ranged from a low of 21% for thallium and selenium to a high of 92% for mercury. All of the maximum concentrations of metals found in samples collected during this investigation were inside the DRMO Yard. Concentrations of metals detected exterior to the site were notably lower.

To facilitate the discussion of data for metals detected in soils, the detected metals have been grouped into three categories (or tiers), listed below. The four metals that comprise Tier 1 are present in the soils at disproportionately high concentrations, and they are collocated in isolated clusters. As a result, their presence is suggestive of a systemic release. The Tier 2 metals were detected at

SEAD-121C at moderate concentrations, with occasional high values that were collocated with the high concentrations of Tier 1 metals. Tier 3 metals are nutrients commonly found in the soils at SEDA; historically, these metals are not considered to be contaminants of concern (COCs). The three groups, or tiers, are shown below.

Tier 1	**Tier 2**	**Tier 3**
Chromium	Antimony	Aluminum
Copper	Arsenic	Barium
Lead	Beryllium	Calcium
Zinc	Cadmium	Cobalt
	Mercury	Iron
	Thallium	Magnesium
	Vanadium	Manganese
		Nickel
		Potassium
		Selenium
		Silver
		Sodium

Each of the Tier 1 metals (chromium, copper, lead, and zinc) was detected in all 48 samples collected, shown in **Table 4-2**.

The distribution of copper, lead, and zinc in surface soil throughout the DRMO Yard is graphed in **Figure 4-4**. This figure suggests that high levels of these three metals are collocated at SEAD-121C. It should be noted that chromium is not included on **Figure 4-4** since the concentration of chromium found is orders of magnitude lower than those reported for copper, lead, and zinc. The chromium data are summarized separately at the end of the discussion of Tier 1 metals.

The concentrations of copper detected in the surface soil are shown on **Figure 4-5**. The two highest hits of copper, 9,750 mg/Kg and 5,050 J mg/Kg, were detected at SB121C-2 and SSDRMO-24, respectively. Both of these locations are near the northern end of the DRMO Yard. The data show that copper was detected at comparatively high concentrations at locations SB121C-1 and SSDRMO-14 at 3,850 J mg/Kg and 1,450 J mg/Kg, respectively. Sample location SSB121C-1 is located at the northern end of the DRMO Yard, in the general vicinity of the two locations where high copper was found, while location SSDRMO-14 is located at the southwestern side of the yard. Further review of **Figure 4-5** shows that all of the elevated levels of copper are generally limited to two areas within the DRMO Yard: one located in the northern corner of the site and the other located in the southwestern corner of the yard. The majority of the southern and central portions of the yard contain relatively low concentrations of copper.

Figure 4-6 shows the distribution of lead concentrations in the surface soil at the DRMO Yard. Lead was detected in all of the samples, with a maximum concentration of 18,900 mg/Kg found at location

SSDRMO-24. This sample location is at the southern end of the storage cells in the northern corner of the DRMO Yard, in the general area where elevated levels of copper were found, as was previously discussed. Three other locations in close proximity (less than 200 foot distance) to SSDRMO-24 also showed elevated concentrations of lead (SB121C-1 – 2,650 J mg/Kg; SB121C-2 – 5,080 mg/Kg; and, SBDRMO-5 – 2,690 mg/Kg). At present, a concentration of 1,250 mg/Kg is being considered as the lead standard for an industrial site based on work completed at SEAD-16 and SEAD-17, which are located roughly 1,250 feet northwest of the DRMO Yard. At the DRMO Yard, lead was detected above the proposed industrial criteria in four samples.

The maximum concentration of zinc detected was 3,610 mg/Kg, located at SBDRMO-15. As is shown on **Figure 4-7**, this location is at the southwestern end of the DRMO Yard, in one of the two areas where high copper was shown to exist, as is discussed above. The second highest detected level of zinc, 2,910 J mg/Kg, was found at SSDRMO-14, which is also in the same general area of the DRMO Yard.

Figures 4-5, **4-6**, and **4-7** confirm the graph in **Figure 4-4**, which suggests that elevated levels of copper, lead, and zinc are collocated.

The maximum detection of chromium, 74.8 mg/Kg, was found at SBDRMO-18. This sample location is located within the copper/lead/zinc cluster at the northern corner of the DRMO Yard, as discussed above. **Figure 4-8** shows that the higher chromium concentrations are also collocated with elevated levels of copper, zinc, and lead.

A statistics summary of detects of Tier 2 metals in the surface soil at SEAD-121C is presented below.

	No. of Detections	Maximum Value	Location of Max. Value
Antimony	39	236 mg/Kg	SSDRMO-24
Arsenic	48	11.6 mg/Kg	SSDRMO-24
Beryllium	48	1.2 mg/Kg	SBDRMO-8
Cadmium	29	29.1 mg/Kg	SSDRMO-14
Mercury	44	0.47 mg/Kg	SBDRMO-18
Thallium	10	1.1 J mg/Kg	SBDRMO-24
Vanadium	48	25.4 mg/Kg	SBDRMO-8

The statistics show that thallium was detected at a low frequency, 21%. Eight of the ten detections of thallium are estimated values and are close to the detection limit of 0.6 mg/Kg.

Table 4-2 shows that in all but one sample, beryllium was detected at concentrations less than 1 mg/Kg. Vanadium detections did not exceed 26 mg/Kg. Based on these low levels of beryllium and vanadium, these compounds will not be considered further.

Antimony was detected in 39 of the 48 surface soil samples analyzed. The maximum detection of antimony, 236 mg/Kg, was located at SSDRMO-24 in the northern corner of the DRMO Yard, which is collocated with high copper, lead, and zinc levels. The distribution of antimony in the surface soil samples is graphed on **Figure 4-9**. This bar chart shows that most detections are at low levels. In addition, the high peaks on **Figure 4-9** correspond to the high peaks on **Figure 4-4**, which indicates that the higher concentrations of antimony are collocated with the high concentrations of the Tier 1 metals.

The maximum detection of arsenic, 11.6 mg/Kg, was found at SSDRMO-24, which is included in the northern cluster of Tier 1 metals with high concentrations. **Figure 4-10**, which graphs the distribution of arsenic concentrations in the surface soil at SEAD-121C, shows that there is little variance among the detected concentrations of arsenic and shows that most detections of arsenic are between 3 mg/Kg and 6 mg/Kg.

Mercury was detected in 44 of the 48 surface soil samples collected. The maximum detected value of mercury, 0.47 mg/Kg, was found at SBDRMO-18 in the northern corner of the DRMO Yard.

Cadmium was detected in 29 of the 48 samples collected, and its maximum detected concentration, 29.1 mg/Kg, was found at SSDRMO-14 in the southwestern corner of the site. The second highest concentration, 21.1 mg/Kg, was detected at SS121C-1 during the EBS. The concentrations of cadmium in the surface soil at SEAD-121C are shown on **Figure 4-11**. The higher concentrations of cadmium are located in the same two clusters as the Tier 1 metals.

The distribution of most of the Tier 2 metals in surface soil throughout the site is graphed in **Figure 4-12**. A comparison of **Figure 4-12** to **Figure 4-4** shows that the high peaks on both charts occur at the same sample locations. **Figure 4-12** shows that concentrations of Tier 2 metals that are significantly above their respective detection limits were detected at sample locations that are included in the two clusters of elevated Tier 1 metals concentrations, discussed above. A review of **Figures 4-5**, **4-6**, **4-7**, and **4-11** confirms the observation that concentrations outside the northern and southwestern clusters are significantly lower. The data suggests that there was a release of metals in two distinct areas.

Metals in Tier 3 that have been detected at the Depot were related to natural sources and are likely a part of the site background. Historically, these metals have not been considered contaminants of concern by the Army, EPA, or NYSDEC. As a result, Tier 3 metals will not be discussed further.

<u>Ditch Soil</u>

Twenty-two metals, plus cyanide, were detected in the ditch soil at the DRMO Yard (**Table 4-3**). Frequency of detection ranged from a low of 10% for cyanide, to a high of 100% for aluminum, arsenic, barium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, sodium, vanadium, and zinc. Cyanide was detected once in ditch soil at

SDDRMO-4 at an estimated concentration of 2.36 J mg/Kg. Some metals (antimony, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc) are shown on **Figure 4-3**. It should be noted that the maximum values for each metal detected in ditch soil is significantly lower than the maximum values for those metals detected in surface and subsurface soils. The table below presents the detected metals based on their respective Tier classification.

Tier 1	Tier 2	Tier 3
Chromium	Antimony	Aluminum
Copper	Arsenic	Barium
Lead	Beryllium	Calcium
Zinc	Cadmium	Cobalt
	Mercury	Iron
	Thallium	Magnesium
	Vanadium	Manganese
		Nickel
		Potassium
		Selenium
		Silver
		Sodium

Only one ditch soil sample location, SDDRMO-9, is located inside the DRMO Yard. This location is situated in the northern area identified in the surface soil discussion in the pervious section, in which heavy metals were found to be pervasive. The remaining samples are located outside of the DRMO Yard, along the southern and northwestern borders. SDDRMO-9 is found in the northern corner of the site. The maximum concentrations of copper (1,190 mg/Kg) and lead (436 mg/Kg) in ditch soil were both detected at SDDRMO-9. The level of copper present is similar to levels found in surface soils in the northern corner of the site. Of the Tier 2 metals, the maximum concentrations of antimony and cadmium (4.9 J mg/Kg and 14.3 mg/Kg) were detected at SDDRMO-9.

The distribution of the Tier 1 metals (copper, chromium, lead, and zinc) is shown in **Figure 4-13**. Copper was detected in all ten samples, with the maximum detection of copper, 1,190 mg/Kg, found at SDDRMO-9, located in the northern corner of the DRMO Yard. The second highest concentration of copper was 133 J mg/Kg at SDDRMO-5 in Drainage Ditch #2.

Chromium was detected in ten samples and the maximum detection of chromium, 29.8 J mg/Kg, was found at SDDRMO-2, shown on **Figure 4-13**, where Drainage Ditch #2 is adjacent to Building 316.

Lead was detected in all ditch soil samples, with a maximum detection of 436 mg/Kg at SDDRMO-9 located inside the DRMO Yard. This value is well below the industrial standard for lead of 1250 mg/Kg, as shown on **Figure 4-13**.

The maximum concentration of zinc detected was 566 mg/Kg at sample location SDDRMO-5 along Drainage Ditch #2. The second highest detection of zinc was 540 mg/Kg at SDDRMO-2, which is upgradient of the DRMO Yard in Drainage Ditch #2.

The distribution of Tier 2 metals in ditch soil at and in the vicinity of the DRMO Yard is shown in **Figure 4-14**. Antimony was detected in five samples, and, as previously stated, the maximum concentration of antimony, 4.9 J mg/Kg, was detected at sample location SDDRMO-9, which is the only ditch soil sample collected inside the DRMO Yard, located in the northern corner of the site. Arsenic, which was detected in all of the ditch soil samples, had a maximum detection at SDDRMO-2 (6.1 J mg/Kg), located upgradient of SEAD-121C in Drainage Ditch #2. Cadmium was detected in five samples, which a maximum concentration of cadmium (14.3 mg/Kg) detected at sample location SDDRMO-9 inside the DRMO Yard. The second highest detection of cadmium, 5.8 J mg/Kg, was found at SDDRMO-5 along Drainage Ditch #2. Mercury was detected in all ditch soil samples, with a maximum detection of 0.3 J mg/Kg at SDDRMO-2.

4.3.1.5 Other Constituents

Total Petroleum Hydrocarbons

Surface Soils

TPH was detected in ten of the 40 surface soil samples collected (**Table 4-2**). The highest detection of TPH (7,600 J mg/Kg) was found at SBDRMO-17, which is located in the southeastern portion of the DRMO Yard. The second highest detection of TPH in the surface soil (4,500 J mg/Kg) was found at SBDRMO-16, which is located upgradient from SEAD-121C, along the road across from Building 316. The second highest BTE value (8.4 mg/Kg) was also detected at SBDRMO-16. In the northern corner of the yard, TPH was recorded at 710 J mg/Kg and 520 J mg/Kg at SBDRMO-18 and SBDRMO-5, respectively.

Ditch Soil

TPH was detected in two ditch soil samples at the DRMO Yard (**Table 4-3**). TPH measured 2,600 J mg/Kg at SDDRMO-2 and 1,000 mg/Kg at SDDRMO-1. Both sample locations are upgradient of the DRMO Yard.

4.3.2 Subsurface Soil

Soil data have been evaluated relative to recommended NYS soil cleanup objectives, listed in NYSDEC TAGM #4046. However, the discussion in the sections below focuses on the presentation of analytes that the Army believes may have particular significance.

Subsurface soil occurs at depths greater than 2 inches bgs or overlying material. Summary statistics for the subsurface soil analyses are shown in **Tables 4-4**. The analytical results for subsurface soil are presented in **Appendix C-4**.

4.2.2.1 Volatile Organic Compounds

Ten VOCs (identified below) were detected in the 20 subsurface soil samples collected in and around the DRMO Yard during the ESI and the RI programs (**Table 4-4**).

VOCs Detected in SEAD-121C Subsurface Soil		
Acetone	Meta/Para Xylene	Styrene
Benzene	Methyl ethyl ketone	Toluene
Chloroform	Methylene chloride	
Ethyl benzene	Ortho Xylene	

As mentioned in the discussion for surface soil, acetone, methyl ethyl ketone, methylene chloride, and toluene may be common laboratory contaminants and may not be considered further (USEPA, 1989). RAGS specifies that the sample results for these specified VOCs should only be considered if the concentration in the sample exceeds ten times the blank concentration. The maximum concentrations of acetone, methyl ethyl ketone, methylene chloride, and toluene, as well as the maximum concentrations detected (or half the detection limit, as a conservative estimate) in the rinse blanks and trip blanks, are shown below.

	Max. Sample Concentration (µg/Kg)	**Max. Blank Concentration (µg/Kg)**	**10 Times Blank Concentration (µg/Kg)**	**Is the sample greater than 10 times blank?**
Acetone	28	16	160	No
Methyl ethyl ketone	7.6	2.5	25	No
Methylene chloride	3.5	2.5	25	No
Toluene	84	2.5	25	Yes

Since concentrations detected in the samples were less than ten times the concentrations found in the rinse blanks, acetone, methyl ethyl ketone, and methylene chloride are not considered to have positive detections. Toluene was detected in four samples, and the maximum detection was 84 µg/Kg, which is greater than 10 times the concentration found in the rinse blank. However, the other three detections of toluene (4 J µg/Kg, 7 J µg/Kg, and 9 J µg/Kg) are significantly less than ten times the maximum amount detected in the rinse blank (2.5 µg/Kg). The detection of 84 µg/Kg of toluene was found at sample location SBDRMO-9, which is the same location where maximum levels of benzene, ethyl benzene, and total xylenes were detected. As a result, the toluene present in the sample from

SBDRMO-9 is assumed to be related to the presence of total BTEX at that location, while the remaining three detections of toluene are considered artifacts of laboratory contamination.

Benzene was detected twice, with a maximum value of 1,800 μg/Kg detected inside the DRMO Yard at SBDRMO-9 at a depth range of 2 ft. to 6 ft. bgs. The sole detection of ethyl benzene, 24,000 μg/Kg, is collocated with the maximum detected value of benzene. Meta/para xylene was also detected once at SBDRMO-9, at a concentration of 130,000 J μg/Kg. BTEX detected at SBDRMO-9 at a depth range of 2 ft. to 6 ft. bgs is 155,959 μg/Kg, as shown on **Figure 4-15**.

All other VOCs (chloroform and styrene) were detected in fewer than 10% of the samples and were not considered significant contaminants. Chloroform was detected twice (4 J μg/Kg and 2 J μg/Kg) at concentrations below the detection limit of 5 μg/Kg. Styrene was detected in one sample (2.7 J μg/Kg) at the detection limit.

4.3.2.2 Semivolatile Organic Compounds

Twenty-four SVOCs (identified below), mainly including PAHs, were detected in the subsurface soil samples at SEAD-121C (**Table 4-4**).

SVOCs Detected in SEAD-121C Subsurface Soil		
2-Methylnaphthalene	Benzo(k)fluoranthene	Dibenzofuran
Acenaphthene	Bis(2-Ethylhexyl)phthalate	Diethyl phthalate
Acenaphthylene	Butylbenzylphthalate	Fluoranthene
Anthracene	Carbazole	Fluorene
Benzo(a)anthracene	Chrysene	Indeno(1,2,3-cd)pyrene
Benzo(a)pyrene	Di-n-butylphthalate	Naphthalene
Benzo(b)fluoranthene	Di-n-octylphthalate	Phenanthrene
Benzo(ghi)perylene	Dibenz(a,h)anthracene	Pyrene

All SVOCs were detected at a frequency of 40% or less. BTE values were calculated for the cPAHs in each subsurface soil sample. The BTE values did not exceeded 10 mg/Kg at any of the locations; and the site-wide average BTE value was 0.42 mg/Kg. The maximum BTE value was 1.4 mg/Kg at SBDRMO-16, collected at a depth of 2 to 6 ft. bgs.

4.3.2.3 Pesticides and PCBs

Twenty subsurface soil samples were collected and analyzed for pesticides and PCBs, summarized in the table below and in **Table 4-4**.

Pesticides/PCBs Detected in SEAD-121C Subsurface Soil		
4,4'-DDE	Delta-BHC	Endrin ketone
4,4'-DDT	Endosulfan I	Heptachlor epoxide
Aldrin	Endrin	Aroclor-1260

4,4’-DDE, 4,4’-DDT, and Aroclor-1260 were detected three times, with maximum concentrations of 17 μg/Kg, 16 μg/Kg, and 200 μg/Kg, respectively. The remaining six pesticides (aldrin, delta-BHC, endosulfan I, endrin, endrin ketone, and heptachlor epoxide) were each detected a single time. The maximum detections of Aroclor-1260 (200 μg/Kg), delta-BHC (1.3 J μg/Kg), and heptachlor epoxide (1.1 J μg/Kg) were collocated at SB121C-2 and obtained from a depth range of 2 ft. to 2.5 ft. bgs. The maximum detections of 4,4’-DDE (17 μg/Kg) and 4,4’-DDT (16 μg/Kg) were collocated at SB121C-3, at a depth range of 2.5 ft. to 3 ft. bgs. The maximum detections of aldrin (11 J μg/Kg), endosulfan I (78 g/Kg), endrin (23 J μg/Kg), and endrin ketone (9.7 NJ μg/Kg) were collocated at SBDRMO-16, at a depth range of 2 ft. to 6 ft. bgs.

4.3.2.4 Metals

Twenty-two metals (identified below) were detected in the 20 subsurface soil samples analyzed at SEAD-121C (**Table 4-4**).

Tier 1	**Tier 2**	**Tier 3**
Chromium	Antimony	Aluminum
Copper	Arsenic	Barium
Lead	Beryllium	Calcium
Zinc	Cadmium	Cobalt
	Mercury	Iron
	Thallium	Magnesium
	Vanadium	Manganese
		Nickel
		Potassium
		Silver
		Sodium

Arsenic, chromium, copper, lead, and zinc were detected in all 20 samples collected. Cadmium was detected twice, at SB121C-2 and at SBDRMO-16. Mercury had a frequency of detection of 95%.

Figure 4-16 shows the distribution of metals in the subsurface soil across the DRMO Yard. This chart shows that one location in the northern corner of the site, SB121C-2 (which was sampled during the EBS), detected metals in the subsurface at concentrations that are significantly higher than the levels in the surrounding samples. The metals found at the highest concentrations were Tier 1 metals (copper, lead, and zinc). The maximum concentrations of antimony, arsenic, cadmium, chromium, copper, lead, mercury, and zinc were each detected at SB121C-2 at a depth range of 2 ft. to 2.5 ft. bgs. The maximum values of copper, lead, and zinc detected at SB121C-2 were 2,440 mg/Kg, 1,780 mg/Kg, and 691 mg/Kg, respectively.

The maximum detection of antimony, arsenic, and mercury are 11.5 mg/Kg, 8.1 mg/Kg, and 0.07 mg/Kg, respectively. Thallium was detected in two of the 20 samples collected, and the highest hit, 1.8 mg/Kg, was measured at SBDRMO-24 at a depth range of 2 ft. to 6 ft. bgs.

4.3.2.5 Other Constituents

Total Petroleum Hydrocarbons

TPH was detected in four of the 16 subsurface soil samples collected (**Table 4-4**). Three of the detections were from sample locations on the southern site of the DRMO Yard. The maximum detection of TPH was 3,700 J mg/Kg, found at SBDRMO-16 at a depth range of 2 ft. to 6 ft. bgs.

4.3.3 Groundwater

Groundwater was sampled from two temporary wells (MW121C-1 and MW121C–2) using bailers during the EBS survey (**Figure 4-17**), and in the 2003 RI two rounds (February and May) of groundwater sampling were completed in three new permanent wells (MW121C-3, MW121C-4, and MW121C-6) using low flow sampling techniques (**Figure 4-18**). The five sampled wells associated with the DRMO Yard are located within the boundary of the site; and well (MW121C-5) was dry on both 2003 sampling events and thus was not sampled. The discussion below presents and summarizes the results from the EBS and RI sampling programs. All the data is presented and discussed below; however, due to the sampling technique and the fact that wells MW121C-1 and MW121C-2 were temporary and not fully developed, the results from the EBS investigation are not considered as reliable as the data derived from the 2003 sampling events. The EBS data served as the basis for further groundwater sampling during the RI field program. While the data from the EBS temporary wells are presented in this discussion, summary statistic in **Table 4-5A,** and the analytical results in **Table C-5A** for completeness, these data are not considered representative of site conditions and will not be included in the dataset used to characterize site groundwater. **Table 4-5B** summarizes the results for the 2003 RI groundwater samples, and the analytical results are presented in **Table C-5B**.

All of the groundwater data developed for SEAD-121C was compared to a combined set of federal and state criteria that was derived by selecting the lowest value defined from the following regulatory lists: New York State Class GA Standards, Federal Drinking Water Standards Maximum Contaminant Levels (MCLs), and secondary MCLs (SEC).

4.3.3.1 Volatile Organic Compounds

Seven VOCs (identified below) were detected in the groundwater samples collected from the temporary wells during the EBS (**Table 4-5A**).

VOCs Detected in SEAD-121C EBS Temporary Wells		
1,4-Dichlorobenzene	Bromoform	Vinyl chloride
Acetone	Carbon disulfide	
Bromochloromethane	Chlorobenzene	

1,4-Dichlorobenzene, which was detected once at 36 μg/L at sample location MW121C-2, is the only VOC that exceeded its GA standard of 3 μg/L, as shown in **Figure 4-17**. Four VOCs (bromochloromethane, bromoform, chlorobenzene, and vinyl chloride) were also detected once in MW121C-2 at concentrations that were less than five times the concentration found in the rinse blank. Carbon disulfide and acetone, which are common laboratory contaminants, were detected once at temporary well MW121C-1 at a concentrations of 57 μg/L of acetone and 2 μg/L of carbon disulfide. According to RAGS, "sample results should only be considered if the concentration of the chemical in the site sample exceeds five times the maximum amount detected in any blank" (USEPA, 1989).

No VOCs were detected in the groundwater during the 2003 RI sampling program, which used low flow sampling techniques and included permanent wells (**Figure 4-18**).

4.3.3.2 Semivolatile Organic Compounds

Eight SVOCs (identified below) were detected in the groundwater samples collected during the EBS at SEAD-121C(**Table 4-5A**).

SVOCs Detected in SEAD-121C EBS Temporary Wells		
Bis(2-Ethylhexyl)phthalate	Diethyl phthalate	Phenanthrene
Butylbenzylphthalate	Fluorene	Pyrene
Di-n-butylphthalate	Hexachlorobutadiene	

However, none exceeded their respective GA or MCL standard. Six SVOCs (butylbenzylphthalate, diethyl phthalate, fluorene, hexachlorobutadiene, phenanthrene, and pyrene) were detected at estimated values that were below their detection limits (ranging from 1 to 1.5 μg/L). The maximum detections of bis(2-ethylhexyl)phthalate and di-n-butylphthalate (1.4 J μg/L and 1.7 μg/L, respectively) were slightly above their detection limits, which ranged from 1 μg/L to 1.2 μg/L. These

SVOCs are not discussed further since no exceedance of groundwater standards was detected in site groundwater.

During the 2003 RI sampling rounds, two SVOCs, bis(2-ethylhexyl)phthalate and di-n-butylphthalate were detected once (**Table 4-5B**). Neither SVOC exceeded its respective GA standard and both were detected at levels slightly above their respective detection limits.

4.3.3.3 Pesticides and PCBs

Nineteen pesticides (identified below) were detected in one or two of the groundwater samples collected during the EBS (**Table 4-5A**).

Pesticides/PCBs Detected in SEAD-121C EBS Temporary Wells		
4,4'-DDD	Dieldrin	Gamma-BHC/Lindane
4,4'-DDE	Endosulfan I	Gamma-Chlordane
4,4'-DDT	Endosulfan II	Heptachlor
Alpha-BHC	Endosulfan sulfate	Heptachlor epoxide
Alpha-Chlordane	Endrin	Methoxychlor
Beta-BHC	Endrin aldehyde	
Delta-BHC	Endrin ketone	

All detected pesticides were found in the two temporary wells that were sampled with bailers. No PCBs were detected in the temporary wells. Nine pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha-BHC, beta-BHC, delta-BHC, dieldrin, heptachlor, and heptachlor epoxide) exceeded their respective GA standard, as shown on **Figure 4-17**. The maximum concentration of dieldrin (0.2 J μg/L) was 50 times the GA standard (0.004 μg/L); the maximum concentration of beta-BHC (0.33 J μg/L) was eight times greater than the GA standard (0.04 μg/L); the maximum concentration of delta-BHC (0.16 J μg/L) were over four times the GA standard (0.04 μg/L); the maximum concentrations of heptachlor (0.14 J μg/L) and 4,4'-DDD (0.81 J μg/L) were three times the GA standard (0.04 μg/L and 0.3 μg/L, respectively). Both temporary wells and bailer sampling increase turbidity in the water column, which can produce false positives or elevated detections.

No pesticides or PCBs were detected in the permanent wells during the RI (**Table 4-5B**). The data from the 2003 sampling rounds are considered more reliable due to the improved sampling technique (low flow sampling) and the permanent installation of the wells.

4.3.3.4 Metals

Eighteen metals were detected in groundwater samples at the DRMO Yard collected EBS temporary well, see (**Table 4-5A**) and summarized in the table below based on their Tier classification.

Tier 1	**Tier 2**	**Tier 3**
Chromium	Arsenic	Aluminum
Copper	Beryllium	Barium
Zinc	Cadmium	Calcium
	Vanadium	Cobalt
		Iron
		Magnesium
		Manganese
		Nickel
		Potassium
		Selenium
		Sodium

Aluminum, iron, and manganese exceeded their respective groundwater standards in both temporary wells; and sodium exceeded its standard in one temporary well. **Figure 4-17** shows exceedances of groundwater standards in the temporary wells. All metals were detected in both temporary wells except arsenic, beryllium, and cadmium, which were detected in a single temporary well.

Nineteen metals (identified below) were detected in the RI permanent wells at the DRMO Yard (**Table 4-5B**).

Tier 1	**Tier 2**	**Tier 3**
Chromium	Antimony	Aluminum
Copper	Beryllium	Barium
Lead	Cadmium	Calcium
Zinc	Mercury	Cobalt
		Iron
		Magnesium
		Manganese
		Nickel
		Potassium
		Selenium
		Sodium

Aluminum, antimony, iron, manganese, and sodium exceeded their respective groundwater standard in the permanent wells. **Figure 4-18** shows exceedances of groundwater standards from the permanent wells. A summary of the exceedances and the locations of the maximum detections in the permanent wells are presented below.

	No. of Detections	Groundwater Criteria (Source)	Maximum Value (Location)	2nd Highest Value (Location)
Aluminum	6	50 µg/L (SEC)	588 J µg/L (MW121C-4)	401 µg/L (MW121C-3)
Antimony	2	3 µg/L (GA)	8.4 J µg/L (MW121C-6)	7.3 J µg/L (MW121C-4)
Iron	3	300 µg/L (GA)	869 J µg/L (MW121C-4)	540 µg/L (MW121C-3)
Manganese	6	50 µg/L (SEC)	297 µg/L (MW121C-6)	286 µg/L (MW121C-4)
Sodium	3	20,000 µg/L (GA)	58,400 µg/L (MW121C-4) Feb 2003	54,100 µg/L (MW121C-4) May 2003

Aluminum exceeded the secondary MCL (SEC) standard of 50 µg/L in four samples. Antimony exceeded the GA standard twice in the May 2003 sampling round. Iron exceeded its GA standard three times. Manganese exceeded the secondary MCL standard in every sample collected, and sodium exceeded the GA standard in three samples.

Sample results for the round conducted in February 2003 were higher than the results from the round conducted in May 2003, which is likely due to seasonal variation.

The maximum concentrations of aluminum, iron, manganese, and sodium detected in the temporary wells were greater than the maximum concentrations in the permanent wells. This data is consistent with the change in sampling techniques (bailers vs. low flow) and groundwater well type (temporary vs. permanent).

4.3.3.5 Other Constituents

Total Petroleum Hydrocarbon

TPH was not detected in the groundwater collected at SEAD-121C.

4.3.3.6 Building 360 (SEAD-27)

There has been periodic monitoring of the groundwater at Building 360, which is immediately east and outside of the DRMO Yard. This sampling is associated with the RCRA closure of SEAD-27 (Building 360 – Steam Cleaning Waste Tank). The fence along the eastern boundary of the Yard hugs the west side of Building 360. Two wells (MW-1 and MW-2) and a T-sump located inside of Building 360, shown in **Figure 4-19,** were sampled in April and May 2003. MW-1 is located to the east of Building 360, between Building 360 and Building 316. MW-2 is located to the west of Building 360, a few feet inside the fence line of the DRMO Yard. The T-sump, a secondary containment device inside of the 1,1,1-trichloroethane (1,1,1-TCA) storage tank, located inside Building 360. Summary statistics of the RI groundwater sampling for MW-1, MW-2, and the T-sump at Building 360 (SEAD-27) are presented in **Table 4-6** and summarized in the table below.

Chemicals Detected in Building 360 (SEAD-27) Groundwater		
VOCs		
1,1-Dichloroethane	Carbon disulfide	Vinyl chloride
1,2-Dichloropropane	Cis-1,2-Dichloroethene	
Acetone	Methylene chloride	
SVOC		
Bis(2-Ethylhexyl)phthalate		
Metals		
Aluminum	Copper	Potassium
Arsenic	Iron	Selenium
Barium	Lead	Silver
Cadmium	Magnesium	Sodium
Calcium	Manganese	Thallium
Chromium	Mercury	Vanadium
Cobalt	Nickel	Zinc

Data from these wells and the T-sump provide information about the groundwater upgradient of the DRMO Yard and may add additional insight as to contaminants that may be related to site activities versus contaminants that migrated from upgradient locations. For this reason, results of sampling of these wells have been included in this discussion.

The groundwater samples collected from Building 360 (SEAD-27) were analyzed for VOCs, SVOCs, PCBs, and metals. Sampling efforts conducted by International Technology Corporation in 1995 used bailers. The results from the 1995 sampling program were not considered as reliable as data from the 2003 sampling efforts, due to the sampling technique employed. The following analytes exceeded groundwater standards in the samples collected during the well development and the three subsequent monthly sampling events: 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1,2,2-tetrachloroethane, and total xylenes. 1,1,1-Trichloroethane was exceeded GA groundwater standard in all the sampling events. All of the remaining exceedances occurred in the final sampling event conducted in May 1995. 1,1-Dichloroethane was detected in MW-1, the upgradient well, at 7.0 μg/L and 7.6 μg/L in the sample and the sample duplicate, respectively; , the GA standard is 5 μg/L. The concentration of 1,1,2,2-tetrachloroethane (7.6 μg/L) and total xylenes (7.6 μg/L) measured were slightly greater than NYSDEC's GA standard concentration of 5 μg/L (for both). The downgradient well MW-2 did not have any exceedances of groundwater standards. The T-sump, located inside of Building 360, detected 1,1,1-trichloroethane above the GA groundwater standard consistently for across the four sampling events, with a maximum detected concentration of 20 µg/L in a sample duplicate for the March 1995 sampling event.

Sampling conducted in 2003 used low flow sampling techniques. The analytes that exceeded their groundwater standards during the sampling conducted in 1995 were either not detected during the 2003 sampling rounds or were found at levels below their respective GA or MCL standards. Most analytes detected in the groundwater during the 2003 sampling rounds were at or below the GA or MCL standards. The maximum concentration of vinyl chloride detected was estimated as 2.3 J µg/L in MW-1, which slightly exceeded the standard of 2 µg/L. **Figure 4-19** shows that vinyl chloride was not detected in any wells inside the DRMO Yard, which suggests that the detection of vinyl chloride is a residual of contaminants present upgradient of the site and is not associated with activities related to the DRMO Yard.

Aluminum, chromium, iron, lead, manganese, sodium, thallium, and zinc exceeded their respective GA or MCL standard; however, their concentrations are within the range of the site-specific background data. Thallium was only detected in the upgradient well, MW-1. **Figure 4-19** shows that aluminum concentrations vary across the site; however, they are higher at the on-site wells than at the upgradient wells, MW-1 and MW-2, and T-sump.

The single detection of lead was found at the T-sump, and a single exceedance of the groundwater standards for chromium and zinc was detected at the T-sump. The maximum detection of iron, 255,000 µg/L, was found at the T-sump at a level that was more than 45 times greater than the iron concentrations detected at MW-1 or MW-2 or at any of the DRMO Yard wells. This result suggests that the presence of iron is an artifact of an upgradient source and is not related to activities performed at the DRMO Yard.

4.3.4 Surface Water

The quality of surface water at SEAD-121C has not been classified by NYSDEC. Summary statistics for the surface water analyses are shown in **Table 4-7**. Surface water data was compared to New York State's Ambient Water Quality Standards (AWQS) Class C standard. Exceedances of this standard are shown on **Figure 4-20**.

4.3.4.1 Volatile Organic Compounds

VOCs were not detected in the surface water collected in the vicinity of the DRMO Yard.

4.3.4.2 Semivolatile Organic Compounds

One SVOC, bis(2-ethylhexyl)phthalate, was detected at one location, SWDRMO-2, which is upgradient of the DRMO Yard, at a concentration of 4.2 J µg/L (shown of **Figure 4-20**). This value exceeds the NYSDEC AWQS Class C standard for surface water, 0.6 µg/L.

4.3.4.3 Pesticides/PCBs

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

4.3.4.4 Metals

Twenty-two metals (identified below) were detected in the surface water at the DRMO Yard (**Table 4-7**).

Tier 1	**Tier 2**	**Tier 3**
Chromium	Arsenic	Aluminum
Copper	Beryllium	Barium
Lead	Cadmium	Calcium
Zinc	Mercury	Cobalt
	Thallium	Iron
	Vanadium	Magnesium
		Manganese
		Nickel
		Potassium
		Selenium
		Silver
		Sodium

Eleven metals exceeded their respective NYS AWQS Class C standard for surface water, with a frequency of detection ranging from 20% for mercury and silver to 100% for aluminum, copper, lead, and zinc. Metals exceedances in surface water are posted on **Figure 4-20**.

The maximum detection for all 11 metals that exceeded their standard were found in one sample location, SWDRMO-2, which is located upgradient of the DRMO Yard and across from Building 316. The second highest detections for all 11 metals were found at SWDRMO-3, which is immediately downgradient of SWDRMO-2, along Drainage Ditch #2. Ten of the metals detected at SWDRMO-3 exceeded their respective surface water standards. These results suggest that the contaminants present in Drainage Ditch #2 are from a source further upgradient that is not related to activities at the DRMO Yard.

Only aluminum, iron, and lead were detected in samples other than SWDRMO-2 and SWDRMO-3 at levels greater than their criteria, shown on **Figure 4-20**. **Figure 4-21**, which graphs the total metals concentrations in surface water at SEAD-121C for each sample location, illustrates a decreasing gradient of metals concentrations across SWDRMO-2, SWDRMO-3, and SWDRMO-5. Summary statistics for the metals that exceeded their criteria in the surface water are summarized below.

	No. of Detections / No. of Exceedances	**NYS AWQS Class C Standard (µg/L)**	**Maximum Value (µg/L) (Location)**	**2nd Highest Value (µg/L) (Location)**
Aluminum	10 / 5	100	8760 (SWDRMO-2)	4500 (SWDRMO-3)
Cadmium	4 / 2	3.84	19.5 (SWDRMO-2)	4.3 (SWDRMO-3)
Cobalt	7 / 2	5	47 (SWDRMO-2)	9.7 (SWDRMO-3)
Copper	10 / 2	17.3	1160 (SWDRMO-2)	118 (SWDRMO-3)
Iron	8 / 5	300	110,000 (SWDRMO-2)	17200 (SWDRMO-3)
Lead	10 / 10	1.46	839 (SWDRMO-2)	261 (SWDRMO-3)
Mercury	2 / 2	0.0007	2.1 (SWDRMO-2)	0.26 (SWDRMO-3)
Nickel	3 / 1	99.9	154 (SWDRMO-2)	20.4 (SWDRMO-3)
Silver	2 / 2	0.1	8 (SWDRMO-2)	1.7 (SWDRMO-3)
Vanadium	5 / 2	14	233 (SWDRMO-2)	14.6 (SWDRMO-3)
Zinc	10 / 2	159.3	6910 (SWDRMO-2)	425 (SWDRMO-3)

4.3.4.5 Other Constituents

Total Petroleum Hydrocarbons

TPH was detected at one surface water sample (SWDRMO-2), upgradient of the DRMO Yard, at a level of 8.08 mg/L.

4.4 SEAD-121I -RUMORED COSMOLINE OIL DISPOSAL FIELD

For the purposes of this discussion, SEAD-121I is defined as the land within the four north-south oriented rectangular blocks, bounded by 3rd Street to the north, Avenue D to the east, 7th Street to the south, and Avenue C to the west. For this discussion, the blocks are numbered from north to south such that the northern most block will be referred to as the first block and the southern most block will be referred to as the fourth block. Soils and surface water samples were collected from locations inside and outside SEAD-121I.

4.4.1 Surface Soil and Ditch Soil

Soil data have been evaluated relative to recommended NYS soil cleanup objectives, listed in NYSDEC TAGM #4046. However, the discussion in the sections below focuses on the presentation of analytes that the Army believes may have particular significance.

Based on field observations, all sediment sample locations have been reclassified as ditch soil. Nine ditch soil sample locations (SD121I-4, SD121I-5, SD121I-6, SD121I-7, SD121I-8, SD121I-9, SD121I-10, SD121I-1EBS, and SD121I-2EBS) are not considered to be sediment since they are not perennially wet and do not support benthic organisms or normal wetland vegetation. These nine ditch soil samples are either located inside SEAD-121I or immediately outside its bounds. The three remaining ditch soil samples (SD121I-1, SD121I-2, and SD121I-3) located downgradient of the site are located in man-made drainage ditch along Avenue A. The material at the bottom of these ditches is competent shale, and any soil in the ditch is the result of erosion due to surface water runoff and is not naturally present in the ditch. As a result, the analytical results from these ditch soil samples have been combined with the results from the surface soil samples to form one cohesive discussion of potential impacts to SEAD-121I. Most soil samples analyzed at SEAD-121I were collected at a depth of less than 2 inches bgs or overlying tar, grass, or vegetative covering. Six samples (at five locations) were collected from the top interval of a soil boring at a depth range of 0 to 2 ft. bgs. For the sake of discussion, these six soil boring samples have been grouped with surface soil since they do not appear to vary in character. Summary statistics for the surface soil and ditch soil analyses are shown in **Tables 4-8**. The results of the chemical analyses for surface soils and ditch soils are presented in **Table C-7** and **C-8** of **Appendix C**.

4.4.1.1 Volatile Organic Compounds

Forty-five soils samples were collected and analyzed for VOCs at SEAD-121I (**Table 4-8**) and summarized in the table below.

VOCs Detected in SEAD-121I Surface and Ditch Soil		
Acetone	Meta/Para Xylene	Ortho Xylene
Benzene	Methyl ethyl ketone	Toluene
Ethyl benzene	Methylene chloride	

Eight VOCs (listed above) were detected in the soils. Acetone was detected in 36 samples. The two highest concentrations of acetone detected (150 μg/Kg and 110 μg/Kg) were found inside SEAD-121I at SD121I-8 and SS121I-15, respectively. The other detections of acetone were lower than 100 μg/Kg. Acetone is considered to be a common laboratory contaminant. In addition, the soil samples collected for VOC analyses were preserved with sodium bisulfate, and acetone is known to form in samples that are preserved with sodium bisulfate (Hewitt, 1999). Each of the remaining seven VOCs were detected in fewer than 24% of the samples collected; frequency of detection ranged from a low of 13% for ethyl benzene and total xylenes to a high of 24% for methyl ethyl ketone. Maximum detections of benzene, toluene, and total xylenes were 41 J μg/Kg, 31 J μg/Kg, and 9.9 J μg/Kg, respectively, which were all collocated at sample location SS121I-29 in the second block next to the northern ore pile. The maximum detected concentration of ethyl benzene, 7.8 J μg/Kg, was found at SS121I-15. Methyl ethyl ketone was detected in 11 samples, with a maximum concentration of 78 μg/Kg found at sample location SD121I-8. Methylene chloride was detected in nine samples below its detection limit with an estimated maximum concentration of 2.8 J μg/Kg.

4.4.1.2 Semivolatile Organic Compounds

Twenty-eight SVOCs (majority were PAHs) were detected in the soil (surface soil and ditch soil) samples collected at SEAD-121I (**Table 4-8**) and summarized in the table below.

SVOCs Detected in SEAD-121I Surface and Ditch Soil		
2-Methylnaphthalene	Bis(2-Ethylhexyl)phthalate	Fluorene
3,3'-Dichlorobenzidine	Butylbenzylphthalate	Indeno(1,2,3-cd)pyrene
Acenaphthene	Carbazole	Isophorone
Acenaphthylene	Chrysene	Naphthalene
Anthracene	Di-n-butylphthalate	Nitrobenzene
Benzo(a)anthracene	Di-n-octylphthalate	Phenanthrene
Benzo(a)pyrene	Dibenz(a,h)anthracene	Phenol
Benzo(b)fluoranthene	Dibenzofuran	Pyrene
Benzo(ghi)perylene	Diethyl phthalate	
Benzo(k)fluoranthene	Fluoranthene	

Five SVOCs (3’3-dichlorobenzidine, di-n-octylphthalate, isophorone, nitrobenzene, and phenol) were detected once at SD121I-7. SVOCs were detected with less frequency and at lower concentrations in the samples collected at the downgradient ditch soil locations along Avenue A. Seven of the detected PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] are known carcinogens. BTE values were calculated for each soil sample at SEAD-121I, and the distribution of the BTE values is shown in **Figure 4-22**. The bar graph presented in **Figure 4-23** shows that three out of 51 samples (SS121I-2, SS121I-20, and SD121I-2EBS) exceeded the 10 mg/Kg BTE guidance value. The site-wide average BTE concentration within SEAD-121I is 3.0 mg/Kg. The maximum value of BTE, located at SS121I-20, was 32 mg/Kg. The next two highest BTE values were at SS121I-2 (21 mg/Kg) and SD121I-2EBS (26 mg/Kg), respectively. **Figure 4-23** illustrates that benzo(a)pyrene, alone, exceeds the 10 mg/Kg benchmark value at these three locations. The bar graph also shows that the BTE values at the other sample locations are well below the 10 mg/Kg guidance value.

As shown in **Figure 4-22**, SS121I-20 is located along Avenue C on the block immediately west of SEAD-121I. The warehouses on the block west of SEAD-121I are currently being used for commercial purposes. Field observations noted that there were frequent truck deliveries to these warehouses. Building 330, which was the destination of much of the traffic, had deliveries to a loading dock on the building's east side, along Avenue C. SS121I-20 is located in front of this loading dock. The sample locations with high BTE values are located along roadways, and thus, it is possible that grease and grime from vehicular traffic or material from the roadway surface itself has contributed to the levels of contamination found. The warehouse roofing/reproofing operations in the area also contribute to the PAHs contamination. The facilities have built-up roofing systems that use layers of hot tar and felt to produce a watertight roofing system. The tar kettles are heated daily while the roofing process occurs in order to liquefy the tar for application with mops. This process generates PAHs from the heated tar. The presence of elevated cPAHs beyond the boundary of SEAD-121I supports the conclusion that general site activity not related to a specific release of hazardous material exist and are contributing to the levels of PAHs detected.

4.4.1.3 Pesticides and PCBS

Seven pesticides and two PCBs (listed below) were detected in the soils at SEAD-121I (**Table 4-8)**.

Pesticides/PCBs Detected in SEAD-121I Surface and Ditch Soil		
4,4'-DDE	Dieldrin	Heptachlor epoxide
4,4'-DDT	Endosulfan I	Aroclor-1254
Aldrin	Endrin	Aroclor-1260

Frequency of detection for pesticides ranged from a low of 4% for dieldrin and endrin to a high of 59% for endosulfan I. Most detections of pesticides, which were relatively low, were found along Avenue C and Avenue D. Pesticides and PCBs were not detected in the downgradient ditch soil locations. 4,4'-DDE was detected in five samples, with a maximum concentration of 34 NJ μg/Kg at sample location SS121I-23. 4,4'-DDT was detected twice at a maximum value of 39 J μg/Kg at SS121I-21, which is located exterior to SEAD-121I. The maximum detection of aldrin and dieldrin were 12 μg/Kg and 34 J μg/Kg, respectively. Endosulfan I and endrin, which were detected in 24 samples and two samples, respectively, had maximum concentrations of 95 J μg/Kg and 30 J μg/Kg, respectively. Heptachlor epoxide was detected in eight samples, with a maximum concentration of 55 J μg/Kg measured at sample location SS121I-21, which is located outside the boundary of SEAD-121I. Aroclor-1254 was detected in two samples, with a maximum concentration of 67 μg/Kg, and Aroclor-1260 was detected in three samples, with a maximum concentration of 46 J μg/Kg.

4.4.1.4 Metals

Twenty-three metals plus cyanide were detected in the 45 soil samples collected at or around SEAD-121I (**Table 4-8**) and summarized in the table below based on their Tier classification.

Tier 1	**Tier 2**	**Tier 3**
Chromium	Antimony	Aluminum
Copper	Arsenic	Barium
Lead	Beryllium	Calcium
Zinc	Cadmium	Cobalt
	Mercury	Iron
	Thallium	Magnesium
	Vanadium	Manganese
		Nickel
		Potassium
		Selenium
		Silver
		Sodium

Fifteen metals (aluminum, arsenic, barium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, vanadium, and zinc) were detected in all samples. The frequency of detection for the remaining ten detected metals ranged from a low of 18% for silver to a high of 98% for beryllium and mercury. Cyanide was detected with a frequency of 7%. Total cyanide was detected at three surface soil locations, with a maximum concentration of 2.00 mg/Kg at SS121I-29.

Figure 4-24 presents the distribution of iron and manganese in soils at SEAD-121I. Iron and manganese were detected in each sample collected. The maximum detections of iron and manganese, both found at SS121I-29, are 58,400 mg/Kg and 311,000 mg/Kg, respectively. SS121I-29 is located in the second block adjacent to the ore pile. Historical records and site observations note the presence of ferrous-manganese ore piles in the second and fourth blocks at SEAD-121I. Based on historical records and site-specific knowledge, the presence of iron and manganese in media of concern at SEAD-121I may need to be addressed at the time of removal of the ore piles. **Figure 4-25** posts the concentrations of iron and manganese in the soils. The data clearly shows there are elevated levels of iron and manganese in the soils at SEAD-121I, which are limited to the areas surrounding the ore piles. The soil samples in the second and fourth blocks were collected in close proximity to the ore piles. Field observations noted that there were gray fines, similar in color to the ore, on the ground near the sampling locations. The data confirms the presence of the ferrous-manganese ore, which concurs with conclusions based on the visual inspection. The three ditch soil samples collected along

Avenue A reported lower levels of iron and manganese compared to samples collected in the vicinity of the ore piles.

For the purposes of discussion, the three tiers developed for the discussion of metals in soils at SEAD-121C will be used in the discussion of soils at SEAD-121I. A summary of the maximum values detected for the four Tier 1 metals (chromium, copper, lead, and zinc) are shown below.

	No. of Detections	**Maximum Value (Location)**	**2nd Highest Value (Location)**
Chromium	45	439 mg/Kg (SS121I-29)	83.9 mg/Kg (SD121I-8)
Copper	40	209 mg/Kg (SS121I-29)	130 mg/Kg (SD121I-4)
Lead	45	122 mg/Kg (SS121I-25)	93.3 mg/Kg (SD121I-6)
Zinc	45	532 mg/Kg (SD121I-6)	329 mg/Kg (SS121I-33)

The distribution of copper in the soils at SEAD-121I is graphed on **Figure 4-26**. The maximum detection of copper, 209 mg/Kg, was found at SS121I-29, next to the northern ore pile in the second block. A comparison of **Figure 4-26** to **Figure 4-24** shows that the higher detections of copper are collocated with the high levels of iron and manganese, surrounding the ore piles.

Lead was detected in all of the soils samples, with a maximum concentration (122 mg/Kg) detected at SS121I-25. A level of 1,250 mg/Kg is being considered as the lead benchmark for an industrial site at SEAD-16 and SEAD-17. The data results for lead in soils at SEAD-121I are significantly below the 1,250 mg/Kg criteria.

The chromium concentrations in the soils at SEAD-121I are shown on **Figure 4-27**. The maximum concentration of chromium, 439 mg/Kg, was found at SS121I-29 in the second block. **Figure 4-28**, which graphs the distribution of chromium in soils across SEAD-121I, shows that the high concentrations of chromium are clustered around the northern ore pile. Zinc concentrations are also displayed on **Figure 4-27**. The maximum concentration of zinc in soils at SEAD-121I, 532 mg/Kg, was detected at SD121I-6, which is located between two railroad tracks next to the southern ore pile in the fourth block. **Figure 4-29** graphs the distribution of zinc in the soils at the site. The second highest hit of zinc, 329 mg/Kg, was detected at SS121I-33, which is in the center of the northern most block of SEAD-121I. **Figure 4-29** shows that the remaining zinc samples are significantly lower that the two highest detections. Concentrations of zinc and chromium inside SEAD-121I are notably higher than the levels detected in samples located outside of the site.

A statistics summary of detects for the seven Tier 2 metals are shown below. With the noted exception of mercury, the higher concentrations of Tier 2 metals were detected within the boundary of SEAD-121I.

	No. of Detections	Maximum Value (Location)	2nd Highest Value (Location)
Antimony	14	7.5 mg/Kg (SS121I-28)	5.2 mg/Kg (SB121I-2)
Arsenic	34	104 mg/Kg (SD121I-8)	32.1 J mg/Kg (SB121I-2)
Beryllium	45	0.68 mg/Kg (SB121I-5)	0.67 mg/Kg (SB121I-4)
Cadmium	14	6.6 mg/Kg (SB121I-3)	5.0 mg/Kg (SS121I-10)
Mercury	44	0.18 mg/Kg (SD121I-3)	0.1 mg/Kg (SD121I-9)
Thallium	9	163 J mg/Kg (SS121I-29)	37.8 J mg/Kg (SS121I-15)
Vanadium	45	182 J mg/Kg (SS121I-29)	69.4 mg/Kg (SD121I-8)

Table 4-8 shows that beryllium was detected at concentrations less than 1 mg/Kg. Vanadium was detected in all soils samples. The maximum detection of vanadium, 182 J mg/Kg, was found at SS121I-29, which is collocated with elevated levels of chromium, iron, and manganese. All other detections of vanadium are significantly lower than the maximum value.

Antimony and cadmium were each detected in less than 31% of the soil samples. The distribution of antimony and cadmium in soils at SEAD-121I is shown on **Figures 4-30** and **4-31**, respectively. The maximum concentrations of antimony, 7.5 mg/Kg, was detected at SS121I-28, and the maximum concentration of cadmium, 6.6 mg/Kg, was found at SB121I-3. Mercury was detected in 98% of the samples collected. The maximum detected concentration was 0.18 mg/Kg.

Arsenic and thallium concentrations in the soils at SEAD-121I are presented on **Figure 4-32**. Arsenic was detected in 100% of the soil samples collected at SEAD-121I. The maximum detection of arsenic, 104 mg/Kg, was found at SD121I-8 in the third block. This sample was collected immediately outside the fence surrounding the northern ore pile. **Figure 4-33** shows that all of the arsenic concentrations detected above 20 mg/Kg are collocated with other metals surrounding the ore piles.

Thallium was detected in 20% of the soil samples collected. Thallium concentrations are posted on a site map in **Figure 4-32** and the distribution of concentrations are plotted on **Figure 4-34**. The maximum detection of thallium is 163 J mg/Kg, located at SS121I-29. This sample location also has high levels of chromium, iron, and manganese, and it is immediately adjacent to the northern ore pile.

Figure 4-34 illustrates that all of the high levels of thallium were detected in samples collected from areas surrounding the ore piles, and that the levels of thallium detected in the samples collected from other areas at or near the site are drastically lower.

In summary, high levels of manganese and iron, shown on **Figure 4-25**, were detected in two areas inside SEAD-121I, each surrounding a ferrous-manganese ore pile. The higher levels of other metals detected (specifically arsenic, chromium, thallium, and zinc) were generally limited to the same sample locations surrounding the ore piles. The concentrations of metals detected in the downgradient samples were substantially lower than the levels of metals found near the ore piles.

In general, metals in Tier 3 that have been detected at the Depot were related to natural sources. Iron and manganese at SEAD-121I are a noted exception and have been discussed at the beginning of this section. Historically, the remaining Tier 3 metals have not been considered contaminants of concern by the Army, EPA, or NYSDEC. As a result, Tier 3 metals (with the noted exception of iron and manganese) will not be discussed further.

4.4.1.5 Other Constituents

<u>Total Petroleum Hydrocarbons</u>

TPH were detected in 15 soils samples at SEAD-121I (**Table 4-8**). The maximum level of TPH detected was 2,200 mg/Kg at sample location SS121I-27, which is located in the middle of the southern ore pile. The second highest detection of TPH, 1,200 J mg/Kg, was found at SS121I-13, near the railroad tracks in the third block.

4.4.2 Surface Water

The quality of surface water at SEAD-121I has not been classified by NYSDEC. Summary statistics for the seven surface water samples collected are shown in **Table 4-9**. Surface water data was compared to NYS AWQS Class C standard. Exceedances of this standard are shown on **Figure 4-35**.

4.4.2.1 Volatile Organic Compounds

VOCs were not detected in the surface water at the Rumored Cosmoline Oil Disposal Area.

4.4.2.2 Semivolatile Organic Compounds

Two SVOCs were detected in the surface water at SEAD-121I, shown on **Table 4-9**. Butylbenzylphthalate was detected in one sample at the northwestern corner of SEAD-121I, SW121I-10, at a maximum concentration of 1.1 J μg/L. Fluoranthene was also detected at a maximum concentration of 1.1 J μg/L in one sample, SW121I-6, located inside SEAD-121I. Neither detection exceeded their AWQS Class C Standards.

4.4.2.3 Pesticides and PCBs

Pesticides and PCBs were not detected in the surface water at SEAD-121I.

4.4.2.4 Metals

Eighteen metals (identified below) were detected in the surface water at SEAD-121I (**Table 4-9**).

Tier 1	**Tier 2**	**Tier 3**
Chromium	Beryllium	Aluminum
Copper	Cadmium	Barium
Lead	Vanadium	Calcium
Zinc		Cobalt
		Iron
		Magnesium
		Manganese
		Nickel
		Potassium
		Selenium
		Sodium

Four metals (aluminum, iron, lead, and zinc) exceeded their respective AWQS Class C standards, shown on **Figure 4-35**. Aluminum and zinc were detected in all seven samples, iron was detected in five samples, and lead was detected in four samples. Aluminum exceeded the AWQS Class C standard at three locations; iron exceeded its standard twice; lead exceeded its standard in four samples; and zinc exceeded its standard once.

The maximum detections of aluminum, iron, lead, and zinc (2,050 μg/L, 3,410 μg/L, 26.3 μg/L, and 190 μg/L, respectively) were collocated at SW121I-6, which is located immediately north of the southern ore pile inside SEAD-121I. This was the only zinc exceedance in surface water, which was only slightly greater than its AWQS standard of 159 μg/L. The second highest concentrations of aluminum, iron, and lead (1,490 μg/L, 3,080 μg/L, and 21 μg/L, respectively) were found at SW121I-10, which is located north of the northern ore pile within the boundary of SEAD-121I.

At sample location SW121I-5, which is upgradient of the site, aluminum slightly exceeded its surface water standard (119 μg/L). Lead was also detected at SW121I-5 (6.6 J μg/L) and at a downgradient location, SW121I-2 (4.3 J μg/L).

4.4.2.5 Other Constituents

Total Petroleum Hydrocarbons

TPH was not detected in the surface water in or near SEAD-121I.

5.0 CONTAMINANT FATE AND TRANSPORT

This section presents a site-specific conceptual site model, summarizes the chemical impacts present in various media at SEAD-121C and SEAD-121I, and describes the potential transport of constituents of concern at these sites. Information developed independently for SEAD-27 (Building 360) is included within the discussion presented below for SEAD-121C, as there is an indication that contaminants from SEAD-27, or from another site located further upgradient, have flowed into SEAD-121C.

The remainder of this section is subdivided organized into three separate subsections. The first two sections address site physical and chemical characteristics at SEAD-121C, Building 360 (SEAD-27), and SEAD-121I. The remaining subsection deals with the fate and transport of individual contaminants identified at SEAD-121C and SEAD-121I.

5.1 CONCEPTUAL SITE MODEL OF SEAD-121C

The conceptual site model defines the physical and chemical setting for SEAD-121C. This conceptual site model combines site information and data collected during the 1998 Environmental Baseline Survey (EBS) and the 2002 Remedial Investigation (RI). This includes geophysical survey data, field observations, and analytical data associated with SEAD-121C.

Information for SEAD-27, the Steam Cleaning Waste Tank located in Building 360, is also summarized in this discussion to address an apparent upgradient source of contaminants that could flow into SEAD-121C. The conceptual site model for SEAD-121C has been adapted to reflect site information collected in 1995 by International Technology Corporation (IT) and two rounds of groundwater sampling in 2003 by Parsons. More details of the IT activities can be found in their document "*Final Report – Volume I, Building 360 Closure, Seneca Army Depot, Romulus, New York*."

5.1.1 Summary of Physical Site Characteristics

The site-wide physical characteristics of SEAD-121C have been described in the preceding sections. In summary, SEAD-121C [Defense Reutilization and Marketing Office (DRMO Yard)] is a triangularly shaped, gravel lot located in the east-central portion of the Depot (**Figure 1-3**). Several buildings (Buildings 360, 316, and 317) are located adjacent and east of the site, and one building (Building T-355) is located within the site boundaries. Building T-355 is located in the central part of the DRMO Yard and is used for storage. The DRMO Yard is surrounded by a chain-linked fence and access into the site is limited by a single gate that is normally locked and that is located south of Building 360.

The surface of the DRMO Yard is graded to allow surface water to drain toward the man-made ditches that bound the site on the north and south sides. The major pathway of surface water flow out of SEAD-121C is to these drainage ditches, which then flow to the west towards a wetland area and the headwaters of Kendaia Creek in the former munitions storage area.

Bedrock is encountered at less than 8 feet below ground surface (bgs) in most locations at SEAD-121C. The geologic units commonly encountered were till, brown silt or clay, fill material (in a few locations), and weathered shale above competent shale. Groundwater was encountered at less than two feet above competent shale (approximately 5 – 6 feet below grade) and flows to the southwest.

In addition to Building T-355, several other man-made features are prominent within the DRMO Yard; these features include: a ladled-shaped, earthen bottomed, storage cell in the southwest corner of the site; a rectangular shaped, earthen bottomed, storage cell immediately adjacent to, and located halfway along the northwest perimeter fence of the site; and a multi-chambered, concrete bottomed, storage cell adjacent to the east perimeter fence, near the northern-most point of the DRMO Yard. Each of the storage cells is bounded horizontally on three sides by concrete (jersey) barriers. Common debris, including scrap metal, wood debris, ordnance components, batteries, tiles, oil filters, auto parts, paint cans, tires, and other miscellanies were found in the concrete bottomed, multi-chambered storage cell. During site visits in 2002, 2003, and 2004, Parsons observed that scrap metal, military items, and old machines were stored in the earthen bottomed storage cell located along the northwest fence, while the ladle-shaped earthen bottomed cell was empty, except for small quantities of metal shavings. A silo-like structure was also found inside the fence of the DRMO Yard, adjacent to the northern edge of Building 360. Furthermore, a large crane was located in the northern portion of the Yard, north of the silo-like structure and Buildings 360 and 316. East of the DRMO Yard, a dielectric transformer box was observed between Building 317 and 1st Street. Train tracks were also observed to approach the DRMO Yard from the north, with one spur ending at Building 317, a second ending at Building 316, while a third spur extended to the area between Building 316 and Building 360.

SEAD-27 is located within Building 360 and is comprised of the steam cleaning waste tank (also known as the Steam Jenny Accumulation Pit). SEAD-27 is an open grate topped, concrete tank that is located within the northern portion of Building 360. The tank measures 35 feet long by 12 feet wide, and the maximum depth is 4 feet. The tank's capacity is 4,500 gallons when filled to near the top or 1,100 gallons when filled to the 2-foot freeboard mark. This tank is no longer in use.

Bedrock was encountered at 15 feet bgs on both the east and west facing sides of Building 360. The geologic units encountered in borings (till, reworked till, weathered shale, etc.) located around SEAD-27 were equivalent to those found in SEAD-121C as described above. Groundwater was encountered less than two feet above competent bedrock and flowed southwesterly.

Meteorological and physical site conditions that may impact the fate and transport at SEAD-121C have been described in **Section 1**.

5.1.2 Summary of Chemical Impacts at SEAD-121C

Available data summarized in this report (See **Section 4.3**, and **Tables 4-2**, **4-3**, and **4-4**) indicate that impacts associated with inorganic (i.e., metals) and semivolatile organic compounds (SVOCs) are found at SEAD-121C in surface soils, ditch soil, and subsurface soils; subsurface soils are also impacted by volatile organic compounds (VOCs). Groundwater at the site has also been impacted by a VOC, PCBs, and metals; while surface water is impacted by one SVOC and metals.

Soil

Surface soils (0-2 in. bgs) at the site show elevated concentrations of carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and metals. The table below summarizes the analytes detected in surface soil samples at levels higher than New York's recommended soil cleanup guidance values.

Analytes Exceeding TAGMs in SEAD-121C Surface Soil			
SVOCs			
Benzo(a)anthracene	Benzo(b)fluoranthene	Chrysene	Dibenz(a,h)anthracene
Benzo(a)pyrene	Benzo(k)fluoranthene		
Metals			
Antimony	Calcium	Lead	Silver
Arsenic	Chromium	Magnesium	Sodium
Barium	Copper	Mercury	Thallium
Beryllium	Iron	Nickel	Zinc
Cadmium			

The SVOCs identified above include six of the seven cPAHs that are of particular interest to the NYSDEC and the NYSDOH. Comparison of reported cPAH concentrations to New York's 10 ppm Benzo(a)pyrene Toxicity Equivalence (BTE) guidance criterion concentration for soils indicated that a single sample (i.e., SSDRMO-12) exceeded the guidance value. This sample was collected from a location near the northwest security fence, approximately one-third of the way between the western and northern most corners of this perimeter fence. The average site-wide surface soil BTE concentration was 1.1 mg/Kg.

The metals listed above were collocated in most instances in two parts of the site, the northeast and southwest corners. These locations coincide with the locations of two storage cells used for scrap metal accumulation.

The table below lists other analytes that were detected at concentrations below NYS's TAGM cleanup objective levels in shallow soil samples at SEAD-121C.

Analytes Detected Below TAGMs in SEAD-121C Surface Soil			
VOCs			
Acetone	Chloroform	Meta/Para Xylene	Ortho Xylene
Benzene	Ethyl benzene	Methylene chloride	Toluene
Carbon disulfide			
SVOCs			
2,4-Dinitrotoluene	Bis(2-Ethylhexyl)phthalate	Dibenzofuran	Indeno(1,2,3-cd)pyrene
2-Methylnaphthalene	Butylbenzylphthalate	Diethyl phthalate	N-Nitrosodiphenylamine
Acenaphthene	Carbazole	Fluoranthene	Naphthalene
Acenaphthylene	Di-n-butylphthalate	Fluorene	Phenanthrene
Anthracene	Di-n-octylphthalate	Hexachlorobenzene	Pyrene
Benzo(ghi)perylene			
Pesticides/PCBs			
4,4'-DDD	Delta-BHC	Endrin	Heptachlor epoxide
4,4'-DDE	Dieldrin	Endrin ketone	Aroclor-1242
4,4'-DDT	Endosulfan I	Gamma-Chlordane	Aroclor-1254
Aldrin	Endosulfan II	Heptachlor	Aroclor-1260
Alpha-Chlordane			
Metals			
Aluminum	Manganese	Selenium	Vanadium
Cobalt	Potassium		

With the exception of acetone and toluene, all of the listed VOCs were detected in fewer than four of the 48 surface soil samples collected. Acetone and toluene were detected at a frequency of 28% and 19%, respectively.

Five of the 21 SVOCs listed above [i.e., benzo(ghi)perylene, bis(2-ethylhexyl)phthalate, fluoranthene, phenanthrene, and pyrene]were detected at frequencies of greater than 50%; 13 other were found in less than 30% of the samples characterized. Three of the listed pesticides (4,4'-DDE, 4,4'-DDT, and Endosulfan I) were detected in more than 25% of the samples characterized, but there is no evidence of a cohesive release as the results show the samples to be randomly distributed across the site. Two PCB congeners (Aroclor-1254 and Aroclor-1260) were found in 10% or more of the samples characterized, but in only two cases were both congeners found in the same sample. All three identified PCB congeners were detected in the sample from location SS121C-4 collected during the EBS.

Subsurface soils (2-15 ft bgs) were impacted by cPAHs and metals, but to a lesser degree than the surface soils, and by VOCs. The table below lists analytes detected in subsurface soil that were found in one or more samples at levels exceeding NYS's soil cleanup objective levels.

Analytes Exceeding TAGMs in SEAD-121C Subsurface Soils		
VOCs		
Benzene	Ethyl benzene	
SVOCs		
Benzo(a)anthracene	Benzo(b)fluoranthene	Dibenz(a,h)anthracene
Benzo(a)pyrene	Chrysene	
Metals		
Antimony	Copper	Nickel
Barium	Iron	Sodium
Cadmium	Lead	Thallium
Chromium	Magnesium	Zinc

Concentrations of benzene and ethyl benzene exceeded their TAGM values in one sample, SBDRMO-9. Benzene and ethyl benzene were also detected in the surface soil sample collected from SBDRMO-9, but in this sample the measured concentrations for both analytes were below their respective TAGM values. Of the five cPAHs listed above, benzo(b)fluoranthene was the most frequently detected compound, as it was found in eight of the 19 subsurface samples collected. Benzo(a)pyrene was found the most number of times at concentrations above NYS's cleanup objective value. The site-wide average BTE concentration in subsurface soil was 0.42 mg/Kg.

No pesticides or PCBs were found in subsurface soils at concentrations exceeding NYS's soil clean-up objective levels.

Twelve metals were detected at concentration above NYS's soil cleanup objectives but generally values found in excess of TAGMs were infrequent, limited to 35% of the sample or fewer. Lead and zinc were the two metals most frequently detected at concentrations above guidance criteria.

Forty-six other TCL or TCL analytes were detected in the subsurface soils collected at SEAD-121C (DRMO Yard), but all of these are considered to be of minimal concern because they were detected at a low frequency and they were detected at concentrations below available NYS soil guidance values.

Man-made drainage ditches, which channel storm-event runoff flow out of SEDA's administrative and industrial areas have been excavated along, and form, much of the southern and northwestern boundaries of the DRMO Yard. These ditches are traditionally dry, except during and after storm or snow melt events.

Results of soil samples collected within the drainage ditches indicate that ditch soil at the DRMO yard has been impacted by benzo(a)anthracene, benzo(a)pyrene, chrysene and 11 metals, as is summarized below.

Analytes Exceeding TAGMs in SEAD-121C Ditch Soil		
SVOCs		
Benzo(a)anthracene	Benzo(a)pyrene	Chrysene
Metals		
Aluminum	Copper	Silver
Cadmium	Lead	Sodium
Calcium	Mercury	Zinc
Chromium	Selenium	

No pesticide or PCB congener was detected in any of the ditch soils characterized. Twenty-seven other VOCs, SVOCs and metals were detected in the ditch soil, but all were at concentrations below TAGM guidance values. The site-wide average BTE concentration in ditch soil was 1.1 mg/Kg with a maximum BTE concentration of 2.0 mg/Kg at sample location SDDRMO-2, which is located outside the fence line of the DRMO Yard to the east along 1st Street and across from Building 316.

Metals listed in the summary table above were detected at varying concentrations and when compared to associated TAGM values, the metals found at concentrations greater than three times the associated TAGM value were cadmium, copper, lead, silver, sodium, and zinc. The maximum concentrations of aluminum, cadmium, calcium, copper, and lead were collocated in the single ditch soil sample collected inside of the DRMO Yard in the northern corner of the site. The detection of high metal concentrations at this ditch soil sample is consistent with the surface soil results in this area of the Yard.

Groundwater

Available groundwater data at SEAD-121C indicate that this media has not been significantly impacted by contaminants found in the soils at the site. Groundwater samples collected during the 1998 EBS were collected from temporary wells and were not collected using USEPA's preferred low flow purging and sampling methods. Several VOCs, SVOCs, pesticides, and PCBs reported in samples collected during the EBS sampling round were not observed during the RI groundwater sampling events conducted in 2003, which included use of low-flow sampling procedures and permanent wells. Based on the RI data, the 1998 EBS data are considered to be biased by turbidity and improper well development, and have been excluded from further consideration. Once the EBS data is removed from consideration, the analytes of concern in groundwater at SEAD-121C are limited to five metals: aluminum, antimony, iron, manganese, and sodium based on noted exceedances of GA groundwater standards.

Results from two rounds of groundwater sampling at locations associated with SEAD-27 (two wells and the "T-sump") indicate that organic compound contamination is present upgradient of SEAD-121C and may be migrating into the site along the eastern bound of the site. Figures displaying the data are provided in **Section 4** as **4-17**, **4-18,** and **4-19**.

Three SVOCs [2-methylnaphthalene, bis(2-ethylhexyl)phthalate, and naphthalene] were each detected once in 1995 at concentrations below the NYSDEC GA groundwater standard. VOCs, including 1,1,1-TCA, 1,1,2,2-tetrachloroethane, 1,1-dichloroethane, cis-1,2-dichloroethene, and vinyl chloride have been found periodically at the SEAD-27 site. The Army believes that the contaminants found at SEAD-27 either result from a source located in Building 360 or from a location upgradient of Building 360. The organic compounds noted in the groundwater in the SEAD-27 wells are not emanating from sources located in SEAD-121C. This belief is supported by the fact that none of the contaminants found in SEAD-27 are found in site wells located for SEAD-121C, which also suggest that any possible plume is not migrating. Furthermore, none of the chlorinated VOCs identified in the groundwater are observed in the surface or subsurface soils in SEAD-121C.

Surface Water

Surface water flow at SEAD-121C results mainly from storm events or storm-event runoff, and is extremely variable in nature. Surface water at SEAD-121C does not appear to have been significantly impacted by contaminants associated with the site. Exceedances of NYSDEC Ambient Water Quality Standard (AWQS) Class C for surface water are limited to 11 metals and bis(2-ethylhexyl)phthalate. The maximum concentrations of metals, and the single detection of bis(2-ethylhexyl)phthalate, are all collocated and found at sample location SWDRMO-2. Location SWDRMO-2 is roughly 20 feet away from soil sampling location SBDRMO-16, where elevated levels of SVOCs and metals were detected in the surface and subsurface soil samples.

The following metals are considered analytes of concern: aluminum, cadmium, cobalt, copper, iron, lead, mercury, nickel, silver, vanadium, and zinc.

5.1.3 Conceptual Model Summary

Based on the analysis of chemical data discussed in **Section 4**, metals and cPAHs are present in soils and ditch soils. A localized site of subsurface soil was impacted by BTEX. The highest concentrations of metals are collocated in two areas of the site focused in the northeast and southwest corners. Concentrations of cPAHs were unevenly distributed across the site, and a single surface soil sample exceeded NYSDEC's suggested cleanup level of 10 mg/Kg BTE. Although surface water is only found at the site following storm or runoff events, available information indicates it has been impacted by metals.

5.2 CONCEPTUAL SITE MODEL OF SEAD-121I

The conceptual site model defines the physical and chemical setting for SEAD-121I. This conceptual site model combines site information collected during the 1998 EBS and the 2002 RI. This includes geophysical survey data, field observations, and analytical data associated with SEAD-121I.

5.2.1 Summary of Physical Site Characteristics

The site-wide physical characteristics of SEAD-121I (Rumored Cosmoline Oil Disposal Area) have been described in the preceding sections. SEAD-121I, shown in **Figure 1-4**, consists of four rectangular grassy areas that are bounded by 3rd and 7th Streets (north and south ends, respectively) and Avenues C and D (west and east sides, respectively). Buried reinforced concrete storm drains run east to west through the site along 3rd St., 4th St., 5th St., 6th St., and 7th St. To the east and west of the four rectangular plots comprising SEAD-121I there are two rows of buildings that are actively used for warehousing. Buildings 331 and 329, located to the west and across Avenue C, receive frequent truck deliveries. A railroad spur line enters SEAD-121I from the south and extends to the northern end of the SEAD where it terminates near the intersection of 3rd Street and Avenue C. Two sidings branch off the main spur line; one terminates in the first (north to south) block and the other terminates in the third (north to south) block. There are concrete loading docks located in the first and third blocks next to the railroad lines. The major pathway of surface water flow out of SEAD-121I is overland flow to ruts located along the sides of the roadways, to catch basins and then into the underground sewer pipes. The sewer pipes discharge to a man-made drainage ditch that flows south to north, and is located two blocks (approximately 1000 feet) west of SEAD-121I. From that point, surface water flow either infiltrates into the ground, or during high flow periods it may enter Kendaia Creek, which flows in a predominant westerly direction, and discharges into Seneca Lake north of Pontius Point and the SEDA's Lake Shore Housing Area. In addition, a portion of the surface water flow from SEAD-121I may move easterly toward Cayuga Lake.

Subsurface conditions at SEAD-121I are governed by shallow bedrock, as the site is located near the top of an apparent geological divide. The site is located on the western slope of this divide and therefore, regional groundwater flow is expected to be primarily westward towards Seneca Lake. Bedrock is typically encountered at a depth of 6 inches to 2 ft. bgs across the entire site, and it is composed mainly of weathered shale and glacial till.

Two ferrous-manganese ore piles are located within the site; one ore pile is in the first (north to south) block and the other ore pile is in the third (north to south) block. These ore piles are part of a strategic stockpile and are not a waste product. The ore piles are exposed to the weather, and run off surface water is collected by the existing storm water collection system within the Planned Development (PID) area. The ore piles are expected to be removed from SEAD-121I at a future time.

Meteorological and physical site conditions that may impact the fate and transport of contaminants at SEAD-121I have been described in **Section 1**.

5.2.2 Summary of Chemical Impacts at SEAD-121I

On the basis of the analytical results obtained from surface soil, ditch soil, and surface water samples, the following impacts to various media are present at SEAD-121I:

- surface soil: PAHs, a pesticide, and metals;
- ditch soils: PAHs and metals; and
- surface water: metals.

<u>Surface Soil and Ditch Soil</u>

Surface (0-2 in. bgs.) and ditch soil at SEAD-121I are impacted by SVOCs, pesticides, and metals. The table below summarizes the analytes of potential concern at SEAD-121I.

Analytes Exceeding TAGMs in SEAD-121I Surface Soil & Ditch Soil		
SVOCs		
Benzo(a)anthracene	Chrysene	Nitrobenzene
Benzo(a)pyrene	Dibenz(a,h)anthracene	Phenanthrene
Benzo(b)fluoranthene	Indeno(1,2,3-cd)pyrene	Phenol
Benzo(k)fluoranthene	Fluoranthene	Pyrene
Pesticides		
Heptachlor epoxide		
Metals		
Antimony	Copper	Nickel
Arsenic	Iron	Selenium
Cadmium	Lead	Silver
Chromium	Manganese	Thallium
Cobalt	Mercury	Zinc

The SVOCs detected in the surface and ditch soils at levels above TAGM values were primarily cPAHs. At least one of the seven cPAHs exceeded its TAGM value in all but seven of these samples collected at SEAD-121I. The average BTE concentration found for all samples collected within and outside the identified SEAD-121I boundary is 3.0 mg/Kg. BTE concentrations exceeded NYSDEC's 10 mg/Kg criteria level at three sample locations: SS121I-2 (21 mg/Kg), SS121I-20 (32 mg/Kg), and SD121I-2EBS (26mg/Kg). The location with the highest overall value (i.e.,SS121I-20) is located outside of the SEAD-121I boundary; the site-wide average BTE concentration based on only those samples collected within SEAD-121I is 2.2 mg/Kg.

Five SVOCs (fluoranthene, nitrobenzene, phenanthrene, phenol, and pyrene) exceeded their TAGM value once. Nitrobenzene and phenol were both detected once in a sample collected at SD121I-7 on the corner of Avenue D and 3rd St. outside of the site boundary; however, neither SVOC was detected in the sample duplicate collected at the same location. Fluoranthene, phenanthrene, and pyrene were detected with a frequency of 94%. The maximum detections of fluoranthene and phenanthrene were collocated with the maximum detection of cPAHs.

Heptachlor epoxide was detected above the comparison TAGM value of 20 µg/Kg three times at SS121I-21 (55 J µg/Kg), SS121I-9 (25 µg/Kg), and SS121I-22 (21 µg/Kg). SS121I-21 was collected next to Building 329; and SS121I-22 was collected next to Building 328. SS121I-9 was collected near the intersection of 5th Street and Avenue C.

The majority of the metals listed above were detected in all of the soil samples collected. The following metals were detected with in site samples frequency ranging from 18% to 98%: antimony (31%), cadmium (31%), mercury (98%), selenium (47%), silver (18%), and thallium (20%).

The table below presents the remaining analytes that were detected in one or more of the surface or ditch soil samples at SEAD-121I, but at levels below their comparison TAGM values.

Analytes Detected Below TAGMs in SEAD-121I Surface Soil & Ditch Soil			
VOCs			
Acetone	Ethyl benzene	Methyl ethyl ketone	Ortho Xylene
Benzene	Meta/Para Xylene	Methylene chloride	Toluene
SVOCs			
2-Methylnaphthalene	Anthracene	Carbazole	Diethyl phthalate
3'3-Dichlorobenzidine	Benzo(ghi)perylene	Di-n-butylphthalate	Fluorene
Acenaphthene	Bis(2-Ethylhexyl)phthalate	Di-n-octylphthalate	Isophorone
Acenaphthylene	Butylbenzylphthalate	Dibenzofuran	Naphthalene
Pesticides/PCBs			
4,4'-DDE	Aldrin	Endosulfan I	Aroclor-1254
4,4'-DDT	Dieldrin	Endrin	Aroclor-1260
Metals			
Aluminum	Beryllium	Cyanide, Total	Potassium
Barium			

Surface Water

Surface water at SEAD-121I has been impacted by metals. Aluminum, iron, lead, and zinc were detected above their NYSDEC AWQS Class C standard. Aluminum, iron, and lead were detected at concentrations more than 10 times greater than their respective surface water standards. Zinc exceeded its standard of 159 µg/L in a single sample (SW121I-6).

The table below identifies the other analytes that were detected in surface water, but not found at levels that exceeded Class C standards.

Analytes Detected in SEAD-121I Surface Water		
SVOCs		
Butylbenzylphthalate	Fluoranthene	
Metals		
Aluminum	Cobalt	Nickel
Barium	Copper	Potassium
Beryllium	Iron	Selenium
Cadmium	Lead	Sodium
Calcium	Magnesium	Vanadium
Chromium	Manganese	Zinc

5.2.3 Conceptual Model Summary

Based on the analysis of chemical data discussed in **Section 4** and summarized above, residual levels of SVOCs and metals exist in site surface soils and ditch soils, and the surface water has been impacted by metals. The highest concentrations of SVOCs, specifically cPAHs, were found along the outside boundary of SEAD-121I along Avenues C and D. Three soil samples exceeded NYSDEC's 10 mg/Kg BTE value for cPAHs, and the site-wide average BTE concentration within SEAD-121I was 2.2 mg/Kg. The highest BTE concentration (32 mg/Kg) was found in a location used for loading/unloading materials onto trucks at Building 330, which is outside the bounds of the Rumored Cosmoline Oil Disposal Area. The other two locations where BTE concentrations were greater than 10 mg/Kg are were located along the fences bordering SEAD-121I on Avenues C and D. The majority of the samples with exceedances for metals (arsenic, chromium, cobalt, copper, iron, lead, manganese, nickel, selenium, silver, thallium, and zinc) were located in the vicinity of the two ferrous-manganese ore piles (see **Figures 4-24**, **4-26**, **4-28**, **4-29**, **4-33**, and **4-34**), which are strategic stockpiles for the United States government. These stockpiles are not waste materials subject to CERCLA regulations.

5.3 SEAD-121C AND SEAD-121I CONTAMINANT FATE AND TRANSPORT

Contaminant fate refers to the chemical characteristics and the predictable behaviors of a contaminant within different media at a site. **Section 5.3.1** presents a discussion of the fate and transport characteristics for chemical classes common to SEAD-121C and SEAD-121I. **Section 5.3.2** discusses the fate and transport properties of specific compounds found at the sites. Fate and transport considerations within specific potential release areas are discussed where applicable. The analytical results for SEAD-121C and SEAD-121I are summarized in **Section 4** and presented in full in **Appendix C**.

There are environmental impacts to surface soil, subsurface soil, ditch soil, surface water, and groundwater within SEAD-121C and to surface soil, ditch soil, and surface water at SEAD-121I. No groundwater transport modeling was performed as part of the chemical fate and transport analysis.

5.3.1 Overview of Compound Fate

5.3.1.1 Fate of Inorganic Compounds (Metals)

This section provides background information that will help assess and evaluate the fate of metals in soils at SEAD-121C and SEAD-121I. The major fate mechanisms for metals are complexation, adsorption, precipitation, oxidation, and reduction.

All soils naturally contain trace levels of metals. The concentration of metals in "uncontaminated" soils is primarily related to the geology of the parent material from which the soil was derived. Therefore, the concentrations of these metals can vary significantly depending on the composition of the parent bedrock material. Background concentrations of metals in till at SEDA have been estimated via a sampling program as discussed in **Section 3.1** (background data are included in **Appendix B**).

The mobility of metals within a soil system is primarily associated with the movement of water through that system. This mobility is associated with the solubility of the metal and its compounds, as well as chemical parameters affecting the oxidation state of the metal in solution. Metals associated with the aqueous phase of soil are subject to movement with water, and may be transported through the vadose zone to groundwater. However, the rate of migration of the metal usually does not equal the rate of water movement through the soil due to fixation and adsorption reactions (Dragun, 1988). Metals, unlike hazardous organic compounds, can not be degraded (McLean and Bledsoe, 1992). Metals become immobile due to mechanisms of adsorption and precipitation.

Mechanisms of adsorption and precipitation inhibit the mobility of metals in groundwater. Metal-soil interactions are such that when metals are introduced at the soil surface, downward transportation does not occur to any great extent unless the metal retention capacity of the soil is overloaded, or metal interaction with the associated waste matrix enhances mobility. Changes in soil environment conditions over time, such as the degradation of the organic waste matrix, changes in pH, oxidation-reduction potential, or soil solution composition, due to natural weathering processes, also may enhance the mobility of metals. The extent of vertical impacts is intimately related to the soil solution and surface chemistry of the soil matrix with reference to the metal and waste matrix in question.

In soils, metals are found in one or more of several categories in the soil. These categories as defined by Shuman (1991) are as follows:

- dissolved in the soil solution;

- occupying exchange sites on inorganic soil constituents;
- specifically adsorbed on inorganic soil constituents;
- associated with insoluble soil organic matter;
- precipitated as pure or mixed solids;
- present in the structure of secondary minerals; and/or
- present in the structure of primary minerals.

In situations where metals have been introduced into the environment through human activities, metals are associated with the first five categories. Native metals may be associated with the first five categories depending on the geological history of the area. The aqueous fraction, and those fractions in equilibrium with this fraction (i.e., the exchange fraction) are of primary importance when considering the migration potential of metals associated with soils.

The following paragraphs discuss general aspects of adsorption and leaching of metals in soil. In general, the clay minerals within most soils possess a negative charge (Dragun, 1988). This is due the polarity of the clays and their interactions with soil moisture (water), as well as other cations and anions present in the soil. These negatively charged positions on clay minerals are responsible for attracting cationic species of elements at the soil surface.

In addition, humus is also responsible for the accumulation of ionic species of elements at soil surfaces. Humus is the relatively stable fraction of soil organic matter that remains in soil after the chemicals comprising the plant and animal residues have decomposed (Dragun, 1988). Humus is colloidal in structure and the colloid surface possesses functional groups that posses negative charges. These charges are responsible for accumulating cationic species of elements at soil surfaces.

The process by which a cation (a positively charged ion) in water is attracted to a soil surface and displaces another cation is known as ion exchange. The term cation exchange specifically refers to the exchange between cations balancing the surface charge on the soil surface and the cations dissolved in water (Dragun, 1988). The total amount of cations adsorbed by these negative charges on a unit mass of soil is defined as the cation exchange capacity of the soil (CEC), which is a stoichiometric and reversible process (Dragun, 1988).

The process by which a cation combines with molecules or anions containing free pairs of electrons is known as complex formation (Dragun, 1988). The cation-anion or cation-molecule combination is known as a complex. The anion(s) or molecule(s) with which the cation forms a complex is usually referred to as a ligand.

According to Dragun (1988), the equilibrium distribution of a cation is governed by two opposing rate processes, the adsorption rate and the desorption rate. The adsorption rate is the rate at which the dissolved cation in water transfers into the adsorbed state. The desorption rate is the opposite process; it is the rate at which the cation transfers from the adsorbed state into water. The extent of adsorption is expressed using the adsorption coefficient or distribution coefficient, K_d. The distribution coefficient is defined as the ratio of the concentration of a solute adsorbed on soil surfaces to the concentration of the solute in water. The greater the extent of adsorption, the greater the magnitude of K_d. The K_d values are dependant such characteristics as ionic size and valence, varying with these characteristics for each metal.

The chemistry and migration of all cationic metals in soil is controlled by pH. At soil pH of greater than 6.5, those metals normally present as cations, are fairly immobile. At higher pH values, cationic metals often form insoluble carbonate and hydroxide complexes. However, some metals (e.g., arsenic and uranium) may form mobile anionic complexes. Cationic metals are most mobile in highly acidic soils, e.g., those with a pH of 5 or less. Anionic metals are most mobile where the soil pH is greater than 7.0.

At SEAD-121C, groundwater pH was measured in the field as an indicator parameter during the February and May 2003 sampling events, as shown in **Table 3-10**. Field measurements for the 2003 sampling of the upgradient wells at SEAD-27 are presented in the table below. No groundwater wells were installed at SEAD-121I.

SEAD-121C Groundwater Field pH Measurements						
	April-03			**May-03**		
Well ID	**Sample ID**	**pH** [1]	**Temperature (°C)**	**Sample ID**	**pH** [1]	**Temperature (°C)**
MW-2	121C-2006	7.24	7.49	121C-2014	7.03	9.46
MW-1	121C-2005	7.42	7.13	121C-2013	9.16	9.5
Notes	1) pH values were not corrected for temperature.					

General trends of element mobility using the published results for studies of ten soils (Dragun, 1988) include:

- Cations and anions exhibit low mobility in clay and silty clay soils. As the surface areas and the clay content increases, the ability of the soil to retain cations and anions will generally increase. [Thus, the presence of silt and clay in the soils, typically 0-6 feet bgs at SEAD-121C and 0-2 feet bgs at SEAD-121I, would tend to decrease the mobility of cations in soil.]

- Cations usually exhibit moderate to high mobility in sandy, loamy sand, and sandy loam soil.

- Cations can exhibit low, moderate, or high mobility in soils with intermediate textures.

- Anions usually exhibit relatively low mobility in clay and silty clay soils and moderate to high mobility in other soil types. [Thus, the presence of silt and clay in the soils at SEAD-121C and SEAD-121I would tend to decrease the mobility of anions in soil.]

As mentioned above, the leaching of metals from soils is controlled by numerous factors. An important consideration for leaching of metals is the chemical form (base metal or cation) present in the soil. However, at SEAD-121C and SEAD-121I, the exact form (or speciation) of individual inorganics is not known.

The leaching of metals from soils is substantial if the metal exists as a soluble salt. Metallic salts have been identified as a component of such items as tracer ammunition, ignition compositions, incendiary ammunition, flares, colored smoke and primer explosive compositions. For example, barium nitrate, lead stearate, lead carbonate, and mercury fulminate are likely metal salts or complexes that may have been incinerated at the sites. During the burning of these materials, a portion of these salts were likely oxidized to their metallic oxide forms. In general, metallic oxides are considered to be less likely to leach metallic ions than metallic salts.

The discussion of the individual metals in **Section 5.3.2.1** provides an overview of the characteristics that affect the fate of each of the metals impacting SEAD-121C and SEAD-121I. Much of the information below was obtained from McLean and Bledsoe (1992).

5.3.1.2 Fate of Organic Compounds

On the basis of the chemical data at SEAD-121C and SEAD-121I, the organic compounds that will be addressed in this section include: VOCs, SVOCs, and pesticides. Organic compounds are affected by both external site conditions and the compounds' inherent chemical and physical properties. These properties will, in combination, determine the compound state and provide insight into its mobility within a media. In the following discussion, the fate characteristics of VOC, SVOCs, and pesticides are discussed.

Important soil properties to consider include the fraction of organic carbon, the mineralogy, and the porosity. Many organic compounds adsorb more strongly to the organic fraction in the soil or sediment. Therefore, the larger the amount of organic compounds in the soil, the less mobile organic constituents will be (i.e., soils with higher organic content will adsorb more organic compounds than soils with more clays). Generally, surface soils will have higher organic content than deeper soils, due to the presence of live and dead plant matter at the surface.

One measure of the affinity of a compound for the organic fraction of the soil is the organic carbon partition coefficient, K_{oc}. The K_{oc} is the ratio of the amount of the compound present in the organic fraction to that present in the aqueous fraction. **Table 5-1** describes the relative relationship between K_{oc} and mobility. As can be seen, compounds with a K_{oc} between 500 ml/g and 2000 ml/g are generally considered to have low mobility; compounds with a K_{oc} greater than 2000 ml/g are considered to be immobile (Dragun, 1988).

Some organic compounds adsorb more strongly to the clay fraction of a soil or sediment. Understanding the type and amount of clays present is crucial to estimating the mobility of the compounds. Most of the soils at SEDA are classified as clay loam. These soils generally have low permeability and high water retention capabilities. Because of these properties, contaminants tend to move slowly through these soils.

Volatile Organic Compounds

VOCs are characterized by relatively high vapor pressures and Henry's Law constants, indicating a strong potential for volatilization. Volatile constituents will enter the air in void spaces in the soil above the saturated zone. These constituents may then leave the system through the ground surface. The tendency of compound to volatilize is usually expressed in terms of a Henry's Law constant K_H. Henry's Law holds in cases where the solute concentration is very low, which is applicable to most constituents found at hazardous waste sites. Henry's Law states that the concentration of a constituent in the vapor phase is directly proportional to the concentration of that constituent in the aqueous phase. The proportionality factor is the Henry's Law constant. Generally, for compounds with a Henry's Law constant less than 5×10^{-3}, volatilization from the soils will not be a major pathway (Dragun, 1988).

VOCs tend to have a low residence time in surface soil and surface water environments. These chemicals can be persistent in groundwater. However, there is evidence that non-chlorinated VOCs may degrade rapidly in the vadose zone above groundwater plumes. (Gas Research Institute, Management of Manufactured Gas Plant Sites, Volume III, Risk Assessment, May 1988, GRI-87/0260.3).

Major exposure routes of interest include the ingestion of groundwater and the inhalation of the gases. The latter can be important in situations involving the excavation of pits or the entrainment of soil gas into buildings. There is little potential for these chemicals to accumulate in aquatic or terrestrial biota.

The organic partition coefficients, K_{oc}, for VOCs vary from being highly mobile (acetone) to being only moderately mobile (xylene). VOCs such as acetone have a K_{oc} of 1 whereas xylenes have a K_{oc} ranging in value from 39 to 365 depending on the soil and pH.

Semivolatile Organic Compounds

SVOCs are characterized by low vapor pressures and low Henry's Law constants, indicating little potential for volatilization. High sorption coefficients (7,500 ml/g) indicate that these chemicals will tend to stay sorbed to the soil, and will migrate only in conjunction with the soil itself.

Polycyclic Aromatic Hydrocarbons (PAHs)

PAH compounds have a high affinity for organic matter and low water solubility. Most PAHs have K_{oc} values greater than 2,000 ml/g. Water solubility tends to decrease and affinity for organic material tends to increase with increasing molecular weight (Gas Research Institute, 1988). Therefore, naphthalene is much more soluble in water than benzo(a)pyrene. When present in soil or sediments, PAHs tend to remain bound to the soil particles and dissolve only slowly into groundwater or the overlying water column. Because of the high affinity for organic matter, the physical fate of the chemicals is usually controlled by the transport of particulate. Thus, soil, sediment, and suspended particulate matter (in air) represent important media for the transport of PAHs.

PAH compounds are readily taken up (bioaccumulated) by living organisms. However, organisms have the potential to metabolize the chemicals and to excrete the polar metabolites (Gas Research Institute, 1988). The ability to do this varies among organisms. Fish appear to have well-developed systems for metabolizing the chemicals. The metabolites are excreted. Shellfish (bi-valves) appear to be less able to metabolize the compounds (Gas Research Institute, 1988). As a result, while PAH compounds are seldom high in fish tissues, they can be high in shellfish tissues.

Several factors can degrade PAH compounds in the environment. Biodegradation on soil microorganisms is an important process affecting the concentrations of the chemicals in soils, sediment and water. Volatilization may also occur. This mechanism is effective for the lighter molecular weight compounds. However, the volatilization of higher molecular weight PAH compounds occurs slowly.

Pesticides/PCBs

The pesticide compounds are all expected to be highly immobile in the soil/groundwater environment when present at low dissolved concentrations (Installation Restoration Program Toxicity Guide, 1987). Bulk quantities of these compounds dissolved in an organic solvent could be transported through the unsaturated zone as the result of a spill. However, their extremely low solubility and their strong tendency to sorb to soils results in a very slow transport rate in soils.

5.3.2 Fate and Transport of Specific Compounds at SEAD-121C and SEAD-121I

The following sections discuss the fate and transport mechanisms specific to elements and compounds found at SEAD-121C and SEAD-121I. Analytes detected in surface soil, subsurface soil, ditch soil, surface water, or groundwater are discussed in the subsequent sections by chemical class.

5.3.2.1 Metals

Aluminum

Aluminum compounds may be found in rock, minerals, clays, and soil and are released naturally by the weathering of rocks and minerals. These compounds are also present in air and water. Since aluminum compounds compose a large portion of the earths crust, natural weathering processes far exceed the contribution of releases from natural activities. Aluminum ions and compounds behavior in the environment is controlled by their coordination chemistry and the characteristics of the local environment such as pH. The major features of the biogeochemical cycle of aluminum include: leaching of aluminum ions from soil and minerals into aqueous environments; adsorption and/or precipitation of aluminum ions and compounds onto soil or sediment; and wet and dry deposition aluminum-containing dust particulates from the air to land or surface water. Aluminum ions and compounds will not bioconcentrate in aquatic organisms to any significant degree. Volatilization of aluminum compounds from moist soil surfaces is not an important fate process because these compounds are ionic and will not volatilize. (Source: *(http://toxnet.nlm.nih.gov)*

Antimony

In the soil environment antimony transport is controlled by the form of antimony in the soil, the soil pH, and the composition of the soil. Antimony bonds strongly with soil and sediment particles; the presence of iron, manganese, and aluminum may lead to the formation of hydroxylated oxides within the soil or groundwater. Organic carbon content does not have a significant influence on the absorption capacity of antimony to soil. (Source: *(http://toxnet.nlm.nih.gov)*

Arsenic

In the soil environment arsenic exists as either arsenate, As (V), or arsenite, As(III), however, arsenite is the more toxic form. And, arsenite compounds are reported to be 4 to 10 times more soluble than arsenate compounds (McLean and Bledsoe, 1992).

The adsorption of both forms of arsenic is strongly pH dependent. Griffin and Shimp (1978) found that arsenate had a maximum adsorption in soils with a pH of 5. These same researchers found that arsenite sorption was observed to increase over a pH range of 3 to 9. Other researches found the maximum adsorption of As(III) by iron oxide occurred at pH of 7.

Both pH and redox are important in assessing the fate of arsenic in soil. At high redox levels, As(V) predominates and arsenic mobility is low and as the pH increases or the redox decreases As(III) predominates (McLean and Bledsoe, 1992). The reduced form of arsenic is more subject to leaching because of its high solubility. Also, arsenite, As(III), can be oxidized to As(V) and manganese oxides are the primary electron acceptor in this oxidation (Oscarson et al., 1983).

Barium

Barium is a highly reactive metal that occurs naturally only in the combined state. Most barium is released into the environment form industrial sources in forms that do not become widely dispersed. In the atmosphere, barium is likely to be present in particulate form. Environmental fate processes may transform one barium compound to another; however, barium itself is not degraded. It is removed from the atmosphere primarily by wet or dry deposition.

Barium in soil may be taken up to a small extent either by vegetation, or transported through soil with precipitation. Barium is not very mobile in most soil systems. The higher the level of organic matter in the soil, the greater the adsorption. The presence of calcium carbonate will also limit mobility, since barium will form barium carbonate ($BaCO_3$), an insoluble carbonate.

Cadmium

Cadmium may be adsorbed by clay minerals, carbonates, or hydrous oxides or iron and manganese or may be precipitated as calcium carbonate, hydroxide, and phosphate. Evidence suggests that adsorption mechanisms may be the primary source of cadmium removal from soils. Several authors have reported that in soils polluted with metals wastes, the greatest percentage of the total cadmium was associated with the exchangeable fraction (McLean and Bledsoe, 1992). As with all cationic metals, the chemistry of cadmium in the soil environment is to a greater extent controlled by pH. Under acidic conditions cadmium solubility increases and very little adsorption of cadmium by soil colloids, hydrous oxides, and organic matter takes place. At pH values greater than 6, cadmium is adsorbed by the soil solid phase or is precipitated, and the solution concentrations of cadmium are greatly reduced. Cadmium forms soluble complexes with inorganic and organic ligands. The formation of these ligands will increase the mobility of cadmium in soils.

Chromium

Chromium occurs naturally in soils and rocks. It may occur in either of two oxidation states; trivalent, Cr(III), or hexavalent, Cr(VI). While Cr (III) is the more stable and common form, hexavalent chromium is the more toxic.

Trivalent chromium is readily adsorbed by soils, exhibiting typical cation sorption behavior. Under normal pH and oxidation-reduction conditions, chromium (III) minerals of oxides and hydroxides are stable and insoluble. Hexavalent chromium can be reduced to Cr(III) under normal soil pH and oxidation-reduction conditions and soil organic matter has been identified as the electron donor in this reaction (Bartlett and Kimble, 1976; Bloomfield and Pruden, 1980). Barlett and James (1979) showed that Cr(III) could be oxidized under conditions prevalent in some soils.

Forms of Cr(VI) in soil are immobilized at pH values of less than 6.5. Because of the anionic structure of Cr(VI), its association with soil surfaces is limited to positively charged exchanges sites, the number of which decreases with increasing soil pH (McLean and Bledsoe, 1992). Generally, hexavalent chromium compounds are readily soluble, however, they are expected to only occur highly mobile in soils. However, some researches have found that clay soil, containing free iron and manganese oxides, significantly retarded Cr(VI) migration. Cr(VI) was also found to be highly immobile in alkaline soils.

Cobalt

Cobalt exists naturally in the earths crust with an average concentration of 18 ppm. Traces of cobalt are found in all rocks, minerals, and soils, and may be release through weathering. Cobalt always occurs in nature in association with nickel, and usually also with arsenic. Ionic cobalt compounds would exist in the particulate phase in air, and these compounds may be removed from the air by wet and dry deposition. Cobalt can be commonly found in an oxidation state of +2 and +3. Soils with higher pH and contents of clay, natural organics, and hydrous manganese and iron oxides, bind cobalt to a greater degree; as these factors decrease, the mobility of cobalt increases. Chelating agents, which are compounds that bind metal ions (i.e., ethylenediamine tetraacetic acid, EDTA), increase the solubility of cobalt and enhance the mobility of cobalt in soil. Kd values for cobalt range from 0.2 to 3,800 ml/g. Mean Freundlich and n values were 37 liters/Kg and 0.754, respectively, in eleven US soils; Freundlich values ranged from 2.6 to 363 liters/Kg and correlated with soil pH and cation exchange capacity. Volatilization from water or moist or dry soil surfaces is not expected based upon cobalt's ionic characteristics. The transport and speciation of cobalt in natural waters and sediments is complicated by many factors. Solubility of cobalt in freshwater can be increased by anthropogenic pollution through the formation of complexes with the sewage-derived organics. The predominant cobalt species in unpolluted freshwater are: Co2+, the carbonate, hydroxide, sulfate, adsorbed forms, oxide coatings, and crystalline sediments. In aqueous solution in the absence of complexing agents, the oxidation of the hexaaquacobalt(II) ion to Co(III) is very unfavorable. In the presence of complexing agents, such as ammonia which forms very stable complexes with Co(III), the stability of Co(III) is improved. Co(III) is inert to ligand exchange relative to Co(II). Volatilization from water surfaces will not occur due to the ionic character of cobalt compounds. Concentration factors for marine and freshwater fish range from 100 to 4000 and 40 to 1000, respectively; bioconcentration factors <30 are low and from 100-1000 are high. (Source: *(http://toxnet.nlm.nih.gov)*

Copper

The degree of persistence of copper in soil depends on the soil characteristics and the forms of the copper that are present. Copper is retained in soils through exchange and specific adsorption mechanisms (McLean and Bledsoe, 1992). This may not be the case in waste-soil systems and precipitation may be an important mechanism of retention. McLean and Bledsoe (1992) state that copper is preferentially adsorbed by soils and soil constituents over other metals (arsenic, cadmium, nickel, zinc, mercury, silver, and selenium), with the exception of lead. However, copper has a high affinity for soluble organic ligands and the formation of these complexes may enhance copper mobility in soil. Copper is not expected to volatilize from soil.

Iron

The following information is adapted from the USEPA Ecological Soil Screening Level for Iron.

Iron is the second most abundant metal in earth's crust after aluminum (about 5%). Iron can occur in either the divalent (ferrous or Fe+2) or trivalent (ferric or Fe+3) states under typical environmental conditions. The valence state is determined by the pH and Eh (redox potential) of the system, and the iron compound is dependent upon the availability of other chemicals.

Iron occurs predominantly as Fe+3 oxides in soils. The divalent state can be oxidized to the trivalent state, where it may form oxide or hydroxide precipitates. The general rule governing the mobilization and fixation of iron are that oxidizing and alkaline conditions promote the precipitation of insoluble iron Fe+3 oxides, whereas acidic and reducing conditions promote the solution of ferrous (Fe+2) compounds. To evaluate site-specific conditions and iron fate and transport, it is recommended that the site-specific measured pH and Eh be used to determine the expected valence state of the iron and associated chemical compound and resulting bioavailability and toxicity in the environmental setting. In well-aerated soils between pH 5 and 8, the iron demand of plants is higher than the amount available. Because of this limitation, plants have developed various mechanisms to enhance iron uptake. Under these soil conditions, iron is not expected to be toxic to plants.

Lead

Lead is one of the least mobile of the common metal contaminants in the environment. Lead is generally present in the +2 oxidation state, and will form lead oxides, although the lead itself is not degraded. Lead occurs naturally, primarily as sulfides, carbonates, and phosphates. Lead contamination may be associated with organometallic complexes associated with historical gasoline releases. Other anthropogenic sources of lead include paints, solders, and military uses.

Soluble lead added to the soil reacts with clays, phosphates, sulfates, carbonates, hydroxides, and organic matter such that lead solubility is greatly reduced. At pH values above 6, lead is either adsorbed on clay surfaces or forms lead carbonate. Generally, studies that evaluate the relative affinity of metals for soils and soil constituents, lead is sorbed by soils and soil constituents to the greatest extent compared to copper, zinc, cadmium, and nickel (McLean and Bledsoe, 1992). Some authors have demonstrated decreased sorption of lead in the presence of complexing ligands and complexing cations. Lead has a strong affinity for organic ligands and the formation of such complexes may greatly increase the mobility of lead in soil.

Magnesium

Magnesium is widely distributed in the environment in a variety of rock and minerals, such as igneous (e.g., olivine), metamorphic (e.g., montmorillonite), and sedimentary rocks (e.g., magnesite, brucite, dolimite). Rocks and minerals contain a higher percentage of magnesium than do soils resulting from the loss of magnesium due to weathering. Magnesium compounds in soil are removed by weathering. As soils weather, soil magnesium compounds become more soluble. Below pH 7.5, most magnesium minerals are too soluble to persist in soils. Volatilization of magnesium compounds from moist soil surfaces is not an important fate process because these compounds are ionic and will not volatilize. If released into water, magnesium compounds may be removed by incorporation into sediment. There is also significant uptake of magnesium by sediment in which sulfate reduction is taking place. The average Kd value for magnesium sorption on sediments is 1.3 cu m/Kg, which suggests that magnesium ions are weakly sorbed. Volatilization of magnesium compounds from water surfaces is not an important fate process because these compounds are ionic and will not volatilize. (Source: *(http://toxnet.nlm.nih.gov)*

Manganese

Manganese compounds are found in the earth's crust in the form of numerous minerals such as pyrolusite, romanechite, manganite, hausmannite. Manganese compounds enter the atmosphere and aqueous environment from the weathering of rocks and windblown soil. Manganese is multi-valent and can exist in the 2+, 3+, 4+, 6+, and 7+ oxidation states, with 2+, 3+, and 4+ being the dominant oxidation states in the environment. Manganese 2+ is the most stable oxidation state in water while manganese 3+ and 4+ compounds are immobile solids. Organic matter may reduce manganese 3+ and 4+ compounds, resulting in the formation of soluble manganese 2+ compounds. Soluble manganese 2+ compounds do not strongly complex to soil and organic matter. Thus manganese 2+ compounds are relatively mobile and may potentially leach into surface and groundwater. As ions or insoluble solids, most manganese compounds are not expected to volatilize from water and moist soil surfaces. Manganese compounds, released into the ambient atmosphere are expected to exist in the particulate phase. In the particulate phase, manganese compounds may be removed from the air by wet and dry deposition. Manganese compounds do not bioconcentrate in humans and animals. Sorption of manganese is complicated by redox reactions that produce compounds of different oxidation states. Soluble manganese 2+ compounds are relatively mobile and may potentially leach into surface water and ground water. At low concentrations (less than 5 mg/l), chemical complexation of manganese 2+ to metal oxides and organic matter occurs. At higher concentrations (greater than 5 mg/l), manganese 2+ associates predominantly through weak electrostatic interactions with metal oxides and organic matter. Manganese 2+ does not form strong complexes with organic ligands such as humic and fulvic acids. Thus enrichment of manganese 2+ compounds on the organic matter fraction of soil is low. Most manganese compounds are salts or insoluble solids and are not expected to volatilize from moist soil surfaces. (Source: *http://toxnet.nlm.nih.gov)*

Mercury

The distribution of mercury species in soils (elemental mercury, mercurous ions, and mercuric ions) is dependent on soil pH and redox potential (McLean and Bledsoe, 1992). Both the mercurous and mercuric cations are adsorbed by clay minerals, oxides, and organic matter. Adsorption is pH dependent, increasing with increasing pH. Mercurous and mercuric mercury are also immobilized by forming various precipitous; Mercurous mercury precipitates with chloride, phosphate, carbonate, and hydroxide. At concentrations of mercury commonly found in soil, only the phosphate precipitate is stable. In alkaline soils, mercuric mercury will precipitate with carbonate and hydroxide to form a stable solid phase. At lower pH and high chloride concentrations, HgCl2 is formed. Divalent mercury also will form complexes with soluble organic matter, chlorides, and hydroxides that may contribute to its mobility (Kinniburgh and Jackson, 1978).

Under mildly reducing conditions, both organically bound mercury and inorganic mercury compounds may be degraded to the elemental form of mercury, Hg0. Elemental mercury can readily be converted to methyl or ethyl mercury by biotic and abiotic processes (Roger, 1976, 1977). These are the most toxic forms of mercury. Some researchers have estimated that mercury can be removed due to volatilization and/or precipitation and the removal increased with pH. The volatilization was found to be inversely related to soil adsorption capacity.

Nickel

Nickel does not form insoluble precipitates in unpolluted soils and retention of nickel is, therefore, exclusively through adsorption mechanisms (McLean and Bledsoe, 1992). Nickel will adsorb to clays, iron, and manganese oxides, and organic matter and it thus removed from the soil solution. The formation of complexes nickel with both inorganic and organic ligands will increase nickel mobility in soils.

Selenium

Selenium can be found in the earth's crust at an average of 0.05 to 0.09 ppm. In nature, selenium usually occurs in the sulfide ores of heavy metals. It predominates in approximately 40 minerals, with higher levels being found in clausthalite, naumannite, tiemannite, and berzelianite. Selenium occurs in volcanic rock, sandstone, carbonaceous rocks, and some types of coal and mineral oil. In nature, selenium is found in the -2 (selenide), 0 (selenium), +4 (selenite), and +6 (selenate) oxidation states. Natural releases of selenium to air may result from biomethylation by plants and bacteria, and volcanic eruptions.

If released to the atmosphere, selenium is expected to exist predominately in the particulate phase. Particulate-phase selenium will be physically removed from the atmosphere by wet and dry deposition. The solubility and mobility of selenium are dependent upon its valence and chemical state. In soils, the behavior of selenium is affected by redox conditions, pH, hydrous oxide content, clay content, organic materials and the presence of competing anions. Selenium has sorptive affinity for hydrous metal oxides, clays and organic materials. Heavy metal selenides, which are insoluble and immobile, predominate in acidic soils and soils with high amounts of organic matter. In alkaline, well-oxidized soil environments, selenates (Se(VI)), which are very mobile, predominate. No sorption of sodium selenate was observed in 10 of 11 soils. Sodium and potassium selenites dominate in neutral, well-drained mineral soils. Selenite (Se(IV)) is soluble, but can strongly adsorb to soil minerals and organic material; iron and manganese oxides sorb Se(IV). No sorption of sodium selenate was observed in 10 of 11 soils; a log Kd value of 0.958 was determined in Kula soil(pH 5.9, 6.62% TOC, 73.7% sand, 25.4% silt, 0.9% clay)(5). Se(IV) adsorption was observed to decrease with increasing pH in the range 4 to 9 and Se(VI) adsorption was minimal under most pH conditions.

In soil and water, biological methylation of selenium species and subsequent volatilization of the alkyl selenides is expected to be an important fate process. If released into water, selenium is expected to form oxyanions and exhibit anionic chemistry. Speciation will be determined by pH and redox potential of the solution. Elemental selenium is favored by low pH and reducing conditions. Selenates are stable under alkaline oxidizing conditions and are not expected to adsorb to suspended solids in the water column. Selenious acid species occur under the intermediate to slightly oxidizing conditions encountered in aerobic water. At pHs less than 7 and under mildly reducing conditions, selenites are reduced to elemental selenium. In sediments, reduced and tightly bound selenium will remain relatively immobile unless the sediments are chemically or biologically oxidized. BCFs ranging from 200 to 3,600 for selenite and 65 to 500 for selenate suggest bioconcentration in aquatic organisms will be moderate to very high. (Source: *http://toxnet.nlm.nih.gov)*

Silver

Published data concerning the interaction of silver with soil are rare. As a cation it will participate in adsorption and precipitation reactions. Silver is very strongly adsorbed by clay and organic matter and precipitates of silver, AgCl, Ag_2SO4, and $AgCO_2$, are highly insoluble (Lindsay, 1979). Silver is highly immobile in the environment.

Thallium

Thallium is a soft, heavy metal that is insoluble in water and organic solvents. Various thallium salts are extremely poisonous, and often used in rodenticides, fungicides and insecticides. Thallium occurs naturally in trace amounts, as a Group III metal, it is often associated with lead and zinc. Thallium is generally univalent, and may form sulfate, nitrate and acetate salts that are moderately soluble in water

Vanadium

Vanadium compounds are widely distributed in the earth's crust. Elemental vanadium does not occur in nature, but its compounds exist in over 50 different mineral ores and in association with fossil fuels. Principal ores are patronite, roscoelite, carnotite, and vanadinite; phosphate rock may also contain vanadium. Vanadium compounds are released naturally to air through the formation of continental dust, marine aerosols, and volcanic emissions. Weathering of rocks and soil erosion are the natural sources of vanadium release into water and soils.

In soil, vanadium's mobility is expected to be dictated by soil pH; mobility is expected to be lower in acidic soils. The more soluble pentavalent cation may leach. Clay soils studied have more vanadium than other soils. If released into water, vanadium is expected to exist primarily in the tetravalent and pentavalent forms. Both species are known to bind strongly to mineral or biogenic surfaces by adsorption or complexing. Vanadium species common found in water are known to bind strongly to mineral or biogenic surfaces by adsorption or complexing. Sorption and biochemical processes are thought to contribute to the removal of vanadium from sea water. Adsorption to organic matter as well as to manganese oxide and ferric hydroxide results in precipitation of dissolved vanadium.

Vanadium is fairly mobile in neutral or alkaline soils relative to other metals, but its mobility decreases in acidic soils. In the presence of humic acids, mobile metavanadate anions can be converted to the immobile vanadyl cations resulting in local accumulation of vanadium. Under oxidizing, unsaturated conditions some mobility is observed, but under reducing, saturated conditions vanadium is immobile. Vanadium may be important in soils with high Fe-oxides and soils experiencing redox reactions, as this element has four oxidation states. It occurs in Fe-oxides and is also adsorbed by silicate clay materials. Clay soils studied have more vanadium than other soils. When mafic rocks weather in a humid climate, the vanadium remains in the trivalent state or is weakly oxidized to the relatively insoluble tetravalent state. In either case, the vanadium is captured along with aluminum in the residual clays. Subsequent leaching of the clays can produce bauxite and lateritic iron ores that contain 400 to 500 ppm vanadium. When mafic rocks are intensely oxidized in an arid climate, some of the vanadium is converted to the pentavalent state. The pentavalent cation is considerably more soluble than the trivalent cation, is readily dissolved by groundwater, and can be transported over long distances. Log Kd values for ammonium vanadate determined in 11 soils ranged from 1.035 to 3.347. (Source: *http://toxnet.nlm.nih.gov)*

Zinc

Zinc is stable in dry air, but upon exposure to moist air it will form a white coating composed of basic carbonate. Zinc loses electrons (oxidizes) in aqueous environments. In the environment zinc is found primarily in the +2 oxidation state. Elemental zinc is insoluble and most zinc compounds show negligible solubility as well, with the exception of elements (other than fluoride) from Group VIIa of the Periodic Table compounded with zinc (i.e., $ZnCl_2$, and ZnI_2) that show a general 4:1 compound to water solubility level. In contaminated waters, zinc often complexes with a variety of organic and inorganic ligands. Therefore, the overall mobility of zinc in an aqueous environment, or through moist to wet soils, may be accelerated by compounding/complexing reactions.

Zinc is readily adsorbed to clay minerals, carbonates, or hydrous oxides. Several authors noted in McLean and Bledsoe (1992) found that the greatest percent of the total zinc found in “polluted” soils and sediments was associated with iron and magnesium oxides. Precipitation of zinc is not a major mechanism of retention of zinc in soils because of the relatively high solubility of zinc compounds. Precipitation may be a more significant mechanism of zinc retention in soil-waste systems. Zinc adsorption increases with pH, and hydrolyzed species are strongly adsorbed to soil surfaces. McLean and Bledsoe (1992) also state that zinc forms complexes with inorganic and organic ligands that will affect its adsorption reactions with the soil surface. Volatilization of zinc is not an important process from soil or water.

5.3.2.2 Volatile Organic Compounds

Acetone

Acetone with an estimated K_{oc} of 1 is expected to be very mobile in a soil matrix and absorption to the soil component is not expected. The Henry’s Law Constant ($1.87X10^{-5}$ atm-cu m/mol) and vapor pressure suggest that volatilization from dry and wet soil surfaces is expected and the dominant migration pathway for acetone. The Henry’s Constant also indicates volatilization from the waters surface is expected and substantial migration pathway. In the water matrix, absorption to suspended solids or sediments is unlikely given the very low K_{oc} value of 1. (Source: *(http://toxnet.nlm.nih.gov)*

Benzene

Benzene is very water soluble based upon a K_{oc} of 85 The low K_{oc} means benzene is potentially highly mobile within the soil. Benzene is expected to volatilization out from moist soil surfaces due to a Henry's Law constant of 5.56X10-3 atm-cu m/mole; and benzene’s vapor pressure indicates it may volatilize from dry soil surfaces. (Source: *(http://toxnet.nlm.nih.gov)*

Ethyl benzene

If released to air, ethyl benzene will exist as a vapor in the ambient atmosphere based upon a vapor pressure of 9.6 mm Hg at 25 deg C. Vapor-phase ethyl benzene will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 55 hr. If released to soil, ethyl benzene is expected to have moderate mobility based upon an estimated Koc of 520. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 7.88X10-3 atm-cu m/mole. Ethyl benzene may volatilize from dry soil surfaces based upon its vapor pressure. Biodegradation in soil takes place via nitrate-reducing processes. If released into water, ethyl benzene may adsorb to suspended solids and sediment in water based upon the estimated Koc. Ethyl benzene was degraded in 8 days in groundwater and 10 days in seawater as a component of gas oil. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant.

Hydrolysis is not expected to occur due to the lack of hydrolyzable functional groups. (Source: http://toxnet.nlm.nih.gov)

Methyl ethyl ketone

Methyl ethyl ketone (MEK), like benzene, is expected to be highly mobile in soils with a K_{oc} of 29 and 34 in silt loam. MEK's Henry's Law Constant (4.7x10-5 atm-cu m/mol) and vapor pressure indicate the tendency to volatilize from wet and dry soil surfaces. MEK has the potentially to be biodegrade under aerobic and anaerobic conditions within the soil. In groundwater, MEK is expected to be very water soluble due to its K_{oc} and not be adsorbed to suspended solids or soils. Volatilization from water is the dominant pathway for migration of MEK. (Source: http://toxnet.nlm.nih.gov)

Toluene

Toluene, like benzene, is expected to be mobile within the soil due to its K_{oc} ranging from 37-178. Its mobility will vary from being moderate to highly mobile depending on factors influencing the matrix interactions. The Henry's Law Constant (6.64x10-3 atm-cu m/mole) and vapor pressure for toluene indicate it will volatilize from moist and dry surface soils. (Source: http://toxnet.nlm.nih.gov)

Vinyl chloride (SEAD-121C only)

Vinyl chloride's production and use in the manufacture of polyvinyl chloride (PVC) and other chlorinated compounds may result in its release to the environment through various waste streams. Vinyl chloride is also an anaerobic biodegradation product of higher chlorinated compounds such as tetrachloroethylene and trichloroethylene. If released to air, vinyl chloride will exist exclusively as a gas in the ambient atmosphere based upon a vapor pressure of 2,980 mm Hg at 25 deg C. In the atmosphere gas-phase vinyl chloride will be degraded by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 55 hours. Direct photolysis is not expected to be an important environmental fate process since this compound only absorbs light weakly in the environmental UV spectrum. If released to soil, vinyl chloride is expected to have high mobility based upon an estimated Koc value of 57. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 0.0278 atm-cu m/mole. Vinyl chloride may volatilize from dry soil surfaces based upon its vapor pressure. The volatilization half-life of vinyl chloride was estimated as 0.2 days when incorporated in a soil at a depth of 1 cm and 0.5 days at a depth of 10 cm. Biodegradation is expected to occur slowly in the environment under both aerobic and anaerobic conditions. In the absence of sand 20% and 55% degradation occurred in 4 and 11 weeks, respectively.

If released into water, vinyl chloride is not expected to adsorb to suspended solids and sediment in water based upon the estimated Koc. The biodegradation half-life of vinyl chloride in aerobic and anaerobic waters was reported as 28 and 110 days, respectively. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant.

Estimated volatilization half-lives for a model river and model lake are 1 hour and 3 days, respectively. Hydrolysis is not expected to be an important environmental fate process based on a hydrolysis half-life of 9.91 years at pH 7 and 25 deg C. Vinyl chloride may undergo indirect photolysis in natural waters when photosensitizers such as humic material are available. This process is only expected to be important in sunlit surface waters containing humic material. (Source: http://toxnet.nlm.nih.gov)

Xylene

Xylene, a widely used industrial solvent, is a mixture of ortho-, meta-, and para- isomers. Natural sources of xylene such as petroleum, forest fires and the volatiles of plants may also account for this compounds presence in the environment. Xylene will enter the atmosphere primarily from fuel emissions and exhausts linked with its use in gasoline. Xylene is expected to exist entirely in the vapor phase, based upon an experimental vapor pressure of 7.99 mm Hg at 25 deg C, in the ambient atmosphere. In the atmosphere xylene will degrade by reaction with photochemically-produced hydroxyl radicals with an estimated atmospheric lifetime of about 1-2 days.

Xylene is expected to have moderate to high mobility in soils based upon experimental Koc values obtained with a variety of soils at differing pH values and organic carbon content. The reported Koc value of o-xylene is in the range of 48-68. Mixtures of xylenes in silt clay soil at pH 8.5 and organic carbon content of 0.17 percent have a reported experimental Koc of 365; xylene in silt clay soil at pH 7.0 and organic carbon content of 1.40 percent have a reported experimental Koc of 39. Volatilization from moist soil surfaces is expected based on an experimental Henry's Law constant of 7.0X10-3 atm-cu m/mole. Biodegradation is an important environmental fate process for xylene. In general, it has been found that xylene is biodegraded in soil and groundwater samples under aerobic conditions and may be degraded under anaerobic denitrifying conditions. In water, xylene is expected to adsorb somewhat to sediment or particulate matter based on its measured Koc values. This compound is expected to volatilize from water surfaces given its experimental Henry's Law constant. Estimated half-lives for a model river and model lake are 3 and 99 hours, respectively. (Source: http://toxnet.nlm.nih.gov)

5.3.2.3 Semivolatile Organic Compounds

Bis(2-ethylhexly)phthalate

Bis(2-ethylhexly)phthalate within a soil matrix is expected to be practically immobile given the K_{oc} ranges 87,420 to 510,000. The Henry's Law Constant (1.3x10-7 atm-cu m/mole) and vapor pressure suggest volatilization from moist or dry soil surfaces are not expected and not a significant migration pathway. The high K_{oc} values also indicate that in the water matrix it has an affinity for absorption into suspended solids and sediments; and volatilization is also not expected given the Henry's Constant. (Source: http://toxnet.nlm.nih.gov)

Butyl benzyl phthalate

Butyl benzyl phthalate is expected to exist in both the vapor and particulate-phase in the ambient atmosphere due to a measured vapor pressure of 8.25X10-6 mm Hg at 25 deg C. Vapor-phase butyl benzyl phthalate is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals with an atmospheric half-life of about 35 hours, while particulate-phase butyl benzyl phthalate is removed from the atmosphere by wet and dry deposition.

Butyl benzyl phthalate is expected to have low mobility in soil based upon a measured log Koc value of greater than 4.7. Volatilization from dry soil surfaces is not expected based upon the vapor pressure; however volatilization from moist soil surfaces is expected based upon the estimated Henry's Law constant of 4.78X10-6 atm-cu m/mole and water solubility of 0.71 mg/l at 25 deg C. This compound is expected to biodegrade rapidly in the environment with estimated half-lives in the range of 4 to 13 days. In water, butyl benzyl phthalate is expected to adsorb to sediment or particulate matter given its measured Koc value. This compound is expected to volatilize from water surfaces given its experimental Henry's Law constant. Estimated half-lives for a model river and model lake are 14 and 106 days respectively. Hydrolysis may be an important environmental fate for this compound based upon an estimated hydrolysis half-life of 51 days at pH 8. (Source: *http://toxnet.nlm.nih.gov*)

Carbazole

Carbazole is released to the atmosphere in emissions from waste incineration, tobacco smoke, aluminum manufacturing, and rubber, petroleum, coal, and wood combustion. If released to the atmosphere, vapor-phase carbazole is rapidly degraded by photochemically produced hydroxyl radicals (estimated half-life of 3 hr). In the particulate phase, the rate of degradation depends upon the adsorbing substrate. Substrates containing carbon (>5%) stabilize carbazole and permit long-range atmospheric transport. Physical removal via wet and dry deposition is important. If released to soil, environmental substrates that commonly adsorb carbazole may limit or prevent photolysis. Based on the UV absorption spectra(1), carbazole may photolyze if spilled on soil surfaces(SRC); however, environmental substrates that commonly adsorb carbazole will limit or prevent photolysis(9). Data are available which suggest that carbazole may be susceptible to rapid aerobic and anaerobic biodegradation in soil and water provided specific degrading bacteria are present(2-6). Although all of these studies are not specific to soil media, they suggest that biodegradation in soil may be important(SRC). An average Koc value of 637(7) indicates low mobility in soil(8,SRC). Biodegradation in soil should be the dominant fate process providing the presence of specific degrading bacteria in the microbial community (biodegradation half-life of 4.3 min-6.2 hr in screening studies). If released to water, volatilization and bioconcentration in aquatic organisms will not be important. Volatilization will not be important(5) based on an estimated Henry's Law constant of 8.65X10-8 atm-cu m/mole at 25 deg C(4). Carbazole should be metabolized to its N-methyl and N-acetyl derivatives in aquatic organisms(6). Sorption of carbazole to sediments is nonlinear and highly correlated with organic content (average Koc of 637)(7). Biodegradation and photolysis should be the dominant fate processes in water systems providing specific degrading bacteria and sufficient sunlight. However, carbazole may partition from the water column to sediment and suspended matter limiting the rate of photolysis. (Source: *http://toxnet.nlm.nih.gov)*

Dibenzofuran

Dibenzofuran with a K_{oc} of 4,200 is expected to be slightly mobile in the soil matrix. The Henry's Law Constant (2.1x10-4 atm-cu m/mole) suggests volatilization from moist soil surfaces is expected and has fate implications. However, volatilization from soil is expected to be hampered by the adsorption to soil. Volatilization from dry soil is also not expected based upon its vapor pressure. Dibenzofuran's K_{oc} also indicates absorption to suspended solids and sediments is expected to detract from the volatilization of it from surface water. (Source: *http://toxnet.nlm.nih.gov)*

Diethyl phthalate

Diethyl phthalate's production and use as a plasticizer, solvent for resins, wetting agent and insect repellent may result in its release to the environment through various waste streams. Based on a measured vapor pressure of 2.1X10-3 mm Hg at 25 deg C, diethyl phthalate is expected to exist primarily in the vapor-phase in the ambient atmosphere. Vapor-phase diethyl phthalate is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals with an atmospheric half-life of about 110 hours. Diethyl phthalate is expected to have moderate to low mobility in soil based upon experimental Koc values in the range of 320-1,726 measured in various soils at different pH and organic carbon content. Volatilization from dry soil surfaces is not expected based upon the vapor pressure of this compound. Volatilization from moist soil surfaces is not expected to be important based upon the estimated Henry's Law constant of 6.1X10-7 atm-cu m/mole and water solubility of 1X10+3 mg/l at 25 deg C(5). In water, biodegradation of diethyl phthalate is expected to occur under aerobic and anaerobic conditions with estimated half-lives of about 3 and 28 days, respectively. Diethyl phthalate is expected to adsorb to sediment or particulate matter given its measured Koc values. This compound is expected to slowly volatilize from water surfaces given its estimated Henry's Law constant. Estimated half-lives for a model river and model lake are 89 and 652 days, respectively. Hydrolysis is expected to occur slowly with an estimated half-life of 110 days at pH 8. (Source: *http://toxnet.nlm.nih.gov)*

Fluorene

Fluorene occurs in fossil fuels. Its release to the environment is wide spread since it is a ubiquitous product of incomplete combustion. It is released to the atmosphere in emissions from the combustion of oil, gasoline, coal, wood and refuse. If released to the atmosphere, fluorene will exist primarily in the vapor phase where it will degrade readily by photochemically produced hydroxyl radicals (estimated half-life of 29 hr). Particulate phase fluorene (such as fluorene associated with fly ash) can be removed from air physically via wet and dry deposition; fluorene has been detected in rain, snow and fog samples. Some particulate phase fluorene can be stable to photo-oxidation which will permit its long range global transport. If released to soil or water, fluorene will biodegrade readily (aerobically) in the presence of acclimated microbes; microbial adaptation is an important fate process. Measured log Koc values of 3.70-4.21(6-8) indicate that fluorene is generally immobile in soil(SRC). Volatilization from soil surfaces does not appear to be an important environmental fate process(9). Biodegradation can be slow in pristine soils or waters (or under conditions of limited oxygen). Strong adsorption to soil and water sediment is an important transport process; fluorene has been detected in numerous, widespread sediment samples. The half-life of fluorene in soil has been reported to range from 2 to 64 days. (Source: *http://toxnet.nlm.nih.gov)*

PAHs

The PAHs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)pyrene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, flouranthene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene, were found in soils sampling locations. As described in **Section 4.4.1.2**, PAHs are relatively immobile, having a high affinity for organic matter.

5.3.2.4 Pesticides/PCBs

4,4'-DDD, 4,4'-DDE, and 4,4'-DDT

DDD, DDE, and DDT are expected to be immobile within a soil matrix based upon their respective K_{oc} values. The absorption to soil will weaken volatilization from moist soil and based upon the vapor pressure volatilization from dry soil is not expected. The three are expected to be absorbed by suspended solids or sediment in the water column based on their K_{oc} values. (Source: *http://toxnet.nlm.nih.gov)*

Aldrin

Aldrin's former use as a pesticide resulted in its direct release to the environment. If released to air, a vapor pressure of 1.2X10-4 mm Hg at 25 deg C indicates aldrin will exist solely in the vapor-phase in the ambient atmosphere. Vapor-phase aldrin will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 6 hrs. Aldrin has a UV absorption max of 227 nm and photodegradative half-life of 113 hrs and dieldrin is the primary photoproduct. If released to soil, aldrin is expected to have moderate to no mobility based upon a range of Koc values of 400-28,000. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 4.4X10-5 atm-cu m/mole. However, adsorption to soil is expected to attenuate volatilization. A loss of 50% of surface applied aldrin to soil was estimated to occur within 1-2 weeks after application compared to 10-15 weeks for soil-incorporated aldrin. Aldrin was classified as moderately persistent with a half-life in soil ranging from 20-100 days. In soil, aldrin is converted to dieldrin by epoxidation, which occurs in aerobic and biologically-active soils. If released into water, aldrin is expected to adsorb to suspended solids and sediment based upon the range of Koc values. A river die-away test was conducted in capped bottles with aldrin in raw water from the Little Miami River in Ohio. After 2, 4, and 8 weeks, 20, 60, and 80% of the initial amount of aldrin had degraded. Aldrin may be degraded rapidly under anaerobic conditions based on an anaerobic wastewater study. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. In a laboratory study using distilled water, the volatilization half-life of aldrin was 5.8 days at 30 deg C and a depth of approximately 1 cm. Experimental BCF values ranging from 735 to 20,000 suggest that bioconcentration in aquatic organisms is high to very high. Hydrolysis is not expected to occur due to the lack of hydrolyzable functional groups. (Source: *http://toxnet.nlm.nih.gov*)

Alpha-chlordane (SEAD-121C only)

No fate and transport information could be found for alpha-chlordane through the following source. (Source: *http://toxnet.nlm.nih.gov*)

Delta-BHC (SEAD-121C)

Delta-Hexachlorocyclohexane's (Delta-BHC) former production and use as a component in the insecticide BHC resulted in its release to the environment through various waste streams. If released to air, a vapor pressure of 3.5X10-5 mm Hg at 25 deg C, indicates that delta-hexachlorocyclohexane is expected to exist in both the vapor and particulate phases in the ambient atmosphere. Vapor-phase delta-hexachlorocyclohexane will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 28 days. Particulate-phase delta-hexachlorocyclohexane will be removed from the atmosphere by wet and dry deposition. If released to soil, delta-hexachlorocyclohexane is expected to have low mobility based upon Koc values of 700-2,700 measured in 2 oil contaminated soils. Volatilization from moist soil surfaces is not expected to be an important fate process based upon an estimated Henry's Law constant of 4.3X10-7 atm-cu m/mole and water solubility, 31.4 mg/l at 25 deg C(4). Delta-Hexachlorocyclohexane is not expected to volatilize from dry soil surfaces based upon its vapor pressure. This compound is expected to biodegrade slowly based upon half-lives of 33.9 and 23.4 days on cropped and uncropped soils. If released into water, delta-hexachlorocyclohexane is expected to adsorb to suspended solids and sediment in the water column based upon its measured Koc values. Volatilization from water surfaces is expected to occur slowly based upon this compound's estimated Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 146 days and 3 years, respectively. (Source: *http://toxnet.nlm.nih.gov*)

Dieldrin

Dieldrin's former production and use as an insecticide resulted in its direct release to the environment. Dieldrin is also a degradation product of the insecticide aldrin, and the former use of aldrin has contributed to the occurrence of dieldrin in the environment. If released to air, a vapor pressure of 5.89X10-6 mm Hg at 25 deg C indicates dieldrin will exist in both the vapor and particulate phases in the ambient atmosphere. Vapor-phase dieldrin will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals. The half-life for the reaction with hydroxyl radicals in air is estimated to be 42 hours. Dieldrin also undergoes direct photolysis in the environment yielding photodieldrin as the primary degradation product. Particulate-phase dieldrin will be removed from the atmosphere by wet and dry deposition. If released to soil, dieldrin is expected to have low to no mobility based upon Koc values of 1,957 to 23,310 measured in soil and sediment. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 1X10-5 atm-cu m/mole; however adsorption may attenuate this process. Dieldrin was volatilized 90 percent in 30 days when applied to vegetation and 20 percent in 50 days when applied to a moist soil surface. Approximately 3.6 percent dieldrin was volatilized in 167 days when incorporated in a soil at a depth of 7.5 cm. Dieldrin degrades slowly in soil surfaces with a reported half-life of about 7 years in field studies. If released into water, dieldrin is expected to adsorb to suspended solids and sediment in water based upon the Koc data. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. However, volatilization from water surfaces is expected to be attenuated by adsorption to suspended solids and sediment in the water column. The estimated volatilization half-life from a model pond is 7 years when adsorption is considered. The hydrolysis half-life of dieldrin has been reported as greater than 4 years. BCF values of 3,300 to 14,500, measured in fish, suggest bioconcentration in aquatic organisms is very high. (Source: *http://toxnet.nlm.nih.gov)*

Endosulfan I

Endosulfan I is of the same general chemical and their environmental fate properties are generally similar. Generally the K_{oc} in a soil matrix is 2,000 and indicates a low mobility for the two chemicals. The vapor pressure is expected to hinder volatilization from dry surface soils; and the Henry’s Law constant (6.6x10-5 atm-cu m/mole at 20 deg C) suggest volatilization from wet soil surfaces is expected to be limited due to absorption. The volatilization from wet soils surfaces is a dominant migration pathway. Biodegradation in aerobic and anaerobic conditions within soil also can have a significant influence in both chemicals fate processes. In the water matrix the K_{oc} is expected to dominate reactions with absorption to suspended solids and sediment; and volatilization from the waters surface is limited by this absorption. (Source: *http://toxnet.nlm.nih.gov)*

Endrin

Endrin with a K_{oc} of 11,420 has no mobility within a soil matrix and this high K_{oc} suggests it prefers partitioning to soil than volatilization and is considered recalcitrant in soil. The Henry’s Law Constant (6.4x10-6 atm-cu m/mole) indicates that volatilization from moist soil surfaces is expected and a major factor in its fate. Endrin is not expected in water given its high K_{oc} and absorption to suspended solids and sediments is the preferred pathway of migration. However, volatilization from the water surface takes place but absorption is the dominant partitioning processes within the water matrix. (Source: *http://toxnet.nlm.nih.gov)*

Endrin ketone (SEAD-121C only)

Endrin ketone (chemically similar to endrin aldehyde) has a K_{oc} (4,300) suggesting it is slightly mobile within a soil matrix. The Henry's Law Constant (4.2x10-6 atm-cu m/mole) indicates that volatilization from moist soil surfaces is slow. Absorption into suspended solids or sediments is not expected given the K_{oc} value estimated. However, absorption is expected to lessen the volatilization from the surface of the water; volatilization from the surface of water based upon the Henry's Constant, is not expected to be a major fate processes. (Source: *http://toxnet.nlm.nih.gov)*

Heptachlor Epoxide

Heptachlor epoxide has a strong affinity for the soil matrix and is biodegradation opportunities are limited. Volatilization from the soil surface is limited to photodegradation and downward migration is not substantial. In the water matrix absorption to suspended solids or sediment is the dominant migration pathway and volatilization from surface waters is expected limited due to need for photolysis. Biodegradation in the water matrix is not expected to be substantial compared to the absorption. (Source: *http://toxnet.nlm.nih.gov)*

Aroclor-1242 (SEAD-121C only)

Aroclor 1242 is a mixture of different congeners of chlorobiphenyl. The approximate distribution of chlorinated biphenyls in Aroclor 1242 is as follows: 3% mono-, 13% di-, 38% tri-, 30% tetra-, 22% penta-, and 4% hexachlorobiphenyls. The relative importance of the environmental fate mechanisms generally depends on the degree of chlorination. In general, the persistence of the PCB congeners increase with an increase in the degree of chlorination. If released to air, estimated vapor pressures ranging from 1.2X10-3 to 5.8X10-7 mm Hg at 25 deg C indicate Aroclor 1242 will exist in both the vapor and particulate phases in the ambient atmosphere, with enrichment of PCBs with the highest vapor pressure (low chlorine). Vapor-phase Aroclor 1242 will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to range from 4.6 to 98 days. Physical removal of PCBS in the atmosphere is accomplished by wet and dry deposition processes; dry deposition will be important only for the PCB congeners associated in the particulate phase. The relatively long degradation half-lives in air indicate that physical removal may be more important than chemical transformation. If released to soil, Aroclor 1242 is expected to adsorb strongly and be immobile based upon estimated log Koc values ranging from 4.0 to 5.1. Aroclor 1242 should not leach significantly in most aqueous soil systems, although the most water soluble PCBs will be leached preferentially. In the presence of organic solvents, which may be possible at waste sites, PCBs may have a tendency to leach through soil. Volatilization from moist soil surfaces is expected to be an important fate process based upon estimated Henry's Law constants ranging from 3.1X10-4 to 6.9X10-5 atm-cu m/mole. Although the volatilization rate of Aroclor 1242 may not be rapid from soil surfaces due to the strong adsorption, the total loss by volatilization over time may be significant because of the persistence and stability of Aroclor 1242. Studies show biodegradation in soil occurs, but slowly. A static flask screening procedure measured

0-66% degradation in 28 days of Aroclor 1242 concentrations at 5 and 10 ppm. <1-27% CO2 evolution was measured after 63 days of inoculation in Altamont soil. If released into water, Aroclor 1242 is expected to adsorb to suspended solids and sediment based upon the estimated K_{oc}s. The lower chlorinated congeners of Aroclor 1242 will sorb less strongly than the higher chlorinated congeners. Screening tests show that Aroclor 1242 in water is expected to biodegrade slowly. A static flask screening procedure utilizing BOD dilution water and settled domestic wastewater inoculum was conducted. It has also been shown that the more highly chlorinated congeners in Aroclor 1242 are susceptible to reductive dechlorination by anaerobic microorganisms found in aquatic sediments. Abiotic transformation processes such as hydrolysis and oxidation do not significantly degrade Aroclor 1242 in the aquatic environment. Volatilization from water surfaces is expected to be an important fate process based upon this compound's estimated Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 2.5 to 87 hrs and 6 to 46 days, respectively. Although adsorption can immobilize PCBs for relatively long periods of time in the aquatic environment, resolution into the water column has been shown to occur. Experimental BCF values of 3,600-43,000 suggest bioconcentration in aquatic organisms is very high. (Source: *http://toxnet.nlm.nih.gov)*

Aroclor-1254

Aroclor 1254 is a mixture of different congeners of chlorobiphenyl. The approximate distribution of chlorinated biphenyls in Aroclor 1254 is: <0.1% di-, 1.8% tri-, 17.1% tetra-, 49.3% penta-, 27.8% hexa-, 3.9% hepta-, <0.05% octa-, and <0.05% nonachlorobiphenyl. The relative importance of the environmental fate mechanisms generally depends on the degree of chlorination. In general, the persistence of the PCB congeners increase with an increase in the degree of chlorination. If released to the atmosphere, the PCB congeners in Aroclor 1254 will exist in both the vapor-phase and particulate phase based on estimated vapor pressures ranging from 8.5X10-6 to 1.3X10-7 mm Hg for the dominant congeners. The dominant atmospheric transformation process for these congeners is the vapor-phase reaction with hydroxyl radicals. The half-lives for this reaction range from 22 to 79 days. Particulate phase Aroclor 1254 will be removed from the atmosphere through wet and dry deposition. If released to soil, the PCB congeners present in Aroclor 1254 will become strongly adsorbed to the soil particles based on experimental log Koc values ranging from 5.0 to 6.1. Screening studies indicate that Aroclor 1254 is generally resistant to biodegradation in soils. Although the volatilization rate of Aroclor 1254 may be low from soil surfaces, the total loss by volatilization over time may be significant because of the persistence and stability of Aroclor 1254. Enrichment of the low chlorine PCBs will occur in the vapor phase relative to Aroclor 1254; the residue will be enriched in the PCBs containing high chlorine content. Based on estimated Henry's law constants ranging from 2.2X10-4 to 3.4X10-4 atm-cu m/mole, Aroclor 1254 is expected to have a volatilization half-life from a model river and lake ranging from 5.5 to 6.2 hrs and 8.8 to 9.4 days, respectively. However, volatilization from water surfaces is expected to be attenuated by adsorption to suspended solids and sediment in the water column. Although adsorption can immobilize Aroclor 1254 for relatively long periods of time, eventual re-solution into the water column will occur. The PCB composition in water will be enriched in the lower chlorinated PCBs because of their greater water solubility while the least water soluble PCBs (higher chlorine content) will remain adsorbed. Although the resulting volatilization rate may be low due to strong adsorption, the total loss by volatilization over time may be significant because of the persistence and stability of Aroclor 1254. (Source: *http://toxnet.nlm.nih.gov*)

Aroclor-1260

Aroclor 1260 is a mixture of different congeners of chlorobiphenyl. The approximate distribution of chlorinated biphenyls in Aroclor 1260 is: <0.3% tri-, <0.3% tetra-, 9.2% penta-, 46.9% hexa-, 36.9% hepta-, 6.3% octa-, and 0.7% nonachlorobiphenyl. The relative importance of the environmental fate mechanisms generally depends on the degree of chlorination. In general, the persistence of the PCB congeners increase with an increase in the degree of chlorination. If released to the atmosphere, the PCB congeners in Aroclor 1260 will exist in both the vapor-phase and particulate phase based on an estimated vapor pressure values ranging from 2.2X10-6 to 2.87X10-8 mm Hg for the dominant congeners. The dominant atmospheric transformation process for these congeners is the vapor-phase reaction with hydroxyl radicals. The half-lives for this reaction range from 48 to 290 days. Particulate phase Aroclor-1260 will be removed from the atmosphere through wet and dry deposition. If released to soil, the PCB congeners present in Aroclor 1260 will become tightly adsorbed to the soil particles based on experimental log Koc values ranging from 4.8 to 6.8. Screening studies indicate that Aroclor 1260 is generally resistant to biodegradation in soils. Although the volatilization rate of Aroclor 1260 may be low from soil surfaces, the total loss by volatilization over time may be significant because of the persistence and stability of Aroclor 1260. Enrichment of the low chlorine PCBs will occur in the vapor phase relative to Aroclor 1260; the residue will be enriched in the PCBs containing high chlorine content. Based on an estimated Henry's law constant ranging from 1.8X10-5 to 7.4X10-5 atm-cu m/mole, Aroclor 1260 is expected to have a volatilization half-life from a model river and lake ranging from 16 to 70 hrs and 14 to 39 days, respectively. However, volatilization from water surfaces is expected to be attenuated by adsorption to suspended solids and sediment in the water column. Although adsorption can immobilize Aroclor 1260 for relatively long periods of time, eventual resolution into the water column will occur. The PCB composition in water will be enriched in the lower chlorinated PCBs because of their greater water solubility while the least water soluble PCBs (higher chlorine content) will remain adsorbed. Although the resulting volatilization rate may be low due to strong adsorption, the total loss by volatilization over time may be significant because of the persistence and stability of Aroclor 1260. Aroclor 1260 is known to bioconcentrate significantly in aquatic organisms. (Source: *http://toxnet.nlm.nih.gov*)

6.0 BASELINE HUMAN HEALTH RISK ASSESSMENT

This section of the SEAD-121C and SEAD-121I Remedial Investigation (RI) report presents the human health baseline risk assessment (BRA) that was performed for the Defense Reutilization and Marketing Office (DRMO) Yard (SEAD-121C) and the Rumored Cosmoline Oil Disposal Area (SEAD-121I) at the Seneca Army Depot Activity (SEDA or the Depot) in Romulus, New York (hereafter referred to as the sites). The ecological risk assessment is presented in Section 7.0.

This baseline human health risk assessment was conducted in accordance with the United States Environmental Protection Agency (USEPA) (1989) *Risk Assessment Guidance for Superfund* (RAGS) and the supplemental guidance and updates to the RAGS. Technical judgment, consultation with USEPA staff, and recent publications were used in the development of the risk assessment. The overall objective of the baseline human health risk assessment was to assess potential risks to current and reasonably anticipated future human receptors resulting from the release of, and exposure to, hazardous substances at the sites. The results of the risk assessment were used to identify whether a corrective action may be warranted.

6.1 SECTION ORGANIZATION

This baseline human health risk assessment section is organized as follows:

Conceptual Site Model (Section 6.2)

A Conceptual Site Model (CSM) has been developed for the sites for the human health risk characterization. This section presents sources and types of contaminants present at the sites; contaminant release and transport mechanisms; affected media; potential receptors that could contact site-related contaminants in affected media under current and future land use scenarios; and potential routes of exposure.

Data Evaluation (Section 6.3)

This section identifies the site data that were included in the baseline risk assessment. Background soil and groundwater data collected from the SEDA are presented in this section. A brief discussion of the data validation is also presented in this section.

Identification of Chemicals of Potential Concern (Section 6.4)

A site-specific screening was performed to identify chemicals of potential concern (COPCs) for each affected medium at the sites. This section presents the methodology and results of the screening.

Exposure Assessment (Section 6.5)

This section presents the exposure point concentrations (EPCs) for the affected media, plausible exposure factors for identified receptors and exposure pathways, and exposure quantitation approach for the baseline human health risk assessment.

Toxicity Assessment (Section 6.6)

This section presents oral, inhalation, and dermal toxicity values used in the human health risk calculations. The USEPA recommended human health toxicity value hierarchy was used to identity toxicity values for this BRA.

Risk Characterization (Section 6.7)

This section presents the risk calculations for all human health exposure pathways for the current and future land use scenarios. Non-carcinogenic and carcinogenic risk estimates are summarized for each receptor and exposure pathway.

Uncertainty Analysis (Section 6.8)

This section discusses uncertainty associated with the baseline human health risk assessment. The uncertainty associated with key variables and major assumptions used in the four major steps (site characterization and data evaluation, exposure assessment, toxicity assessment, and risk characterization) of the risk assessment are discussed to address their potential impacts on the results of the baseline human health risk assessment.

COC Identification (Section 6.9)

A further evaluation of COPCs contributing to elevated potential risks, if any, based on the risk characterization is presented in this section. Final chemicals of concern (COCs) identified for the sites are presented in this section.

Comparison of Chemicals Detected in Site Samples to ARARs and TBCs (Section 6.10)

A comparison of chemicals detected at the sites to the identified Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) criteria was conducted and presented in this section.

Summary and Conclusions (Section 6.11)

This section summarizes overall findings based on the baseline human health risk assessment.

6.2 CONCEPTUAL SITE MODEL

Potential sources of contamination, exposure pathways, and receptors are depicted in the CSMs for SEAD-121C and SEAD-121I presented in **Figures 6-1A** and **6-1B**, respectively. The CSM provides an overall assessment of the primary and secondary sources of contamination at the sites, and the corresponding release mechanisms and affected media. The CSM also identifies the potential human receptors and the associated pathways of exposure to the affected media. The CSM is further discussed below.

6.2.1 Sources, Release Mechanisms, and Affected Media

The contaminant source areas, release mechanisms, and affected media for each site are discussed in **Sections 1** and **4** of the report and are summarized below:

SEAD-121C

The source of contamination at SEAD-121C (DRMO Yard) results from the materials that were brought into the DRMO Yard for sorting, evaluation, and re-distribution. The materials found at the DRMO Yard included scrap metal, wood debris, ordnance components, batteries, tiles, oil filters, auto parts, paint cans, and tires. Historically, there was a rapid turnaround of materials and vehicles stored in this area. Presently, several areas composed of concrete barriers and concrete blocks are located within the site and during the site visits conducted in 2002 and 2003, Parsons observed that scrap metal, military items, and old machines were still present in these areas. The primary release mechanisms from the site include soil particles resuspension and deposition, surface water runoff, and the infiltration of precipitation through the source areas.

Polycyclic aromatic hydrocarbons (PAHs) and metals were detected in soil and ditch soil above New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum (TAGM) TBCs. Metals and bis(2-ethylhexyl)phthalate were detected in surface water above New York State (NYS) Ambient Water Quality Standard (AWQS) Class C for Surface Water. Metals were detected in groundwater above the lowest applicable groundwater standard.

Benzene, seven polycyclic aromatic hydrocarbons [PAHs; benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd) pyrene], three aroclors (i.e., 1242, 1254, and 1260), dieldrin, and five metals (antimony, arsenic, copper, iron, and lead) were detected in soil and ditch soil above USEPA Region IX residential preliminary remediation goals (PRGs). Eight metals (arsenic, cadmium, chromium, iron, lead, manganese, thallium and vanadium) were detected in surface water above USEPA Region IX tap water PRGs. None of the chemicals detected in the groundwater at SEAD-121C were found at levels above the USEPA Region IX tap water PRGs.

SEAD-121I

Information provided by the Army indicates that the loading docks at the Rumored Cosmoline Oil Disposal Area (SEAD-121I) were used for delivery of equipment and machinery that was frequently packed in or coated with Cosmoline (oil). During delivery and unpacking of the equipment and machinery, Cosmoline may have been released to the ground. The results of the investigation showed no evidence of any systemic release of Cosmoline oil. Two piles of ferro-manganese ore, which are part of the United States' strategic stockpile of raw materials, are staged directly on the ground within SEAD-121I, and these are the likely source of elevated concentrations of iron and manganese detected in the soils within the area. PAHs detected in the vicinity of SEAD-121I were likely a result of either roofing or maintenance operations at the surrounding warehouses or the historic and continuing truck traffic to and from neighboring active warehouses. The primary release mechanisms from the site are soil particles resuspension and deposition, surface water runoff, and infiltration of precipitation through the potential source areas.

PAHs, heptachlor epoxide, and metals were detected in soil and ditch soil above NYSDEC TAGMs, which are TBC criteria. Metals were detected in surface water above NYS AWQS Class C for Surface Water.

Seven PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd) pyrene], two chlorinated pesticides (dieldrin and heptachlor epoxide), and six metals (arsenic, chromium, iron, manganese, thallium and vanadium) were detected in soil above USEPA Region IX residential PRGs. All of the PAHs and four of the metals (arsenic, iron, manganese, and thallium) were also found in samples of the SEAD-121I ditch soils at levels above the USEPA Region IX residential soil PRGs. Lead was detected in surface water above USEPA Region IX tap water PRGs. No groundwater samples were collected at SEAD-121I, because the water table was not found in the overburden.

6.2.2 Fate and Transport

The environmental fate and transport associated with the general classes of chemicals found at SEAD-121C and SEAD-121I is presented in **Section 5** and is discussed briefly below.

Volatile Organic Compounds

Volatile organic compounds (VOCs) were detected with a low frequency of detection in soil at SEAD-121C and SEAD-121I, and the concentrations found were generally below USEPA Region IX residential soil PRGs and below the NYSDEC TAGM TBCs. Because of the low frequency of detection and low concentrations, the sites are not significantly impacted by VOCs and volatilization of VOCs was not considered significant in this assessment.

Semivolatile Organic Compounds

The principal semivolatile organic compounds (SVOCs) found in soil SEAD-121C and SEAD-121I were PAHs. Generally, these constituents are relatively persistent and immobile in the environment. Transport of PAHs is limited due to their low water solubility and strong soil affinity. Several SVOCs [di-n-butylphthalate, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, and fluoranthene] were detected in the groundwater and/or the surface water at SEAD-121C and SEAD-121I with low frequency of detection.

Pesticides/PCBs

Pesticides and polychlorinated biphenyls (PCBs) were found in soil at both sites. Exceedances of the Region IX residential soil PRG were observed for dieldrin at both SEAD-121C and 121I and for heptachlor epoxide at SEAD-121I; three aroclor congeners (aroclor-1242, 1254, and 1260) were also found at concentrations above the Region IX residential soil PRGs at SEAD-121C. All other pesticides and PCBs were detected below Region IX residential PRGs and NYSDEC's TAGM criteria. Affinity for absorption into the soil reduces the transport potential of pesticides. Low concentrations of pesticides can dissolve into water but absorption to soil is the dominant partitioning route. Transport of suspended solids and sediment in groundwater or surface water is a potential transportation mechanism. Surface water flow across the sites is expected to be more significant than groundwater flow due to the low hydraulic groundwater gradient at SEAD-121C and SEAD-121I. No pesticides or PCBs were detected in groundwater or surface water samples collected from SEAD-121C and SEAD-121I.

Metals

The metals detected at SEAD-121I were deposited from the surface water runoff of the ferrous-manganese ore piles (as discussed previously). The ore piles are part of the United States' strategic stockpile of raw materials. The behavior of metals in soil is unlike organic compounds in many aspects. For example, volatilization of metals from soil is not considered a realistic mechanism for pollutant migration. Leaching and sorption are considered potential mechanisms for metal transport. Leaching of metals from soil is controlled by numerous factors. The most important factor is the chemical form (base metal or cation) in the soil. The leaching of metals from soils is substantial if the metal exists as a soluble salt. Upon contact with surface water or precipitation, the metals, either as metal oxides or metal salts, can be solubilized, eventually leaching to the groundwater. Multiple metals were found in soil and surface water at SEAD-121C and SEAD-121I; and in groundwater at SEAD-121C. Five metals (antimony, arsenic, copper, iron and lead) exceeded Region IX residential soil PRGs and most metals exceeded NYSDEC TAGM values at SEAD-121C; six metals (arsenic, chromium, iron, manganese, thallium and vanadium) exceeded Region IX residential soil PRGs and most metals exceeded NYSDEC TAGM values at SEAD-121I. Groundwater samples from SEAD-121C and surface water samples from SEAD-121I had exceedances of respective NYSDEC GA groundwater standards for several metals, although none of the groundwater levels measured for metals at SEAD-121C exceeded the Region IX tap water PRG. Surface water samples from SEAD-121C exhibited exceedance of the Region IX tap water PRG for eight metals (arsenic, cadmium, chromium, iron, lead, manganese, thallium, and vanadium) and several also exceeded NYSDEC AWQS Class C levels. Only lead exceeded the Region IX tap water PRGs at SEAD-121I, while several other metals exceeded NYSDEC AWQS Class C levels.

6.2.3 Physical Setting and Characteristics

The physical setting and characteristics of the sites are described in **Section 1** of this report and are discussed briefly below. SEAD-121C and SEAD-121I are located in the east-central portion of the SEDA facility near the rounded top of a geologic formation separating two of the Finger Lakes. Glacial till varying in depth from a few feet to as much as 20 feet is the predominant geological unit at the SEDA. Bedrock underlies the glacial till at SEDA. Groundwater is typically less than 10 feet below ground surface (bgs) at the sites and groundwater flow is generally to the south-west.

The physical characteristics of SEAD-121C have been described in the preceding sections. In summary, SEAD-121C (DRMO Yard) is a triangularly shaped, gravel lot located in the east-central portion of the Depot (**Figure 1-3**). Several building (Buildings 360, 316, and 317) are located adjacent and east of the site, and one building (Building T-355) is located within the site boundaries. Building T-355 is located in the central part of the DRMO Yard and is used for storage. The DRMO Yard is surrounded by chain-linked fence and access into the site is limited by a single gate, which is normally locked. The access is located south of Building 360. The surface of the DRMO Yard is graded to allow surface water to drain toward the man-made ditches that bound the site on the north and south sides. In addition to Building T-355, several other man-made features are prominent within the DRMO Yard; these features include: a ladled-shaped, earthen bottomed, storage cell in the southwest corner of the site; a rectangular shaped, earthen bottomed, storage cell immediately adjacent to, and halfway along the northwest perimeter fence of the site; and a multi-chambered, concrete bottomed, storage cell adjacent to the east perimeter fence, near the northern-most point of the DRMO Yard. Each of the storage cells is bounded horizontally on three sides by concrete (jersey) barriers. A silo-like structure was also found inside the fence of the DRMO Yard, adjacent to the northern edge of Building 360. Furthermore, a large crane was located in the northern portion of the Yard, north of the silo-like structure and Buildings 360 and 316. Train tracks were observed to approach the DRMO Yard from the north, with one spur ending at Building 317, a second ending at Building 316, while a third spur extended to the area between Building 316 and Building 360.

The physical characteristics of SEAD-121I (Rumored Cosmoline Oil Spill Area) have been described in the preceding sections. SEAD-121I, shown in **Figure 1-4**, consists of four rectangular grassy areas that are bounded by 3rd and 7th Streets (north and south ends, respectively) and Avenues C and D (west and east sides, respectively). Buried reinforced concrete storm drains run east to west through the site along 3rd St., 4th St., 5th St., 6th St., and 7th St. To the east and west of the four rectangular plots comprising SEAD-121I are two rows of buildings that are actively used for warehousing. Buildings 331 and 329 located to the west and across Avenue C receive frequent truck deliveries. A railroad spur line enters SEAD-121I from the south and extends to the northern end of the SEAD where it terminates near the intersection of 3rd Street and Avenue C. Two sidings branch off the main spur line; one terminates in the first (north to south) block and the other terminates in the third (north to south) block. There are concrete loading docks located in the first and third blocks next to the railroad lines. The major pathway of surface water flow out of SEAD-121I is overland flow to ruts located along the sides of roadways, to catch basins and then into the underground sewer pipes. The sewer pipes discharge to a man-made drainage ditch that flows south to north, and is located two blocks (approximately 1,000 feet) west of SEAD-121I. From here, surface water flow either infiltrates into the ground or during high flow periods may enter Kendaia Creek, which flows in a predominant westerly direction, and discharges into Seneca Lake at a location north of Pontius Point and the SEDA's former Lake Shore Housing Area. In addition, a portion of the surface water flow from SEAD-121I may move easterly toward Cayuga Lake.

Two ferrous-manganese ore piles are located within the site; one ore pile is in the first (north to south) block and the other ore pile is in the third (north to south) block. These ore piles are part of United States' Strategic Stockpile. The ore piles are exposed to the weather and run off surface water is collected by the existing storm water collection system within the Planned Industrial Development (PID) area. The ore piles are expected to be removed from SEAD-121I at a future time.

6.2.4 Land Use and Potentially Exposed Populations

The SEDA is a 1995 Base Realignment and Closure (BRAC) facility, and the Army is attempting to transfer the property for redevelopment and reuse by private and public parties. As part of the BRAC process, current and future land use of areas within SEDA were established in 1995, and these are now being updated by the local land redevelopment authority. This section discusses the current and future land use of SEAD-121C and SEAD-121I.

6.2.4.1 Current Land Use

SEDA was closed in September of 2000 and military operations at these sites ceased. SEAD-121I is surrounded by active warehouses. SEAD-121C is bounded on two sides by vacant space, and on one side by inactive industrial facilities. Neither SEAD-121C nor SEAD121I is currently occupied, and only infrequently do any personnel visit these sites for periodic inspections or other reasons. There are no drinking water supply wells at SEAD-121C or SEAD-121I, and connections to a public water supply system exist throughout the Depot's former administrative, industrial and warehouse area.

6.2.4.2 Potential Future Land Use

In 1995, the SEDA was selected for closure under DoD's BRAC process. Congress approved the recommendation, which became public law on October 1, 1995.

In accordance with BRAC regulations, the Army will notify all appropriate regulatory agencies and will perform any additional investigations and remedial actions to assure that any changes in the intended use of the sites is protective of human health and the environment in accordance with CERCLA. As part of the 1995 BRAC process, a Land Redevelopment Authority (LRA) comprised of representatives of the local public was established. This group commissioned a study to recommend future uses of the Seneca Army Depot. The Land Reuse Plan produced by the LRA designated various uses for different parcels of SEDA ["Reuse Plan and Implementation Strategy for the Seneca Army Depot Activity" (RKG Associates, Inc., 1996)]. The Land Reuse Plan is the basis of future land use assumptions for SEAD-121C and SEAD-121I included in this risk assessment. **Figure 1-7** shows the intended future land use of each parcel of SEDA. As shown in **Figure 1-7**, SEAD-121C and SEAD-121I are located in the Planned Industrial/Office Development parcel. That is, the planned future land use for SEAD-121C and SEAD-121I is industrial development.

All land within the PID area, which includes SEAD-121C and SEAD-121I, is subject to conditions of a separate finalized ROD that include institutional controls (ICs) ["Final Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" signed on September 28, 2004 (Parsons, 2004)]. The land use control performance objectives include:

- Prevent the development of residential housing, elementary and secondary schools, childcare facilities and playgrounds; and,

- Prevent access to or use of the groundwater until Class GA Groundwater Standards are met.

With USEPA approval, once groundwater cleanup standards are achieved, the groundwater use restrictions may be eliminated. Former solid waste management units that are still subject to CERCLA remedial actions or investigations, including SEAD-121C and SEAD-121I, have been retained by the Army pending completion of the CERCLA process.

6.2.4.3 Potentially Exposed Populations

Potentially exposed populations that are relevant to the current and future land use have been identified in this risk assessment as follows:

- Future Construction Worker;
- Future Industrial Worker; and
- Current/Future Adolescent Trespasser.

<u>Current/Future Construction Worker</u>

Current/future construction workers will potentially be involved in site construction work. The workers are expected to be exposed to contaminants in soil via ingestion, dermal contact, and inhalation of particulates generated from contaminated soils such as surface soil, subsurface soil, and ditch soil. In addition, exposure to contaminants in groundwater and surface water may occur as a result of dermal contact. Intake of groundwater may be possible and is included in the exposure scenarios.

<u>Future Industrial Worker</u>

SEAD-121C and SEAD-121I are located within the PID Area, and the planned future use of the sites is industrial. The future industrial worker is a potential receptor at the sites and may be exposed to contaminants in soil via ingestion, dermal contact, and inhalation of particulates generated from soils such as surface soil and ditch soil. In addition, exposure to contaminants in groundwater may occur as a result of intake.

<u>Current Adolescent Trespasser/Future Adolescent Visitor</u>

SEDA is fenced to limit access and is occasionally patrolled by site security and local law enforcement personnel. It is also located in a sparsely populated, rural, agricultural area. It is unlikely for anyone to trespass SEAD-121C or SEAD-121I. As a conservative measure, adolescent trespassers (ages 11 to 16 yr) were selected as a potential receptor. Adolescent trespassers were assumed to trespass the sites and potentially be exposed to contaminants in soils (such as surface soil and ditch soil) and surface water. In addition, intake of groundwater was included as a potential exposure pathway as a conservative measure. The adolescent trespasser can be used as a surrogate receptor for future adolescent visitors.

As discussed in **Section 6.2.4.2**, the Army recommends prohibiting the development and use of land within the PID area for residential housing, elementary and secondary schools, childcare facilities and playgrounds for the whole PID areas. This recommendation is recorded in the signed *Final Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or*

Warehousing Areas (signed on September 28, 2004 by USEPA). As a result, receptors such as future residents or day-care children were not evaluated in this risk assessment.

6.2.5 Identification of Exposure Pathways

Exposures were estimated only for plausible complete exposure pathways. According to USEPA (1989), a pathway is complete if there is:

- A source or chemical release from a source;
- An exposure point where contact can occur; and
- An exposure route by which contact can occur.

A pathway is not complete unless each of these elements is present. **Table 6-1** illustrates the selection of exposure pathways for the sites.

The pathways presented reflect the current and projected future site use of SEAD-121C and SEAD-121I. This section presents the rationale for including these exposure pathways in this risk assessment.

Inhalation of Particulate Matter in Ambient Air From Soils

Surface soil (0-2 ft. bgs.) particles may become airborne via wind erosion and/or site activities, which in turn may be inhaled by potential receptors at the sites. Construction workers may be exposed to subsurface soil (2-6 ft. bgs.) particles in addition to surface soil (0-2 ft. bgs.) particles. Therefore, inhalation exposure to soil particulates in ambient air was assessed for all receptors.

Inhalation of Particulate Matter in Ambient Air From Ditch Soils

Ditch soil particles may become airborne via wind erosion and/or site activities, which in turn may be inhaled by potential receptors at the sites. Therefore, inhalation exposure to ditch soil particulates in ambient air was assessed for all receptors.

Incidental Ingestion and Dermal Contact to On-Site Soils

All receptors could come into contact with site surface soils (0-2 ft. bgs.) and involuntarily ingest and have their skin exposed to site surface soils during the course of site activities. Therefore, exposure via dermal contact and soil ingestion was assessed for all receptors. An on-site construction worker may come into contact with surface (0-2 ft. bgs.) and subsurface (2-6 ft. bgs.) soils during intrusive activities and may involuntarily ingest and have his/her skin exposed to surface and subsurface soils. Subsurface soil is defined as soil 2 ft. to 6 ft. bgs., since bedrock was generally encountered at approximately 6 ft. bgs.

Incidental Ingestion and Dermal Contact to On-Site Ditch Soils

All receptors could come into contact with site ditch soils and involuntarily ingest and have his/her skin exposed to site ditch soils during the course of site activities. Therefore, exposure via dermal contact and ingestion were assessed for all receptors.

Groundwater Intake

Groundwater is not currently used as a potable water source at the Depot. Three private groundwater supply wells are located approximately one mile to the south-east of the sites (**Figure 1-11**). However, the three private wells are located on the east sloping side of the watershed divide, while the sites are located on the west slope of the watershed divide (**Figure 1-5**). The future plan for all areas of SEDA is to obtain potable water from the existing water supply line that passes through the Town of Varick. Varick's water is obtained from Seneca Lake and processed through the water treatment plant in the Town of Waterloo. It is unlikely that a groundwater well would be installed for future drinking water use since a potable water pipeline exists. The shallow groundwater aquifer at SEAD-121C and SEAD-121I is inadequate for either yield or quality. Groundwater at SEAD-121C is generally at 2 ft. above the bedrock, and the bedrock is typically less than 8 ft. bgs. SEAD-121I does not have groundwater monitoring wells. Typically bedrock at SEAD-121I was encountered 0.5 to 2 ft. bgs. Therefore, groundwater, if it exists at SEAD-121I, would be inadequate for either yield. In addition, the land in the PID Area surrounding SEAD-121C and SEAD-121I is subject to a groundwater use restriction, indicating that site groundwater will not be a drinking water source (Parsons, 2004).

Nonetheless, to evaluate potential risk posed by groundwater, it was assumed that wells would be installed on-site for potable water at SEAD-121C. Therefore, for the risk assessment intake of site groundwater is considered a complete pathway for all receptors at SEAD-121C. SEAD-121I has less than two ft of groundwater laying on top of bedrock, which ranges in depth from 0.5 ft to 2 ft bgs; and thus not an adequate source for groundwater. As a result, intake of groundwater at SEAD-121I was not evaluated since groundwater data are not available at the site due to the shallow depth to bedrock and practically inability to install groundwater wells at the site.

Dermal Contact with On-Site Groundwater

Bedrock at SEAD-121C was typically less than 8 ft. bgs and groundwater was encountered at approximately 2 ft. above bedrock. Bedrock at SEAD-121I was typically encountered 0.5 to 2 ft bgs. Dermal contact with groundwater at SEAD-121I was considered unlikely and, therefore, not included in the risk assessment.

Construction workers may be exposed to groundwater via dermal contact while working at SEAD-121C (e.g., digging trenches). Therefore, exposure via dermal contact with groundwater was evaluated for construction workers at SEAD-121C. Dermal contact with groundwater by industrial worker or adolescent trespasser was considered unlikely and not included in the risk assessment.

Dermal Contact with On-Site Surface Water

Surface water was found at both SEAD-121C and SEAD-121I during and following precipitation events but does not persist in drainage ditches at either site throughout the year. Potential exposure to surface water would be limited. Construction workers may be exposed to surface water via dermal contact while working at the sites. An adolescent trespasser may be exposed to surface water via dermal contact. Industrial workers are unlikely to have activities that would expose them to surface water; therefore dermal exposure to surface water for industrial workers was considered minimal and therefore not included in the risk assessment.

6.3 DATA EVALUATION

This section identifies the site data that were included in the BRA. Data used in the BRA, background SEDA data for soil and groundwater, quality control aspects such as precision and accuracy, completeness and representativeness of the data, and procedure for sample and sample duplicate averaging are presented in the following discussion.

6.3.1 Data Used in Risk Assessment

The data sets used for the BRA were:

- Surface soil (0-2 ft. bgs) from SEAD-121C and SEAD-121I;
- Surface and Subsurface soil (0-6 ft. bgs) from SEAD-121C, hereafter referred to as total soil;
- Ditch soil from SEAD-121C and SEAD-121I;
- Groundwater from SEAD-121C; and
- Surface water from SEAD-121C and SEAD-121I.

These data sets have been obtained to characterize the site conditions. Unless otherwise specified in this report, all analytical data were used to conduct the human health and ecological risk assessment for SEAD-121C and SEAD-121I.

Groundwater data representative of site conditions were used in the risk assessment. As discussed in Section 4, the data from the temporary wells placed in SEAD-121C were not reliable because: 1) the temporary wells could not be properly developed and purged prior to sample collection; and, 2) bailers were used to collect the samples. Both of these factors contributed to increased turbidity in samples and result in overstated results, especially for metals. Data from samples collected at the

DRMO Yard using low-flow sampling techniques at permanent wells were considered to be representative of the site conditions. Therefore, only the groundwater data collected during the RI sampling program at SEAD-121C were included in the risk assessment.

In summary, the following data were used for the human health risk assessment and ecological risk assessment:

- Soil data collected during the 1998 EBS (Parsons, 1999);
- Soil data (surface soil, ditch soil, and subsurface soil) collected during the RI sampling program;
- Surface water data collected during the RI sampling program; and
- Groundwater data collected in 2003 during the RI sampling program.

Samples collected from man-made drainage ditches, originally classified as sediment, were reclassified as ditch soil based on a review of the site conditions. The drainage ditches were constructed by the Army to promote drainage within and away from the PID area. The drainage ditches located near SEAD-121C and SEAD-121I do not support aquatic life, as they are only wet after storm events and continue to provide stormwater runoff infiltration and runoff control. The following subsections provide discussion of each data set used in the risk assessment.

The data used in the risk assessment are presented in **Appendix C**, **Tables C-2** through **C-4, C-5B,** and **C-6** through **C-9**.

6.3.2 Background Data

The SEDA background data sets for metals in soil and groundwater were reviewed for the purposes of the risk assessment. Background soil and groundwater samples collected during site investigations conducted throughout the SEDA have been combined into the background database, and this database has been previously shared with the USEPA and NYSDEC. This was done so that the statistical evaluation of the data would be representative of the variations in the site soil and groundwater. Geologically, the soil material is identical throughout SEDA and has been deposited from the same source. This fact justifies combining the background soil and groundwater chemical composition data from all SEDA background locations into a single database.

Groundwater samples collected prior to implementing the USEPA's low-flow purging and pumping draft Standard Operating Procedure (SOP) had elevated concentrations of inorganic elements. The high reported concentrations were due to the high amount of suspended particulates in the groundwater samples. Several locations were re-sampled using the draft USEPA low flow purging and pumping protocols where high NTU groundwater samples had been collected in the past. The results from these locations showed that the concentrations of inorganic elements in the low NTU samples were greatly reduced when compared to the reported concentrations in those samples with high NTUs. Therefore, the results from the high NTU samples may overstate the true inorganic element concentrations in the background groundwater.

The background soil and groundwater data are presented in **Appendix D.**

6.3.3 Data Usability Evaluation

Data used in the risk assessment have been validated and qualified by a Parsons' chemist under the guidelines set forth in the USEPA Contract Laboratory Program National Functional Guidelines, the Region 2 Resource Conservation and Recovery Act (RCRA) and CERCLA Data Validation SOPs and NYSDEC Contract Laboratory Program Analytical Services Protocol (ASP), with consideration for the methodology requirements. The data were qualified during the data validation process. Rejected ("R" qualified) data were excluded from the risk assessment and all the other validated data were included in the risk assessment data sets. If a chemical was detected at least once in a specific medium at the sites, surrogate values for any nondetects ("U" or "UJ" qualified results) for that analyte were included in the risk assessment data sets at one-half the associated reporting limits.

Qualifiers were attached to data by laboratories conducting analyses and by data validation personnel. These qualifiers often pertain to Quality Assurance/Quality Control (QA/QC) problems and may indicate questions concerning chemical identity, chemical concentration, or both. The qualifiers used by data validation personnel are as follows:

For Organics:

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

For Inorganics:

J The associated value is an estimated quantity.

U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

R The data was unusable. (Note: Analyte may or may not be present.).

A summary of the relative percent difference and the quality of the data's acceptability are presented in **Section 4**.

6.3.4 Precision

The term precision is used to describe the reproducibility of results. It can be defined as the agreement between the numerical values of two or more measurements resulting from the same process. In the case of chemical analyses, precision is determined through the analyses of duplicate environmental samples. Duplicate sample analyses include matrix spikes, laboratory control spikes, field duplicates, and replicate instrumental analyses of individual environmental samples.

Matrix spikes involve the introduction of known concentrations of compounds or elements to a sample. The assumption is that these introduced compounds will be recovered from environmental samples to the same degree as in matrix spikes. Laboratory control spikes involve the introduction of known concentrations of compounds or elements to laboratory reagent water or pre-purified and extracted sand. Blank spikes eliminate the possibility of matrix interferences or contributions, thereby monitoring analytical performance from sample preparation to analysis. Field duplicates are a pair of samples taken from the same sampling location. They are collected simultaneously and provide the most legitimate means of assessing precision. A total of 16 field duplicate samples were collected for SEAD-121C and SEAD-121I.

Site	Media	Number of Field Sample-Duplicate Pairs
SEAD-121C	Surface Soil	5
SEAD-121C	Ditch Soil	1
SEAD-121C	Groundwater	2
SEAD-121C	Surface Water	1
Building 360 (SEAD-27)	Groundwater	2
SEAD-121I	Surface Soil	3
SEAD-121I	Ditch Soil	1
SEAD-121I	Surface Water	1

Precision estimates were obtained using the relative percent difference (RPD) between duplicate analyses. Overall the RPDs of the data set were found to be acceptable (i.e. within the USEPA Region 2 limits, see **Table 4-1A**. A summary of field sample duplicate pairs by site and media with RPDs > 50% is presented in **Tables 4-1B** through **4-1F**; and **Appendix C Tables C-1B** through **C-1F** presents the results of the RPD values for all sample duplicate pairs. The associated results were qualified in accordance with the USEPA Region 2 SOPs. No data were deemed unacceptable based on the precision evaluation.

6.3.5 Accuracy

Accuracy is a measure of the closeness of a reported concentration to the true value. Accuracy is usually expressed as a bias (high or low) and is determined by calculating percent recovery (%R) from spiked samples. During field sampling and sample shipping, contamination that could affect the accuracy of analysis results may be introduced into the samples. Field blanks were used during sample collection and shipment to detect field contamination. Contamination affecting accuracy can also be introduced during laboratory analysis. Method blanks were used during laboratory procedures to assess laboratory-introduced contamination.

Estimates of accuracy are more difficult to obtain than precision since accuracy requires knowledge of the quantity being measured. In the case of chemical analyses, accuracy is determined through the introduction of known concentrations of compounds or elements to samples or analytical spikes. The assumption is that compounds will be recovered from environmental samples to the same degree as in analytical spikes.

Two types of compounds were added to environmental samples for assessing accuracy: surrogate compounds and matrix spike compounds. Surrogates are compounds that closely approximate target analytes in structure, but are not target analytes. Surrogate compounds are added to samples in the preparation stages and monitor the effectiveness of the preparation process. Matrix spike compounds are target analytes that are added based upon expectations of matrix interferences that impede analyte detection. Laboratory method blank samples were spiked with surrogate compounds, per analysis day, as an additional means of estimating accuracy. The accuracy of chemical analyses was estimated using the percent recovery (PR) of compounds or elements that were added to analytical spikes.

Matrix spike/matrix spike duplicate (MS/MSD) recoveries for the data sets were found to be acceptable (i.e. within the USEPA Region 2 limits), except that the recoveries of certain SVOC fractions from some MS/MSD samples were outside the limits. The associated results were qualified in accordance with the USEPA Region 2 SOPs. No data were deemed unacceptable based on the MS/MSD evaluation.

LCS/LCSD recoveries for the SEAD-121C and SEAD-121I data sets were found to be acceptable (i.e. within the USEPA Region 2 limits), except that the recoveries of several VOCs fractions from some LCS/LCSD samples were outside the limits. The associated results were qualified in accordance with the USEPA Region 2 SOP. No data were deemed unacceptable based on the LCS/LCSD evaluation.

Surrogate recoveries for the SEAD-121C and SEAD-121I data sets were found to be acceptable (i.e. within the USEPA Region 2 limits) except that the recoveries of certain VOC, SVOC, pesticide, and PCB fractions from some samples were outside the limits. The associated results were qualified in accordance with the USEPA Region 2 SOPs.

Acetone, carbon disulfide, chloroform, methyl ethyl ketone, and methylene chloride were detected in one or more method blank or rinseate blank samples. The associated results were qualified in accordance with the USEPA Region 2 SOPs.

6.3.6 Representativeness

Representativeness expresses the extent to which collected data define site contamination. Factors influencing representativeness include sample collection, selection of sampling locations representative of site conditions, and use of appropriate chemical methods for sample analyses. Chemical analysis methods are addressed in **Section 2.2.5**. Sampling from locations representative of site conditions was achieved through implementation of the field sampling plan (Parsons, 2002).

Field duplicates were collected and analyzed in order to assess the influence of sample collection on representativeness.

During the data validation, representativeness has also been evaluated by the review of:

- Sample Package Completeness and Deliverables
- Technical Holding Time

- QA/QC Results

6.3.6.1 Sample Preservation and Technical Holding Time

Samples were preserved according to the USEPA Region 2 preservation criteria and analyzed within the holding time except that several samples were extracted slightly beyond the holding time (i.e., less than three days beyond holding time) for the SVOC analysis. The associated results were qualified in accordance with the USEPA Region 2 SOPs. Solids percentage was greater than 50% for all soil samples analyzed.

6.3.6.2 Other QA/QC Results

Other QA/QC results were reviewed during the data validation such as instrument performance, reporting limits, instrument calibration, Inductively Coupled Plasma (ICP) serial dilution for inorganic analysis, ICP linear range for inorganic analysis, and ICP interference check. Several issues with laboratory instrument performance were noted in the data validation process. The data were qualified based on the Region 2 SOPs.

6.3.7 Protocol for Using Field Duplicate Results

The analytical results of each pair of sample and field duplicate sample were averaged to produce a single result used to represent the concentration at the sample location. The following procedures were used to average the results of a sample and its field duplicate:

- If an analyte was detected in both the sample and duplicate sample, then the detected values were averaged.

- If an analyte was not detected in the sample and its duplicate sample, then the reporting limits (RL) were averaged and reported as the reporting limit for the duplicate pair.

- If an analyte was detected in only one sample; then the analyte was considered present at a level equal to the average of the detected value and one-half of the reporting limits for the non-detect.

Table C-1A in **Appendix C** presents the method used for selecting qualifiers for the average results. The sample and its field duplicate were treated as one entry and the average concentration was used to represent the result at the sampling location. This protocol is reflected in all the summary statistics (i.e. number of detections or exceedances and the maximum concentration) presented in this report and the risk assessment. **Tables C-1J** through **C-1P** presented in **Appendix C** present the data for sample duplicate pairs and their corresponding average values. It should be noted that a maximum reported value can be generated from the average of a sample duplicate pair. Laboratory duplicates were not used for the risk assessment.

6.4 IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN

Chemicals of potential concern (COPCs) for the human health risk assessment were selected based on the screening process described below. The COPCs identified were quantitatively and/or qualitatively evaluated in the human health BRA.

- The maximum detected concentration of each chemical detected in each soil data set (i.e., surface soil, total soil, and ditch soil data sets) was compared to the USEPA Region 9 preliminary remediation goals (PRGs) for residential soil and other appropriate USEPA screening values if Region 9 PRGs were not available (e.g., USEPA Region 3 Risk-Based Concentrations for residential soil). The residential PRG value is a chemical concentration that corresponds to a risk level of 1 x 10^{-6} (for carcinogens) or hazard quotient level of 1 (for non-carcinogens), whichever is lower.

  Chemicals were eliminated as COPCs in soil for human exposure if the maximum detected concentration was less than the screening level or if no screening level was available. A chemical was considered a COPC in soil if the maximum detected concentration was greater than the screening level. For closely related chemicals (structure and mode of toxicity), screening criteria for surrogate chemicals were used.

- For groundwater and surface water, the maximum detected concentration of each data set was compared to the Region 9 PRGs for tap water corresponding to a risk level of 1 x 10^{-6} (for carcinogens) or hazard quotient level of 1 (for non-carcinogens). Other appropriate USEPA screening values were used if Region 9 PRGs were not available [e.g., USEPA Region 3 Risk-Based Concentrations for tap water, and USEPA Maximum Contaminant Level (MCL) for drinking water]. Chemicals were eliminated as COPCs for human exposure if concentrations were less than the screening level or if there was no screening value available. A chemical was considered a COPC if the maximum detected concentration was greater than the screening value.

- Essential nutrients were eliminated as COPCs in all media, if applicable. Essential nutrients include calcium, magnesium, sodium, and potassium. The recommended dietary allowances and adequate intakes by Wright (2001) and other resources were evaluated to determine whether the concentration is within the recommended daily requirements for essential nutrients.

- An evaluation was made to determine whether any previously eliminated chemical or medium should be included due to other considerations (e.g., potential break-down products, chemicals with detection limits above health-based levels). In addition, any member of a chemical class that has other members selected as COPCs was retained (e.g., detected carcinogenic PAHs).

- For each medium, a determination was made as to whether there were any COPCs identified. If no COPCs identified, the medium was dropped from further consideration in the risk assessment.

Results of the above screening process for SEAD-121C are summarized in **Tables 6-2A, 6-2B, 6-2C, 6-2D**, and **6-2E** for total soil, surface soil, ditch soil, groundwater, and surface water, respectively. Results of the screening process for SEAD-121I summarized in **Tables 6-3A**, **6-3B**, and **6-3C** for surface soil, ditch soil, and surface water, respectively.

Constituents identified as human health COPCs at SEAD-121C include:

- benzene (total soil),
- PAHs (total soil, surface soil, and ditch soil),
- pesticides/PCBs (total and surface soils), and
- inorganics (total soil, surface soil, ditch soil, and surface water)

Constituents identified as human health COPCs at SEAD-121I include:

- PAHs (surface soil, and ditch soil),
- pesticides (surface soils), and
- inorganics (surface soil, ditch soil, and surface water)

No chemicals were identified as COPCs in groundwater at SEAD-121C. Therefore, exposure to groundwater was not quantitatively evaluated in this BRA.

6.5 EXPOSURE ASSESSMENT

The objective of the exposure assessment was to estimate the type and magnitude of exposures to the COPCs that are present at, or migrating from, the site. The exposure assessment consists of three steps (USEPA, 1989):

1. **Characterize Exposure Setting:** In this step, information on the physical characteristics of the site that may influence exposure is considered. The physical setting involves climate, vegetation, soil characteristics, and surface and groundwater hydrology. All potentially exposed populations and sub-populations therein (receptors) are assessed relative to their potential for exposure. Additionally, locations relative to the site along with the current and potential future land use of the site are considered. This step is a qualitative one aimed at providing a general site perspective and offering insight on the surrounding population.

2. **Identify Exposure Pathways:** All exposure pathways, ways in which receptors can be exposed to contaminants that originate from the source, are reviewed in this step. Chemical sources and

mechanisms for release along with subsequent fate and transport are investigated. Exposure points of human contact and exposure routes are discussed before quantifying the exposure pathways in step 3.

3. **Quantify Exposure**: In this final step, the exposure levels (COPC intakes or doses) are calculated for each exposure pathway and receptor. These calculations typically follow USEPA guidance for assumptions of intake variables or exposure factors for each exposure pathway and USEPA-recommended calculation methods.

Section 1 of this report presents the physical setting of the sites. The exposure pathways are presented in **Section 6.2.5**. This section presents the three key factors involved in the exposure quantification process: exposure point concentrations (**Section 6.5.1**), exposure factor assumption (**Section 6.5.2**), and exposure quantification (**Section 6.5.3**).

6.5.1 Derivation of Exposure Point Concentrations

After COPCs were identified for the risk assessment, exposure point concentrations (EPCs) were calculated for each of the COPCs in each medium at SEAD-121C and SEAD-121I. Two types of exposure were estimated for the baseline human health risk assessment: a reasonable maximum exposure (RME) and central tendency (CT) exposure. The RME is defined as the highest exposure that could reasonably be expected to occur for a given exposure pathway at a site, and is intended to account for both uncertainty in the contaminant concentration and variability in the exposure parameters (such as exposure frequency or averaging time). The CT may be evaluated for comparison purposes and is generally based on mean exposure parameters. Both scenarios have been evaluated in this risk assessment. The EPCs were assumed to be the same for the RME and CT scenarios.

The EPCs were derived for the following exposure points:

- SEAD-121C total soil;
- SEAD-121C and SEAD-121I surface soil;
- SEAD-121C and SEAD-121I ditch soil;
- SEAD-121C groundwater; and
- SEAD-121C and SEAD-121I surface water.

6.5.1.1 Soil and Ditch Soil EPC

Soil EPCs were calculated for three exposure points at SEAD-121C: 1) total soil, defined as surface soil and subsurface soil (0-6 ft bgs.); 2) surface soil (0-2 ft bgs.); and 3) ditch soil. At SEAD-121I EPCs were calculated for two exposure points: 1) surface soil (0-2 ft bgs.) and 2) ditch soil. The industrial worker and adolescent trespasser were assumed to be exposed to the surface soil (0-2 ft bgs.) and ditch soil at both sites. The construction worker was assumed to be exposed to the total soil and ditch soil at SEAD-121C; and assumed to be exposed to the surface soil and ditch soil at SEAD-121I.

Soil EPCs for the reasonable maximum exposure and central tendency risk calculations are equal to an appropriate upper confidence limit (i.e., 95th UCL or 99th UCL based on data distributions) of the arithmetic mean of the concentrations (USEPA, 2004c). The EPC, or the appropriate UCL of the mean concentration, was calculated using the USEPA Software for Calculating Upper Confidence Limits (ProUCL version 3.00.02). ProUCL provides summary results for normal distribution test, lognormal distribution test, and gamma distribution test of the data. Based upon the data distribution and the associated skewness, ProUCL provides recommendations about an appropriate UCL computation method that may be used to estimate the unknown mean concentration of a COPC.

For lead, the arithmetic mean of each data set was used as the EPC, which is consistent with the USEPA (1994) guidance.

Tables 6-4A, 6-4B, and **6-4C** summarize the EPC for the total soil, surface soil, and ditch soil, respectively, at SEAD-121C. **Tables 6-5A** and **6-5B** summarize EPCs for surface soil and ditch soil, respectively, at SEAD-121I.

6.5.1.2 Groundwater EPC

No COPCs were identified during the screening step described in **Section 6.4**. As a result, EPCs were not developed for groundwater at the DRMO Yard. As part of the *COC Identification* discussion in **Section 6.9.1**, the impact of groundwater at SEAD-27 on the DRMO Yard was evaluated as part of a combined SEAD-27 and SEAD-121C evaluation.

Groundwater was not recovered from the aquifer at SEAD-121I; hence risk from contact to groundwater was not evaluated at SEAD-121I.

6.5.1.3 Surface Water EPC

Due to the small sample size (i.e., less than or equal to 10 samples), the maximum detected concentration was used as the EPC to estimate potential exposure to surface water for both the RME and CT scenarios.

Tables 6-4E and **6-5C** summarize surface water EPCs at SEAD-121C and SEAD-121I, respectively.

6.5.1.4 Ambient Air EPC From Soil Dust

EPCs for COPCs in ambient air caused by soil dust were estimated based on the soil EPCs and PM_{10} concentrations in ambient air. Industrial workers and adolescent trespassers were assumed to be exposed to surface soil and dust caused by surface soil. Construction workers were assumed to be exposed to dust resulting from surface and subsurface soil. Therefore, ambient air EPCs caused by surface soil (0-2 ft. bgs.) were calculated for both SEAD-121C and SEAD-121I, and ambient air EPCs caused by surface and subsurface soil (0-6 ft. bgs.) were calculated for SEAD-121C. A detailed discussion of PM_{10} concentration evaluation is presented in **Section 6.5.3**.

Tables 6-6A and **6-6B** summarize ambient air EPCs caused by dust from surface soil at SEAD-121C and SEAD-121I, respectively, for industrial workers and adolescent trespassers. **Table 6-6C** summarizes ambient air EPC caused by dust from surface soil at SEAD-121I for construction workers. **Table 6-7** summarizes ambient air EPCs caused by dust from surface and subsurface soil at SEAD-121C for construction workers.

6.5.1.5 Ambient Air EPC From Ditch Soil Dust

Industrial workers, construction workers, and adolescent trespassers were assumed to be exposed to dust caused by ditch soil. Therefore, EPCs for COPCs in ambient air caused by ditch soil dust were estimated based on the ditch soil EPCs and PM_{10} concentrations in ambient air. A detailed discussion of PM_{10} concentration evaluation is presented in **Section 6.5.3**.

Tables 6-8A and **6-8B** summarize ambient air EPCs caused by dust from ditch soil at SEAD-121C and SEAD-121I, respectively, for industrial workers and adolescent trespassers. **Tables 6-8C** and **6-8D** summarize ambient air EPCs caused by dust from ditch soil at SEAD-121C and SEAD-121I, respectively, for construction workers.

6.5.2 Exposure Factor Assumptions

An important aspect of exposure assessment is the determination of assumptions regarding how receptors may be exposed to contaminants. An extensive listing of exposure factors are provided in USEPA guidance, and these were followed throughout this assessment. Standard scenarios and USEPA-recommended default assumptions were used where appropriate.

The exposure scenarios in this assessment involve the following receptors, based on the current land use and future use of Planned Industrial Development:

- current/future construction worker
- future industrial worker
- adolescent trespasser

The exposure assumptions for these scenarios were intended to approximate the frequency, duration, and manner in which receptors would be exposed to environmental media. For example, the exposure scenarios for industrial workers were established to approximate the exposure potential of future individuals employed at SEAD-121C or SEAD-121I.

Exposure assumptions and parameters were identified for both RME and CT exposure scenarios based on the following USEPA guidance and conservative professional judgment if USEPA guidance is not available.

- USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors

- USEPA, 1997a: Exposure Factors Handbook

- USEPA, 2002a: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December

- USEPA, 2004a: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Details of the exposure assumptions and parameters for each exposure scenario are shown in **Tables 6-9A, 6-9B,** and **6-9C** for the construction worker, industrial worker, and adolescent trespasser, respectively. A brief summary of two selected exposure factor assumptions are presented below for each receptor.

Construction Worker. Construction workers were assumed to spend one year working at the sites, which is a typical duration for a significant construction project. These workers spend 5 days/week for 50 weeks (i.e., 250 days, RME scenario) or 219 days (CT scenario) at the sites. During each working day, construction workers inhale the ambient air at the site and may be exposed to surface and subsurface soil (0-6 ft. bgs.) or ditch soil through ingestion or dermal contact. No COPCs were identified in groundwater at SEAD-121C; therefore groundwater exposure was not evaluated. For uncertainty analysis, construction workers were assumed to dermally contact groundwater with their hands and forearms at a frequency of one event each day during 100 workdays (i.e., one day at the beginning of the week and one day at the end of the week for 50 weeks) to assemble or disassemble a pumping system. Each event was assumed to last half an hour. Construction workers were also assumed to be exposed to COPCs in surface water via dermal contact.

Industrial Worker. The future industrial workers were assumed to spend 5 days/week for 50 weeks (i.e., 250 days, RME scenario) or 219 days (CT scenario) each year at the sites. This exposure lasts for an entire 25-year (RME scenario) or 9-year (CT scenario) career. During each workday at SEAD-121C or SEAD-121I, industrial workers inhale the ambient air, and ingest and dermally contact surface soil (0-2 ft bgs.) or ditch soil. No COPCs were identified in groundwater at SEAD-121C; therefore groundwater exposure was not evaluated.

Adolescent Trespasser. Adolescent trespassers were assumed to spend 14 days a year for 6 years (ages 11-16 yr) at the sites. During each visit to SEAD-121C or SEAD-121I, the adolescent inhales the ambient air, dermally contacts surface water, and ingests and dermally contacts surface soil (0-2 ft bgs.) or ditch soil. No COPCs were identified in groundwater at SEAD-121C; therefore groundwater exposure was not evaluated.

6.5.3 Quantification of Exposure

Once the EPCs were calculated, each receptor's potential exposures to COPCs were quantified for each of the exposure pathways. A human health intake or the absorbed dose, depending on the exposure route, was calculated based on the EPC and exposure factor assumptions following methods recommended in USEPA guidance documents, such as the RAGS (USEPA 1989). Intakes or doses are normally expressed as the amount of chemical at the environment-human receptor exchange boundary in milligrams per kilogram of body weight per day (mg/kg-day), which represents an exposure normalized for body weight over time. The total exposure was divided by the period of interest to obtain an average exposure. The averaging time is a function of the toxic endpoint: for non-carcinogenic effects, it is the exposure time (specific to the scenario being assessed) and for carcinogenic effects, it is a lifetime (70 years).

The generic equation used to calculate intake for receptors is as follows (USEPA 1989):

$$\mathbf{DI = \frac{EPC \times CR \times EFD}{BW \times AT}}$$

Where:

DI = Daily intake; the amount of chemical at the exchange boundary (mg/kg body weight-day);
EPC = Exposure point concentration (e.g., mg/L or mg/kg);
CR = Contact rate; the amount of contaminated medium contacted per unit time or event (e.g., L/d or mg/d);
EFD = Exposure frequency and duration; describes how long and how often exposure occurs. Often calculated using two terms (EF and ED):
EF = Exposure frequency (d/y) and ED = Exposure duration (y);
BW = Body weight (kg); and
AT = Averaging time; period over which exposure is averaged (d).

In this section, the methods used to calculate exposures by each pathway are explained. Tables that show the human intake or absorbed dose values calculated for each exposure scenario at each site are presented in **Appendices E** and **F**. The intakes and doses were used to assess overall carcinogenic and non-carcinogenic risks, as discussed later in the risk characterization section (**Section 6.6**).

6.5.3.1 Inhalation of Particulate Matter in Ambient Air

The equation for inhalation of particulate matter in ambient air is as follows (USEPA, 1989):

$$\textbf{Intake (mg/Kg/day)} = \frac{\mathbf{EPC_{air} \; x \; IR \; x \; EF \; x \; ED}}{\mathbf{BW \; x \; AT}}$$

Where:

EPC_{air} = Exposure point concentration in air (mg/m^3)

IR = Inhalation rate (m^3/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Bodyweight (kg)

AT = Averaging Time (days)

As discussed in **Section 6.5.1**, the EPC in air was calculated based on the soil and ditch soil EPCs and particulate matter less than 10µm aerodynamic diameter (PM_{10}). PM_{10} represents smaller particles which can be inhaled (particles larger than 10µm diameter typically cannot enter the narrow airways in the lung). Ambient PM_{10} concentrations for a construction worker were estimated using an emission and dispersion model. PM_{10} concentrations for industrial workers and adolescent trespassers were based on existing site air measurements shown in **Table 6-10**.

PM_{10} Concentrations for Construction Worker at SEAD-121C

During construction activities, fugitive dusts may be generated from soil by wind erosion, construction vehicle traffic on temporary unpaved roads, excavation, and other construction activities. The dusts would contain the chemicals present in the soil. Construction workers in the construction area would breathe this fugitive dust in the ambient air and therefore may be exposed to chemicals in site soils via inhalation. As current and future subsurface activities (e.g., excavation) could bring subsurface soils to the surface, both surface and subsurface soil (0-6 ft. bgs.) data were used to evaluate the EPC in air associated with the fugitive dust for construction workers. A model presented in the USEPA's Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (USEPA, 2002a), which evaluates the fugitive dust emission from truck traffic on unpaved roads during construction, was used to estimate the EPC in ambient air during the construction. This model was selected since truck traffic on unpaved roads is a common activity at a construction site and, therefore, is considered a significant mechanism to cause dust. According to USEPA (2002a), "*emissions from truck traffic on unpaved roads, which typically contribute the majority of dust emissions during construction . . . In the case of particulate matter, traffic on contaminated unpaved roads typically accounts for the majority of emissions, with wind erosion, excavation soil dumping, dozing, grading, and tilling operations contributing lesser emissions.*" Based on the above discussion, the emissions from truck traffic on unpaved roads were used as a model to represent PM produced by the construction activity.

$$EPC_{air} = EPC_{soil} \times \tfrac{1}{PEF_{sc}}$$

Where:

EPC_{air} = Exposure point concentration of chemicals in air associated with fugitive dust (mg/m^3);

EPC_{soil} = Exposure point concentration of chemicals in soil (mg/kg);

PEF_{sc} = Subchronic road particulate emission factor (m^3/kg).

$$PEF_{sc} = Q/C_{sr} \times \tfrac{1}{F_D} \times \left[\frac{T \times A_R}{556 \times (W/3)^{0.4} \times \frac{365d/yr - p}{365d/yr} \times \sum VKT} \right]$$

Where:

Q/C_{sr} = Inverse of the ratio of the 1-h geometric mean air concentration to the emission flux along a straight road segment bisecting a square site (g/m^2-s per kg/m^3)

F_D = Dispersion correction factor (unitless), 0.185

T = Total time over which construction occurs (s)

A_R = Surface area of contaminated road segment (m^2)

$A_R = L_R x W_R x 0.092903 m^2/ft^2$

L_R = Length of road segment (ft), assumed 511 ft for the sites

W_R = Width of road segment (ft), assumed 20 ft

W = Mean vehicle weight (tons)

p = Number of days with at least 0.01 inches of precipitation (days/year), 120 days/year based on Exhibit 5-2 of the USEPA (2002a) document

ΣVKT = Sum of fleet vehicle kilometers traveled during the exposure duration (km)

$$Q/C_{sr} = A \times \exp\left[\frac{(\ln A_s - B)^2}{C}\right]$$

Where:

A = Constant (unitless), 12.9351

A_s = Area extent of site surface soil contamination (acres), for SEAD-121C, A_S was assumed to be the whole site area (5 acres) as a conservative estimate

B = Constant (unitless), 5.7383

C = Constant (unitless), 71.7711

Mean vehicle weight (W) can be estimated by assuming the numbers and weights of different types of vehicles. For SEAD-121C, assuming that the daily unpaved road traffic consists of 20 two-ton cars and 10 twenty-ton trucks, the mean vehicle weight would be:

$$W = [(20cars \times 2tons/car) + (10trucks \times 20tons/truck)]/30vehicles = 8tons$$

The sum of the fleet vehicle kilometers traveled during construction (ΣVKT) can be estimated based on the size of the area of surface soil contamination, assuming the configuration of the unpaved road, and the amount of vehicle traffic on the road. The area of surface soil contamination at SEAD-121C is approximately 5 acres (or 23,000 m^2), it was assumed that this area is configured as a square with the unpaved road segment dividing the square evenly, the road length would be equal to the square root of 23,000 m^2, 146 m (or 0.146 km, or 480 ft). Assuming that each vehicle travels the length of the road once per day, 5 days per week for a total of 6 months, the total fleet vehicle kilometers traveled would be:

$$\sum VKT = 30vehicles \times 0.146km/day \times 50wks/yr \times 5days/wk = 1096km$$

The PM_{10} concentration estimated for the construction scenario is 954 ug/m^3 based on the above assumptions for soil exposure. For ditch soil exposure, the PM_{10} concentration calculated for SEAD-121I was used. The ambient air EPC for the construction worker exposed to surface and subsurface soil at SEAD-121C is presented in **Tables 6-7**; and the ambient air EPC for ditch soil is presented in **Table 6-8C.**

PM_{10} Concentrations for Construction Worker at SEAD-121I

During construction activities, construction workers may be exposed to chemicals in site soils via inhalation. Construction activities, such as excavation, have the potential to create dust, or suspended particulate matter (PM), originating from the soils being removed. This dust would contain the chemicals present in the soil. Construction workers in the construction area would breathe the fugitive dust in the ambient air. Access to SEAD-121I is limited to existing paved roads and additional access roads are unlikely to be built since an extensive roadway system is already in place within the warehousing area. However, dust generated from excavation is expected to be produced from construction activities at SEAD-121I. An excavation scenario was evaluated for SEAD-121I to assess the risk to construction workers from dust generated by ditch soil in the ambient air.

Concentrations of site COPCs in the air were estimated for this exposure pathway using excavation models recommended in the EPA's "Models for Estimating Air Emission Rates from Superfund Remedial Actions" (EPA 451/R-93-001). Particulate emissions from soil excavation and loading into trucks were estimated with the following equation:

$$\mathbf{E} = \frac{\mathbf{k\,(0.0016)\,(M)\,[\,U/2.2\,]^{1.3}}}{\mathbf{[\,X/2\,]^{1.4}}}$$

Where:
E = emissions (g)
k = particle size multiplier (unitless)
0.0016 = empirical constant (g/Kg)
M = mass of soil handled (Kg)
U = mean wind speed (m/sec)
2.2 = empirical constant (m/sec)
X = percent moisture content (%)

The construction worker receptor is assumed to work at a site for a one-year period. To conservatively estimate potential particulate emissions from construction activities during this period, it was assumed that an area equivalent to the site area (approximately 16 acres, or a 65,000 square meter area) is excavated to a depth of 2 meters over the course of one year as part of the site construction.

This results in the following mass of soil removed:

Mass = Area x Depth x Soil Bulk Density

= 65,000 square meters x 2 meters x 1.5 g/cm^3 x 10^6 cm^3/m^3
= 2.0×10^{11} grams
= 2.0×10^{8} Kg

Other parameter values for the model are as follows:

k = 0.35 for PM_{10} (USEPA 1993c)
U = 4.4 m/sec, average wind speed for Syracuse, NY (USEPA 1985)
X = 10%, recommended default (USEPA 1993c)

With these values for M, k, U and X, the emission rate (E) from excavation activities is calculated 29,000 grams of PM_{10} over the course of a year. This emission rate would be representative if all top two meters of soil at the site were excavated, and if local climatic factors did not suppress emissions. For example, precipitation, snow cover and frozen soil in the winter will minimize emissions. To account for these climatic/seasonal factors, it was assumed that emissions occur only for half of the construction time. This results in a representative emission rate (E) of 14,500 grams/year. This is equivalent to an average emission rate of 58 g/day, 7.3 g/hr or 2 mg/sec, assuming emissions occur only during work days: 250 days/yr, 8 hr/day.

Much greater short-term emissions are estimated for site grading with a bulldozer or tractor. This type of activity is assumed to occur for 90 work days (8-hour day) over the course of a year. The model equation for grading emissions is:

$$\mathbf{E} = \frac{\mathbf{0.094\,(s)^{1.5}}}{\mathbf{X^{1.4}}}$$

Where:
E = emission rate (g/sec)
0.094 = empirical constant (g/sec)
s = percent silt content (%)
X = percent moisture content (%)

Assuming the USEPA-recommended default values of 8% for s, and 10% for X, the emission rate (E) from grading is calculated as 0.085 g/sec. Averaged over the course of a year with 90, 8-hour days of grading emissions, the result is 38 g/hr or 11 mg/sec of PM_{10} emissions, assuming all emissions occur during working hours.

Total annual average emissions from excavation and grading are estimated as 2 mg/sec + 11 mg/sec = 13 mg/sec.

Localized exposure concentrations for construction workers are estimated with a simple box model. The model treats a defined surface area as a uniform emission source over the time period of interest. The box, or mixing volume, is defined by this surface area and an assumed mixing height. The emitted PM_{10} is assumed to mix uniformly throughout the box, with dilution from surface winds.
The general model equation is:

$$\mathbf{C} = \frac{\mathbf{E}}{\mathbf{(U)\,(W)\,(H)}}$$

Where:
E = emission rate, mg/sec
U = wind speed, m/sec
W = crosswind width of the area source, m
H = mixing height, m

E and U are the same as defined or calculated above. To determine W, the construction activity is assumed to be confined to approximately 260 square meters at any time. This area is assumed to be square, and W is the square root of 260 m^2, or 16 meters. H is assumed to be the height of the breathing zone, or 1.75 meters.

With these values, the PM_{10} exposure concentration for a construction worker is calculated as 0.11 mg/m^3. All of this PM_{10} was assumed to be airborne soil released from the site as represented by surface soil and ditch soil. This value was also used as an estimate for PM_{10} associated with SEAD-121C ditch soil.

The ambient air EPCs for surface soil for a construction worker at SEAD-121I are presented in **Table 6-6C**; and the ambient air EPCs for ditch soil are presented in **Table 6-8D.**

PM_{10} Concentrations for Industrial Workers and Adolescent Trespassers

Ambient air normally contains particulate matter derived from various natural sources, including soil erosion, fuel burning, automobiles, etc. Dust generated from ditch soil may contain particular matter derived from various natural and SEDA activities sources. The PM_{10} concentrations were measured at four locations in SEDA over a four-month period (April-July) in 1995. A summary of the data collected in this air sampling program is shown in **Table 6-10**.

For this assessment, the highest 4-month average PM_{10} concentration measured at any of the four monitoring stations (16.9 $\mu g/m^3$, rounded to 17 $\mu g/m^3$) was assumed to represent ambient air at SEAD-121C and SEAD-121I. The entire particulate loading was assumed to be airborne soil released from the site as represented by the surface soil and ditch soil EPCs for each site.

The concentration of particulate-associated chemicals in ambient air was calculated with the same equation used for the construction worker, above.

$$EPC_{air} = EPC_{soil} \times PM_{10} \times C$$

Where:
EPC_{air} = Exposure point concentration of chemicals in air associated with fugitive dust (mg/m^3);
EPC_{soil} = Exposure point concentration of chemicals in soil (mg/Kg);
PM_{10} = Concentration of particulate matter less than 10µm aerodynamic diameter in air ($\mu g/m^3$);
C = Conversion factor, 10^{-9} Kg/µg.

The ambient air EPCs from surface soil and ditch soil for the industrial worker and adolescent trespasser at SEAD-121C are presented in **Tables 6-6A** and **6-8A**. The ambient air EPCs for surface soil and ditch soil for the industrial worker and adolescent trespasser at SEAD-121I are presented in **Tables 6-6B** and **6-8B.**

6.5.3.2 Incidental Ingestion of Soil

The equation for intake via incidental ingestion of soil is as follows (adjusted from USEPA 1989):

$$\textbf{Intake (mg/Kg-day)} = \frac{\mathbf{EPC_{soil} \times IR \times CF \times FI \times EF \times ED}}{\mathbf{BW \times AT}}$$

Where:

EPC_{soil} = Soil exposure point concentration (mg/Kg)
IR = Soil ingestion rate (mg /day)
CF = Conversion factor (1 Kg/10^6 mg)
FI = Fraction ingested from contaminated source (unitless)
EF = Exposure frequency (days/years)
ED = Exposure duration (years)
BW = Body weight (Kg)
AT = Averaging time (period over which exposure is averaged -- days)

6.5.3.3 Dermal Contact with Soils

The equation for the absorbed dose from dermal exposure is as follows, based on guidance in USEPA (2004a):

$$\text{Absorbed Dose (mg/Kg-day)} = \frac{DA_{event} \times EF \times ED \times EV \times SA}{BW \times AT}$$

$$DA_{event} = EPC_{soil} \times CF \times AF \times ABS_d$$

Where:

DA_{event} = Absorbed dose per event (mg/cm^2-event)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
EPC_{soil} = Exposure point concentration in soil (mg/Kg)
EV = Event frequency (events/day)
SA = Skin surface area available for contact (cm^2)
BW = Body weight (Kg)

AT = Averaging time (period over which exposure is averaged -- days)
CF = Conversion factor (10^{-6} Kg/mg)
AF = Soil to skin adherence factor (mg/cm^2-event)
ABS_d = Dermal absorption factor (unitless)

6.5.3.4 Groundwater Intake

No COPCs were identified in groundwater from SEAD-121C. However, for the Uncertainty Analysis all receptors were assumed to intake groundwater from SEAD-121C and SEAD-27 (Building 360). . The equation for groundwater intake is as follows (USEPA, 1989):

$$\textbf{Intake (mg/Kg-day)} = \frac{\mathbf{EPC_{gw} \times IR \times EF \times ED}}{\mathbf{BW \times AT}}$$

Where:
EPC_{gw} = Exposure point concentration in groundwater (mg/liter)
IR = Groundwater intake rate (liters/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
BW = Bodyweight (Kg)
AT = Averaging time (days)

6.5.3.5 Dermal Contact with Groundwater

No COPCs were identified in groundwater from SEAD-121C. However, for the Uncertainty Analysis a construction worker was assumed to have dermal contact to groundwater from SEAD-121C and SEAD-27 (Building 360). The equation for the absorbed dose, according to USEPA (2004a) is as follows:

$$\textbf{Absorbed Dose (mg/Kg-day)} = \frac{\mathbf{DA_{event} \times EF \times ED \times EV \times SA}}{\mathbf{BW \times AT}}$$

Where:
DA_{event} = Absorbed dose per event (mg/cm^2 - event)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
EV = Event frequency (events/day)
SA = Skin surface area available for contact (cm^2)
BW = Body weight (Kg)
AT = Averaging time (period over which exposure is averaged -- days)

The absorbed dose per event (DA) was calculated as described in EPA’s "Supplemental Guidance for Dermal Risk Assessment," (USEPA, 2004a).

For organics, a parameter, B was first calculated. This value attempts to characterize the relative contribution of each compound’s specific permeability coefficient (K_p value) in the stratum corneum and the viable epidermis.

$$B = K_p \frac{\sqrt{MW}}{2.6}$$

Where:
K_p = Dermal permeability coefficient in water (cm/hr)
MW = Molecular weight (g/mole)

Once calculated, the B value was used to calculate time conditions associated with estimates of compound breakthrough time.

$$If \quad B \leq 0.6, \quad then \quad t^* = 2.4\tau_{event}$$

$$If \quad B > 0.6, \quad then \quad t^* = 6\tau_{event}(b - \sqrt{b^2 - c^2})$$

$$b = \frac{2(1+B)^2}{\pi} - c$$

$$c = \frac{1 + 3B + 3B^2}{3(1+B)}$$

$$\tau_{event} = 0.105 \times 10^{(0.0056MW)}$$

Where:
B = Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless)
t^* = Time to reach steady-state (hr)
τ_{event} = Lag time per event (hr/event)
b,c = Correlation coefficients which have been fitted to the Flynn’s data

The lag time (τ_{event}), is defined as the time it takes a chemical to penetrate to reach a steady-state condition during a dermal exposure in aqueous media. By properly defining the lag time, the permeability coefficient (K_p) can be more properly used in the risk calculation further reducing uncertainty. Lag time and breakthrough time (t*) for each organic COPC were from Exhibit B.3 of the USEPA (2004a) Supplemental Guidance for Dermal Risk Assessment, or calculated using the above USEPA recommended equations.

If the exposure time per event (t_{event}) is less than the breakthrough time (t*) of steady-state conditions specific to each compound, then the absorbed dose is calculated as follows:

$$DA_{event} = 2FA \times K_p \times EPC_{gw} \times CF \times \sqrt{\frac{6\tau_{event} \times t_{event}}{\pi}}$$

If the exposure time is longer than t*, then the absorbed dose is calculated using:

$$\mathbf{DA_{event} = FA\ x\ K_p\ x\ EPC_{gw}\ x\ CFx} \left[\frac{t_{event}}{1+B} + 2\tau_{event} \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$$

Where, for both equations:

FA = Fraction absorbed water (dimensionless), assumed as 1

K_p = Dermal permeability coefficient (cm/hr)

EPC_{gw} = EPC Concentration in Water (mg/L)

ET = Exposure Time (hours)

CF = Volume Conversion Factor = 0.001L/cm^3

For inorganics, DA was calculated by:

$DA = K_p \text{ x } EPC_{gw} \text{ x } t_{event} \text{ x } CF$

Dermal permeability coefficients for a number of organic inorganic chemicals can be found in the USEPA (2004a) Supplemental Guidance for Dermal Risk Assessment. When no organic K_p value was available, a value was calculated using the following equation:

$\text{Log } K_p = -2.80 + 0.66 (\log K_{ow}) - 0.0056 (MW)$

Where:

K_{OW} = Octanol/water partition coefficient of the non-ionized species (dimensionless)

6.5.3.6 Dermal Contact with Surface Water

The construction worker and adolescent trespasser may be exposed to surface water while at the sites. The equation for the absorbed dose, according to USEPA (2004a) is as follows:

$$\text{Absorbed Dose (mg/Kg-day)} = \frac{DA_{event} \times EF \times ED \times EV \times SA}{BW \times AT}$$

Where:

DA_{event} = Absorbed dose per event (mg/cm^2 - event)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
EV = Event frequency (events/day)
SA = Skin surface area available for contact (cm^2)
BW = Body weight (Kg)
AT = Averaging time (period over which exposure is averaged -- days)

The absorbed dose per event (DA) was calculated as described in USEPA's "Supplemental Guidance for Dermal Risk Assessment," (USEPA, 2004a).

6.5.3.7 Evaluation of Lead Exposure

Lead was considered to be a COPC in surface soil, subsurface soil, ditch soil, and surface water at SEAD-121C, and in surface water at SEAD-121I. For the industrial worker, risk associated with lead was evaluated using the Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil (USEPA, 2003b). This adult lead model provides an assessment of non-residential exposure by relating soil lead intake to blood lead concentrations in women of childbearing age. Thus, while adult exposure is addressed by USEPA's analysis, the most sensitive receptor (i.e., the fetus) is being protected. The methodology focuses on estimating fetal blood lead levels in women exposed to site soils. The adult lead model was used to evaluate exposure to SEAD-121C surface soil and ditch soil by the industrial worker. It should be noted that the adult lead model is based on the assumption of continuing long term exposure. As construction workers are expected to work at the sites in short-term (i.e., 1 year), risk associated with lead exposure is expected to be minor and therefore not evaluated in this risk assessment.

For an adolescent trespasser, the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) developed by USEPA was used to evaluate receptor lead level via exposure to surface soil and ditch soil at SEAD-121C. The IEUBK model results, based on residential exposure assumptions, were used as a screening tool to evaluate potential risks for adolescent trespasser. The IEUBK windows version software package was developed based on the USEPA (1994) IEUBK Guidance Manual. The model utilizes four interrelated modules (exposure, uptake, biokinetic, and probability distribution) to estimate blood lead (PbB) levels in children exposed to lead-contaminated media.

For both models, the site-specific EPCs and central tendency exposure factors were used along with the default assumptions presented in the models to derive the lead level estimation for the receptors. Surface water at both sites has elevated levels of lead; however quantification of dermal exposure to lead from surface water could not be completed since a model is not available at this time to quantify risk due to contact with surface water. The exposure to surface water is expected to be infrequent and therefore potential risks are expected to be minor.

6.6 TOXICITY ASSESSMENT

The objective of the toxicity assessment is to weigh available evidence regarding the potential of the chemicals to cause adverse effects in exposed individuals, and to provide, where possible, an estimate of the relationship between the extent of exposure to a chemical and the increased likelihood and/or severity of adverse effects. The types of toxicity information considered in this assessment include the reference dose (RfD) and reference concentration (RfC) used to evaluate non-carcinogenic effects, and the slope factor and unit risk to evaluate carcinogenic potential. The toxicity values for this risk assessment were selected in accordance with the USEPA recommended human health toxicity value hierarchy. In a memorandum issued to Superfund Regions 1-10 National Policy Managers in December 2003, the USEPA Office of Solid Waste and Emergency Response (OSWER) provided a revised recommended human health toxicity value hierarchy as follows:

- Tier 1 – USEPA's IRIS

- Tier 2 – USEPA's Provisional Peer Reviewed Toxicity Values (PPRTVs) developed by the Office of Research and Development / National Center for Environmental Assessment (NCEA) / Superfund Health Risk Technical Support Center (STSC).

- Tier 3 – Other Toxicity Values from additional USEPA and non-EPA sources with priority given to those sources of information that are the most current, the basis for which is transparent and publicly available, and which have been peer reviewed.

For chemicals without toxicity values, it may be appropriate to generate a value by alternate methods. Such methods may include route-to-route extrapolation or use of toxicity values of chemicals that are related both chemically and toxicologically (e.g., evaluation of structure-activity relationships). For this assessment, no surrogate toxicity values were derived.

For the evaluation of carcinogenic PAHs, toxicity equivalency factors (TEFs) based on the toxicity of benzo(a)pyrene were used (USEPA 1993a). For cPAHs with incomplete toxicity data, slope factors were calculated using TEFs, which are values that compare the carcinogenic potential of a given chemical in a class to the carcinogenic potential of a chemical in the class that has a verified slope factor. USEPA has provided TEFs for cPAHs (USEPA, 1993a). TEF values are as follows:

PAH	TEF
Benzo(a)pyrene	1.0
Benzo(a)anthracene	0.1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Dibenzo(a,h)anthracene	1.0
Chrysene	0.001
Indeno(1,2,3-cd)pyrene	0.1

To calculate a slope factor for a given PAH the appropriate TEF value is multiplied by the slope factor for benzo(a)pyrene.

For the development of dermal toxicity values, information regarding gastrointestinal (GI) absorption efficiency for administered doses was used. Specifically, oral slope factors were converted to dermal slope factors by dividing by the GI absorption efficiency. Oral reference doses were converted to dermal reference doses by multiplying by the GI absorption efficiency. The derivation of the dermal toxicity values for this risk assessment is consistent with the USEPA (2004a) recommendation and the GI absorption efficiency recommended by USEPA in its Supplemental Guidance for Dermal Risk Assessment was used for the COPCs in this risk assessment. In the absence of any information on absorption for the substance or chemically related substances, an oral absorption efficiency of 100 percent was assumed in accordance with USEPA Region 2 guidance (personal communication between A. Schatz of Parsons and M. Maddeloni of EPA Region 2).

RfCs were converted to inhalation reference doses in units of milligrams of chemical per kilogram of body weight per day (mg/kg-day); similarly, inhalation unit risk factors were converted to inhalation slope factor in units of per milligrams of chemical per kilogram of body weight per day ((mg/Kg-day)$^{-1}$). The conversion was made by assuming an inhalation rate of 20 m^3/day and an adult body weight of 70 Kg. Thus:

$$\text{Inhalation slope factor (mg/kg-day)}^{-1} = UnitRisk\left(\frac{ug}{m^3}\right)^{-1} \times \frac{day}{20m^3} \times 70kg \times \frac{1000ug}{mg}$$

$$\text{Inhalation Reference Dose (mg/kg/day)} = RfC\left(\frac{mg}{m^3}\right) x \left(\frac{20m^3}{day}\right) x \left(\frac{1}{70kg}\right)$$

Chronic RfDs and RfCs are ideally based on chronic exposure studies in humans or animals. Chronic exposure for humans is considered to be exposure of roughly seven years or more, based on exposure of rodents for one year or more in animal toxicity studies. Construction workers and adolescent trespassers at the sites were assumed to be exposed to the contaminants at the sites for 1 year and 6 years, respectively; therefore, subchronic RfDs and RfCs would be appropriate to evaluate the non-carcinogenic threshold effects. For this risk assessment, chronic RfDs and RfCs were used to conservatively assess risks for these receptors.

The toxicity factors used in this evaluation are summarized in **Tables 6-11A, 6-11B, 6-11C,** and **6-11D**.

6.7 RISK CHARACTERIZATION

To characterize risk, toxicity and exposure assessments were summarized and integrated into quantitative expressions of risk. To characterize potential non-carcinogenic effects, comparisons were made between estimated intakes of substances and toxicity values. To characterize potential carcinogenic effects, probabilities that an individual will develop cancer over a lifetime of exposure were evaluated from estimated intakes and chemical-specific dose-response information.

6.7.1 Non-carcinogenic Effects

The potential for non-carcinogenic effects is evaluated by comparing an exposure level over a specified period with an RfD derived for a similar exposure period. This ratio of exposure to toxicity is called a hazard quotient according to the following equation:

$$\textit{Noncancer Hazard Quotient (HQ)} = I/RfD$$

Where:
I = Intake or Absorbed Dose (mg/Kg-day)
RfD = Reference Dose (mg/Kg-day)

The non-cancer hazard quotient assumes that there is a level of exposure (i.e., an RfD) below which it is unlikely for even sensitive populations to experience adverse health effects. If the intake or absorbed dose exceeds the threshold (i.e., If I/RfD exceeds 1), there may be concern for potential non-cancer effects.

To assess the overall potential for non-carcinogenic effects posed by more than one chemical, a hazard index (HI) approach has been developed by the USEPA. This approach assumes that simultaneous sub-threshold exposures to several chemicals could result in an adverse health effect. It also assumes that the magnitude of the adverse effect will be proportional to the sum of the ratios of the subthreshold exposures to respective acceptable exposures.

This is expressed as:

$$HI = I_1/RfD_1 + I_2/RfD_2 + ... + I_i/RfD_i$$

Where:

I_i = the Intake or absorbed dose of the i^{th} COPC, and

RfD_i = the reference dose for the i^{th} COPC.

While any single chemical with an exposure level greater that the toxicity value will cause the HI to exceed one, for multiple chemical exposures, the HI can also exceed one even if no single chemical exposure exceeds its RfD. The assumption of dose additivity reflected in the HI is best applied to compounds that induce the same effects by the same mechanisms. Applying the HI to cases where the known compounds do not induce the same effect may overestimate the potential for effects. To assess the overall potential for non-carcinogenic effects posed by several exposure pathways, the total HI for chronic exposure is the sum of the HI's for each pathway, for each receptor.

6.7.2 Carcinogenic Effects

For carcinogens, risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the potential carcinogen (i.e., excess individual lifetime cancer risk). The slope factor converts estimated daily intakes or absorbed dose averaged over a lifetime of exposure directly to incremental risk of an individual developing cancer. It can generally be assumed that the dose-response relationship will be linear in the low-dose portion of the multistage model dose-response curve. Under this assumption, the slope factor is a constant, and risk will be directly related to intake. Thus, the following linear low-dose equation was used in this assessment:

$$\text{Risk} = \text{CDI} \times \text{SF}$$

Where:

Risk = A unitless probability of an individual developing cancer,

CDI = Chronic Daily Intake over 70 years (mg/Kg-day), and

SF = Slope Factor $(\text{mg/Kg-day})^{-1}$

For simultaneous exposure to several carcinogens, the USEPA assumes that the risks are additive. That is to say:

$$\text{Risk}_T = \text{Risk1} + \text{Risk2} + ... + \text{Risk}_i$$

Where:

Risk_T = Total cancer risk, expressed as a unitless probability, and

Risk_i = Risk estimate for the i^{th} COPC.

Addition of the carcinogenic risks is valid when the following assumptions are met:

- doses are low,
- no synergistic or antagonistic interactions occur, and
- similar endpoints are evaluated.

According to guidance in the National Contingency Plan, the target overall lifetime carcinogenic risks from exposures for determining clean-up levels should range from 10^{-4} to 10^{-6}.

6.7.3 Risk Characterization for Lead Exposure

Risk characterization for lead exposure was conducted based on a comparison between the estimated blood lead level and the target PbB level of concern. Blood lead level was estimated based on the USEPA IEUBK model or the Adult Lead Model. The target PbB level of concern is 10.0 ug/dL for child (USEPA, 1994, 2003b).

6.7.4 Risk Summary

Human health risks were calculated for the construction worker, industrial worker, and adolescent trespasser from exposure to soil, ditch soil, and surface water at SEAD-121C, and from surface soil, ditch soil, and surface water at SEAD-121I. The risks via various exposure routes were summed up to represent the total risks for the receptors for the scenarios in the table below.

Summary of the Exposure Scenarios		
Exposure Scenarios	**Receptor**	**Exposure Routes**
SEAD-121C soil and groundwater exposure	Industrial Worker	Ingestion, inhalation, and dermal contact to soil; and intake of groundwater
	Construction Worker	Ingestion, inhalation, and dermal contact to soil; intake of groundwater; and dermal contact to groundwater
	Adolescent Trespasser	Ingestion, inhalation, and dermal contact to soil; and intake of groundwater
SEAD-121C ditch soil, surface water, and groundwater exposure	Industrial Worker	Ingestion, inhalation, and dermal contact to ditch soil; and intake of groundwater
	Construction Worker	Ingestion, inhalation, and dermal contact to ditch soil; intake of groundwater; and dermal contact to groundwater and surface water
	Adolescent Trespasser	Ingestion, inhalation, and dermal contact to ditch soil; intake of groundwater; and dermal contact to surface water
SEAD-121I soil and groundwater exposure	Industrial Worker	Ingestion, inhalation, and dermal contact to soil
	Construction Worker	Ingestion, inhalation, and dermal contact to soil
	Adolescent Trespasser	Ingestion, inhalation, and dermal contact to soil
SEAD-121I ditch soil, surface water, and groundwater exposure	Industrial Worker	Ingestion, inhalation, and dermal contact to ditch soil
	Construction Worker	Ingestion, inhalation, and dermal contact to ditch soil; and dermal contact to surface water
	Adolescent Trespasser	Ingestion, inhalation, and dermal contact to ditch soil; and dermal contact to surface water

The risk results for the above scenarios are presented in **Tables 6-12A** and **6-12B**. For each scenario, both the RME and CT values are presented. The risk calculation tables for each exposure route are presented in **Appendix E** for SEAD-121C soil, ditch soil, groundwater, and surface water exposure, and in **Appendix F** SEAD-121I surface soil, ditch soil, and surface water exposure. The following sections summarize the risk characterization results for SEAD-121C, SEAD-121I, and lead exposure.

6.7.4.1 SEAD-121C

Human health risks were calculated for the construction worker, industrial worker, and adolescent trespasser from exposure to soil, ditch soil, groundwater, and surface water at SEAD-121C. The potential risks due to the exposure pathways are summed up for each receptor (shown in **Table 6-12A**). For all receptors, risks were calculated for two exposure scenarios: 1) exposure to soil and groundwater, and 2) exposure to ditch soil, surface water (except industrial worker), and groundwater. The risks calculated for these two scenarios provide a range of potential risks resulted from any combinations of soil and ditch soil exposure at the site. **Table 6-12A** summarizes the cancer and non-cancer risks for all receptors and exposure routes corresponding to SEAD-121C soil, ditch soil, groundwater, and surface water exposure. The results for both the RME and CT scenarios are presented. The risk calculation tables for each exposure route are presented in **Appendix E**.

At the DRMO Yard all total hazard indices calculated are less than 1, and the total cancer risks found for each receptor are less than 10^{-4}. The hazard indices and cancer risks are summarized in **Table 6-12A** and in the table below.

SEAD-121C RME Non-Cancer Hazard Index & Cancer Risk		
Receptor	**Non-Cancer Hazard Index**	**Cancer Risk**
Industrial Worker (Soil)	0.4	3.E-05
Industrial Worker (Ditch Soil)	0.02	1.E-06
Construction Worker (Soil)	0.8	2.E-06
Construction Worker (Ditch Soil)	0.3	7.E-07
Adolescent Trespasser (Soil)	0.03	3.E-07
Adolescent Trespasser (Ditch Soil)	0.03	1.E-07

The cancer risks for all receptors based on the RME scenario are below the USEPA upper limit of $1x10^{-4}$. The cancer risk values for the industrial worker and the construction worker are a result of ingestion of soil and dermal contact to soil, and the major contributors are cPAHs, most significantly benzo(a)pyrene, and arsenic.

Risk due to exposure to groundwater is not expected to be significant, since no COPCs were identified during the screening process.

The total cancer risks and non-cancer hazard indices based on the CT scenario for all receptors are within the EPA target range (i.e., total non-cancer hazard indices below 1 and total cancer risks below $1x10^{-4}$).

6.7.4.2 SEAD-121I

Table 6-12B summarizes the cancer and non-cancer risks for all receptors and exposure pathways for both the RME and CT scenarios. The risk calculation tables for each exposure route are presented in **Appendix F**.

At SEAD-121I, the total non-cancer risks for the industrial worker and the construction worker are above the EPA limit of 1 as shown in **Table 6-12B** and in the summary table below.

SEAD-121I RME Non-Cancer Hazard Index & Cancer Risk		
Receptor	**Non-Cancer Hazard Index**	**Cancer Risk**
Industrial Worker (Soil)	30	7.E-05
Industrial Worker (Ditch Soil)	3	2.E-05
Construction Worker (Soil)	200	8.E-06
Construction Worker (Ditch Soil)	20	1.E-05
Adolescent Trespasser (Soil)	0.6	9.E-07
Adolescent Trespasser (Ditch Soil)	0.08	1.E-06

The cancer risks for the RME scenario are below the USEPA upper limit of $1x10^{-4}$ for all receptors. The hazard indices for the adolescent trespasser are within the USEPA limits. For the industrial worker and construction worker, the RME hazard indices for soil exposure are one order of magnitude greater than the hazard indices for ditch soil exposure, but both are above the USEPA limit.

The elevated hazard indices for the industrial worker were caused by inhalation of dust in ambient air from soil, ingestion of soil, and inhalation of dust in ambient air from ditch soil. For the construction worker the major pathways contributing to the hazard indices were inhalation of dust in ambient air from soil, ingestion of soil, dermal contact to soil, inhalation of dust in ambient air from ditch soil, and ingestion of ditch soil. The significant contributing COPC to all non-cancer risk for all receptors and exposure pathways is manganese. Arsenic also contributed to 27% of the non-cancer risk to the construction worker from ingestion of ditch soil. **Table 6-13** presents the contribution of major COPCs to hazard indices greater than 1.

6.7.4.3 Lead Risk Characterization Results

At SEAD-121C, lead was identified as a COPC in surface soil, subsurface soil, ditch soil, and surface water. At SEAD-121I lead was retained as a COPC in surface water. This section presents the results of the quantitative and qualitative assessment of the risk via lead exposure at SEAD-121C and SEAD-121I.

SEAD-121C Soil

The central tendency exposure factors for industrial workers were used to evaluate potential risks associated with lead in soil. That is, the industrial worker was assumed to accidentally intake 50 mg soil each day while working at the site for 219 days each year. This assumption is consistent with the default assumptions used in the adult lead model (USEPA, 2003b).

Lead risk characterization results for surface soil exposure for the industrial worker at SEAD-121C are presented in **Table E-8A**. The 95th percentile PbB among fetuses of adult industrial workers are 7.8 and 9.8 ug/dL, assuming a homogeneous and a heterogeneous population, respectively. Both estimates are below the USEPA target PbB level of concern (i.e., 10 ug/dL). Therefore, lead in SEAD-121C soil is not expected to pose potential risks to industrial workers or their fetuses, if any. It should be noted that the adult lead model is based on the assumption of continuing long term exposure. As construction workers are expected to work at the site in short-term (i.e., 1 year), risk associated with lead exposure is expected to be minor and therefore not evaluated in this risk assessment.

The IEUBK model results, based on residential child exposure assumptions, were used as a screening tool to evaluate potential risks associated with lead in SEAD-121C soil for adolescent trespassers. The results are presented in **Table E-8B**. It should be noted that the results can only be used as a screening tool as the exposure frequency for the adolescent trespasser is much less than the residential child. In addition, a child receptor is considered more sensitive than an adolescent receptor. As shown in **Table E-8B**, the 95th percentile PbB levels among residential children are below the USEPA target PbB level of concern (i.e., 10 ug/dL). Therefore, it is concluded that lead in SEAD-121C surface soil does not pose a health risk to the adolescent trespasser receptor.

SEAD-121C Ditch Soil

The lead risk characterization results for SEAD-121C ditch soil exposure are presented in **Tables E-9A** for the industrial worker. The 95th percentile PbB levels among fetuses of adult industrial worker are 5.2 and 6.8 μg/dL, assuming a homogeneous and a heterogeneous population, respectively. Both estimates are below the USEPA target PbB level of concern (i.e., 10 μg/dL). As the 95th percentile PbB levels among the industrial workers are below the USEPA target PbB level of concern (i.e., 10 μg/dL), it is concluded that lead in SEAD-121C ditch soil does not pose a health risk to the industrial worker receptors. Although potential risks from lead in SEAD-121C ditch soil were not evaluated for construction workers, construction workers are expected to work at the site in short-term (i.e., 1 year). Therefore, risk associated with lead exposure is expected to be minor.

The IEUBK model results, based on residential child exposure assumptions, were used as a screening tool to evaluate potential risks associated with lead in SEAD-121C ditch soil for adolescent trespassers. The results are presented in **Table E-9B**. It should be noted that the results can only be used as a screening tool as the exposure frequency for the adolescent trespasser is much less than the residential child. In addition, a child receptor is considered more sensitive than an adolescent receptor. As shown in **Table E-9B**, the 95th percentile PbB levels among residential children are below the USEPA target PbB level of concern (i.e., 10 ug/dL). Therefore, it is concluded that lead in SEAD-121C ditch soil does not pose a health risk to the adolescent trespasser receptor.

As mentioned in **Section 6.5.3.7**, a quantitative evaluation of dermal exposure to lead in surface water at SEAD-121C and SEAD-121I was not conducted as a reliable model is not available at this time to quantify risk due to contact with surface water. However, the ditches at the sites are dry most of the time and contact with surface water is not frequent by any receptors; therefore, risk associated with dermal exposure to lead in surface water is expected to be minor.

6.8 UNCERTAINTY ANALYSIS

All risk assessments involve the use of assumptions and professional judgments to varying degrees. This results in uncertainty in the final estimates of risk. There are uncertainties associated with each component of the risk assessment from data collection through risk characterization. The qualitative evaluation of uncertainty associated with the four major steps (site characterization and data evaluation, exposure assessment, toxicity assessment, and risk characterization) of the risk assessment is discussed below in **Sections 6.8.1** through **6.8.4**. **Section 6.8.5** presents a quantitative evaluation of uncertainty associated with the COPC screening approach and specific exposure assumptions.

6.8.1 .Uncertainty in Site Characterization and Data Evaluation

The baseline human health risk assessment was conducted based on total soil, ditch soil, and surface water data available from SEAD-121C and SEAD-121I. Groundwater data collected using low flow sampling techniques at SEAD-121C was used in the human health risk assessment. At SEAD-121C, approximately 70 soil samples, ten ditch soil samples, six groundwater samples, and ten surface water samples were included in the baseline human health risk assessment. At SEAD-121I, over 50 surface soil and ditch soil samples, and eight surface water samples were included in the baseline human health risk assessment. The samples were collected biased toward overestimation of chemical concentrations at the sites. The size of the soil samples and the biased sampling approach indicate the uncertainty associated with site characterization is low.

Uncertainty in contaminant identification is considered low because generally full suite of CLP target compounds including VOCs, SVOCs, PCBs, pesticides, and metals were analyzed for the samples. Reasonable certainty also is assumed because of the sample data validation and quality assurance/quality control (QA/QC) procedures applied to sample analysis and data evaluation.

Chemicals were screened against USEPA Region 9 PRGs or other appropriate screening values and only those with the maximum detected concentrations exceeding the screening values were included in the risk characterization. As a conservative step, the Region 9 PRGs for the residential scenario were used for screening SEAD-121C and SEAD-121I data, even though the planned future use for both of these sites is industrial / office development and warehousing.

Region 9 PRGs are derived based on direct contact exposure (i.e., ingestion and dermal contact for soil and intake and inhalation for tap water) and a target cancer risk of $1x10^{-6}$ or a target hazard quotient of 1, whichever is lower. Therefore, the COPC screening conducted for this risk assessment might underestimate potential risks for the following reasons: 1) using a PRG corresponding to a hazard quotient of 1 may screen out COPCs that might contribute significantly to the total risks; and 2) using this approach may screen out COPCs that might contribute significantly to the total risks via exposure pathways not covered under the Region 9 PRG calculation. However, as the exposure pathways covered under the Region 9 PRG calculation are normally the most significant risk-contributing exposure pathways, this latter reason is not expected to significantly impact the results.

To evaluate the uncertainty associated with the first reason, the Army repeated the COPC screening process and compared the maximum detected concentrations with the Region 9 PRGs corresponding to a target cancer risk of 1×10^{-6} or a target hazard quotient of 0.1, whichever is lower. Due to this modification, several additional COPCs, all metals, were identified for each affected medium. The risk calculation was re-performed to include the additional COPCs. The COPC screening and risk calculation results along with a detailed discussion of the risk results are presented in **Appendix I** and are summarized in **Section 6.8.5, below**. In summary, the revised COPC screening approach does not change the overall risk assessment conclusion for the sites.

6.8.2 Uncertainty in Exposure Assessment

Factors that can contribute to uncertainty in the exposure assessment include identification and evaluation of exposure pathways, assumptions for exposure scenario development, exposure parameters and derivation of exposure point concentrations.

The potential exposure pathways and receptors were identified based on the current and foreseeable future land use at the sites and other site-specific conditions. To the extent possible, receptors and exposure parameters were identified based on conservative (i.e., health protective) assumptions. For example, the future receptors were assumed to drink groundwater. Logically, it is extremely unlikely that this will occur since there is currently an acceptable potable water supply in the PID area that does not draw from the local groundwater. Further, data exists that suggests that the aquifer beneath the sites is not productive enough to supply the drinking water needs at the sites. Therefore, this assumption yields an overestimate of risk for this scenario.

Values assumed for exposure parameters (e.g., soil ingestion rate, inhalation rate, and exposure frequencies) used in calculations for intakes are based primarily on USEPA guidance. These assumptions may result in underestimating or overestimating the intakes for specific receptors, depending on the accuracy of the assumptions relative to actual site conditions and uses. For the scenarios in this risk assessment, upper bound values were selected for each exposure factor for the RME scenario. In the calculations of exposure, these multiple upper-bound exposure factor estimates compound to yield intakes and absorbed doses that likely overestimate exposure levels.

A 14 days/year exposure frequency was selected for the adolescent trespasser based on best professional judgment and knowledge of site-specific conditions. Specific factors considered included:

- the Depot is situated in a sparsely populated rural area;
- the Depot is fenced to limit access and is occasionally patrolled by site security personnel;
- the two sites are remotely located (300 – 5000 feet away) from the main entrance to the Depot;
- SEAD-121C and SEAD-121I are both located in close proximity to the Army's current office locations;
- SEAD-121I is located in an area where current warehousing operations are performed;
- both sites are typified as relatively open and generally flat; and,
- the setting of SEAD-121C/121I is generally similar to the surrounding areas and there are no specific features (e.g., vehicles, buildings, towers, culverts, etc.) that would attract special attention from potential adolescent trespassers.

Therefore, trespassing at SEAD-121C/121I is considered unlikely to occur frequently or for extended periods without individuals being challenged or noticed. On this basis, a 14 days/year exposure frequency is considered a reasonable assumption for the sites. Nonetheless, an elevated exposure frequency, 50 days/year (equivalent to two days a week for 25 weeks or approximately half a year), was also evaluated for the uncertainty analysis and is summarized in **Section 6.8.5.** In summary, even if the exposure frequency were increased from 14 days/year to 50 days/year, there would be no significant risks to the potential adolescent trespasser.

The exposure point concentrations used to calculate site-related risks were the 95% UCL, or other appropriate UCL recommended by USEPA, of the sample data's mean. This is a conservative approach which tends to overstate potential risks. The EPCs derived from the measured chemical concentrations are assumed to persist without change for the entire duration of each exposure scenario. It is likely that some degradation would occur over time, particularly for some of the organic compounds, which would reduce the current concentrations. Therefore, this steady state assumption tends to overestimate exposure levels.

A USEPA recommended model was used to calculate EPCs based on emissions from truck traffic on unpaved roads to estimate EPCs in ambient air from soil dust for a construction worker. The EPCs estimated using this model may overestimate the EPCs as dust caused by wind erosion and other construction activities such as soil excavation and loading are expected to be lower than those caused by emission from truck traffic on unpaved roads.

The USEPA IEUBK model assuming a child resident was used as a screening tool for adolescent trespasser, who is exposed infrequently at the sites. The model results tend to overestimate potential risks for the adolescent trespasser and therefore were only used as a screening tool for the adolescent trespasser.

Default dermal absorption values recommended by USEPA (2004a) were used for this risk assessment. Because various factors affect the efficiency of dermal absorption, there is considerable uncertainty associated with these values. For example, some of the default dermal absorption values are based on studies of dermal absorption of metals in aqueous solutions; dermal uptake of metals in soil is likely to be lower. In addition, many compounds are only absorbed through the skin after a long exposure duration (i.e., >24 hours). Since most individuals bathe at least once each day, washing may remove any soil residues adhering to the skin before absorption can occur. Therefore, dermal absorption rates based on studies with long exposure durations may overestimate actual absorption. As an example, the default dermal absorption value for PAHs may overstate potential risks associated with dermal exposure to soil. In contrast with the default value of 13%, which is based on a single data set, the dermal absorption value of 2%, as recommended by Magee *et al*. (1996), is a point estimate based on four different data sets, including the *in vivo* data from Wester *et al*. (1990); human *in vitro* data also from Wester *et al*.; as well as *in vivo* and *in vitro* data in rats, from Yang *et al*., (1989, as cited in Magee *et al*., 1996). Because no single study is ideal for estimating dermal absorption, it seems appropriate to base dermal absorption on several data sets, each of which seem equally suited for a deriving dermal absorption factor.

6.8.3 Uncertainty in Toxicity Assessment

Uncertainty is inherent in the toxicity values used in characterizing the carcinogenic and noncarcinogenic risks. Such uncertainty is chemical-specific and is incorporated into the toxicity value during its development. For example, an uncertainty factor may be applied for interspecies and intrahuman variability, for extrapolation from subchronic to chronic exposures, and/or for epidemiological data limitations. Most cancer slope factors are calculated using a model that extrapolates low dose effects from high dose animal studies. Because toxicity constants are generally based on the upper limit of the 95th-percentile confidence interval or incorporate safety factors to compensate for uncertainty, chemical-specific risks may be overestimated. In addition, chronic toxicity values were used to evaluate subchronic non-cancer risks in this baseline risk assessment due to the general lack of subchronic toxicity values. This practice will potentially overstate risks for the construction worker and the adolescent trespasser.

Toxicity values may not be available for some COPCs, thereby precluding their inclusion in the quantitative risk estimates. The resulting risk estimates will not include the chemical-specific risks from these chemicals, and, therefore, may underestimate risk. Risks associated with exposure to iron were assessed using the toxicity value (RfD) developed by USEPA National Center for Environmental Assessment (NCEA). The toxicity value has not yet been adopted by USEPA IRIS database or the PPRTV database. Risks associated with exposure to PAHs were assessed using the TEF approach. The potential hazards/risks associated with these chemicals may be uncertain.

Toxicity information was not available for dermal exposure. This is due to the lack of scientific studies available to quantify dermal toxicity and carcinogenic potential for the vast majority of priority pollutants and because chemical specific information needed to convert ingested dose to absorbed dose is not available. In accordance with the USEPA (2004a) guidance, oral toxicity values were used with adjustment to derive dermal toxicity values. The dermal toxicity value developed using this approach may result in over or under estimation of potential risks associated with dermal exposure.

6.8.4 Uncertainty in Risk Characterization

Some of the procedures used and uncertainties inherent in the human health risk characterization process may tend to underestimate or overestimate potential risk. The summing of hazard quotients (HQs) for all COPCs represents a conservative approach because the reference dose (or the reference concentration) for a given COPC for a given pathway is calculated for a certain toxicological end-point (*e.g.*, liver, kidneys, etc.). To calculate an accurate estimate of potential non-carcinogenic health risks, HQs with the same toxicological endpoints should only be summed. Therefore, the risks calculated by summing the HQs for all COPCs are likely overstated. On the other hand, the assumption of additivity does not allow for potential synergistic or antagonistic effects of various chemicals, which may result in an underestimation or overestimation of risk, respectively.

On March 29, 2005 the EPA issued two final guidance documents: “Guidelines for Carcinogen Risk Assessment” and “Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens”. The new risk guidance reflects the EPA’s current procedure for assessing cancer risk. The supplemental document deals specifically with assessing the health impact from early-life exposure. This final guidance document recommends adjusting the potency factor (e.g., cancer slope factor) for carcinogens acting through a mutagenic mode of action to address early-life exposure. A default 10-fold adjustment is proposed to apply for the first 2 years of life and a 3-fold adjustment is proposed to apply for ages after 2 through 16. According to the supplemental guidance, benzo(a)pyrene and dibenz(a,h)anthracene are associated with a mutagenic mode of action for carcinogenesis. For the uncertainty analysis, risks for trespasser (ages 11-16 yr) were evaluated based on the adjusted oral cancer slope factor for benzo(a)pyrene and dibenz(a,h)anthracene (i.e., three times of the value listed in IRIS). The cancer risks for the adolescent trespasser would still be less than 10^{-4} if the adjusted cancer slope factor were used. Due to limited information of mode of action, default adjustment was not conducted for the other carcinogens. As benzo(a)pyrene and dibenz(a,h)anthracene are the predominant cancer contributor at the site, the uncertainty associated with not adjusting for early-life exposure is not expected to impact the risk results.

6.8.5 Quantitative Uncertainty Analysis

The risk assessments were re-performed for SEAD-121C and SEAD-121I under the RME scenario with the following revised approach/assumptions to evaluate associated uncertainty.

- The COPC screening was conducted by comparing the maximum detected concentrations with Region 9 PRGs corresponding to a target cancer risk of $1x10^{-6}$ or a target hazard quotient of 0.1, whichever is lower; and

- Risk assessment was repeated for an elevated exposure frequency of 50 days/year for the adolescent trespasser (ages 11-16 yr).

The modified risk results are presented and discussed in detail in **Appendix I**. This section summarizes the risk results and potential impact to the human health risk assessment conclusion caused by the COPC screening revision. In summary, the above approach and assumption revisions do not impact the overall risk assessment conclusions at the sites. Although elevated non-cancer risks were identified for construction workers exposed to COPCs in the impacted mediums at SEAD-121C, the risks were caused by background metal levels at the site and groundwater intake. Elevated non-cancer risks were identified for industrial workers, construction workers, and adolescent trespassers with elevated exposure frequency (i.e., 50 days/year) who may potentially be exposed to COPCs in the impacted mediums at SEAD-121I, the risks were caused by manganese and iron associated with the ore piles and background metal levels at the site. Once the strategic materials at SEAD-121I and their associated residues are removed by the DoD, and with the recommended institutional control (i.e., restriction of groundwater use and access and prohibition of residential housing, school, childcare facility and playground development) in place for the sites, the sites would not pose unacceptable risks to human health.

6.9 COC IDENTIFICATION

This section presents the COC identification based on the human health risk assessment results.

6.9.1 SEAD-121C Soil, Groundwater, and Surface Water

As discussed in **Section 6.7.4.1**, the total cancer risks and non-cancer hazard indices based on the RME and CT scenarios for all receptors with exposure to SEAD-121C surface soil, ditch soil, and surface water are within the USEPA target range (i.e., total non-cancer hazard indices below 1 and total cancer risks below $1x10^{-4}$). No COPCs were identified in groundwater at the DRMO Yard during the screening process. Therefore, no COCs were identified for any media at SEAD-121C.

Since concentrations detected in the groundwater at the DRMO Yard were below screening levels, risk due to exposure to groundwater is expected to be minimal. Data from SEAD-27 (Building 360), which is adjacent to the DRMO Yard, was collected from three sampling points (two wells and a T-sump) immediately upgradient of the DRMO Yard wells (refer to **Figures 4-19**). The risks identified at SEAD-27 (Building 360) are covered in a separate document, "Final ROD for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" (Parsons, 2004) and a groundwater use restriction has been placed on the groundwater at this site. Since SEAD-27 (Building 360) is in close proximity to the DRMO Yard, the potential risk due to intake of groundwater (for all receptors) and dermal contact to groundwater (for the construction worker) was calculated using the low flow groundwater data at SEAD-121C and SEAD-27 (Building 360). **Table 6-14A** presents the risk from ingestion of groundwater at SEAD-27 (Building 360) and SEAD-121C. The hazard index for all three receptors is greater than 1 due to the presence of iron in the samples collected from the T-sump in Building 360. **Table 6-14C** shows that the potential risk due to dermal contact to groundwater has a hazard quotient less than 1 and a cancer risk value of 2×10^{-9}. While risk from groundwater intake is identified for this combined data set, it is noted that the contaminants leading to this risk were detected at SEAD-27 (Building 360) and were absent from all permanent wells located in the DRMO Yard. This suggests that the contaminants and associated risk are limited to SEAD-27 (Building 360) and have not migrated to downgradient wells. The results of the risk calculation based on SEAD-27 (Building 360) and SEAD-121C low flow data confirms the need for a groundwater use restriction at SEAD-27 (Building 360), which is already in place as a result of the IC ROD (Parsons, 2004). In addition, risk to residential children due to contact with lead in the groundwater was evaluated using the IEUBK model, and the results indicated that there was no risk from lead exposure.

As discussed in **Section 6.7.4.4**, the lead levels in SEAD-121C surface soil and ditch soil do not pose a health risk to the receptors. Therefore, lead should not be considered as a COC at the site.

As stated previously, ditch soils were treated as surface soil, which assumed that the soils were dry. Site observations indicated that some of the drainage ditches at SEAD-121C was occasionally wet during portions of the year. Wet soils adhere to skin more than dry soil, so the exposure scenario would be different for dermal contact to soil. As a conservative estimate, Parsons reran the risk assessment assuming that all ditch soils were wet in order to evaluate potential risk in this worst-case scenario. At SEAD-121C potential risk due to dermal contact to ditch soils was re-calculated by adjusting the adherence factor to 1. A comparison of hazard quotients and cancer risk values for dermal contact to dry ditch soil and wet ditch soil is presented in **Table 6-15**. The table shows that even using the conservative and unrealistic assumption that all ditch soil is wet does not cause hazard quotients to exceed 1 or cancer risk values to exceed 10^{-4}. Therefore, even in an unrealistic scenario where ditch soil at SEAD-121C was always wet, the potential for risk is below USEPA guidance levels.

6.9.2 SEAD-121I Soil and Surface Water

As discussed in **Section 6.7.4.2**, the total cancer risks based on the RME and CT scenarios are below the USEPA upper target limit ($1x10^{-4}$) for all the receptors with exposure to SEAD-121I surface soil, ditch soil, and surface water.

The total non-cancer hazard indices based on the RME for the industrial worker and construction worker are above the USEPA target limit of 1, due to inhalation, intake, and dermal exposure to surface soil or ditch soil. Inhalation of dust generated from surface soil or ditch soils posed the greatest hazard risk for the industrial worker and construction worker.

SEAD-121I Contributing Pathways to Risk

Receptor	Pathway	% Contributing to RME Total Non-Cancer Hazard Index
Industrial Worker	Inhalation of Dust (Soil)	82%
	Ingestion of Soil	16%
	Inhalation of Dust (Ditch Soil)	94%
Construction Worker	Inhalation of Dust (Soil)	91%
	Ingestion of Soil	9%
	Dermal Contact to Soil	1%
	Inhalation of Dust (Ditch Soil)	86%
	Ingestion of Ditch Soil	13%

Manganese was the major contributor to the non-cancer risk. Strategic stockpiles of ferrous-manganese ore are staged at SEAD-121I. The levels of manganese detected at SEAD-121I are associated with the ore piles. Once the time when the Strategic Stockpiles are removed, residues associated with the historic stockpiling activities will be addressed by the DoD through the authority responsible for management of the piles. Therefore, manganese is not considered a COC at SEAD-121I.

6.10 COMPARISON OF CHEMICALS DETECTED IN SITE SAMPLES TO ARARS

USEPA (1989) guidance dictates that all chemicals detected in site media be compared to applicable or relevant and appropriate requirements (ARARs) at a site. Although a contaminant may not be identified as a COC from the risk assessment, it may exceed an ARAR and, therefore, should be evaluated in the HHRA. A discussion of the ARARs and TBCs identified for the sites is presented in **Section 4**. No ARARs were identified for soil and NYSDEC (1998 with addendum) Ambient Water Quality Standards [Technical Operating Guidance (TOGS), 1.1.1, Class GA Standards] were identified as ARARs for groundwater and surface water at the sites. The NYSDEC TAGMs were identified as TBC for soil at the sites. An evaluation of the data compared with the ARARs and TBCs is presented in **Section 4** of this report. In brief, PAH concentrations in soil exceeded the TAGM values in various sample locations. Concentrations of various metals in soil were above the TAGM values. Various metals in groundwater had concentrations above the NYS Groundwater Standards. None of these constituents were identified as COCs based on the baseline human health risk assessment. That is, the concentrations of these constituents in soil did not result in a derived risk or hazard greater than the USEPA target limits.

6.11 SUMMARY AND CONCLUSIONS

Risks to the three receptors identified for SEAD-121C and SEAD-121I based on the current and future use of the sites (i.e., industrial worker, construction worker, and adolescent trespasser) via exposure to surface soil, subsurface soil, ditch soil, groundwater, and surface water at SEAD-121C; and exposure to surface soil, ditch soil, and surface water at SEAD-121I were evaluated in accordance with the USEPA RAGS. The baseline risk assessment results associated with exposure to the following scenarios are summarized in this section:

SEAD-121C

- exposure to surface soil (inhalation, ingestion, and dermal contact) for all receptors; and subsurface soil (inhalation, ingestion, and dermal contact) for the construction worker.
- exposure to ditch soil (inhalation, ingestion, and dermal contact) and dermal contact to surface water for the construction worker and adolescent trespasser.
- exposure to surface water via dermal contact was evaluated for the construction worker and adolescent trespasser.
- exposure to groundwater was not evaluated since no COPCs were identified.

SEAD-121I

- exposure to surface soil (inhalation, ingestion, and dermal contact) for all receptors.
- exposure to ditch soil (inhalation, ingestion, and dermal contact) and dermal contact to surface water for the construction worker and adolescent trespasser.
- exposure to surface water via dermal contact was evaluated for the construction worker and adolescent trespasser.
- exposure to groundwater was not evaluated since no COPCs were identified.

6.11.1 SEAD-121C Soil and Surface Water Exposure

A summary of the risk assessment results for exposure to SEAD-121C surface and subsurface soil, ditch soil, and surface water is presented below.

Risks Based on RME Scenario SEAD-121C Soil and Surface Water Exposure				
Receptor	**Hazard Index for Soil**	**Cancer Risk for Soil**	**Hazard Index for Ditch Soil**	**Cancer Risk for Ditch Soil**
Industrial Worker	0.4	3.E-05	0.02	1.E-06
Construction Worker	0.8	2.E-06	0.3	7.E-07
Adolescent Trespasser	0.03	3.E-07	0.03	1.E-07

USEPA target limits: cancer risk of 10^{-6} – 10^{-4}; hazard index of 1

The total cancer risks and non-cancer hazard indices based on the RME and CT scenarios for all receptors were within the USEPA target range (i.e., cancer risks below 10^{-4} and hazard indices below 1), summarized in **Table 6-12A**. In addition, lead in surface soil and ditch soil is not expected to pose significant risks to the receptors at the sites. Therefore, media at SEAD-121C pose no risks to potential human receptors and no COCs were identified for soils, ditch soils, groundwater, or surface water at SEAD-121C.

6.11.2 SEAD-121I Soil and Surface Water Exposure

A summary of the risk assessment results for receptors exposed to SEAD-121I surface soil, ditch soil, and surface water is presented below.

Risks Based on RME Scenario SEAD-121I Soil and Surface Water Exposure				
Receptor	**Hazard Index for Soil**	**Cancer Risk for Soil**	**Hazard Index for Ditch Soil**	**Cancer Risk for Ditch Soil**
Industrial Worker	30	7.E-05	3	2.E-05
Construction Worker	200	8.E-06	20	1.E-05
Adolescent Trespasser	0.6	9.E-07	0.08	1.E-06

USEPA target limits: cancer risk of 10^{-6} – 10^{-4}; hazard index of 1

The total cancer risk based on the RME and CT scenarios for all receptors exposed to surface soil, ditch soil, and surface water at SEAD-121I are within the EPA target range. The total non-cancer risk based on the RME and CT scenarios for the industrial worker and construction worker are above the USEPA target range, summarized in **Table 6-12B**. Exposure to dust generated from either the surface soil or ditch soil may pose a non-cancer hazard to the industrial worker and construction worker. Manganese is the COPC contributing to the elevated hazard index. **Table 6-13** summarizes the contributing COPCs and exposure route that generate risk to human health. The manganese detected in the soils was a result of the strategic ferrous-manganese ore piles. Therefore, manganese is not a COC and no other COCs have been identified in the risk assessment for surface soil, ditch soil, groundwater, or surface water at SEAD-121I.

In addition, lead in SEAD-121I surface soil or ditch soil does not pose a health risk to the receptors. Therefore, the surface soil and ditch soil do not pose significant risks to potential human receptors.

6.11.3 Conclusion

The Army intends to place institutional controls in the form of land use restrictions on the PID parcel and these restrictions would eventually apply to SEAD-121C and SEAD-121I. As described in the Final Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas (Parsons, 2004), signed on September 28, 2004 by USEPA, these restrictions are as follows:

- Prohibit the development and use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds.

- Prevent access to or use of groundwater until the Class GA Groundwater Standards are met.

Based upon the planned future land use for the sites, no COCs were identified for any affected media at SEAD-121C or SEAD-121I. Chemicals associated with the release at the sites do not pose a health risk to potential receptors at the sites.

At SEAD-121C, the cancer and non-cancer risks are within the USEPA limits. Any contamination causing risk at SEAD-27 is not impacting the DRMO Yard. No actions will be necessary at SEAD-121C based on the baseline human health risk assessment.

At SEAD-121I, the cancer risks are within the USEPA limits, while there is a potential for non-cancer risk due to the presence of manganese in soils and ditch soils. All non-cancer risks are caused by the presence of manganese, which are related to the storage of strategic ore piles. The Army is consolidating the Strategic Stockpiles and the ore piles on site will be removed in the future when any cleanup of the ore pile area will be handled under a different cleanup project.

Based on the above discussion, it is the Army’s position that soil, ditch soil, surface water, and groundwater at SEAD-121C and SEAD-121I do not pose a health risk to potential receptors at the sites and no further action is warranted at SEAD-121C or SEAD-121I based on the human health baseline risk assessment.

7.0 SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT

A screening-level ecological risk assessment (SLERA) was performed for the Defense Reutilization and Marketing Office (DRMO) Yard (SEAD-121C) and the Rumored Cosmoline Oil Disposal Area (SEAD-121I) at the Seneca Army Depot Activity in Romulus, New York to evaluate whether contaminants at the sites have the potential to cause adverse effects to ecological resources. This section provides a description of the methodology and a summary of the SLERA results. Complete exposure calculation tables are provided in **Appendix G**.

7.1 INTRODUCTION

This SLERA was conducted in accordance with several USEPA and NYSDEC guidance documents including Ecological Risk Assessment Guidance for Superfund (ERAGS): Process for Designing and Conducting Ecological Risk Assessments (USEPA, 1997c), Guidelines for Ecological Risk Assessment (USEPA, 1998b), Fish and Wildlife Impact Analysis (NYSDEC, 1994b), and The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments (USEPA, 2001a).

The current USEPA (1997c) ecological risk assessment paradigm includes eight general steps:

1. Screening-Level Problem Formulation and Ecological Effects Evaluation;
2. Screening-Level Exposure Estimate and Risk Calculation;
3. Baseline Risk Assessment Problem Formulation;
4. Study Design and Data Quality Objective (DQO) Process;
5. Field Verification of Sampling Design;
6. Site Investigation and Analysis Phase;
7. Risk Characterization; and
8. Risk Management.

The ecological risk assessment presented in this section includes a screening-level ecological risk assessment (SLERA, Steps 1 and 2) and further refinement of chemicals of concern (COCs) (Step 3.2). Step 3.2, COC refinement, was performed in accordance with the USEPA's ERAGS (1997c) and the supplemental guidance of ERAGS (USEPA, 2001a). The SLERA process is summarized in **Figure 7-1**.

Upon completion of screening-level Ecological Risk Assessment (ERA) Step 2, there is a Scientific Management Decision Point (SMDP) with four possible decisions according to the ERAGS (USEPA, 1997c) and the supplemental guidance (USEPA, 2001a):

- There is adequate information to conclude that ecological risks are negligible and therefore no need for remediation on the basis of ecological risks;
- The information is not adequate to make a decision at this point and the ERA process should continue to a baseline ERA;
- The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted; or
- It may be preferable to cleanup the site to the screening values for some sites of relatively small size or where the contamination has a sharply defined boundary rather than to spend time and resources determining a less conservative cleanup number.

The results of the SLERA indicate which contaminants found at the site can be eliminated from further consideration and which should be evaluated further. The refinement of COCs helps streamline the overall ERA process by considering additional components early in the baseline ERA. The results of the ecological risk assessment presented will be used to determine the need for further study. The baseline ERA, if conducted, will further evaluate potential or actual adverse ecological effects associated with site-related contaminants and results will be used to develop appropriate remedial measures, if required.

7.2 STEP 1A: SCREENING-LEVEL PROBLEM FORMULATION

This step considers environmental characteristics of the sites, contaminants present, potential fate and transport processes, and potential receptor categories and exposure pathways. A brief ecological characterization is provided, contaminants of potential concern are identified, and a preliminary conceptual site model is presented.

7.2.1 Environmental Setting

Information of the sites is provided in **Sections 1** through **5** of the report: general site information is presented in **Section 1.0**; all investigations conducted for the sites are summarized in **Sections 2.0** and **3.0**; nature and extent of impact is discussed in **Section 4.0**; and the fate and transport of contaminants is presented in **Section 5.0**. This section provides a brief introduction of SEAD-121C (**Section 7.2.1.1**) and SEAD-121I (**Section 7.2.1.2**) and a habitat and ecological community characterization for the sites (**Section 7.2.1.3**).

7.2.1.1 SEAD-121C – The DRMO Yard

SEAD-121C is comprised of a triangularly-shaped gravel lot located in the east-central portion of the Depot (**Figure 1-3**), roughly 4,000 ft. (0.75 miles) southwest of the Depot's main entrance off of State Route 96. Several buildings (Buildings 360, 316, and 317) are located adjacent and east of the site, and one building (Building T-355) is located within the site boundaries. Building T-355 is located in the central part of the DRMO Yard and is used for storage. The DRMO Yard is surrounded by a chain-linked fence and access into the site is limited by a single gate that is normally locked and that is located south of Building 360.

The surface of the DRMO Yard is graded to allow surface water to drain toward the man-made ditches that bound the site on the north and south sides. The major pathway of surface water flow out of SEAD-121C is to these drainage ditches, which then flow to the west towards a wetland area and the headwaters of Kendaia Creek in the former munitions storage area.

Bedrock is encountered at less than 8 feet below the ground surface (bgs) in most locations at SEAD-121C. The geologic units commonly encountered were till, brown silt or clay, fill material (in a few locations), and weathered shale above competent shale. Groundwater was encountered at less than 2 feet above competent shale (approximately 5 – 6 feet below grade) and flows to the southwest.

In addition to Building T-355, several other man-made features are prominent within the DRMO Yard; these features include: a ladled-shaped, earthen-bottomed, storage cell in the southwest corner of the site; a rectangular-shaped, earthen-bottomed, storage cell immediately adjacent to, and located halfway along the northwest perimeter fence of the site; and a multi-chambered, concrete-bottomed, storage cell adjacent to the east perimeter fence, near the northern-most point of the DRMO Yard. Each of the storage cells is bounded horizontally on three sides by concrete (jersey) barriers. Common debris, including scrap metal, wood debris, ordnance components, batteries, tiles, oil filters, auto parts, paint cans, tires, and other miscellanies, were found in the concrete-bottomed, multi-chambered storage cell. During site visits in 2002, 2003, and 2004, Parsons observed that scrap metal, military items, and old machines were stored in the earthen-bottomed storage cell located along the northwest fence, while the ladle-shaped earthen-bottomed cell was empty, except for small quantities of metal shavings. A silo-like structure was also found inside the fence of the DRMO Yard, adjacent to the northern edge of Building 360. Furthermore, a large crane was located in the northern portion of the Yard, north of the silo-like structure and Buildings 360 and 316. East of the DRMO Yard, a dielectric transformer box was observed between Building 317 and First Street. Train tracks were also observed to approach the DRMO Yard from the north, with one spur ending at Building 317, a second ending at Building 316, while a third spur extended to the area between Building 316 and Building 360.

7.2.1.2 SEAD-121I - The Rumored Cosmoline Oil Disposal Area

The site-wide physical characteristics of SEAD-121I (Rumored Cosmoline Oil Disposal Area) have been described in the preceding sections. SEAD-121I, shown in **Figure 1-4**, consists of four rectangular grassy areas that are bounded by 3rd and 7th Streets (north and south ends, respectively) and Avenues C and D (west and east sides, respectively). Buried reinforced concrete storm drains run east to west through the site along 3rd St., 4th St., 5th St., 6th St., and 7th St. To the east and west of the four rectangular plots comprising SEAD-121I there are two rows of buildings that are actively used for warehousing. Buildings 331 and 329, located to the west and across Avenue C, receive frequent truck deliveries. A railroad spur line enters SEAD-121I from the south and extends to the northern end of the SEAD where it terminates near the intersection of 3rd Street and Avenue C. Two sidings branch off the main spur line; one terminates in the first (north to south) block and the other terminates in the third (north to south) block. There are concrete loading docks located in the first and third blocks next to the railroad lines. The major pathway of surface water flow out of SEAD-121I is overland flow to ruts located along the sides of the roadways, to catch basins, and then into the underground sewer pipes. The sewer pipes discharge to a man-made drainage ditch that flows south to north, and is located two blocks (approximately 1,000 feet) west of SEAD-121I. From that point, surface water flow either infiltrates into the ground, or during high flow periods it may enter Kendaia Creek, which flows in a predominant westerly direction, and discharges into Seneca Lake at a location north of Pontius Point and the SEDA’s Lake Shore Housing Area. In addition, a portion of the surface water flow from SEAD-121I may move easterly toward Cayuga Lake.

Subsurface conditions at SEAD-121I are governed by shallow bedrock, as the site is located near the top of a geological divide. The site is located on the western slope of this divide and therefore, regional groundwater flow is expected to be primarily westward towards Seneca Lake. Bedrock is typically encountered at a depth of 6 inches to 2 ft. bgs across the entire site, and it is composed mainly of weathered shale and glacial till.

Two ferrous-manganese ore piles are located within the site; one ore pile is in the first (north to south) block and the other ore pile is in the third (north to south) block. These ore piles are part of Strategic Stockpile. The ore piles are exposed to the weather and run off surface water is collected by the existing storm water collection system within the Planned Industrial/Office Development (PID) area. The ore piles are expected to be removed from SEAD-121I at a future time.

7.2.1.3 Habitat and Ecological Community Characterization

Site-specific ecological evaluations of the plant and animal habitats and communities at SEAD-121C and SEAD-121I have not been conducted. Characterizations of the habitat and ecological communities present at the sites are based on general observations made during the 1998 Environmental Baseline Survey (EBS) and the 2002 Remedial investigation (RI), and on the results of the ecological evaluations and assessment that have been conducted at other solid waste management units at the Depot (e.g., SEADs-4, 12, 16, 17, 25 and 26, and the Open Burning (OB) Grounds) as part of the remedial investigations. The results and findings of the ecological characterizations completed at the other SWMUs were used along with observations made at the sites to characterize the ecological settings at SEAD-121C and SEAD-121I. Key aspects of these characterizations relevant to this risk assessment are presented below.

Ecological site characterizations conducted for other SWMUs at the Depot are based on compilation of existing ecological information and on-site reconnaissance activities. The methods used to characterize the ecological resources included site-walkovers for the evaluation of existing wildlife and vegetative communities; interviews with local, state, and SEDA resource personnel; and review of environmental data obtained from previous Army reports. SEDA has a strong wildlife management program that is reviewed and approved by the New York Fish and Game Agency. The Depot manages an annual white-tailed deer (*Odocoileus virginiana*) harvest and has constructed a large wetland called the "duck pond" in the northeastern portion of the facility to provide a habitat for migrating waterfowl.

The NYSDEC Natural Heritage Program Biological and Conservation Data System identifies no known occurrences of federal- or state-designated threatened or endangered plant or animal species within a 2-mile radius of the sites. No species of special concern are documented within the Depot property.

The only significant terrestrial resource known to occur at SEDA is the population of white-pelaged white-tailed deer, which inhabits the fenced portion of the Depot. Annual deer counting conducted at the Depot indicates that the size of the deer herd is approximately 600 animals of which approximately one-third (i.e., 200) are white-pelaged. Since the Depot is totally enclosed, the white-pelaged deer is thought to result from inbreeding within the herd. The Depot maintains the herd through an annual hunting season to prevent overgrazing and starvation of the deer. The management plan of the herd is conducted by the New York State Division of Fish and Wildlife (DFW). The normal brown-pelaged deer are also common. White-tailed deer are not listed as a rare or endangered species.

Agricultural crops and deciduous forests comprise the vegetative resources used by humans near SEDA. Although no crops are grown at the Depot, farmland is the predominant land use of the surrounding private lands. Crops including corn, wheat, oats, beans and hay mixtures, are grown primarily for livestock feed. Deciduous forestland on the Depot and surrounding private lands is under active forest management. Timber and firewood are harvested from private woodlots that surround the Depot, but timber harvesting does not occur on the Depot.

Vegetation across the Depot consists of successional old field, successional shrub, and successional hardwoods. The NYSDEC Natural Heritage Program Biological and Conservation Data System identifies no known occurrences of federal- or state-designated threatened or endangered plant. No species of special concern are documented within the Depot property. No rare or endangered species were observed during the site assessment.

Several wildlife species are hunted and trapped on private lands near SEDA. Game species hunted include the eastern cottontail, white-tailed deer, ruffed grouse, ring-necked pheasant, and various waterfowl. Gray squirrel and wild turkey are hunted to a lesser extent. At the Depot, deer, waterfowl, and small game hunting is allowed. Trapping is also permitted on the Depot.

Animals that have been identified at the Depot during various ecological surveys include the beaver, eastern coyote, deer, red and gray fox, eastern cottontail rabbit, muskrat, raccoon, gray squirrel, striped skunk, and the woodchuck. Bird species that have been identified include the bluejay, black-capped chickadee, American crow, mourning dove, northern flicker, ruffed grouse, ring-billed gull, red-tailed hawk, northern junco, American kestrel, white breasted nuthatch, ring-necked pheasant, American robin, eastern starling, turkey vulture, and pileated woodpecker.

There are no permanent lakes, ponds, streams or wetlands in either SEAD-121C or SEAD-121I. Surface water only exists intermittently in man-made drainage ditches; thus, it does not directly support aquatic life.

No signs of stressed or altered terrestrial biota (vegetation and wildlife species) were observed at either SEAD-121C or SEAD-121I. There were no indications of unnatural die-off or stunted vegetation.

7.2.2 Preliminary Ecological Conceptual Site Model

A preliminary Conceptual Site Model (CSM) was developed for the sites and presented in **Figure 7-2**. The CSM provides an overall assessment of the primary and secondary sources of contamination at the sites, and the corresponding release mechanisms and affected media. Potential sources of contamination, potentially complete exposure pathways, and ecological receptors are depicted in the CSM. Sources, release mechanisms, affected media, contaminant fate and transport, and current and future foreseeable land use of the sites are discussed in **Section 6.0** of the report. Potentially complete exposure pathways and potential ecological receptors are further discussed below.

A complete exposure pathway consists of a source and mechanism of contaminant release, a transport mechanism for the released contaminants, a point of contact, and a route of contaminant entry into the receptor. If any of these elements is missing, the pathway is incomplete. In addition, potential receptors were identified to allow evaluation of potentially complete pathways.

The CSM identifies exposure to surface soils (0-2 ft. bgs), ditch soil, and surface water at SEAD-121C and SEAD-121I as complete exposure pathways (current and future) for ecological receptors. Pathways evaluated in the SLERA are presented in **Figure 7-2**. Pathways evaluated in the SLERA include direct exposure (ingestion, dermal, and inhalation) and ingestion of contaminated biota. Various prey items such as plants and animals are consumed by receptors and serve as indirect exposure routes for contaminants. Receptors also incidentally ingest media during foraging activities. While terrestrial receptors are exposed to air, uncertainties associated with inhalation exposures to chemicals inhibit assessment of the impacts from exposure to this medium. Similarly, dermal exposure to chemicals is difficult to quantify due to a lack of toxicity data. Given these factors, the SLERA for SEAD-121C and SEAD-121I quantitatively assesses exposure to contaminants in the mediums (soil, ditch soil, and surface water) and biota through ingestion.

For most terrestrial receptors, soil exposure intervals are limited to the upper 2 feet of the soil column. For purposes of this SLERA, surface soil was defined as the 0-2 ft. bgs. Surface and subsurface soil (0-4 ft. bgs, hereafter referred to as total soil) may be uncovered during excavation activities in the future and therefore may result in contaminants in the soil becoming available for contact. Therefore, exposure to total soil (0-4 ft. bgs) was also evaluated in this SLERA.

Ecological receptors are not directly exposed to contaminants in groundwater. As shown in **Figure 7-2**, exposure to groundwater was considered an incomplete pathway at SEAD-121C and SEAD-121I.

There are no permanent lakes, ponds, streams or wetlands in either SEAD-121C or SEAD-121I. Man-made drainage ditches at SEAD-121C and SEAD-121I are dry most of the time during the year and are not expected to support any balanced aquatic community. Exposure to ditch soil and surface water was evaluated for wildlife receptors identified for the SLERA.

7.2.3 Identification of Ecological COPCs

Chemicals of potential concern (COPCs) were identified by comparing the maximum detected concentrations in each impacted medium to ecological risk-based screening values. The data used for the ecological risk assessment are the same as those used for the human health risk assessment. The data are presented in **Appendix C** of this report, and the sample locations are shown in **Figure 3-1** and **Figure 3-2**. All analytical data were validated prior to inclusion in the SLERA. A discussion of the data used in both the baseline human health risk assessment and the SLERA is presented in **Section 6.3.1**. The following seven data sets were used for the screening-level ecological risk assessment:

1. SEAD-121C surface soil (0-2 ft. bgs.);
2. SEAD-121C total soil (0-4 ft. bgs,);
3. SEAD-121C ditch soil (0-2 ft. bgs.);
4. SEAD-121C surface water;
5. SEAD-121I soil (0-2 ft. bgs.);
6. SEAD-121I ditch soil (0-2 ft. bgs.); and
7. SEAD-121I surface water.

For each data set, the maximum detected concentration was compared with the ecological screening value. For soil, the maximum detected concentration of all sample results (including surface and subsurface soil results) was used for the screening purposes, and the COPCs identified were used for both the surface soil and the total soil data sets. The ecological screening values are based on conservative (i.e., environmentally protective) generic values derived by various agencies. In brief, the following sources (cited in order of preference) were consulted for screening value selection for soil:

- USEPA (2000b, 2003c, 2005b) Ecological Soil Screening Levels;
- USEPA Region III (1995) Biological Technical Assistance Group (BTAG) Screening Levels;
- USEPA Region 5 (2003) Ecological Screening Levels;
- Oak Ridge National Laboratory (ORNL) Screening Benchmarks for Soil and Litter Invertebrates and Heterotrophic Process (Efroymson et al., 1997a), and Terrestrial Plants (Efroymson et al., 1997b);
- Canadian Environmental Quality Guidelines developed by the Canadian Council of Ministers of the Environment (2003); and
- Circular on Target Values and Intervention Values for Soil Remediation developed by the Netherlands (2000)

For surface water, the New York State Ambient Water Quality Standards (NYS AWQC) and Guidance Values for Class C water and the National Recommended Water Quality Criteria (USEPA, 2002c) (whichever is lower) were used as screening values. If screening values are not provided by either of the above documents, the USEPA Region III (1995) BTAG screening levels were used for the screening. Screening values for certain metals (cadmium, chromium, copper, lead, nickel, and zinc) are dependent on the hardness in surface water. For the screening purposes, the screening values for these metals were calculated at a hardness of 217 mg/L ($CaCO_3$), which was the average surface water hardness for SEDA using data from two upstream surface water samples: 232 mg/L at SW-801 from the Ash Landfill remedial investigation and 201 mg/L at SW0196 from the OB Grounds remedial investigation.

Constituents with the maximum detected concentrations exceeding the corresponding screening values were retained as COPCs. With the exception of the nutrients (i.e., calcium, magnesium, potassium, and sodium), constituents with no screening values available were retained as COPCs. In addition, all bioaccumulative compounds identified by USEPA (2000a) in its report Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment as important bioaccumulative compounds were retained as COPCs as a conservative approach, which is consistent with the ecological risk assessment guidance set forth by USEPA for the Mid-Atlantic Hazardous Site Cleanup program.

Results of the screening process are summarized in **Tables 7-1A**, **7-1B**, and **7-1C** for SEAD-121C soil, ditch soil, and surface water, respectively. **Tables 7-2A**, **7-2B**, and **7-2C** summarize the screening results for SEAD-121I soil, ditch soil, and surface water, respectively.

Aluminum in soil was not retained as a COPC as USEPA recommends that aluminum be considered as a COPC only at sites where the soil pH is less than 5.5 (USEPA, 2003c). The basis for this is as follows:

- Total aluminum in soil is not correlated with toxicity to the tested plants and soil invertebrates.
- Aluminum toxicity is associated with soluble aluminum.
- Soluble aluminum and not total aluminum is associated with the uptake and bioaccumulation of aluminum from soil into plants.
- The oral toxicity of aluminum compounds in soil is dependant upon the chemical form. Insoluble aluminum compounds, such as aluminum oxides, are considerably less toxic compared to the soluble forms.

The pH of soil at SEDA is generally between 7 and 8 (Soil pH for SEADs 38, 39, & 40 were presented in the Action Memorandum and Decision Document Removal Actions, Three VOC Sites (Parsons, 2001)). Consequently, aluminum was not retained as a COPC in accordance with the USEPA guidance (USEPA, 2003c).

Iron is essential for plant growth and is generally considered to be a micronutrient (Thompson and Troeh, 1973, cited from USEPA, 2003c). According to USEPA (USEPA, 2003c), currently, identifying a specific benchmark for iron in soils is difficult since iron's bioavailability to plants and resulting toxicity are dependent upon site-specific soil conditions (pH, Eh, soil-water conditions). In well-aerated soils between pH 5 and 8, the iron demand of plants is higher than the amount available (Römheld and Marschner, 1986, cited from USEPA 2003c). Because of this limitation, plants have developed various mechanisms to enhance iron uptake (Marschner, 1986, cited from USEPA 2003c). Under these soil conditions, iron is not expected to be toxic to plants. Based on the fact that soil pH at the sites is generally between 7 and 8 and surface soil at the sites is expected to be well aerated, iron in soil was not retained as a COPC in accordance with the USEPA guidance (USEPA, 2003c).

COPCs identified for soil at the sites include volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, and inorganics. COPCs identified for ditch soil at the sites include semivolatile organic compounds (SVOCs) (predominantly PAHs) and inorganics. COPCs identified for surface water at the sites include one SVOC (bis(2-ethylhexyl)phthalate) and metals. Ecotoxicity associated with these types of contaminants includes the effects associated with direct as well as indirect exposures.

7.2.4 Selection of Assessment Endpoints

Ecological risks should be expressed in terms of a definite endpoint, which is defined as an environmental value to be protected. Assessment endpoints are "explicit expressions of the actual environmental value that is to be protected" (USEPA 1998b). The assessment endpoints provide a transition between broad management, or policy goals, and the specific measures used in the assessment.

The proposed assessment endpoints for the SLERA are the survival and reproduction of wildlife populations (associated with suitable habitat) that may be affected by previous site operations. Specifically, assessment endpoints are provided for populations at two trophic levels: small mammals and ground-feeding birds and higher trophic level predators. The assessment endpoints are addressed through the survival and reproduction of mammal and bird populations at the sites. The proposed policy goals, ecological assessment endpoints, and measurement endpoints are summarized in **Table 7-3**.

7.2.5 Selection of Receptor Species

This section presents the receptor species identified for the sites. Ecological receptors evaluated include wildlife that may reasonably be expected to reside or regularly forage in areas affected by site contaminants, given current and anticipated future site conditions.

Guidelines considered in selecting receptors from the potentially exposed community include the following:

- relationship to the assessment endpoint;
- limited home range;
- role in local food chains;
- potential high abundance and wide distribution at the sites;
- relatively long-lived to provide chronically exposed individuals;
- sufficient toxicological information available in the literature for comparative and interpretive purposes;
- sensitivity to COPCs;
- likely current and future occurrence; and
- suitability for long-term monitoring, if necessary.

The selected receptor species have either been observed at, or are likely to be present in the vicinity of the Depot, given habitat conditions.

When selecting representative receptor species, it is important that sufficient toxicological information is available in the literature on the receptor species, or a closely-related species. While the ecological communities at the individual sites may have species with desirable characteristics for use as receptor species, not all of these species have been extensively used for toxicological testing.

The receptors were also selected to represent the trophic levels and characteristics of the area being assessed. Based on available information, specific receptor species were selected to be representative of ecological populations potentially exposed to COPCs at the sites. These representative receptor species were evaluated according to the measurement endpoints selected for the site. These measurement endpoints in turn evaluate the assessment endpoints and policy goals that were ultimately evaluated in the ecological assessment.

Consideration was given to special-concern (i.e., threatened or endangered) species potentially present at the sites when selecting receptor species. There are no known occurrences of federal- or state-designated threatened or endangered plant or animal species within a 2-mile radius of the Depot. No species of special concern are documented within the Depot property.

Vegetation across the Depot consists of successional old field, successional shrub, and successional hardwoods. In the absence of special-concern plant species or sensitive plant communities at the Depot, plants were evaluated as an exposure medium (i.e., food source) for wildlife receptors, and not as individual receptors. Likewise, invertebrates, such as insects, were evaluated as potential indirect exposure media. Therefore, no primary producer or detritivore receptor species were identified for qualitative evaluation. The general health of these populations in areas affected by site contamination was evaluated qualitatively in the ecological site characterization. The plant assemblages representing the dominant cover types present at the site and general invertebrate group were evaluated as biotransfer media, assuming that all forage plants and soil invertebrates have the capacity to take up contaminants from soils within the root zone or from dermal contact (dust).

The terrestrial indicator species identified for the SLERA are the deer mouse, short-tailed shrew, and meadow vole as representative of first-order consumer/prey species with a relatively small foraging range, the American robin for maintained grass cover type, and the red fox was evaluated for potential bioaccumulation/biomagnification of soil COPCs by a second-order consumer (higher trophic level predator). A higher trophic level bird raptor, such as a red-tailed hawk (*Buteo jamaicensis*), was initially considered as a potential receptor for this SLERA. However, the home range of a hawk, approximately 1,800 acres or more (USEPA 1993b), is much greater than the area of the sites considered in this assessment, approximately 21 acres altogether. Therefore, it is unlikely that a hawk would derive a significant portion of its diet from prey at any one of the sites evaluated. Consequently, the raptor was not evaluated further in this SLERA.

The selected species are considered to be representative of current and/or future ecological receptors at the site and are discussed below.

Small mammal populations likely to be present at SEAD-121C and SEAD-121I include mice, shrews, and other rodents. The deer mouse (*Peromyscus maniculatus*) was selected as the resident species with the niche best met by conditions present at the sites. These are one of the vertebrate receptors most likely to be maximally exposed to contaminants in soil at the site. They represent a significant component of the food chain, feeding on seeds and berries and soil invertebrates and providing prey for predators.

A second terrestrial receptor, the short-tail shrew (*Blarina brevicauda*), was also evaluated. The shrew was selected because more of its diet is derived from soil invertebrates and less is derived from seeds and berries than the deer mouse. The shrew may be directly exposed to contaminants during burrowing activities and indirectly through prey. Therefore, the shrew may be more susceptible than the mouse to the effects of COPCs that bioaccumulate in soil biota. For this reason, the shrew was used to evaluate potential risk for small carnivorous mammals.

Although not observed at SEDA, the meadow vole (*Microtus pennsylvanicus*) was selected as the herbivorous mammalian receptor for the purposes of the screening-level risk assessment. The meadow vole subsists almost entirely on vegetative matter. The vole may be directly exposed to contaminants during burrowing activities and indirectly through consumption of contaminated plant materials.

The American robin (*Turdus migratorius*) has been identified at SEDA during site reconnaissance visits and has been selected as an appropriate avian receptor species for soil. Birds are frequently more sensitive to specific chemicals (e.g., pesticides and phthalates) than terrestrial mammalian species. The American robin was selected because a large portion of its diet is derived from soil invertebrates that would make it more susceptible to the effects of COPCs that bioaccumulate in soil biota. Additionally, its home range is roughly comparable to those of both the deer mouse and shrew.

The red fox (*Vulpes vulpes*) has been identified at SEDA during site reconnaissance visits and has been selected as an appropriate receptor species for potential bioaccumulation/biomagnification of soil. It should be noted that the home range of a red fox, approximately 200 acres or more (USEPA 1993b), is much greater than the area of any of the sites considered in this assessment (approximately 21 acres altogether for SEAD-121C and SEAD-121I). Therefore, it is unlikely that a fox would derive a significant portion of its diet from prey at any one of the sites evaluated. Nonetheless, as a conservative approach, the red fox was identified for potential bioaccumulation/biomagnification of soil.

As discussed in **Section 7.2.2**, the drainage ditch systems at the sites are not wetlands and are not regulated as wetlands. They do not support aquatic life. Therefore, the ecological receptors selected for the site soil (deer mouse, short-tailed shrew, meadow vole, red fox, and American robin) will be used for the drainage ditch system at SEAD-121C and SEAD-121I. In addition, a higher trophic level wetland bird - the great blue heron (*Ardea herodias*) was selected to evaluate potential exposure to contaminants in water and ditch soil via ingestion of ditch soil and water and ingestion of contaminants that bioaccumulate in prey. It should be noted that the great blue heron feeds primarily on aquatic animal life and is adapted for wading in shallow water (USEPA, 1993b); therefore, the ditch systems at SEAD-121C and SEAD-121I are not suitable habitats for the great blue heron. Nonetheless, as a conservative approach, the great blue heron was selected for the screening-level risk assessment to evaluate potential exposure to ditch soil and surface water. Great blue heron prey includes primarily crustaceans, amphibians, and small fish that could be exposed to contaminated sediment or surface water. For the SLERA, the great blue heron was assumed to prey small animals.

7.2.6 Characterization of Exposure Pathways

Potentially completed pathways were identified for SEAD-121C and SEAD-121I in the CSM (**Figure 7-2**). Potential ecological receptors identified for the sites (i.e., deer mouse, short-tailed shrew, meadow vole, red fox, American robin, and great blue heron) are potentially exposed to COPCs in soil, ditch soil, and surface water via direct intake and biota intake. The primary potential ecological receptor exposure interval for which characterization data were collected is shallow soils (0 to 2 ft. bgs). This interval was considered appropriate for the evaluation of soil contaminant exposures to surface-foraging and shallow-burrowing wildlife and to many forage plants (e.g., grasses and forbs). To assess both potential future burrowing and/or deep-rooted plant site conditions, the deeper soil interval (0 to 4 ft. bgs) was also evaluated. Animals may be exposed directly to site-related contaminants through ingestion, dermal contact, and inhalation. In addition, animals may be exposed indirectly to site-related contaminants through ingestion of biota (plants, invertebrates, and animals) that have bioaccumulated contaminants. Because analysis of biological tissue is not proposed for these sites, the potential for exposure via completed pathways was inferred based on estimated contaminant uptake and assimilation by vegetation and prey species, and on the bioaccumulation and biomagnification properties of the contaminants.

While ecological receptors are exposed to air, uncertainties associated with inhalation exposures to chemicals inhibit assessment of the impacts from exposure to this medium. Similarly, dermal exposure to chemicals is difficult to quantify due to a lack of toxicity data. Given these factors, the dermal and inhalation exposure pathways were not quantitatively assessed.

7.3 STEP 1B: SCREENING-LEVEL EFFECTS EVALUATION

The SLERA for mammalian and avian receptors was conducted by comparing potential exposures to COPCs to screening ecotoxicity values (SEVs). SEVs for those analytes identified as COPCs were derived from studies reported in the literature, in the absence of site-specific data, by establishing data selection criteria such that SEVs would be as relevant as possible to assessment endpoints at the sites. In accordance with USEPA guidance (1997c), the lowest available, appropriate toxicity values were used with modifying factors to ensure a conservative (i.e., health protective) screening-level evaluation.

Using the relevant toxicity information, receptor-specific SEVs were calculated for each of the COPCs. SEVs represent no-observed-adverse-effect-level (NOAELs) and lowest-observed-adverse-effect-level (LOAELs) with conversion values incorporated for toxicity information derived from studies other than no-effect or lowest-effect studies. The order of taxonomic preference when choosing SEVs was data from studies using (1) native species potentially present at the site, or (2) proxy species, such as commonly studied laboratory species. The preferred toxicity test was the lowest appropriate chronic NOAEL or LOAEL for non-lethal or reproductive effects. Values based on chronic studies were preferred. If NOAEL data were not available for a contaminant, the next preferred endpoints for SEV derivation were chronic or subchronic LOAEL, then acute endpoints including LD50 (median lethal dose) in diet, or an LC50 (median lethal concentration). SEVs were calculated using conversion factors to adjust the reported effects doses to a final SEV. Two factors are used to convert other types of study results into SEVs comparable to NOAEL and LOAEL studies. The factors are 1) study duration, and 2) endpoint (e.g. LD50 or LC50). These factors were multiplied together to derive the total conversion factor. The reported effects dose was divided by the total conversion factor to account for potential uncertainties in extrapolation from one endpoint to another. These factors are presented in **Table 7-4**. For chemicals for which toxicity data were not available for the site-specific receptor, but toxicity data were available for another test organism, the toxicity data were adjusted for difference in body size for mammals. For COPCs without chemical-specific SEVs, the SEV for a surrogate chemical was used based on the chemical structure of the compounds and in a conservative approach. As an example, the SEV for benzo(a)pyrene, the most toxic PAH, was used as SEVs for the other PAHs without chemical-specific SEVs.

NOAEL and LOAEL SEVs and information used to derive them including test organisms, effect dose, and study duration, are summarized in **Tables 7-5** and **7-6**, respectively.

7.4 STEP 2A: SCREENING-LEVEL EXPOSURE ESTIMATE

To compare potential wildlife exposures to adverse effect levels, an estimate of contaminant exposures, expressed as daily dose ingested of contaminated food items (i.e., plants, invertebrates, and animals) and media, was calculated. COPC daily dose ingested (expressed as the mass of COPC ingested per kilogram body weight per day) depends on the COPC concentration in food items and media, the receptor's trophic level, the trophic level of food items, and the receptor's ingestion rate of each food item and media. The daily dose of COPC ingested by a receptor, considering all food items and media ingested, can be calculated from the following generic equation (USEPA, 1999b):

$$DD = \sum IR_F \cdot C_i \cdot P_i \cdot F_i + \sum IR_M \cdot C_M \cdot P_M$$

Where:

DD = Daily dose of COPC ingested (mg COPC/Kg BW-day);
IR_F = Receptor food ingestion rate (Kg/Kg BW-day);
C_i = COPC concentration in i^{th} food item (mg COPC/Kg);
P_i = Proportion of i^{th} food item that is contaminated (unitless);
F_i = Fraction of diet consisting of food item i (unitless);
IR_M = Receptor media ingestion rate (Kg/KgBW-day);
C_M = COPC concentration in media (mg/Kg for soil and mg/L for water); and
P_M = Proportion of ingested media that is contaminated (unitless).

Based on this algorithm, the daily dose equation for each receptor is as follows:

Deer mouse, meadow vole, and American robin average daily exposure dose (mg/Kg-day) =

$$[[(C_s \text{ x } SP \text{ x } I_p \text{ x } CF) + (C_s \text{ x } BAF_i \text{ x } I_{in}) + (C_s \text{ x } I_s \text{ x } ST) + (C_w \text{ x } WR)] * SFF] / BW$$

Where:

C_s = Exposure point concentration in the appropriate soil matrix (surface soil/deeper soil/ditch soil) (mg COPC/Kg dry soil);
C_w = Exposure point concentration in surface water (mg/L);
SP = Soil-to-plant uptake factor ((mg COPC/Kg dry tissue)/(mg COPC/Kg dry soil));
I_p = Receptor-specific ingestion rate of plant material (Kg wet tissue/day)
    I_p = PDF * FR
    Where PDF = Plant dietary fraction;
    and FR = Feeding rate (Kg wet food/day);
CF = Dry weight to wet weight plant matter conversion factor, 0.2 (unitless);
BAF_i = Constituent-specific soil-to-invertebrate bioaccumulation factor ((mg COPC/Kg wet tissue)/(mg COPC/Kg dry soil));
I_{in} = Receptor-specific ingestion rate of soil invertebrate (Kg wet tissue/day);
    I_{in} = FR * IDF
    Where IDF = Invertebrate dietary fraction;
    and FR = Feeding rate (Kg wet food/day);
    For meadow vole, soil invertebrate intake is negligible and I_{in} was assumed to be 0.
I_s = Receptor-specific ingestion rate of soil (Kg dry/day);
ST = Bioavailability factor for constituents ingested in soil (assumed to be 1 for all constituents) (unitless);
WR = Water intake rate (L/day)
SFF = Site foraging frequency - ratio of site exposure area to receptor foraging range (unitless), assumed to be 1; and
BW = Average adult body weight (Kg).

Short-tailed shrew, red fox, and great blue heron average daily exposure dose (mg/Kg-day) =

$$[[(C_s * SP * I_p * CF) + (C_s * BAF_i * I_{in}) + (C_s * BAF_a * I_a) + (C_s * I_s * ST) + (C_w \text{ x } WR)] * SFF] / BW$$

Where:

C_s = Exposure point concentration in the appropriate soil matrix (surface soil/deeper soil/ditch soil) (mg COPC/Kg dry soil);
C_w = Exposure point concentration in surface water (mg/L);
SP = Soil-to-plant uptake factor ((mg COPC/Kg dry tissue)/(mg COPC/Kg dry soil));
I_p = Receptor-specific ingestion rate for plant material (Kg wet tissue/day);
  I_p = PDF * FR
  Where PDF = Plant dietary fraction;
  and FR = Feeding rate (Kg wet food/day);
CF = Dry weight to wet weight plant matter conversion factor, 0.2 (unitless);
I_{in} = Receptor-specific ingestion rate for invertebrates (Kg wet/day);
  I_{in} = FR * IDF
  Where IDF = Invertebrate dietary fraction;
  and FR = Feeding rate (Kg wet food/day);
BAF_i = Constituent-specific soil-to-invertebrate bioaccumulation factor ((mg COPC/Kg wet tissue)/(mg COPC/Kg dry soil));
I_a = Receptor-specific ingestion rate for animal material (Kg wet tissue/day);
  I_a = ADF * FR
  Where ADF = Animal dietary fraction;
  and FR = Feeding rate (Kg wet food/day);
BAF_a = constituent-specific soil-to-small mammal bioaccumulation factor ((mg COPC/Kg wet tissue)/(mg COPC/Kg dry soil));
I_s = Receptor-specific ingestion rate of soil (Kg dry/day);
ST = Bioavailability factor for constituents ingested in soil (assumed to be 1 for all constituents) (unitless);
WR = Water intake rate (L/day)
SFF = Ratio of site exposure area to average receptor foraging range (unitless), assumed to be 1; and
BW = Average adult body weight (Kg).

USEPA (1993b, 1999b, and 2005b) has provided a variety of exposure information for a number of avian and mammalian species. Data are directly available for body weights of various species. Similarly, information regarding feeding rates, and dietary composition, including incidental soil ingestion, are also available for many species. Such exposure parameters were compiled for the selected receptor species (deer mouse, short-tailed shrew, meadow vole, red fox, American robin, and great blue heron). Feeding rates for receptors were based upon USEPA (1999b, 2005b) or allometric equations presented in Nagy (1999). Literature values for diet fraction and body weights were taken from USEPA (1993b, 1999b, 2005b). Great blue herons fish in shallow waters (up to 0.5 m) with a firm substrate (USEPA, 1993b). They capture fish by thrusting the beak into the fish's side or back (Eckert and Karalus, 1983; as cited in TAMS, 2000). Based on the great blue heron's fishing technique, a value of 2% of the food ingestion rate (on a dry weight basis) was applied based on incidental ingestion during feeding and grooming. This value is used in the Phase 2 Report of Further Site Characterization and Analysis, Volume 2E - Revised Baseline Ecological Risk Assessment, Hudson River PCBs Reassessment (TAMS, 2000) prepared for USEPA Region 2 and USACE Kansas City District.

For the screening-level exposure estimate, site foraging frequency factors for all receptors were assigned as 1, in accordance with the USEPA (1997c) guidance. That is, all receptors were assumed to be exposed 100% of the time to the COPCs at the sites. This is a very conservative assumption as most receptors will spend at least part of the time outside of the site boundaries, either by having a larger home range than the site area, seasonal migration patterns, and/or winter dormancy periods. As an example, the red fox has much larger foraging range compared to the size of SEAD-121C and SEAD-121I (i.e., over 200 acres vs. approximately 21 acres). This factor will be considered in the COC refinement step (**Section 7.6**).

The soil-to-plant uptake factors and soil-to-soil invertebrate uptake factors were obtained from the USEPA Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities (1999b). Small mammal bioaccumulation factors were from published literature or were calculated based on chemical-specific partitioning coefficients from the literature.

The exposure point concentration (EPC) evaluated for each soil COPC was determined based on the maximum detected concentration, in accordance with the USEPA (1997c) guidance. The EPCs are summarized in **Tables 7-7A, 7-7B**, and **7-7C** for SEAD-121C soil, ditch soil, and surface water, respectively. EPCs for SEAD-121I soil, ditch soil, and surface water are summarized in **Tables 7-8A**, **7-8B**, and **7-8C**, respectively.

Receptor food intake rate and dietary fraction information is presented in **Table 7-9**. The uptake parameters are presented in **Appendix G**, **Table G-1**. The exposure calculation sheets are presented in **Appendix G** (**Tables G-2A** through **G-2E** for exposure to SEAD-121C soil and surface water, **Tables G-3A** through **G-3F** for exposure to SEAD-121C ditch soil and surface water, **Tables G-4A** through **G-4E** for exposure to SEAD-121I soil and surface water, and **Tables G-5A** through **G-5F** for exposure to SEAD-121I ditch soil and surface water).

7.5 STEP 2B: SCREENING-LEVEL RISK CALCULATION

For wildlife receptors, the risk calculation step uses the results of the wildlife exposure and toxicity effects assessments to calculate a hazard quotient for each COPC. A hazard quotient (HQ) is a ratio of the estimated exposure dose (for mammal and bird receptors) of a contaminant to the SEV.

Generally, the greater this ratio, or quotient, the greater the likelihood of an effect. An HQ less than 1 indicates that the contaminant alone is unlikely to cause adverse ecological effects. Because conservative (i.e., health protective) estimates of potential chronic exposures and toxicity were used, screening-level HQs tend to overestimate actual risks. Cumulative effects of COPCs were not quantitatively evaluated in this SLERA. For metals, there is no evidence of clearly additive effects in ecological systems. For PAHs, the uncertainty associated with the cumulative effects is discussed in the uncertainty section (**Section 7.5.2**). Calculated HQs for mammal and bird receptors are reviewed below.

For all identified receptors, HQs were calculated based on the NOAEL SEVs, the maximum detected concentrations for the COPCs, and a site foraging frequency factor of 100% in accordance with the USEPA (1997c) guidance. A site foraging frequency factor of 100% assumes the receptor is present at the site and does not forage or range beyond the boundaries of the site being evaluated. This is a very conservative assumption as most receptors will spend at least part of the time outside of the site boundaries, either by having a larger home range than the site area, seasonal migration patterns, and/or winter dormancy periods.

7.5.1 Summary of Risk Results and Preliminary COC Identification

HQ results for the identified receptors based on the maximum detected concentrations for the COPCs and the NOAEL SEVs are presented in **Table 7-10A** for SEAD-121C soil and surface water exposure, **Table 7-10B** for SEAD-121C ditch soil and surface water exposure, **Table 7-11A** for SEAD-121I soil and surface water exposure, and **Table 7-11B** for SEAD-121I ditch soil and surface water exposure.

The results are discussed in the following subsections for potential risks associated with SEAD-121C surface water, SEAD-121C soil, SEAD-121C ditch soil, SEAD-121I surface water, SEAD-121I soil, and SEAD-121I ditch soil, respectively. All COPCs with HQs greater than or equal to 1 for one or more receptors based on the maximum detected concentrations and the NOAEL SEVs were identified as preliminary COCs. A further discussion of the preliminary COCs and a refinement of the COCs is presented in **Section 7.6**.

7.5.1.1 SEAD-121C Surface Water

HQ results for the identified receptors exposed to COPCs in SEAD-121C soil, ditch soil, and surface water based on the maximum detected concentrations for the COPCs and the NOAEL SEVs are presented in **Tables 7-10A** and **7-10B** for soil and ditch soil exposure, respectively. Estimated exposures based on the maximum detected concentrations of the COPCs for the deer mouse, American robin, short-tailed shrew, meadow vole, red fox, and great blue heron are presented in **Tables G-2A** through **G-3F**.

Surface water COPC concentrations (with the exception of aluminum and iron concentrations) would result in insignificant exposure compared to the soil or ditch soil COPC concentrations. With the exception of aluminum and iron, the COPCs in soil and ditch soil contribute significantly (more than 90%) to the elevated HQs at or above 1. As aluminum and iron were not identified as soil COPCs, exposure to aluminum and iron in surface water is the sole source of HQs for aluminum and iron. Therefore, only aluminum and iron were retained as preliminary COCs in surface water.

The HQs associated with exposure to the maximum detected concentration of aluminum in surface water at SEAD-121C are below 1 for all the receptors with the exception of meadow vole. The HQ associated with exposure to aluminum in SEAD-121C surface water is at 1 for the meadow vole.

Exposure to the maximum detected concentration of iron in SEAD-121C surface water results HQs greater than 1 based on the NOAEL SEVs for all identified receptors with the exception of the American robin and great blue heron. The HQs are approximately 20 for the deer mouse, short-tailed shrew, and meadow vole and 10 for the red fox.

7.5.1.2 SEAD-121C Soil

HQ results for the identified receptors exposed to COPCs in SEAD-121C soil and surface water based on the maximum detected concentrations for the COPCs and the NOAEL SEVs are presented in **Table 7-10A**. Estimated exposures based on the maximum detected concentrations of the COPCs in surface water and soil (0-2 ft. bgs soil and 0-4 ft. bgs soil) at SEAD-121C for the deer mouse, American robin, short-tailed shrew, meadow vole, and red fox are presented in **Tables G-2A** through **G-2E**.

Soil COPCs and surface water COPCs with the maximum detected concentrations that generated HQs based on the NOAEL SEVs greater than or equal to 1 for one or more identified receptors include one VOC (meta/para xylene), two PAHs (phenanthrene and pyrene), one PCB (Aroclor-1254), one pesticide (4,4’-DDT), and several metals (aluminum, antimony, barium, cadmium, copper, iron, lead, silver, thallium, and zinc). With the exception of aluminum and iron, these COPCs were identified as preliminary COCs in SEAD-121C soil and were further evaluated in **Section 7.6**. As discussed in the previous section, aluminum and iron were identified as preliminary COCs in SEAD-121C surface water.

Table 7-10A indicates that exposure to the maximum detected concentrations of meta/para xylene (total soil only), Aroclor-1254, and several metals (antimony, barium, cadmium, copper, lead, silver, and zinc) in SEAD-121C soil by the deer mouse results in HQs greater than 1 based on the NOAEL SEVs. All the other HQs for the deer mouse were below 1.

HQs based on the NOAEL SEVs are below 1 for the avian receptor (American robin) exposed to all COPCs in SEAD-121C soil with the exception of Aroclor-1254, 4,4’-DDT, and several metals (barium, cadmium, copper, lead, and zinc). The HQ for the American robin exposed to lead in

SEAD-121C soil is approximately 100 and the HQ for the 4,4'-DDT exposure is approximately 20. The HQs associated with exposure to all the other COPCs are below 10. An antimony SEV was not identified for birds and therefore, risks to the American robin were not quantified for exposure to antimony.

Exposure to the maximum detected concentrations of meta/para xylene (total soil only), pyrene, Aroclor-1254, and several metals (antimony, barium, cadmium, copper, lead, silver, thallium – total soil only, and zinc) in SEAD-121C soil by the short-tailed shrew results HQs greater than 1 based on the NOAEL SEVs. The HQs associated with exposure to the maximum detected concentration of phenanthrene in soil are at 1 for the short-tailed shrew. The HQs resulting from the maximum detected concentrations of all the other COPCs in SEAD-121C soil are all below 1.

Table 7-10A indicates that exposure to the maximum detected concentrations of meta/para xylene (total soil only), phenanthrene, pyrene, and several metals (antimony, barium, cadmium, copper, lead, silver, and zinc) in SEAD-121C soil by the meadow vole results in HQs greater than or equal to 1 based on the NOAEL SEVs.

HQs based on the NOAEL SEVs are below 1 for the high trophic level mammal (red fox) exposed to all COPCs in SEAD-121C soil with the exception of meta/para xylene in total soil (0-4 ft. bgs) and antimony, copper, and lead in surface soil and total soil.

7.5.1.3 SEAD-121C Ditch Soil

HQ results for the identified receptors exposed to COPCs in SEAD-121C ditch soil and surface water based on the maximum detected concentrations for the COPCs and the NOAEL SEVs are presented in **Table 7-10B**. Estimated exposures based on the maximum detected concentrations of the COPCs in SEAD-121C ditch soil and surface water for the deer mouse, American robin, short-tailed shrew, meadow vole, red fox, and great blue heron are presented in **Tables G-3A**, **G-3B**, **G-3C**, **G-3D**, **G-3E**, and **G-3F**, respectively.

Using the maximum detected concentrations and the NOAEL SEVs, COPCs in ditch soil and surface water that generated HQs greater than or equal to 1 for one or more identified receptors include cyanide and several metals (aluminum, antimony, cadmium, copper, iron, lead, selenium, and zinc). With the exception of aluminum and iron, these COPCs were identified as preliminary COCs in SEAD-121C ditch soil and were further evaluated in **Section 7.6**. As discussed in **Section 7.5.1.1**, aluminum and iron were identified as preliminary COCs in SEAD-121C surface water.

Table 7-10B indicates that exposure to the maximum detected concentrations of antimony, cadmium, and copper in SEAD-121C ditch soil by the deer mouse results HQs greater than 1 based on the NOAEL SEVs. All the other HQs for the deer mouse are below 1.

HQs based on the NOAEL SEVs are below 1 for the avian receptor (American robin) exposed to all COPCs in SEAD-121C ditch soil with the exception of cadmium, cyanide, and lead. The HQ for the American robin exposed to zinc in SEAD-121C ditch soil is at 1.

Exposure to the maximum detected concentrations of antimony, cadmium, and copper in SEAD-121C ditch soil by the short-tailed shrew results in HQs greater than 1 based on the NOAEL SEVs. The HQs associated with exposure to the maximum detected concentrations of lead and selenium in ditch soil are at 1 for the short-tailed shrew. The HQs resulting from the maximum detected concentrations of all the other COPCs in SEAD-121C ditch soil are all below 1.

Table 7-10B indicates that exposure to the maximum detected concentrations of antimony, cadmium, copper, and lead in SEAD-121C ditch soil by the meadow vole results in HQs greater than or equal to 1 based on the NOAEL SEVs.

HQs based on the NOAEL SEVs are below 1 for the high trophic level mammal (red fox) exposed to all COPCs in SEAD-121C ditch soil.

HQs based on the NOAEL SEVs are below 1 for the great blue heron exposed to all COPCs in SEAD-121C ditch soil with the exception of cyanide and lead. The HQ associated with exposure to the maximum detected concentration of cyanide and lead in ditch soil is at 1 for the great blue heron.

7.5.1.4 SEAD-121I Surface Water

HQ results for the identified receptors exposed to COPCs in SEAD-121I soil, ditch soil, and surface water based on the maximum detected concentrations for the COPCs and the NOAEL SEVs are presented in **Tables 7-11A** and **7-11B**. Estimated exposures based on the maximum detected concentrations of the COPCs for the deer mouse, American robin, short-tailed shrew, meadow vole, red fox, and great blue heron are presented in **Tables G-4A** through **G-4F**.

Surface water COPC concentrations (with the exception of aluminum and iron concentrations) would result in insignificant exposure compared to the soil or ditch soil COPC concentrations. HQs associated with exposure to aluminum and iron in SEAD-121I surface water are below 1 for all receptors; therefore, no preliminary COCs were identified for SEAD-121I surface water.

7.5.1.5 SEAD-121I Soil

HQ results for the identified receptors exposed to COPCs in SEAD-121I soil and surface water based on the maximum detected concentrations for the COPCs and the NOAEL SEVs are presented in **Table 7-11A**. Estimated exposures based on the maximum detected concentrations of the COPCs in surface water and soil (0-2 ft. bgs soil and 0-4 ft. bgs soil) at SEAD-121I for the deer mouse, American robin, short-tailed shrew, meadow vole, and red fox are presented in **Tables G-4A**, **G-4B**, **G-4C**, **G-4D**, and **G-4E**, respectively.

Soil COPCs and surface water COPCs with the maximum detected concentrations that generated HQs based on the NOAEL SEVs greater than or equal to 1 for one or more identified receptors include nine PAHs (anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, phenanthrene, and pyrene), one pesticide (4,4'-DDT), cyanide, and several metals (antimony, arsenic, cadmium, chromium, cobalt, copper, lead, manganese, selenium, silver, thallium, and vanadium). These COPCs were identified as preliminary COCs in SEAD-121I soil and were further evaluated in **Section 7.6**.

Table 7-11A indicates that exposure to the maximum detected concentrations of two PAHs (phenanthrene and pyrene) and several metals (antimony, arsenic, cadmium, cobalt, manganese, selenium, thallium, and vanadium) in SEAD-121I soil by the deer mouse results in HQs greater than or equal to 1 based on the NOAEL SEVs. All the other HQs for the deer mouse were below 1.

HQs based on the NOAEL SEVs are below 1 for the avian receptor (American robin) exposed to all COPCs in SEAD-121I soil with the exception of 4,4'-DDT, cyanide, and several metals (cadmium, chromium, manganese, selenium, thallium, and vanadium). The HQ for the American robin exposed to manganese in SEAD-121I soil is approximately 100 and the HQs for selenium and thallium are approximately 30 and 50, respectively. The HQs associated with exposure to all the other COPCs are below 10.

Exposure to the maximum detected concentrations of two PAHs (phenanthrene and pyrene) and several metals (antimony, arsenic, cadmium, cobalt, manganese, selenium, thallium, and vanadium) in SEAD-121I soil by the short-tailed shrew results in HQs greater than 1 based on the NOAEL SEVs. The HQs associated with exposure to the maximum detected concentration of several PAHs (benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, and chrysene) and silver in soil are at 1 for the short-tailed shrew. The HQs resulted from the maximum detected concentrations of all the other COPCs in SEAD-121I soil are all below 1.

Table 7-11A indicates that exposure to the maximum detected concentrations of several PAHs (anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, phenanthrene, and pyrene) and several metals (antimony, arsenic, cobalt, copper, lead, manganese, selenium, thallium, and vanadium) in SEAD-121I soil by the meadow vole results in HQs greater than or equal to 1 based on the NOAEL SEVs.

HQs based on the NOAEL SEVs are below 1 for the high trophic level mammal (red fox) exposed to all COPCs in SEAD-121I soil with the exception of manganese, selenium, and thallium.

7.5.1.6 SEAD-121I Ditch Soil

HQ results for the identified receptors exposed to COPCs in SEAD-121I ditch soil and surface water based on the maximum detected concentrations for the COPCs and the NOAEL SEVs are presented in **Table 7-11B**. Estimated exposures based on the maximum detected concentrations of the COPCs in surface water and ditch soil at SEAD-121I for the deer mouse, American robin, short-tailed shrew, meadow vole, red fox, and great blue heron are presented in **Tables G-5A**, **G-5B**, **G-5C**, **G-5D**, **G-5E**, and **G-5F**, respectively.

Ditch soil COPCs and surface water COPCs with the maximum detected concentrations that generated HQs based on the NOAEL SEVs greater than or equal to 1 for one or more identified receptors include six PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and pyrene) and several metals (arsenic, cobalt, manganese, selenium, silver, thallium, vanadium, and zinc). These COPCs were identified as preliminary COCs in SEAD-121I ditch soil and were further evaluated in **Section 7.6**.

Table 7-11B indicates that exposure to the maximum detected concentrations of several metals (arsenic, cobalt, manganese, selenium, silver, thallium, and vanadium) in SEAD-121I ditch soil by the deer mouse results in HQs greater than or equal to 1 based on the NOAEL SEVs. All the other HQs for the deer mouse are below 1. The HQ for the deer mouse exposed to thallium in SEAD-121I ditch soil is approximately 10. All the other HQs for the deer mouse are below 10.

HQs based on the NOAEL SEVs are below 1 for the avian receptor (American robin) exposed to all COPCs in SEAD-121I ditch soil with the exception of several metals (arsenic, manganese, selenium, thallium, and zinc). The HQ associated with exposure to zinc in ditch soil is at 1. The HQs associated with exposure to all the other COPCs are below 1.

Exposure to the maximum detected concentrations of several metals (arsenic, cobalt, manganese, selenium, silver, thallium, and vanadium) in SEAD-121I ditch soil by the short-tailed shrew results in HQs greater than 1 based on the NOAEL SEVs. The HQs associated with exposure to the maximum detected concentration of two PAHs (benzo(b)fluoranthene and benzo(k)fluoranthene) in ditch soil are at 1 for the short-tailed shrew. The HQs resulted from the maximum detected concentrations of all the other COPCs in SEAD-121I ditch soil are all below 1.

Table 7-11B indicates that exposure to the maximum detected concentrations of several PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and pyrene) and several metals (arsenic, cobalt, manganese, selenium, silver, thallium, and vanadium) in SEAD-121I ditch soil by the meadow vole results in HQs greater than or equal to 1 based on the NOAEL SEVs.

HQs based on the NOAEL SEVs are below 1 for the high trophic level mammal (red fox) exposed to all COPCs in SEAD-121I ditch soil except that the HQ for thallium is slightly above 1 at a value of 2.

HQs based on the NOAEL SEVs are below 1 for the great blue heron exposed to all COPCs in SEAD-121I ditch soil except that the HQs associated with exposure to manganese and thallium in ditch soil are at 1.

7.5.2 Uncertainties for ERA Steps 1 and 2

For this aspect of the SLERA, a qualitative analysis was made of the uncertainties associated with the various components of the assessment, including the problem formulation and screening of contaminants and criteria used, toxicity and exposure characterization, and characterization of risk. This analysis identifies the potential magnitude of underestimating or overestimating the potential for adverse effects to organisms.

7.5.2.1 Uncertainty in Screening-Level Problem Formulation

The preliminary problem formulation step of the SLERA may have some degree of uncertainty regarding the selection of COPCs, identification of potential exposure pathways, and the selection of receptor species.

The assessment and measurement endpoints were selected according to the USEPA guidance (1997c and 1998b). The screening criteria used for the selection of ecological COPCs were derived from various sources. Most of these criteria are recommended for screening of site contaminants and are developed by the USEPA and various USEPA regions. Uncertainties associated with the sources and derivation of the criteria could possibly underestimate or overestimate the number of site COPCs.

In order to determine the potential exposure to ecological receptors to site-related constituents, the presence of constituents in environmental media must first be established. The magnitude at which these constituents are present also greatly influences resulting exposure estimates. The SLERA was conducted based on all data available for the sites. As discussed in **Section 6.8**, the size of the soil samples and the biased sampling approach indicate the uncertainty associated with site characterization is low. In addition, uncertainty in contaminant identification is considered low because generally full suite of Contract Laboratory Program (CLP) target compounds including VOCs, semivolatile organic compounds, PCBs, pesticides, and metals were analyzed for the samples. Reasonable certainty also is assumed because of the sample data validation and quality assurance/quality control procedures applied to sample analysis and data evaluation.

Receptors were selected based on several factors, including their known or potential occurrence in the vicinity of the Depot, as well as their level of sensitivity to contaminants. These decisions are based on best professional judgment and recommendations by USEPA (1997c and 1999b) regarding wildlife exposure parameters and calculations. Limitations regarding the determination of receptor species include the availability of exposure and toxicity information, abundance versus sensitivity, and ecological relevance. The potential for overestimation or underestimation exists when using receptor species and extrapolating calculated risks to other species within that trophic level.

7.5.2.2 Uncertainty in Screening-Level Ecological Effect Evaluation

The evaluation of ecological effects involves the derivation of ecological SEVs for comparison to the calculated exposures (e.g., daily dose). Because toxicity information is limited for many chemicals, SEVs from similar or related chemicals were sometimes used. The use of surrogate toxicity values may underestimate or overestimate risk. For other chemicals, analytical results may not distinguish between different isomers or forms of a chemical although available toxicity information does, or vice versa. The absence of isomer specific toxicity values or isomer specific analytical data for some chemicals may tend to overestimate or underestimate risks. The SEV selection process may overestimate risk since overall the most conservative (and scientifically defensible) SEV is chosen rather than a range of or median SEV(s). In addition, the toxicity values used are chemical-specific and are incorporated into the SEV by use of conversion factors. For example, a conversion factor may be applied for the extrapolation from LD50 to chronic exposures. The use of conversion factors may overestimate or underestimate risk for a particular COPC. Toxicity studies for species other than the receptor species of concern are often used in the development of SEVs. The use of related species to estimate toxicity to a representative receptor species may overestimate or underestimate risk due to different species sensitivity to particular toxicants.

SEVs may not be available for some COPCs, thereby precluding their inclusion in the quantitative risk estimates. The resulting risk estimates will not include the chemical-specific risks from these chemicals and therefore, may underestimate risk. For this assessment, toxicity data were available for all of the identified COPCs with the exception of antimony, benzene, and ethylbenzene. No SEVs of antimony, benzene, and ethylbenzene were identified for avian receptors (the American robin and great blue heron). Benzene and ethylbenzene were detected in only three out of 68 soil samples at SEAD-121C. There is no evidence that benzene and ethylbenzene are associated with any historical release at the site. In addition, due to the high volatility of benzene and ethylbenzene, exposure to these chemicals in surface soil is expected to be minimal. Therefore, risks associated with benzene and ethylbenzene are expected to be minor. A further evaluation of antimony in soil is presented in **Section 7.6**.

For many COPCs, especially metals, the form of the compound has a direct affect on its toxicity. For this screening ERA, the most toxic form of the COPC was utilized to derive the SEVs. NOAELs or estimated NOAELs were always utilized as the SEVs for the screening level ERA. However, LOAELs may be better for estimating risk since LOAELs are the lowest concentrations at which a receptor demonstrates adverse effects. Thus, HQs can be generated utilizing LOAELs in lieu of NOAELs to represent the concentration at which receptors start showing effects due to exposure to the COPCs.

7.5.2.3 Uncertainty in Screening-Level Exposure Assessment

Factors that can contribute to uncertainty in the exposure assessment include identification and evaluation of exposure pathways, intake parameters, and EPCs.

The identification of potential exposure pathways and receptors was based on site-specific reasonable current use and future ecological habitat. Site-specific receptors were identified to the extent possible and exposure parameters tailored to these receptors to minimize uncertainty in the defined scenarios and exposure assessments.

Values assumed for exposure parameters (e. g., feeding rates and dietary intake) used in calculations for intakes are based on Nagy (1999) and USEPA (1993b, 1997c, and 1999b) guidance. These assumptions may result in underestimating or overestimating the intakes calculated for specific receptors, depending on the accuracy of the assumptions relative to actual site conditions and uses. Since conservative assumptions were used to select intake rates, bioaccumulation factors and site utilization factors, the estimated risk to the receptors is generally overestimated.

Exposure and toxicity information are generally not available for dermal or inhalation exposure; hence, the lack of quantitative evaluation may underestimate risk. On-site exposure of COPCs to receptors may occur via dermal and inhalation pathways. Although intake of contaminants from these additional pathways may occur, these exposure routes are expected to be negligible compared to exposure via ingestion routes. Therefore, the impact to the overall contaminant exposure is expected to be minor.

Another source of exposure estimation uncertainty is that contamination is assumed to remain constant over time. Fate and transport mechanisms, which would result in the degradation and loss of some COPCs from the environment, may not be considered in the exposure evaluation for ecological receptors. In addition, the use of the maximum detected concentration as the EPC may overestimate risk since the receptor is actually exposed to a broader range of contaminant concentrations rather than the maximum detected concentrations. Exposure would occur throughout the site at various levels, including the EPC. Thus, actual risks may be lower than those presented in the assessment.

Estimations of uptake and retention of COPCs using bioaccumulation factors (BAFs) often do not account for the depuration of COPCs from the organism's system over time. BAFs are also reflective of the most contaminated source of the organism's diet fraction. For example, a receptor's invertebrate diet may consist largely of insects, yet for most COPCs, the invertebrate BAF used was reflective of earthworm bioaccumulation since the earthworm BAFs are generally more conservative than other invertebrate BAFs.

Metals in environmental media, particularly solid matrices, are frequently bound to particles or complexed with other elements, making them less available to biological organisms. Metals such as lead can react with anions in water, such as hydroxides, carbonates, sulfates, and phosphates that have low water solubilities, and will precipitate out of the water column, or occur as sorbed ions or surface coatings on sediment mineral particles (ATSDR, 2003). Zinc is capable of forming complexes with a variety of organic and inorganic complexing groups. Sorption is the dominant reaction of zinc, resulting in the enrichment of zinc in suspended and bed sediments (ATSDR, 2003). These complexes would limit the bioavailability of chemicals of potential ecological concern to receptors. Extraction and analysis of total metals in samples does not differentiate between the bioavailable and non-bioavailable fraction (complexed with other compounds present in bulk sediment samples) of metals in soil. This would result in an overestimation of hazard for the ecological receptors exposed to metals in soil.

Biota uptake is a major exposure pathway evaluated in the SLERA. The USEPA recommended food chain models have been used in the analysis. However, no biota sampling has been conducted to validate the model. If a further evaluation (i.e., a baseline ecological risk assessment) is warranted, a biota sampling would provide site-specific information and improve the understanding of the ecological impacts to the site habitat.

A conservative site foraging frequency factor of 1 was used for all mammalian receptors. A site utilization factor of 100% assumes the receptor is present at the site and does not forage or range beyond the boundaries of the site being evaluated. This is a very conservative assumption as most receptors will spend at least part of the time outside of the site boundaries, either by having a larger home range than the site area, seasonal migration patterns, and/or winter dormancy periods.

7.5.2.4 Uncertainty in Screening-Level Risk Characterization

The screening level risk characterization step may result in some degree of uncertainty for the SLERA results. Uncertainties in the risk characterization are compounded under the assumption of dose additivity or non-additivity for multiple substance exposure. For this assessment, it was assumed that the potential toxic effects of the COPCs were non-additive. This assumption may result in the underestimation of risk since concurrent exposure to several contaminants might have synergistic toxic effects. The risk characterization of metals does not include additive effects since there is no evidence of clearly additive effects in ecological systems. For PAHs in SEAD-121C and SEAD-121I soil, although the sum of the HQs exceeded 1 for the deer mouse, short-tailed shrew, and meadow vole, the SEVs are based on the SEV for benzo(a)pyrene, the most toxic chemical among the PAHs. In addition, the sum of the HQs would be below or at 1 if LOAEL SEVs were used. Therefore, PAHs in SEAD-121C and SEAD-121I soil are not expected to pose significant risk to the environment.

In summary, identification and evaluation of exposure pathways, intake parameters, and EPCs can all contribute to uncertainty in the SLERA. Overall, the HQs calculated from conservative SEVs, the maximum detection exposure concentrations, and 100% site utilization factor for mammals were intended to provide confidence that the risk assessment yields reasonably conservative estimates of the potential risk of adverse ecological effects on the assessment endpoints.

7.6 FURTHER REFINEMENT OF CHEMICALS OF CONCERN

For the screening level ERA, NOAEL toxicity values, the maximum detected COPC concentrations, and conservative exposure assumptions were used to calculate screening level HQs. Due to the conservative nature of these assumptions, additional evaluation is required to refine the contaminants of concern. The refinement of COCs streamlines the overall ERA process to determine if further evaluation is warranted. This section presents the results of further refinement of chemicals of concern conducted in accordance with the USEPA's ERAGS supplemental guidance (USEPA, 2001a).

Lines of evidence (COC refinement) evaluated include:

- COC detection frequency;
- risk results based on reasonable site average concentration and/or LOAEL SEVs;
- size of site relative to foraging area of receptors;
- site risk relative to background risk;
- relative uncertainties of SLERA results;
- sufficiency and quality of literature toxicity data and experimental designs;
- strength of cause/effect relationships; and
- quality of habitat for receptors.

Alternative toxicity values and mean exposures based on mean concentrations were considered for the refinement of COCs. Utilizing the mean concentration instead of the maximum concentration presents a more realistic approach to evaluate exposure for a receptor that comes into contact with a COPC. The receptor is likely to range over the entire site and not be continuously exposed to the maximum concentration at all times. Thus, the mean is more representative of the actual exposure concentration for a receptor to contact on a continual basis. This additional risk characterization performed as part of the ERA Step 3, together with the other lines of evidence, is discussed in **Sections 7.6.2** through **7.6.7** for SEAD-121C surface water, SEAD-121C soil, SEAD-121C ditch soil, SEAD-121I surface water, SEAD-121I soil, and SEAD-121I ditch soil, and can be used to refine the COCs and support a decision for either additional evaluation or no further evaluation of environmental risk.

7.6.1 Overall Conservative Evaluation of Ecological Risks in Steps 1 and 2

In accordance with the USEPA (1997c) ERAGS, this SLERA was conducted using highly conservative assumptions. Therefore, the SLERA in general leads to an overestimation of the risks to the ecosystem. This section discusses three major parameters for which conservative estimations were used: the relative bioavailability, the site foraging frequency factor, and the NOAEL/LOAEL multiplier.

Relative Bioavailability

Although the relative bioavailability of contaminants at the sites was assumed to be 100 % for the SLERA, contaminants in environmental media are generally less available to biological organisms compared with the same contaminants in the experimental medium (i.e., diet, water, etc.). For example, most of the soil COPCs identified in the initial screening level ERA are PAHs and metals. The following factors should be considered in the refinement of PAH and metal COCs:

- Metals in soil are frequently bound to particles or complexed with other elements, making them less available to biological organisms. These tendencies would tend to limit the bioavailability of metal to ecological receptors.

- Metal toxicity is generally associated with the soluble fraction.

- Soluble metal, not total metal, is associated with the uptake and bioaccumulation of metal from soil into plants.

- The oral toxicity of metal compounds in soil is dependant upon the chemical form. Insoluble compounds are considerably less toxic compared to the soluble forms. The soil pH observed at the site (7 to 8) favors formation of insoluble fractions.

- Although bioaccumulation has been observed for some metals (e.g., Cd, Pb, etc.), biomagnification is not reported for these metals.

Although there are some interaction effects between certain metals (for example, lead may enhance cadmium absorption (ATSDR, 1999), the overall conservative assumptions (100% bioavailability) tend to overestimate the risks.

Over time (e.g., months or years), an organic compound can enter the microscopic pores on the surface of soil particles and become sequestered into the solid portion by binding tightly to the organic content in soil, thereby making it less bioavailable (Alexander, 2000). Extensive scientific data now exist to support the concepts that the longer the chemicals remain in soil, (1) the less readily they are removed by solvents, including water, (2) the less available they become to microorganisms, (3) the less toxic they become to organisms such as earthworms, and (4) the less they are ingested by organisms such as earthworms. This reduction in availability of the chemicals reduces the risk associated with their presence in the soil (GRI, 1997, as cited in Nakles et al., 2002). For example, the toxicity of DDT declined by 25~80% for animals (including fruit flies, houseflies, and cockroaches) after 90 days of aging (Nakles, et al., 2002). The assumption that COPCs are completely bioavailable, given the age and history of the site, is likely to overestimate systemic absorption of these COPCs.

Chemical-specific bioavailability factors are discussed in the following sections where appropriate on a case-by-case basis.

Site Foraging Frequency Factor

The site foraging frequency factors (or area-use factors) were assumed to be 1 for the mammalian receptors at the sites. That is, the receptors were assumed to be present at the site and do not forage or range beyond the boundaries of the site being evaluated. This is a very conservative assumption as most receptors will spend at least part of the time outside of the site boundaries, either by having a larger home range than the site area, seasonal migration patterns, and/or winter dormancy periods. As an example, the red fox has much larger foraging range (i.e., over 200 acres) compared to the size of SEAD-121C or SEAD-121I (5 acres and 16 acres, respectively). Site foraging frequency factors of 0.025 and 0.08 would be more appropriate for the red fox for SEAD-121C and SEAD-121I.

For the avian receptors, a site foraging frequency factor of 100% was assumed. This is an overly conservative assumption. American robins in the northern portions of the range that complete full migration leave the breeding grounds from mid-August through mid-October and arrive on their northern breeding grounds in April and May (Whitefish Point Bird Observatory, 2005). Although there are partially migratory populations and sedentary populations, during winter these populations are not likely to be exposed to soil or earthworms, the predominant contaminated diet items contributing to the total daily dose of contaminants. In addition, only part of the site has been impacted by the contaminants. Therefore, a site foraging frequency factor of 0.5 would be a more appropriate estimate for the American robin. Similarly, the great blue herons are seasonal residents in New York State, spending around half the year at the site (http://www.mbr-pwrc.usgs.gov/bbs/anim/h1940.html). Therefore, a foraging factor of 0.5 is a more reasonable estimate.

NOAEL/LOAEL Multiplier

A NOAEL is preferred to a LOAEL as a screening ecotoxicity value to ensure that risk is not underestimated (USEPA, 1997c). However, NOAELs currently are not available for many groups of organisms and many chemicals. When a LOAEL value, but not a NOAEL value, is available from the literature, a standard practice is to multiply the LOAEL by a NOAEL/LOAEL multiplier (0.1) and to use the product as the NOAEL for the screening evaluation. Although a NOAEL/LOAEL multiplier of 0.1 was used, the true NOAEL may be only slightly lower than the experimental LOAEL, particularly if the observed effect is of low severity (Sample et al., 1996). The data review referred to in the ERAGS that is used to support the use of 0.1 as the NOAEL/LOAEL multiplier indicates that 96% of chemicals included in the review had a NOAEL/LOAEL multiplier no less than 0.2. Therefore, using a default NOAEL/LOAEL multiplier of 0.1 may result in an overestimation of the HQs. LOAEL values were used in Step 3.2 as alternative SEV values.

Maximum Detected Concentration

The use of the maximum detected concentration as the EPC may overestimate risk since the receptor is actually exposed to a broader range of contaminant concentrations rather than the maximum detected concentrations. Exposure would occur throughout the site at various levels, including the EPC. Thus, actual risks may be lower than those presented in the assessment. Mean concentrations for preliminary COCs (as presented in **Tables 7-12A/B** and **7-13A/B)** were used in Step 3.2 as the alternative values for EPCs.

7.6.2 Identification of COCs in SEAD-121C Surface Water

Only aluminum and iron were retained as preliminary COCs in surface water. The HQ associated with exposure to aluminum in SEAD-121C surface water is at 1 for the meadow vole. If the LOAEL was used, the HQ would be below 1 (**Table 7-14A**).

The HQs associated with exposure to iron in SEAD-121C surface water are approximately 20 for the deer mouse, short-tailed shrew, and meadow vole, and 10 for the red fox. The maximum concentration detected at SWDRMO-2 (110 mg/L) is much higher than the iron concentrations detected in other surface water samples (ranging from not detected to 17.2 mg/L). The average iron concentration detected in surface water at SEAD-121C is 12 mg/L. If the second highest iron concentration (17.2 mg/L) were used, the HQs for all receptors would be at or below 3. The alternative HQs based on the maximum detected concentration and the LOAEL SEVs are at 1 or 2 (**Table 7-14A).** Further, it should be noted that as no iron toxicity information was available for ecological receptors, the dietary reference intake for a child (Wright, 2001) was used as the SEV for iron. This is an overly conservative assumption.

Based on the above discussion, aluminum and iron in surface water were not retained as final COCs. As a result, no COCs were identified for SEAD-121C surface water.

7.6.3 Identification of COCs in SEAD-121C Soil

Based on the calculated risk estimates for the screening level ERA, one VOC (meta/para xylene), two PAHs (phenanthrene and pyrene), one PCB (Aroclor-1254), one pesticide (4,4'-DDT), and several metals (antimony, barium, cadmium, chromium, copper, lead, silver, thallium, and zinc) were identified as preliminary COCs in SEAD-121C soil as the associated HQs were at least 1 for one or more receptors (see **Table 7-10A**). This section presents further evaluation of the preliminary COCs identified in SEAD-121C soil based on the SLERA results. Upon the refinement described in this section, no COPC was identified for SEAD-121C soil.

Meta/para xylene

For meta/para xylene, the HQs for the deer mouse, short-tailed shrew, meadow vole, and red fox exposed to total soil (0-4 ft. bgs) are above 1. The HQs for all receptors exposed to surface soil (0-2 ft. bgs) and the American robin exposed to total soil are below 1.

Meta/para xylene and ortho xylene were detected infrequently in SEAD-121C soil (four out of 56 samples and two out of 56 samples, respectively). The maximum meta/para xylene concentration

(130 mg/Kg) was detected in SBDRMO-9 at 2-6 ft. bgs. The meta/para xylene concentration detected in SBDRMO-9 at 0-2 ft. bgs was 4.4 mg/Kg. Meta/para xylene was not detected in any of the adjacent locations (SBDRMO-6, SBDRMO-12, and SSDRMO-8). Therefore, the maximum detected concentration of meta/para xylene, 130 mg/Kg, at 2-6 ft. bgs, is an isolated hit and does not represent the average EPC in soil. If the average meta/para xylene concentration were used, the HQs for all identified receptors would be below 1 (as shown in **Table 7-14B**). In addition, the HQs based on the maximum detected concentration and the LOAEL are below 1 for all receptors (**Table 7-14A**). Based on the infrequent detection of meta/para xylene, the high volatility of xylene, and the relatively low (i.e., below 1) HQs based on the alternative assumptions (LOAEL used as SEV and/or average concentration used as EPC) for all receptors, meta/para xylene is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC in SEAD-121C soil.

Phenanthrene

For phenanthrene, the HQs for the short-tailed shrew exposed to surface and total soil are at 1; the HQs for the meadow vole exposed to surface and total soil are approximately 2; and the HQs for all the other receptors are below 1. The HQs are based on the maximum detected concentrations and the NOAEL SEVs derived from the LOAEL value for benzo(a)pyrene. The alternative HQs based on the maximum detected concentration and the LOAEL value for benzo(a)pyrene are all below 1 (as shown in **Table 7-14A**). The alternative HQs based on the NOAEL SEV and the mean concentration of phenanthrene in surface and total soil for the shrew and vole are at least one magnitude below 1 (as shown in **Table 7-14B**). The alternative HQs based on the LOAEL SEV and the mean concentration of phenanthrene in surface and total soil for the shrew and vole are at least two magnitudes below 1 (as shown in **Table 7-14C**). Due to the fact that the HQs based on the SLERA are at 1 or 2 for the shrew and vole and all the alternative HQs are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., SEV for benzo(a)pyrene was used for phenanthrene), phenanthrene is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Pyrene

For pyrene, the HQs for the short-tailed shrew exposed to surface and total soil are approximately 2; the HQs for the meadow vole exposed to surface and total soil are approximately 3; and the HQs for all the other receptors are below 1. The HQs are based on the maximum detected concentrations and the NOAEL SEVs derived from the LOAEL value for benzo(a)pyrene. The alternative HQs are based on the maximum detected concentration and the LOAEL values for benzo(a)pyrene are all below 1 (as shown in **Table 7-14A**). The alternative HQs based on the NOAEL SEVs and the mean concentrations of pyrene in surface and total soil for the shrew and vole are approximately 0.1 (as shown in **Table 7-14B**). The alternative HQs based on the LOAEL SEV and the mean concentrations of pyrene in surface and total soil for the shrew and vole are approximately 0.01 (as shown in **Table 7-14C**). Due to the fact that the HQs based on the SLERA are slightly above 1 for the shrew and vole and all the alternative HQs are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., SEV for benzo(a)pyrene was used for pyrene), pyrene is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Aroclor-1254

For Aroclor-1254, the HQs for the deer mouse, American robin, and short-tailed shrew exposed to surface and total soil are slightly above 1 (i.e., ranging from 2 to 3) and the HQs for all the other receptors are below 1. The HQs are based on the maximum detected concentrations and the NOAEL SEVs. The NOAEL SEV for the robin was derived from the LOAEL value for the ring-necked pheasant. Aroclor-1254 was detected in nine out of 68 soil samples and was only detected in surface soil (i.e., 0-2 ft. bgs).

The alternative HQs based on the maximum detected concentration and the LOAEL value are all below 1 (as shown in **Table 7-14A**). The alternative HQs based on the NOAEL SEVs and the mean concentration of Arcolor-1254 in surface and total soil for the mouse, robin, and shrew range from 0.1 to 0.2 (as shown in **Table 7-14B**). The alternative HQs based on the LOAEL SEV and the mean concentration of Aroclor-1254 in surface and total soil are at least two magnitudes below 1 (as shown in **Table 7-14C**). Due to the fact that the HQs based on the SLERA are slightly above 1 for the mouse, robin, and shrew and all the alternative HQs are below 1, and the fact that the SLERA results are based on conservative assumptions, Aroclor-1254 is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

4,4’-DDT

For 4,4’-DDT, the HQs for the American robin exposed to surface and total soil are above 1 at approximately 20. The HQs for all the other receptors are below 1. The HQs are based on the maximum detected concentrations and the NOAEL SEV derived from the LOAEL value for the brown pelican. It should be noted that the NOAEL SEV identified for the SLERA may overstate potential risks associated with 4,4’-DDT exposure. As an example, the toxicity reference values adopted by Navy/USEPA Region 9 BTAG and recommended by the California Department of Toxic Substances Control Human and Ecological Risk Division (HERD) range from 0.009 mg/Kg-day to 1.5 mg/Kg-day for birds. The NOAEL SEV identified for this SLERA was 0.0028 mg/Kg-day for birds. Therefore, the NOAEL SEV identified for 4,4’-DDT is a conservative estimate and may overstate potential risks. The alternative HQs based on the maximum detected concentration and the LOAEL SEV are 2 for the American robin (as shown in **Table 7-14A**). The alternative HQs based on the NOAEL SEV and the mean concentration of 4,4’-DDT in surface and total soil are at 1 for the American robin (as shown in **Table 7-14B**). The alternative HQs based on the LOAEL SEV and the mean concentration of 4,4’-DDT in surface and total soil are 0.1 for the American robin (as shown in **Table 7-14C**). Due to the fact that the HQs based on the SLERA are below 1 for all the mammalian receptors and that the alternative HQs for the robin are close to 1 (ranging from 0.1 to 2), and the fact that the SLERA results are based on conservative assumptions (e.g., conservative SEVs for birds), 4,4'-DDT is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Antimony

For antimony, the HQs for all identified receptors exposed to surface and total soil are above 1. An antimony SEV was not identified for birds and therefore, risks to the American robin were not quantified for exposure to antimony. The HQs for the mammalian receptors are based on the maximum detected concentrations and the NOAEL SEVs. The SEVs for antimony are based on the LOAEL value from a drinking water study. Metals tend to be more bioavailable in their soluble forms while less bioavailable in soil. Antimony has been shown to adsorb strongly to most soils with a median percent adsorption of 93% and as much as 100% adsorption in several soil types (ATSDR, 1992). Therefore, bioavailability of antimony is expected to be much lower than that of the toxicity studies from which the SEVs were identified. Further, the alternative HQs based on the LOAEL SEVs and the mean concentration of antimony in surface and total soil for all receptors are at 1 as shown in **Table 7-14C**. Due to the fact that the alternative HQs are based on the LOAEL SEVs and the mean concentrations of antimony are at 1, and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability and SEVs based on drinking water study were used), antimony is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Barium

For barium, the HQs for the deer mouse, American robin, short-tailed shrew, and meadow vole exposed to surface and total soil are slightly above 1 (ranging from 2 to 5) and the HQs for the red fox are below 1. The alternative HQs based on the mean concentrations of barium in surface and total soil are all below 1 (as shown in **Table 7-14B** and **Table 7-14C**). The alternative HQs based on the LOAEL SEV and the maximum barium concentrations in surface and total soil are below 1 for the mouse, shrew, and vole, and are at 3 for the American robin (as shown in **Table 7-14A**). Due to the fact that the HQs based on the SLERA are slightly above 1 (ranging from 2 to 5) for the mouse, robin, shrew, and vole and that all the alternative HQs based on the mean barium concentrations are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), barium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Cadmium

For cadmium, the HQs for the deer mouse, American robin, short-tailed shrew, and meadow vole exposed to surface and total soil are above 1 (ranging from 3 to 10), and the HQs for the red fox are below 1. The alternative HQs based on the maximum detected concentration and the LOAEL SEV are below or at 1 (as shown in **Table 7-14A**). The alternative HQs based on the LOAEL SEV and the mean concentrations of cadmium in surface and total soil are all below 1 (as shown in **Table 7-14C**).

The alternative HQs based on the NOAEL SEV and the mean cadmium concentrations in surface and total soil are below or at 1 for the mouse, robin, and vole and are at 2 for the shrew (as shown in **Table 7-14B**). All the alternative HQs are below or at 1 except that the HQs based on the NOAEL SEV, and the mean cadmium concentrations are slightly above 1 (2) for the shrew. Further, the SLERA results are based on conservative assumptions (e.g., 100% bioavailability). Therefore, cadmium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Copper

For copper, the HQs for all identified receptors are above 1 (ranging from 4 to approximately 70). The SLERA results are based on the maximum copper concentrations, the NOAEL SEVs, and the 100% bioavailability. Copper binds relatively strongly to soils. This adsorption to soils is less affected by pH than other metals, making copper less likely to become bioavailable in the acidic conditions of an animal's digestive tract (USEPA, 2001b). Further, the alternative HQs based on the mean copper concentrations are below 1 or slightly above 1 (ranging from 0.1 to 4 as shown in **Table 7-14B** and **Table 7-14C**). Due to the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability) and that the alternative HQs based on the mean copper concentrations are below 1 or slightly above 1, copper is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Lead

For lead, the HQs for all identified receptors are above 1 (ranging from 5 to approximately 200). The SLERA results are based on the maximum lead concentrations, the NOAEL SEVs, and the 100% bioavailability. The NOAEL SEVs identified for mammals are based on a study of lead acetate. Lead acetate is much more soluble than the other lead compounds expected in soil (e.g., lead carbonates and lead oxides). Therefore, the bioavailability of lead in soil is expected to be much lower than the bioavailability of lead acetate. The oral bioavailability of lead in soil has been more extensively studied than any other metal. USEPA assumes a relative bioavailability factor for lead of 0.6 in its adult lead model (USEPA, 1996a). Further, the alternative HQs based on the mean lead concentration and the LOAEL SEV are below 1 for all receptors (as shown in **Table 7-14C**). Due to the fact that the alternative HQs based on the mean concentrations and the LOAEL SEVs are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), lead is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Silver

For silver, the HQs for the deer mouse, short-tailed shrew, and meadow vole exposed to surface and total soil are above 1 (6, 7, and 6, respectively), and the HQs for all the other receptors are below 1. The HQs are based on the maximum detected concentrations and the NOAEL SEVs. The alternative

HQs based on the maximum detected concentration and the LOAEL SEV are below 1 for the mouse, shrew, and vole (as shown in **Table 7-14A**). The alternative HQs based on the NOAEL SEVs and the mean concentrations of silver in surface and total soil are below 1 for the mouse, shrew, and vole (as shown in **Table 7-14B**). The alternative HQs based on the LOAEL SEVs and the mean concentrations of silver in surface and total soil are below 1 for the mouse, shrew, and vole (as shown in **Table 7-14C**). Due to the fact that the HQs based on the SLERA are at 1 for the short-tailed shrew and all the alternative HQs are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), silver is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Thallium

For thallium, the HQs for all receptors are below 1 except that the HQ for the short-tailed shrew exposed to total soil is slightly above 1 at 2. The HQs are based on the maximum detected concentrations and the NOAEL SEVs. The NOAEL SEVs for mammals were derived from the LOAEL value by adjusting the NOAEL/LOAEL multiplier. As discussed in **Section 7.6.1**, the NOAEL/LOAEL multiplier is likely to overstate potential risks. It should be noted that the NOAEL SEV identified for the SLERA (0.16 mg/Kg-day for the shrew) may overstate potential risks associated with thallium exposure. As an example, the toxicity reference values adopted by Navy/USEPA Region 9 BTAG and recommended by the California Department of Toxic Substances Control HERD range from 0.48 mg/Kg-day to 1.43 mg/Kg-day for mammals. Further, the alternative HQ based on the maximum detected concentration in total soil and the LOAEL SEV for the shrew is 0.09 (as shown in **Table 7-14A**). The alternative HQ based on the NOAEL SEV and the mean concentration of thallium in total soil for the shrew is 0.3 (as shown in **Table 7-14B**). The alternative HQ based on the LOAEL SEV and the mean concentration of thallium in total soil for the shrew is 0.03 (as shown in **Table 7-14C**). Due to the fact that the HQs based on the SLERA are slightly above 1 and all the alternative HQs are below 1, and the fact that SLERA results are based on conservative assumptions (e.g., conservative SEV), thallium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Zinc

For zinc, the HQs for the red fox exposed to SEAD-121C surface and total soil are below 1 at 0.6. The HQs for the meadow vole are at 1 and the HQs for the other receptors are above 1 at 4, 7, and 6 for the deer mouse, American robin, and short-tailed shrew, respectively. Zinc is an essential nutrient and is relatively nontoxic to most animals because they can physiologically regulate zinc absorption and excretion. Zinc is capable of forming complexes with a variety of organic and inorganic complexing groups. Sorption is the dominant reaction of zinc (ATSDR, 2003). Further, the alternative HQs based on the maximum zinc concentrations and the LOAEL SEVs are 2, 7, 3, and 0.7 for the mouse, robin, shrew, and vole, respectively (as shown in **Table 7-14A**). The alternative HQs based on the mean zinc concentrations are below 1 for all receptors (as shown in **Tables 7-14B** and **7-14C**). Zinc is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC based on the following facts: 1) the alternative HQs based on the mean concentrations are below 1 for all receptors; 2) the SLERA results are based on conservative assumptions (e.g., 100% bioavailability); and 3) zinc is an essential nutrient and organisms can physiologically regulate absorption and excretion.

Based upon the above discussions and the factors presented in **Section 7.6.1**, no COCs were identified for SEAD-121C surface and total soil.

7.6.4 Identification of COCs in SEAD-121C Ditch Soil

Based on the calculated risk estimates for the SLERA, cyanide and several metals (antimony, cadmium, copper, lead, selenium, and zinc) were identified as preliminary COCs in SEAD-121C ditch soil. This section presents further evaluation of the preliminary COCs identified in SEAD-121C ditch soil based on the SLERA results. Upon the refinement described in this section, no COPC was identified as COCs for SEAD-121C ditch soil.

Antimony

For antimony, the HQs for all mammalian receptors exposed to SEAD-121C ditch soil are above 1 except the HQ for the red fox, which is 0.2. Antimony SEV was not identified for birds and therefore, risk to the American robin or great blue heron was not quantified for exposure to antimony. The HQs are based on the maximum detected concentration and the NOAEL SEVs. For mammals, the antimony SEVs are based on the LOAEL value from a drinking water study. Metals tend to be more bioavailable in their soluble forms while less bioavailable in soil. Antimony has been shown to adsorb strongly to most soils with a median percent adsorption of 93% and as much as 100% adsorption in several soil types (ATSDR, 1992). Therefore, bioavailability of antimony is expected to be much lower than that of the toxicity studies from which the SEVs were identified. Further, the alternative HQs based on the LOAEL SEVs for all mammalian receptors are below 1 as shown in **Table 7-15A** and **Table 7-15C**. Due to the fact that the alternative HQs based on the LOAEL SEVs are below 1 and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability and SEVs based on drinking water study were used), antimony is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Cadmium

For cadmium, the HQs for the deer mouse, American robin, and short-tailed shrew exposed to SEAD-121C ditch soil are above 1 (4, 4, and 6, respectively). The HQ for the meadow vole exposed to cadmium in ditch soil is at 1, and the HQs for the red fox and great blue heron are below 1. The alternative HQs based on the maximum detected concentration and the LOAEL SEVs are below 1 for all receptors (as shown in **Table 7-15A**). The alternative HQs based on the LOAEL SEV and the mean concentration of cadmium in ditch soil are all below 1 (as shown in **Table 7-15C**). The alternative HQs based on the NOAEL SEV and the mean cadmium concentrations in ditch soil are below or at 1 for all receptors (as shown in **Table 7-15B**). Further, the SLERA results are based on conservative assumptions (e.g., 100% bioavailability). Therefore, cadmium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Copper

For copper, the HQs for deer mouse, short-tailed shrew, and meadow vole are above 1 (3, 3, and 9, respectively) and the HQs for the American robin, red fox, and great blue heron are below 1. The SLERA results are based on the maximum copper concentration, the NOAEL SEVs, and the 100% bioavailability. Copper binds relatively strongly to soils. This adsorption to soils is less affected by pH than other metals, making copper less likely to become bioavailable in the acidic conditions of an animal’s digestive tract (USEPA, 2001b). Further, the alternative HQs based on the mean copper concentrations are below 1 or at 1 for all receptors (as shown in **Table 7-15B** and **Table 7-15C**). Due to the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability) and that the alternative HQs based on the mean copper concentration are below or at 1, copper is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Lead

For lead, the HQs for the American robin and meadow vole are above 1 (3 and 4, respectively). The HQs for the short-tailed shrew and great blue heron are at 1, and the HQs for all the other receptors are below 1. The NOAEL SEVs identified for mammals are based on a study of lead acetate. Lead acetate is much more soluble than the other lead compounds expected in soil (e.g., lead carbonates and lead oxides). Therefore, the bioavailability of lead in soil is expected to be much lower than the bioavailability of lead acetate. The oral bioavailability of lead in soil has been more extensively studied than any other metal. USEPA assumes a relative bioavailability factor for lead of 0.6 in its adult lead model (USEPA, 1996a). Further, the alternative HQs based on the LOAEL SEVs are below 1 for all receptors (as shown in **Tables 7-15A** and **7-15C**). Due to the fact that the HQs based on the SLERA are slightly above 1 for the robin and vole and the alternative HQs based on the LOAEL SEVs are below 1 and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), lead is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Selenium

The HQs for all receptors exposed to selenium to SEAD-121C ditch soil are below 1 except the HQ for the short-tailed shrew, which is at 1. The HQs are based on the maximum detected concentration, the NOAEL SEV, and 100% bioavailability. The alternative HQs for the shrew are all below 1 (**Tables 7-15A**, **7-15B**, and **7-15C**). Due to the fact that the HQs based on the NOAEL SEVs and the maximum selenium concentration are below or at 1 for all receptors and the alternative HQs are all below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., 100%

bioavailability), selenium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Zinc

The HQs for all receptors exposed to zinc to SEAD-121C ditch soil are below 1 except the HQ for the American robin, which is at 1. Zinc is an essential nutrient and is relatively nontoxic to most animals because they can physiologically regulate zinc absorption and excretion. Zinc is capable of forming complexes with a variety of organic and inorganic complexing groups. Sorption is the dominant reaction of zinc (ATSDR, 2003). Further, the alternative HQs are all below or at 1 for the American robin (as shown in **Tables 7-15A**, **7-15B,** and **7-15C**). Zinc is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC based on the following facts: 1) the HQs based on the NOAEL SEVs and the maximum detected concentration were below or at 1 for all receptors; 2) the alternative HQs are below or at 1 for all receptors; 3) the SLERA results are based on conservative assumptions (e.g., 100% bioavailability and a foraging factor of 1); and 4) zinc is an essential nutrient and organisms can physiologically regulate absorption and excretion.

Based upon the above discussions and the factors presented in **Section 7.6.1**, no COCs were identified for SEAD-121C ditch soil.

7.6.5 Identification of COCs in SEAD-121I Surface Water

As discussed in Section **7.5.1.4**, surface water COPC concentrations (with the exception of aluminum and iron concentrations) would result in insignificant exposure compared to the soil or ditch soil COPC concentrations. HQs associated with exposure to aluminum and iron in SEAD-121I surface water are below 1 for all receptors; therefore, no COCs were identified for SEAD-121I surface water.

7.6.6 Identification of COCs in SEAD-121I Soil

Based on the calculated risk estimates for the SLERA, nine PAHs (anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, phenanthrene, and pyrene), one pesticide (4,4'-DDT), cyanide, and several metals (antimony, arsenic, cadmium, chromium, cobalt, copper, lead, manganese, selenium, silver, thallium, and vanadium) were identified as preliminary COCs in SEAD-121I soil as the associated HQs were at least 1 for one or more receptors (see **Table 7-11A**). This section presents further evaluation of the preliminary COCs identified in SEAD-121I soil based on the SLERA results. Upon the refinement described in this section, no COPCs were identified as soil COCs for SEAD-121I soil.

PAHs

The HQs for the American robin and red fox exposed to PAHs in SEAD-121I soil are all below 1. The HQs for the deer mouse are below 1 for all PAHs except that the HQs for the mouse exposed to phenanthrene and pyrene are slightly above 1 at 2. For the short-tailed shrew, the HQs associated with exposure to benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, and chrysene are at 1 and the HQs associated with exposure to phenanthrene and pyrene are slightly above 1 at 3. For the meadow vole, the HQs for nine PAHs (anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, phenanthrene, and pyrene) are at 1 or slightly above 1 (ranging from 1 to 5). These HQs are based on the maximum detected concentrations and the NOAEL SEVs derived from the LOAEL value for benzo(a)pyrene, the most toxic PAH. The NOAEL was developed by applying a NOAEL/LOAEL multiplier of 0.1 to the LOAEL. The conservative estimate of the NOAEL/LOAEL multiplier may result in overestimate of potential risks. In addition, Magee et al. (1996) recommended a PAH bioavailability value of 0.29 for the soil oral exposure route based on a review of available studies. Further, the alternative HQs based on the maximum detected concentrations and the LOAEL value for benzo(a)pyrene are below 1 for all receptors exposed to the nine PAHs identified as preliminary COCs (as shown in **Table 7-16A**). The alternative HQs based on the mean concentrations in soil for all receptors are below 1 (as shown in **Tables 7-16B** and **7-15C**). Due to the fact that the HQs based on the SLERA are below 1 or slightly above 1 for the mouse, shrew, and vole and all the alternative HQs are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., SEV for benzo(a)pyrene was used for other PAHs, 100% bioavailability), PAHs were not expected to have any significant impacts on ecological receptors at the site and were not identified as COCs.

4,4'-DDT

For 4,4'-DDT, the HQ for the American robin is above 1 at 7, and the HQs are below 1 for all the other receptors. The HQs are based on the maximum detected concentration and the NOAEL SEVs. The NOAEL SEV for the American robin was based on the LOAEL value for the brown pelican. It should be noted that the NOAEL SEV identified for the SLERA may overstate potential risks associated with 4,4'-DDT exposure. As an example, the toxicity reference values adopted by Navy/USEPA Region 9 BTAG and recommended by the California Department of Toxic Substances Control HERD range from 0.009 mg/Kg-day to 1.5 mg/Kg-day for birds. The NOAEL SEV identified for this SLERA was 0.0028 mg/Kg-day for birds. Therefore, the NOAEL SEV identified for 4,4'-DDT is a conservative estimate for birds and may overstate potential risks. The alternative HQ based on the maximum detected concentration and the LOAEL SEV is below 1 for the American robin (as shown in **Table 7-16A**). The alternative HQs based on the mean concentration of 4,4'-DDT in soil are below 1 for the American robin (as shown in **Table 7-16B** and **Table 7-16C**). Due to the fact that the alternative HQs are below 1 for all receptors, and the fact that the SLERA results are based on conservative assumptions (e.g., conservative SEVs), 4,4'-DDT is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Antimony and Arsenic

For antimony and arsenic, the HQs for the deer mouse, short-tailed shrew, and meadow vole exposed to SEAD-121I surface soil are above or at 1, and the HQs for all the other receptors are below 1.

Antimony SEV was not identified for birds and therefore, risks to the American robin was not quantified for exposure to antimony. The HQs are based on the maximum detected concentrations and the NOAEL SEVs. The SEVs for antimony are based on the LOAEL value from a drinking water study, and the SEVs for arsenic are based on a drinking water (plus incidental food intake) study. Metals tend to be more bioavailable in their soluble forms while less bioavailable in soil. Antimony has been shown to adsorb strongly to most soils with a median percent adsorption of 93% and as much as 100% adsorption in several soil types (ATSDR, 1992). Numerous studies of the oral bioavailability of soil-bound arsenic have been conducted (reviewed in Valberg et al., 1997; Ruby et al., 1999). The mean bioavailability of arsenic in soil ranged from 0.03 to 0.48. Therefore, bioavailability of antimony and arsenic is expected to be much lower than that of the toxicity studies from which the SEVs were identified. Further, the alternative HQs based on the LOAEL SEVs and the mean concentrations of antimony and arsenic in surface soil for all receptors are below 1 as shown in **Tables 7-16C**. Due to the fact that the alternative HQs based on the LOAEL SEVs and the mean concentrations are below 1 and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability and SEVs based on drinking water study were used), neither antimony nor arsenic are expected to have any significant impacts on ecological receptors at the site and were not identified as COCs.

Cadmium

For cadmium, the HQs for the deer mouse, American robin, and short-tailed shrew exposed to surface soil are above 1 (2, 2, and 3, respectively), and the HQs for the meadow vole and red fox are below 1. The alternative HQs based on the maximum detected concentration and the LOAEL SEV are below 1 for the mouse, robin, and shrew (as shown in **Table 7-16A**). The alternative HQs based on the mean concentration of cadmium in surface soil are all below 1 (as shown in **Tables 7-16B** and **7-16C**). Due to the fact that the HQs based on the NOAEL SEV and the maximum detected concentration are either below 1 or slightly above 1 and the alternative HQs are all below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), cadmium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Chromium

For chromium, the HQ for the American robin is slightly above 1 at 3 and the HQs for all the other receptors are below 1. The alternative HQ for the robin based on the maximum detected concentration and the LOAEL SEV is 2 (as shown in **Table 7-16A**). The alternative HQ based on the NOAEL SEV and the mean concentration of chromium in surface soil for the robin is 0.2 (as shown in **Table 7-16B**). The alternative HQ based on the LOAEL SEV and the mean concentration of chromium in surface soil is 0.1 (as shown in **Table 7-16C**). Due to the fact that the HQs based on the SLERA are below 1 or slightly above 1 for the identified receptors and that the alternative HQs based on the mean chromium concentration are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., foraging factor of 1 for the robin), chromium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Cobalt

For cobalt, the HQs for the deer mouse, short-tailed shrew, and meadow vole exposed to surface soil are above 1 (5, 8, and 9, respectively) and the HQs for the American robin and red fox are below 1. The HQs are based on the maximum detected concentration and the NOAEL SEVs. The NOAEL SEVs for mammals were derived from the LOAEL value by adjusting the NOAEL/LOAEL multiplier. As discussed in **Section 7.6.1**, the NOAEL/LOAEL multiplier is likely to overstate potential risks. Further, the alternative HQs based on the maximum detected concentration and the LOAEL SEVs are below 1 for the mouse, shrew, and vole (as shown in **Table 7-16A**). The alternative HQs based on the mean concentration of cobalt in surface are all below 1 for the mouse, shrew, and vole (as shown in **Table 7-16B** and **Table 7-16C**). Due to the fact that all the alternative HQs are below 1 and the fact that the SLERA results are based on conservative assumptions (e.g., conservative SEV), cobalt is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Copper

For copper, the HQ for the meadow vole is slightly above 1 at 2 and the HQs for all the other receptors are below 1. The SLERA results are based on the maximum copper concentration, the NOAEL SEV, and the 100% bioavailability. Copper binds relatively strongly to soils. This adsorption to soils is less affected by pH than other metals, making copper less likely to become bioavailable in the acidic conditions of an animal's digestive tract (USEPA, 2001b). Further, the alternative HQ based on the maximum detected concentration and the LOAEL SEV is at 1 for the vole (as shown in **Table 7-16A**). The alternative HQs based on the mean copper concentrations are below 1 (as shown in **Table 7-16B** and **Table 7-16C**). Due to the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability) and that all alternative HQs are below or at 1, copper is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Cyanide

For cyanide, the HQ for the American robin is slightly above 1 at 2 and the HQs for all the other receptors are below 1. The alternative HQ for the robin based on the maximum detected concentration and the LOAEL SEV is 0.07 (as shown in **Table 7-16A**). The alternative HQ based on the NOAEL SEV and the mean concentration of cyanide in surface soil for the robin is 0.4 (as shown in **Table 7-16B**). The alternative HQ based on the LOAEL SEV and the mean concentration of cyanide in surface soil is 0.01 (as shown in **Table 7-16C**). Due to the fact that the HQs based on the SLERA are below 1 or slightly above 1 for the identified receptors and that the alternative HQs are all below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., foraging factor of one for the robin), cyanide is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Lead

For lead, the HQ for the meadow vole exposed to SEAD-121I surface soil is at 1 and the HQs for all the other receptors are below 1. The NOAEL SEVs identified for mammals are based on a study of lead acetate. Lead acetate is much more soluble than the other lead compounds expected in soil (e.g., lead carbonates and lead oxides). Therefore, the bioavailability of lead in soil is expected to be much lower than the bioavailability of lead acetate. The oral bioavailability of lead in soil has been more extensively studied than any other metal. USEPA assumes a relative bioavailability factor for lead of 0.6 in its adult lead model (USEPA, 1996a). Further, the alternative HQ based on the maximum lead concentrations and the LOAEL SEV is 0.1 for the vole (as shown in **Table 7-16A**). The alternative HQs based on the mean lead concentration are below 1 for the vole (as shown in **Tables 7-16B** and **7-16C**). Due to the fact that the HQs based on the SLERA are below or at 1 for all receptors and all alternative HQs are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), lead is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Manganese

For manganese, the HQs for the deer mouse, American robin, short-tailed shrew, meadow vole, and red fox exposed to SEAD-121I surface soil are above 1 (ranging from 10 to approximately 300). The HQs are based on the maximum detected concentration, the NOAEL SEVs, and 100% bioavailability. In humans and animals, manganese is an essential nutrient that plays a role in bone mineralization, protein and energy metabolism, metabolic regulation, cellular protection from damaging free radical species, and the formation of glycosaminoglycans (ATSDR, 2000). The alternative HQs based on the mean concentration and the LOAEL SEVs are below 1 for the robin and fox and are at 1, 2, and 4 for the mouse, shrew, and vole, respectively (as shown in **Table 7-16C**). Due to the fact that the alternative HQs based on the LOAEL SEVs and the mean concentration are below 1 or slightly above 1 and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), manganese is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC. Further discussion of the source of manganese at the site is presented in **Section 7.7.3**.

Selenium

The HQs for the deer mouse, American robin, short-tailed shrew, meadow vole, and red fox are above 1 (ranging from 5 to 80). The HQs are based on the maximum detected concentration, the NOAEL SEVs, and 100% bioavailability. The alternative HQs based on the mean selenium concentration and the LOAEL SEVs are below 1 or slightly above 1 (the highest at 2) for all receptors (as shown in **Table 7-16C**). The alternative HQs based on the mean selenium concentration and the NOAEL

SEVs are below or slightly above 1 (the highest at 3) for all receptors (as shown in **Table 7-16B**). Due to the fact that the alternative HQs based on the mean selenium concentration are below or slightly above 1 and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), selenium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Silver

For silver, the HQ for the short-tailed shrew is at 1, and the HQs for all the other receptors are below 1. The HQs are based on the maximum detected concentration and the NOAEL SEVs. The alternative HQ based on the maximum detected concentration and the LOAEL SEV is 0.1 for the short-tailed shrew (as shown in **Table 7-16A**). The alternative HQs based on the mean concentration of silver in surface soil are below 1 for the shrew (as shown in **Tables 7-16B** and **7-16C**). Due to the fact that the HQs based on the SLERA are below or at one for all receptors and all the alternative HQs are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), silver is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Thallium

For thallium, the HQs for the deer mouse, American robin, short-tailed shrew, meadow vole, and red fox exposed to SEAD-121I surface soil are above 1 (ranging from 10 to approximately 100). The HQs are based on the maximum detected concentration and the NOAEL SEVs derived from the LOAEL value (for mammals) or lethal dose value (for birds). It should be noted that the NOAEL SEVs identified for the SLERA for mammals (0.11-0.16 mg/Kg-day) may overstate potential risks associated with thallium exposure. As an example, the toxicity reference values adopted by Navy/USEPA Region 9 BTAG and recommended by the California Department of Toxic Substances Control HERD range from 0.48 mg/Kg-day to 1.43 mg/Kg-day for mammals. Further, the alternative HQs based on the mean concentration and the LOAEL SEVs are below or at 1 for all receptors (as shown in **Table 7-16C**). The alternative HQs based on the NOAEL SEVs and the mean concentration of thallium in surface soil are below 1 or slightly above 1 (ranging from 2 to 5) for all receptors (as shown in **Table 7-16B**). Due to the fact that the alternative HQs based on the mean concentration are below 1 or slightly above 1 and the fact that the SLERA results are based on conservative assumptions (e.g., conservative SEVs), thallium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Vanadium

For vanadium, the HQs for the deer mouse, American robin, short-tailed shrew, and meadow vole exposed to surface soil are above 1 (4, 2, 6, and 3, respectively), and the HQ for the red fox is below 1. The HQs are based on the maximum detected concentration and the NOAEL SEVs. The assumption of 100% bioavailability used in the risk assessment might result in overestimate of potential risks. For vanadium, bioavailability is very low, usually found to be less than 1% of an administered dose (http://www.tjclarkinc.com/minerals/vanadium.htm). Further, the alternative HQs based on the mean concentration are below or at 1 for all receptors (as shown in **Table 7-16B** and **Table 7-16C**). Due to the fact that the alternative HQs based on the mean concentration are below or at 1 and the fact that SLERA results are based on conservative assumptions (e.g., 100% bioavailability), vanadium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Based upon the above discussions and the factors presented in **Section 7.6.1**, no COCs were identified for SEAD-121I surface soil.

7.6.7 Identification of COCs in SEAD-121I Ditch Soil

Based on the calculated risk estimates for the SLERA, six PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and pyrene) and several metals (arsenic, cobalt, manganese, selenium, silver, thallium, vanadium, and zinc) were identified as preliminary COCs in SEAD-121I ditch soil as the associated HQs were at least 1 for one or more receptors (see **Table 7-11B**). This section presents further evaluation of the preliminary COCs identified in SEAD-121I ditch soil based on the SLERA results. Upon the refinement described in this section, no COPCs were identified as COCs for SEAD-121I ditch soil.

PAHs

The HQs for the deer mouse, American robin, red fox, and great blue heron exposed to PAHs in SEAD-121I ditch soil are all below 1. The HQs for the short-tailed shrew are below 1 for all PAHs except for the HQs for the shrew exposed to benzo(b)fluoranthene and benzo(k)fluoranthene, which are at 1. For the meadow vole, the HQs associated with exposure to benzo(a)anthracene, benzo(a)pyrene, and pyrene are at 1 and the HQs associated with exposure to benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene are slightly above 1 at 2. These HQs are based on the maximum detected concentrations and the NOAEL SEVs derived from the LOAEL value for benzo(a)pyrene, the most toxic PAH. The NOAEL was developed by applying a NOAEL/LOAEL multiplier of 0.1 to the LOAEL. The conservative estimate of the NOAEL/LOAEL multiplier may result in overestimate of potential risks. In addition, Magee et al. (1996) recommended a PAH bioavailability value of 0.29 for the soil oral exposure route based on a review of available studies. Further, the alternative HQs based on the maximum detected concentrations and the LOAEL value for benzo(a)pyrene are below 1 for all receptors exposed to the six PAHs identified as preliminary COCs (as shown in **Table 7-17A**). The alternative HQs based on the mean concentrations in soil for all receptors are below 1 (as shown in **Tables 7-17B and 7-17C**). Due to the fact that the HQs based on the SLERA are at 1 or slightly above 1 for the shrew and vole and all the alternative HQs are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., SEV for benzo(a)pyrene was used for other

PAHs, 100% bioavailability), PAHs were not expected to have any significant impacts on ecological receptors at the site and were not identified as COCs.

Arsenic

For arsenic, the HQs for the deer mouse, American robin, short-tailed shrew, and meadow vole exposed to surface soil are above 1 (ranging from 3 to 7), and the HQs for all the other receptors are below 1. The HQs are based on the maximum detected concentration and the NOAEL SEVs. The SEVs for arsenic are based on a drinking water (plus incidental food intake) study. Metals tend to be more bioavailable in their soluble forms while less bioavailable in soil. Numerous studies of the oral bioavailability of soil-bound arsenic have been conducted (reviewed in Valberg et al., 1997; Ruby et al., 1999). The mean bioavailability of arsenic in soil ranged from 0.03 to 0.48. Therefore, bioavailability of arsenic is expected to be much lower than that of the toxicity studies from which the SEVs were identified. Further, the alternative HQs based on the mean concentrations of arsenic in ditch soil for all receptors are below or at 1 as shown in **Tables 7-17B** and **7-17C**. Due to the fact that the alternative HQs based on the mean concentration are below or at 1 and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability and SEVs based on drinking water study were used), arsenic is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Cobalt

For cobalt, the HQs for the deer mouse, short-tailed shrew, and meadow vole exposed to SEAD-121I ditch soil are above 1 (2, 4, and 4, respectively) and the HQs for the American robin, red fox, and great blue heron are below 1. The HQs are based on the maximum detected concentration and the NOAEL SEVs. The NOAEL SEVs for mammals were derived from the LOAEL value by adjusting the NOAEL/LOAEL multiplier. As discussed in **Section 7.6.1**, the NOAEL/LOAEL multiplier is likely to overstate potential risks. Further, the alternative HQs based on the maximum detected concentration and the LOAEL SEVs are below 1 for the mouse, shrew, and vole (as shown in **Table 7-17A**). The alternative HQs based on the mean concentration of cobalt in ditch soil are all below 1 for the mouse, shrew, and vole (as shown in **Table 7-17B** and **Table 7-17C**). Due to the fact that all the alternative HQs are all below 1 and the fact that the SLERA results are based on conservative assumptions (e.g., conservative SEV), cobalt is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Manganese

For manganese, the HQs for the deer mouse, American robin, short-tailed shrew, and meadow vole exposed to SEAD-121I ditch soil are above 1 (ranging from 5 to approximately 10). The HQ for the great blue heron is at 1, and the HQ for the red fox is below 1. The HQs are based on the maximum detected concentration, the NOAEL SEVs, and 100% bioavailability. In humans and animals, manganese is an essential nutrient that plays a role in bone mineralization, protein and energy metabolism, metabolic regulation, cellular protection from damaging free radical species, and the formation of glycosaminoglycans (ATSDR, 2000). The alternative HQs based on the mean concentration and the LOAEL SEVs are below 1 for all receptors (as shown in **Table 7-17C**). Due to the fact that the alternative HQs based on the LOAEL SEVs and the mean concentration are below 1 and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), manganese is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC. Further discussion of the source of manganese at the site is presented in **Section 7.7.3.**

Selenium

The HQs for the deer mouse, American robin, short-tailed shrew, and meadow vole are above 1 (ranging from 4 to 10), and the HQs for the red fox and great blue heron are below 1. The HQs are based on the maximum detected concentration, the NOAEL SEVs, and 100% bioavailability. The alternative HQs based on the mean selenium concentration and the LOAEL SEVs are below 1 for all receptors (as shown in **Table 7-17C**). The alternative HQs based on the mean selenium concentration and the NOAEL SEVs are below or at 1 for all receptors (as shown in **Table 7-17B**). Due to the fact that the alternative HQs based on the mean selenium concentration are below or at 1 and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), selenium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Silver

For silver, the HQs for the deer mouse, short-tailed shrew, and meadow vole are slightly above 1 (3, 4, and 3, respectively), and the HQs for all the other receptors are below 1. The HQs are based on the maximum detected concentration and the NOAEL SEVs. The alternative HQs based on the maximum detected concentration and the LOAEL SEVs are below 1 for all receptors (as shown in **Table 7-17A**). The alternative HQs based on the NOAEL SEV and the mean concentration of silver in ditch soil are below or at 1 for all receptors (as shown in **Table 7-17B**). The alternative HQs based on the LOAEL SEVs and the mean concentration of silver in ditch soil are below 1 for all receptors (as shown in **Table 7-17C**). Due to the fact that the HQs based on the SLERA are below or slightly above 1 for the receptors and all the alternative HQs are below 1, and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), silver is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Thallium

For thallium, the HQs for the deer mouse, American robin, short-tailed shrew, meadow vole, and red fox exposed to SEAD-121I ditch soil are above 1 (ranging from 2 to approximately 20). The HQ for the great blue heron is at 1. The HQs are based on the maximum detected concentration and the NOAEL SEVs derived from the LOAEL value (for mammals) or lethal dose value (for birds). It should be noted that the NOAEL SEVs identified for the SLERA for mammals (0.11-0.16 mg/Kg-day) may overstate potential risks associated with thallium exposure. As an example, the toxicity reference values adopted by Navy/USEPA Region 9 BTAG and recommended by the California Department of Toxic Substances Control HERD range from 0.48 mg/Kg-day to 1.43 mg/Kg-day for mammals. Further, the alternative HQs based on the mean concentration and the LOAEL SEVs are below 1 for all receptors (as shown in **Table 7-17C**). The alternative HQs based on the NOAEL SEVs and the mean concentration of thallium in ditch soil are below 1 or slightly above 1 (ranging from 1 to 2) for all receptors (as shown in **Table 7-17B**). Due to the fact that the alternative HQs based on the mean concentration are below 1 or slightly above 1 and the fact that the SLERA results are based on conservative assumptions (e.g., conservative SEVs), thallium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Vanadium

For vanadium, the HQs for the deer mouse, short-tailed shrew, and meadow vole exposed to SEAD-121I ditch soil are at 1 or slightly above 1 (1, 2, and 1, respectively), and the HQs for all the other receptors are below 1. The HQs are based on the maximum detected concentration and the NOAEL SEVs. The assumption of 100% bioavailability used in the risk assessment might result in overestimate of potential risks. For vanadium, bioavailability is very low, usually found to be less than 1% of an administered dose (http://www.tjclarkinc.com/minerals/vanadium.htm). Further, the alternative HQs based on the mean concentration are below or at 1 for all receptors (as shown in **Table 7-17B** and **Table 7-17C**). Due to the fact that the SLERA HQs are below 1 or slightly above 1 and the alternative HQs based on the mean concentration are below or at 1 and the fact that the SLERA results are based on conservative assumptions (e.g., 100% bioavailability), vanadium is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC.

Zinc

The HQs for all receptors exposed to zinc to SEAD-121I ditch soil are below 1 except for the HQ for the American robin, which is at 1. Zinc is an essential nutrient and is relatively nontoxic to most animals because they can physiologically regulate zinc absorption and excretion. Zinc is capable of forming complexes with a variety of organic and inorganic complexing groups. Sorption is the dominant reaction of zinc (ATSDR, 2003). Further, the alternative HQs are all below or at 1 for the American robin (as shown in **Table 7-17A**, **Table 7-17B,** and **Table 7-17C**). Zinc is not expected to have any significant impacts on ecological receptors at the site and was not identified as a COC based on the following facts: 1) the HQs based on the NOAEL SEVs and the maximum detected concentration were below or at 1 for all receptors; 2) the alternative HQs are below or at 1 for all receptors; 3) the SLERA results are based on conservative assumptions (e.g., 100% bioavailability and a foraging factor of 1); and 4) zinc is an essential nutrient and organisms can physiologically regulate absorption and excretion.

Based upon the above discussions and the factors presented in **Section 7.6.1**, no COCs were identified for SEAD-121I ditch soil.

7.7 RISK MANAGEMENT

This risk management section presents the Army's position on whether further evaluation of ecological risks is warranted based on the evaluation presented above as well as other site-specific factors, such as future use of the sites, site background comparison, and site contaminant source management. Impact to habitat based on the future use of the sites is presented in **Section 7.7.1**. A comparison of the site concentrations to background was conducted for the preliminary inorganic COCs as the rationale supporting the Army’s proposal that no additional assessment is needed for the preliminary COCs identified in Step 2B. Comparison of the site data to background data is presented in **Section 7.7.2**. **Section 7.7.3** presents the site contaminant source management.

7.7.1 Impact to Habitat Based on Future Site Use

SEAD-121C and SEAD-121I are located in the Planned Industrial/Office Development (PID) parcel. That is, the planned future land use for SEAD-121C and SEAD-121I is industrial development. Based on the future use of the sites, the sites are not expected to support, sustain, or attract ecological receptors and therefore are not expected to be a wildlife habitat. The presence of ecological receptors is expected to be generally curtailed in these areas where habitat conditions are poor and human activity levels are sufficiently disruptive to discourage wildlife use. Therefore, it is the Army’s position that no further action is warranted at SEAD-121C or SEAD-121I to mitigate potential risks to ecological receptors.

7.7.2 Comparison of Site Data with Background Data

A streamlined evaluation was conducted to compare the concentrations of the preliminary inorganic COCs identified in Step 2B in SEAD-121C soil, SEAD-121C ditch soil, SEAD-121I soil, and SEAD-121I ditch soil to the corresponding SEDA background levels. A discussion of the SEDA background data is provided in **Section 6.3.2**. **Tables 7-18A**, **7-18B**, **7-19A**, and **7-19B** summarize the comparison of the descriptive statistics between the site data and SEDA background data for SEAD-121C soil, SEAD-121C ditch soil, SEAD-121I soil, and SEAD-121I ditch soil, respectively.

For SEAD-121C soil, as shown in **Table 7-18A**, the site arithmetic mean concentrations of chromium and thallium are comparable with the corresponding 95% upper confidence limits of the arithmetic means of the SEDA background data (25 mg/Kg vs. 22 mg/Kg for chromium and 0.4 mg/Kg vs. 0.32 mg/Kg for thallium). Therefore, chromium and thallium levels in SEAD-121C soil are considered to be consistent with background levels.

For SEAD-121C ditch soil, as shown in **Table 7-18B**, the site maximum detected concentration of antimony is below the SEDA maximum detected background concentration and the site arithmetic mean concentration of antimony is below the 95% upper confidence limit of the arithmetic mean of the SEDA background value. Therefore, antimony level in SEAD-121C ditch soil is consistent with background levels.

For SEAD-121I soil, as shown in **Table 7-19A**, the site arithmetic mean concentrations of antimony, cadmium, and vanadium are below the corresponding 95% upper confidence limits of the arithmetic means of the SEDA background (2.5 mg/Kg vs. 3.3 mg/Kg for antimony, 0.65 mg/Kg vs. 0.74 mg/Kg for cadmium, and 21 mg/Kg vs. 22.9 mg/Kg for vanadium). The site arithmetic mean concentrations of cyanide and lead are comparable with the corresponding 95% upper confidence limits of the arithmetic means of the SEDA background (0.36 mg/Kg vs. 0.30 mg/Kg for cyanide and 30 mg/Kg vs. 27.6 mg/Kg for lead). Therefore, antimony, cadmium, cyanide, lead, and vanadium levels in SEAD-121I soil are considered to be consistent with background levels.

For SEAD-121I ditch soil, as shown in **Table 7-19B**, the site arithmetic mean concentration of vanadium is below the 95% upper confidence limit of the arithmetic mean of the SEDA background (21 mg/Kg vs. 22.9 mg/Kg). Therefore, vanadium level in SEAD-121I ditch soil is consistent with background levels.

In summary, the concentrations of several preliminary inorganic COCs identified in Step 2B are consistent with SEDA background levels. As discussed in **Section 7.6**, these preliminary COCs are not expected to pose significant impact to the ecological receptors at the sites.

7.7.3 Contaminant Source Management

The contaminant sources at SEAD-121I are from activities involving the loading and unloading of materials at the site and in the surrounding buildings. The source of the metal contamination is the strategic stockpiles of ferrous-manganese ore stored in two of the four blocks at the site. The Army is consolidating the Strategic Stockpiles and the ore piles on site will be removed. In addition, the highest concentrations of metals are localized to the area surrounding the ore piles. At the time that the strategic piles are removed, residues associated with the historic stockpiling activities will be addressed by the DoD through the authority responsible for management of the piles.

7.8 SUMMARY

In accordance with the USEPA guidance (USEPA, 1997c), a SLERA was performed to evaluate potential ecological risks associated with exposure to contaminants in SEAD-121C soil, SEAD-121C ditch soil, SEAD-121C surface water, SEAD-121I soil, SEAD-121I ditch soil, and SEAD-121I surface water. Exposure to groundwater is considered an incomplete exposure pathway; therefore, groundwater at the sites poses no potential risks to the environment. This SLERA was completed in the following steps.

For Steps 1 and 2, NOAEL toxicity values and conservative exposure assumptions were used to calculate screening level HQs. The maximum detected concentrations were compared to screening criteria to identify COPCs (Step 1). Potential exposures and effects resulting from the maximum detected concentrations of COPCs were then evaluated by estimating potential direct and indirect exposures for wildlife receptors - deer mouse, American robin, short-tailed shrew, meadow vole, red fox, and great blue heron (for ditch soil only) and comparing exposures to NOAEL toxicity values (Step 2).

Due to the conservative nature of the assumptions used in Step 1 and Step 2, additional evaluation (Step 3.2) was performed to further characterize potential ecological risks and determine if further evaluation is warranted. Step 3.2, COC refinement, was performed in accordance with the USEPA ERAGS (1997c) and the supplemental guidance of ERAGS (USEPA, 2001a). Some of the additional information used to help characterize risks included using alternative HQ values based on mean concentrations and LOAEL-based SEVs and analysis of factors that may result in potential overestimation of risks.

Upon completion of ERA Steps 1and 2, there is a SMDP with four possible decisions:

- There is adequate information to conclude that ecological risks are negligible and therefore no need for remediation on the basis of ecological risks;
- The information is not adequate to make a decision at this point and the ERA process should continue to a baseline ERA;
- The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted; or
- It may be preferable to cleanup the site to the screening values for some sites of relatively small size or where the contamination has a sharply defined boundary rather than to spend time and resources determining a less conservative cleanup number.

No COCs were identified for SEAD-121C soil, SEAD-121C ditch soil, SEAD-121C surface water, SEAD-121I soil, SEAD-121I ditch soil, or SEAD-121I surface water and the rationales are summarized below.

1. No preliminary COCs were identified for SEAD-121I surface water. Although preliminary COCs were identified for SEAD-121C soil, ditch soil, and surface water and SEAD-121I soil and ditch soil, the alternative HQs calculated during the refinement of COCs (Step 3.2), especially the HQs based on the mean concentrations and LOAEL SEVs are either below 1 or close to 1 (with the highest at 5). Therefore, no final COCs were identified for any medium at SEAD-121C or SEAD-121I.
2. The planned future land use for SEAD-121C and SEAD-121I is industrial development. The sites are not expected to support, sustain, or attract ecological receptors and therefore are not expected to be a wildlife habitat. The presence of ecological receptors is expected to be generally

curtailed in these areas where habitat conditions are poor and human activity levels are sufficiently disruptive to discourage wildlife use.

3. The concentrations of several preliminary COCs identified in Step 2B (chromium and thallium in SEAD-121C soil; antimony in SEAD-121C ditch soil; antimony, cadmium, cyanide, lead, and vanadium in SEAD-121I soil; and vanadium level in SEAD-121I ditch soil) are consistent with SEDA background.

4. The source of the metal contamination at SEAD-121I is the strategic stockpiles of ferrous-manganese ore stored at the site. At the time that the strategic piles are removed, residues associated with the historic stockpiling activities will be addressed by the DoD through the authority responsible for management of the piles.

Based on the above discussion, it is the Army’s position that soil, ditch soil, surface water, and groundwater at SEAD-121C and SEAD-121I are not expected to significantly impact ecological receptors at the site and no further action is warranted at SEAD-121C or SEAD-121I based on the ecological risk assessment.

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

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

There are two discrete areas where materials have been stored in the past, which have impacted the surface soil with metals. There is no indication of a systemic or wide-spread release of organic compounds across the site. The media at SEAD-121C do not pose a risk to future industrial receptors at the site. Additionally, the ecological risk assessment indicates that the residual chemicals identified at the site are not expected to significantly impact ecological receptors at the site. Therefore, a risk-based action will not be necessary at the DRMO Yard.

8.1.2 SEAD-121I: Rumored Cosmoline Oil Disposal Area

There is no evidence of a systematic release of hazardous waste or materials at SEAD-121I. The media at SEAD-121I do not pose a risk to future industrial receptors at the site. Additionally, the ecological risk assessment indicates that the residual chemicals identified at the site are not expected to significantly impact ecological receptors at the site. Therefore, a risk-based action will not be necessary at the Rumored Cosmoline Oil Disposal Area.

8.2 RECOMMENDATIONS

Based on the baseline risk assessment and the screening level ecological risk assessment, a risk-based action will not be necessary at SEAD-121C or SEAD-121I. Institutional controls (ICs) in the form of land use restrictions have been imposed on the greater PID Area in the Final Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas (Parsons, 2004), signed on September 28, 2004 by USEPA. These restrictions are as follows:

- Prohibit the development and use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds.

- Prevent access to or use of groundwater until the Class GA Groundwater Standards are met.

The Army recommends that these restrictions remain in effect for SEAD-121C and SEAD-121I until additional data are developed and evaluated to substantiate their removal at either or both of the sites.

TABLE 1-1
Climatological Data for Seneca Army Depot Activity
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Month	**Temperature (1),°F**			**Mean Precip-itation (1), in.**	**Mean Relative Humidity (%)**	**Percent Sunshine**	**Mean Number of Days (4)**		
	Maximum	**Minimum**	**Mean**				**Clear**	**Partly Cloudy**	**Cloudy**
January	30.9	14.0	22.5	1.88	70	35	3	7	21
February	32.4	14.1	23.3	2.16	70	50	3	6	19
March	40.6	23.4	32.0	2.45	70	50	4	7	20
April	54.9	34.7	44.8	2.86	70	50	6	7	17
May	66.1	42.9	54.5	3.17	70	50	6	10	15
June	76.1	53.1	64.6	3.70	70	60	8	10	12
July	80.7	57.2	69.0	3.46	70	60	8	13	10
August	78.8	55.2	67.0	3.18	70	60	8	11	12
September	72.1	49.1	60.7	2.95	70	60	7	11	12
October	61.2	39.5	50.3	2.80	70	50	7	8	16
November	47.1	31.4	39.3	3.15	70	30	2	6	22
December	35.1	20.4	27.8	2.57	70	30	2	5	24
Annual	56.3	36.3	46.3	34.33	70	50	64	101	200

Period	Mixing Height (2), m	Wind Speed (2), m/s
Morning (Winter)	900	8
Morning (Spring)	700	6
Morning (Summer)	500	5
Morning (Autumn)	600	5
Morning (Annual)	650	6
Afternoon (Winter)	900	8
Afternoon (Spring)	1600	8
Afternoon (Summer)	1800	7
Afternoon (Autumn)	1300	7
Afternoon (Annual)	1400	7

Mean Annual Pan Evaporation (3), inches : 35
Mean Annual Lake Evaporation (3), inches : 28

Number of episodes lasting more than 2 days (2), (No. of episode-days) :
Mixing Height < 500 m, wind speed < 2 m/s : 0 (0)
Mixing Height < 1000 m, wind speed < 2 m/s : 0 (0)
Number of episodes lasting more than 5 days (2), (No. of episode-days) :
Mixing Height < 500 m, wind speed < 4 m/s : 0 (0)

Notes:

1) Climate of New York Climatography of the United States No. 60. National Oceanic and Atmospheric Administration, June 1982. Data for Ithaca Cornell University, NY.
2) Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution throughout the Contiguous United States. George C. Holzworth, Jan. 1972.
3) Climate Atlas of the United States. U.S. Department of Commerce, 1983.
4) Climate of New York Climatography of the United States No. 60. National Oceanic and Atmospheric Administration, June 1982. Data for Syracuse, NY.

TABLE 2-1
SUMMARY OF WELL DEVELOPMENT CRITERIA

SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity – Romulus, New York

Water Quality Indicator Parameter	**SEAD-121C Development Criteria**
Water Volume Removed	At least three well volumes*
Dissolved Oxygen	Not Applicable
PH	± 10 %
Specific Conductance	± 10 %
Temperature	± 10%
Turbidity	Preferably < 50 NTUs
* unless well pumped to dryness and low recharge.	

TABLE 2-2
SUMMARY OF SOIL SAMPLE ANALYSES

SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity – Romulus, New York

Sample Analysis	**SEAD-121C ESI**	**SEAD-121C RI**	**SEAD-121I ESI**	**SEAD-121I RI**
TCL* volatile organic compounds by Method 8260B	●	●	●	●
TCL* semivolatile organic compounds by Method 8270C	●	●	●	●
TCL* pesticides by Method 8081 and PCBs by Method 8082	●	●	●	●
TAL* metals by EPA Method 6010	●	●	●	●
Cyanide by EPA SW846 Method 9012		●		●
Total Petroleum Hydrocarbon by EPA Method 418.1		●		●
Total Organic Carbon by Lloyd Kahn Method		●		●

* TCL = Target Compound List
TAL = Target Analyte List
ESI = Expanded Site Investigation
RI = Remedial Investigation

TABLE 2-3
SUMMARY OF SURFACE WATER SAMPLE ANALYSES

SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity – Romulus, New York

Analysis	**SEAD 121C**	**SEAD 121I**
Volatile organic compounds by Method 524.2	●	●
TCL* semivolatile organic compounds by NYSDEC CLP	●	●
TCL* pesticides/PCBs according the NYSDEC CLP SOW	●	●
TAL* metals and cyanide by NYSDEC CLP	●	●
Cyanide (total and amenable) by SW846 9012	●	●
Total Petroleum Hydrocarbon by EPA Method 418.1	●	●
* TCL = Target Compound List TAL = Target Analyte List		

TABLE 2-4
SUMMARY OF DITCH SOIL SAMPLE ANALYSES

SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity – Romulus, New York

Analysis	**SEAD 121C**	**SEAD 121I**
TCL* volatile organic compounds by NYSDEC CLP	●	●
TCL* semivolatile organic compounds by NYSDEC CLP	●	●
TCL* pesticides/PCBs according the NYSDEC CLP SOW	●	●
TAL* metals and cyanide by NYSDEC CLP	●	●
Cyanide (total and amenable) by SW846 9012	●	●
Total Petroleum Hydrocarbon by EPA Method 418.1	●	●
Total Organic Carbon by Lloyd Kahn	●	●

* TCL = Target Compound List
TAL = Target Analyte List

TABLE 2-5
SUMMARY OF GROUNDWATER SAMPLE ANALYSES

SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity – Romulus, New York

Analysis	**SEAD-121C**		
	EBS	**R1**	**R2**
TCL* volatile organic compounds by NYSDEC ASP	●		
Volatile organic compounds by EPA Method SW846 8260B		●	
Volatile organic compounds by EPA Method 524.2			●
TCL* semivolatile organic compounds by EPA SW846 Method 8270C	●	●	●
TCL* pesticides/PCBs according the NYSDEC CLP SOW	●	●	●
TAL* metals by EPA Method 6010B	●	●	●
Total Petroleum Hydrocarbon by EPA Method 418.1		●	●

TCL = Target Compound List
TAL = Target Analyte List
ESI = Expanded Site Investigation
R1 = Round 1 of Remedial Investigation
R2 = Round 2 of Remedial Investigation

Table 3-1
Summary of Survey Data: SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Location Identification	Northing (NAD 83 - ft)	Easting (NAD 83 - ft)	Ground Surface Elevation (NAVD 88 - ft)	PVC Elevation (NAVD 88 - ft)	Top of Protective Casing Elevation (NAVD 88 - ft)
Surface Soil Locations					
SSDRMO-10	996979.99	749845.55	729.787		
SSDRMO-11	996973.27	749677.57	731.542		
SSDRMO-12	997083.39	749644.32	733.004		
SSDRMO-13	996890.19	749719.71	730.811		
SSDRMO-14	996863.35	749438.48	730.492		
SSDRMO-15	996781.68	749440.86	721.836		
SSDRMO-16	996836.69	749605.78	722.562		
SSDRMO-17	997030.18	749381.86	727.098		
SSDRMO-18	997378.1	749795.19	728.871		
SSDRMO-19	997551.16	749950.74	728.419		
SSDRMO-20	996839.49	750051.42	730.837		
SSDRMO-21	997631.71	750195.56	731.43		
SSDRMO-22	997437.44	750143.35	733.244		
SSDRMO-23	996766.4	749792.29	723.86		
SSDRMO-24	997409.47	749923.52	730.505		
SSDRMO-5	997220.91	749915.22	730.849		
SSDRMO-6	997044.64	749908.68	730.113		
SSDRMO-7	996847.89	750221.31	734.765		
SSDRMO-8	996870.74	749882.54	728.736		
SSDRMO-9	997121.1	749788.9	731.807		
Soil Borings Locations					
SBDRMO-10	996990.44	749577.77	732.214		
SBDRMO-11	997052.79	749709.09	732.515		
SBDRMO-12	996871.54	749767.39	730.348		
SBDRMO-13	996936.58	749456.42	731.156		
SBDRMO-14	996875.84	749671.6	730.688		
SBDRMO-15	996827.45	749547.31	728.93		
SBDRMO-16	996838.91	750135.15	731.232		
SBDRMO-17	996840.35	749947.1	728.546		
SBDRMO-18	997435.34	750008.24	733.033		
SBDRMO-19	997231.46	749728.31	731.946		
SBDRMO-20	996834.74	749456.43	729.377		
SBDRMO-21	997705.32	750165.5	731.05		
SBDRMO-22	997454.92	750291.57	736		
SBDRMO-23	997655.65	749996.35	727.832		
SBDRMO-24	997288.85	750056.52	732.531		
SBDRMO-5	997322.07	749936.83	730.879		
SBDRMO-6	996918.05	749882.82	729.161		
SBDRMO-7	997254.23	749819.49	729.519		
SBDRMO-8	996982.28	749778.83	731.39		
SBDRMO-9	996875.42	749831.47	730.43		

Table 3-1
Summary of Survey Data: SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Location Identification	Northing (NAD 83 - ft)	Easting (NAD 83 - ft)	Ground Surface Elevation (NAVD 88 - ft)	PVC Elevation (NAVD 88 - ft)	Top of Protective Casing Elevation (NAVD 88 - ft)
Monitoring Well Locations					
MW121C-3	997507.91	749999.17	733.328	733.41	733.7
MW121C-4	996866.95	749922.29	729.859	731.24	731.4
MW121C-5	996896.87	749448.53	731.62	732.3	732.5
MW121C-6	997040.99	749613.64	733.041	734.08	734.3
Surface Water and Ditch Soil Locations					
SW/SDDRMO-1	997783.54	750020.78	722.758		
SW/SDDRMO-10	997567.58	750188.66	726.577		
SW/SDDRMO-2	996827.47	750120.08	728.57		
SW/SDDRMO-3	996851.59	749726.49	720.916		
SW/SDDRMO-4	997327.43	749775.48	721.405		
SW/SDDRMO-5	996770.81	749452.27	719.279		
SW/SDDRMO-6	996864.4	749334.6	717.145		
SW/SDDRMO-7	996572.01	749161.74	715.185		
SW/SDDRMO-8	996634.58	749081.28	716.346		
SW/SDDRMO-9	997370.53	749955.47	730.482		

TABLE 3-2
SUMMARY OF SOIL SAMPLE ANALYSES: SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Location ID	Sample ID	QC Code	Sample Date	TCL VOCs EPA SW-846 Method 8260B	TCL SVOCs EPA SW-846 Method 8270B	TAL Metals by SW-846 6010/7###	TCL Pesticides/PCBs by EPA SW-846 Method 8081A/8082A	Total Petroleum Hydrocarbon - EPA 418.1	Total Organic Carbon - Lloyd Kahn	TCL PCBs by EPA SW-846 Method 8081A	TCL Pesticides by EPA SW-846 Method 8081A	Cyanide by EPA SW-846 Method 9012	Sample Depth (ft.)
SURFACE SOIL													
SB121C-1	EB226	SA	9-Mar-98	X	X	X	X						0 - 0.2
SB121C-1	EB231	SA	9-Mar-98	X	X	X	X						0 - 0.2
SB121C-2	EB014	DU	9-Mar-98	X	X	X	X						0 - 0.2
SB121C-3	EB233	SA	9-Mar-98	X	X	X	X						0 - 0.2
SB121C-4	EB020	DU	9-Mar-98	X	X	X	X						0 - 0.2
SB121C-4	EB229	SA	9-Mar-98	X	X	X	X						0 - 0.2
SBDRMO-10	DRMO-1056	SA	25-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-11	DRMO-1059	SA	26-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-12	DRMO-1062	SA	25-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-13	DRMO-1065	SA	26-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-14	DRMO-1068	SA	25-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-15	DRMO-1071	SA	26-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-16	DRMO-1074	SA	27-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-16	DRMO-1080	SA	27-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-17	DRMO-1077	SA	28-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-18	DRMO-1081	SA	27-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-19	DRMO-1084	SA	27-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-20	DRMO-1087	SA	26-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-21	DRMO-1090	SA	27-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-22	DRMO-1091	SA	27-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-23	DRMO-1095	SA	28-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-24	DRMO-1098	SA	28-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-5	DRMO-1040	SA	27-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-6	DRMO-1043	SA	25-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-6	DRMO-1050	SA	25-Oct-02	X	X	X		X	X	X	X	X	0 - 2

TABLE 3-2
SUMMARY OF SOIL SAMPLE ANALYSES: SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Location ID	Sample ID	QC Code	Sample Date	TCL VOCs EPA SW-846 Method 8260B	TCL SVOCs EPA SW-846 Method 8270B	TAL Metals by SW-846 6010/7###	TCL Pesticides/PCBs by EPA SW-846 Method 8081A/8082A	Total Petroleum Hydrocarbon - EPA 418.1	Total Organic Carbon - Lloyd Kahn	TCL PCBs by EPA SW-846 Method 8081A	TCL Pesticides by EPA SW-846 Method 8081A	Cyanide by EPA SW-846 Method 9012	Sample Depth (ft.)
SBDRMO-7	DRMO-1046	SA	27-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-8	DRMO-1049	SA	25-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SBDRMO-9	DRMO-1053	SA	25-Oct-02	X	X	X		X	X	X	X	X	0 - 2
SS121C-1	EB235	SA	9-Mar-98	X	X	X	X						0 - 0.2
SS121C-2	EB236	SA	9-Mar-98	X	X	X	X						0 - 0.2
SS121C-3	EB237	SA	9-Mar-98	X	X	X	X						0 - 0.2
SS121C-4	EB241	SA	10-Mar-98	X	X	X	X						0 - 0.2
SSDRMO-10	DRMO-1006	SA	23-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-11	DRMO-1007	SA	23-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-12	DRMO-1008	SA	23-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-13	DRMO-1009	SA	23-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-14	DRMO-1010	SA	23-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-15	DRMO-1011	SA	30-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-16	DRMO-1012	SA	30-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-17	DRMO-1013	SA	30-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-18	DRMO-1014	SA	30-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-19	DRMO-1015	SA	30-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-20	DRMO-1016	SA	24-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-21	DRMO-1017	SA	24-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-22	DRMO-1018	SA	24-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-23	DRMO-1019	SA	30-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-24	DRMO-1020	SA	23-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-5	DRMO-1000	SA	23-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-6	DRMO-1001	SA	24-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-7	DRMO-1002	SA	24-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-7	DRMO-1003	SA	24-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-8	DRMO-1004	SA	23-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2
SSDRMO-9	DRMO-1005	SA	23-Oct-02	X	X	X		X	X	X	X	X	0 - 0.2

TABLE 3-2
SUMMARY OF SOIL SAMPLE ANALYSES: SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Location ID	Sample ID	QC Code	Sample Date	TCL VOCs EPA SW-846 Method 8260B	TCL SVOCs EPA SW-846 Method 8270B	TAL Metals by SW-846 6010/7###	TCL Pesticides/PCBs by EPA SW-846 Method 8081A/8082A	Total Petroleum Hydrocarbon - EPA 418.1	Total Organic Carbon - Lloyd Kahn	TCL PCBs by EPA SW-846 Method 8081A	TCL Pesticides by EPA SW-846 Method 8081A	Cyanide by EPA SW-846 Method 9012	Sample Depth (ft.)
SUBSURFACE SOIL													
SB121C-1	EB232	SA	9-Mar-98	X	X	X	X						2.5 - 3
SB121C-2	EB228	SA	9-Mar-98	X	X	X	X						2 - 2.5
SB121C-3	EB234	SA	9-Mar-98	X	X	X	X						2.5 - 3
SB121C-4	EB230	SA	9-Mar-98	X	X	X	X						2.5 - 3
SBDRMO-10	DRMO-1057	SA	25-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-11	DRMO-1060	SA	26-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-12	DRMO-1063	SA	25-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-13	DRMO-1066	SA	26-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-14	DRMO-1069	SA	25-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-16	DRMO-1075	SA	27-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-17	DRMO-1078	SA	28-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-18	DRMO-1082	SA	27-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-20	DRMO-1088	SA	26-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-21	DRMO-1102	SA	27-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-23	DRMO-1096	SA	28-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-24	DRMO-1099	SA	28-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-5	DRMO-1041	SA	27-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-6	DRMO-1044	SA	25-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-7	DRMO-1047	SA	27-Oct-02	X	X	X		X	X	X	X	X	2 - 6
SBDRMO-9	DRMO-1054	SA	25-Oct-02	X	X	X		X	X	X	X	X	2 - 6

TABLE 3-3
SUMMARY OF DITCH SOIL SAMPLE ANALYSES: SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Location ID	Sample ID	QC Code	Sample Date	TCL VOCs EPA SW-846 Method 8260B	TCL SVOCs EPA SW-846 Method 8270B	TAL Metals by SW-846 6010/7###	Total Petroleum Hydrocarbon - EPA 418.1	Total Organic Carbon - Lloyd Kahn	TCL Pesticides by EPA SW-846 Method 8081A	TCL PCBs by EPA SW-846 Method 8082A	Cyanide by EPA SW-846 Method 9012	Sample Depth (ft.)
SDDRMO-1	DRMO-4000	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SDDRMO-2	DRMO-4001	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SDDRMO-3	DRMO-4002	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SDDRMO-4	DRMO-4003	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SDDRMO-5	DRMO-4004	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SDDRMO-6	DRMO-4006	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SDDRMO-7	DRMO-4007	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SDDRMO-8	DRMO-4005	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SDDRMO-8	DRMO-4008	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SDDRMO-9	DRMO-4009	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SDDRMO-10	DRMO-4010	SA	5-Nov-02	X	X	X	X	X	X	X	X	0 - 2

TABLE 3-4
Summary of Ditch Soil Sample Characteristics: SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Ditch Soil Sampling Location	Ditch Soil Sample ID	Date Sampled	Sample Depth (in)	Field Description	USCS Classification
SDDRMO-1	DRMO-4000	5-Nov-02	0-2"		
SDDRMO-2	DRMO-4001	5-Nov-02	0-2"	Light gray silt and fine clay, some organic matter	ML
SDDRMO-3	DRMO-4002	5-Nov-02	0-2"	Dark black organic matter, anerobic odor	OL
SDDRMO-4	DRMO-4003	5-Nov-02	0-2"		
SDDRMO-5	DRMO-4004	5-Nov-02	0-2"		
SDDRMO-6	DRMO-4006	5-Nov-02	0-2"		
SDDRMO-7	DRMO-4007	5-Nov-02	0-2"		
SDDRMO-8	DRMO-4005	5-Nov-02	0-2"	Light gray clay, trace organic material	CL
SDDRMO-9	DRMO-4009	5-Nov-02	0-2"		
SDDRMO-10	DRMO-4010	5-Nov-02	0-2"		

TABLE 3-5
SUMMARY OF SURFACE WATER SAMPLE ANALYSES: SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Location ID	Sample ID	QC Code	Sample Date	TCL VOCs EPA SW-846 Method 8260B	TCL SVOCs EPA SW-846 Method 8270B	TAL Metals by SW-846 6010/7###	TCL PCBs by EPA SW-846 Method 8082A	TCL Pesticides by EPA SW-846 Method 8081A	Total Petroleum Hydrocarbon - EPA 418.1	Cyanide by EPA SW-846 Method 9012
SWDRMO-1	DRMO-3000	SA	5-Nov-02	X	X	X	X	X	X	X
SWDRMO-2	DRMO-3001	SA	5-Nov-02	X	X	X	X	X	X	X
SWDRMO-3	DRMO-3002	SA	5-Nov-02	X	X	X	X	X	X	X
SWDRMO-4	DRMO-3003	SA	5-Nov-02	X	X	X	X	X	X	X
SWDRMO-5	DRMO-3004	SA	5-Nov-02	X	X	X	X	X	X	X
SWDRMO-6	DRMO-3006	SA	5-Nov-02	X	X	X	X	X	X	X
SWDRMO-7	DRMO-3007	SA	5-Nov-02	X	X	X	X	X	X	X
SWDRMO-8	DRMO-3005	SA	5-Nov-02	X	X	X	X	X	X	X
SWDRMO-8	DRMO-3008	SA	5-Nov-02	X	X	X	X	X	X	X
SWDRMO-9	DRMO-3009	SA	5-Nov-02	X	X	X	X	X	X	X
SWDRMO-10	DRMO-3010	SA	5-Nov-02	X	X	X	X	X	X	X

Table 3-6
SEAD-121C - Summary of Temporary Well Installations and Water Level Elevations
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Location Identification	Depth of Boring (ft bgs)	Depth of Bedrock (ft bgs)	Point of Well (ft bgs)	Top of Well Screen (ft bgs)	Top of Well Casing (ft bgs1)	Depth to Water (ft TOC)	Depth to Water (bgs) (ft bgs)	Sampling Date
MW121C-1	9.9	2.9	9.7	2.1	-1.9	4.6	2.7	3/11/1998
MW121C-2	6	4	5.9	1.6	-2.1	4.74	2.64	3/11/1998

ft bgs = Feet Below Grade Surface
ft TOC = Measurement relative to Top of Casing in feet.
(1) Negative ft bgs value indicates that the referenced surface is above than grade surface.

Table 3-7
SEAD-121C - Monitoring Well Construction Details

SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Well ID	Well Type	Point of Well Relative to Ground Surface (ft)	Point of Well Relative to Top of PVC (ft)	Diameter of Boring (in)	Diameter of Well (in)	Well Screen Length (ft)	Screened Interval Relative to TOC (ft)			Well Screen Slot Size (in)	Ground Surface Elevation	Elevation of Top of PVC Well (MSL)	Elevation of Top of Casing	Height of PVC Well Stickup (ft)	Well Casing Material	Well Screen Material
MW121C-3	T/WS	724.20	725.61	6	2	5	2.80	to	7.80	0.010	732.00	733.41	733.70	1.41	PVC	PVC
MW121C-4	T/WS	720.29	721.63	6	2	5	4.61	to	9.61	0.010	729.90	731.24	731.40	1.34	PVC	PVC
MW121C-5	T/WS	720.84	722.54	6	2	5	4.76	to	9.76	0.010	730.60	732.30	732.50	1.70	PVC	PVC
MW121C-6	T/WS	725.50	726.88	6	2	5	2.20	to	7.20	0.010	732.70	734.08	734.30	1.38	PVC	PVC

Notes:
T/WS = Till Weathered Shale Aqufier

Table 3-8
SEAD-121C - Monitoring Well Development Information

SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Well ID	Date Purged	Installation Date	Development Method	Field-Measured Parameters *				Purge Water Removed (mL)
				Temperature (^oC)	Specific Conductivity (mS)	pH	Turbidity (NTU)	
MW121C-3	1/17/2003	10/29/2002	Teflon Bailer & Peristaltic Pump	4.8	0.88	7.28	0.69	3750
MW121C-4	1/17/2003	10/29/2002	Teflon Bailer & Peristaltic Pump	7.1	2.09	6.94	18.9	3700
MW121C-5	1/17/2003	10/29/2002	Well was Dry	--	--	--	--	--
MW121C-6	1/17/2003	10/29/2002	Teflon Bailer & Peristaltic Pump	5.5	2.63	7.06	0.37	3750

* Measurements taken at end of purging event.

TABLE 3-9
SUMMARY OF GROUNDWATER SAMPLE ANALYSES: SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Location ID	Sample ID	QC Code	Sample Date	TCL VOCs EPA SW-846 Method 8260B	TCL VOCs EPA Method 524.2	TCL SVOCs EPA SW-846 Method 8270B	TAL Metals by SW-846 6010/7###	Total Petroleum Hydrocarbon - EPA 418.1	TCL Pesticides/PCBs by EPA SW-846 Method 8081A/8082A	TCL Pesticides by EPA SW-846 Method 8081A	TCL PCBs by EPA SW-846 Method 8082A	Cyanide by EPA SW-846 Method 9012
MW121C-1	EB153	SA	17-Mar-98	X		X	X		X			
MW121C-1	EB023	DU	17-Mar-98	X		X	X		X			
MW121C-2	EB154	SA	17-Mar-98	X		X	X		X			
MW121C-3	121C-2000	SA	3-Feb-03	X		X	X	X		X	X	X
MW121C-4	121C-2002	SA	3-Feb-03	X		X	X	X		X	X	X
MW121C-4	121C-2004	SA	4-Feb-03	X		X	X	X		X	X	X
MW121C-6	121C-2003	SA	3-Feb-03	X		X	X	X		X	X	X
MW121C-3	121C-2009	SA	7-May-03		X	X	X	X		X	X	X
MW121C-4	121C-2010	SA	7-May-03		X	X	X	X		X	X	X
MW121C-6	121C-2012	SA	7-May-03		X	X	X	X		X	X	X

Table 3-10
Monitoring Well Field Sampling Information: SEAD-121C

SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Well ID	Sample ID	Date Sampled	Field-Measured Parameters						Gallons of Purge Water Removed (L)
			Temperature (°C)	Specific Conductivity (umhos)	pH	ORP (mv)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	
MW121C-3	121C-2000	3-Feb-03	6.20	0.576	7.12	68	1.02	36.4	1.1
MW121C-4	121C-2002/4	3-Feb-03	4.08	2.12	7.08	165	6.28	15.6	0.80
MW121C-6	121C-2003	3-Feb-03	7.09	2.61	6.90	181	2.46	5.90	1.4

Well ID	Sample ID	Date Sampled	Field-Measured Parameters						Gallons of Purge Water Removed (L)
			Temperature (°C)	Specific Conductivity (umhos)	pH	ORP (mv)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	
MW121C-3	121C-2009	7-May-03	9.8	0.57	7.08	19	0.8	318	0.45
MW121C-4	121C-2010	7-May-03	11.84	2.11	7.12	147	4.15	127.00	1.7
MW121C-6	121C-2012	7-May-03	10.73	2.52	6.84	148	0.69	189.00	0.92

Table 3-11
Summary of Groundwater Elevation Data: SEAD-121C

SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Well Id	Elevation Top of PVC Well	Prior to Development (Oct 29, 2002)		During Development (Jan 17, 2003)		Round 1 (Feb 3, 2003)		Round 2 (May 7, 2003)	
		Depth to Water (ft)	Groundwater Elevation	Depth to Water (ft)	Groundwater Elevation	Depth to Water (ft)	Groundwater Elevation	Depth to Water (ft)	Groundwater Elevation
MW-1	734.21	Not Developed in 2003				5.44	728.77	6.25	727.96
MW-2	733.88	Not Developed in 2003				5.13	728.75	5.90	727.98
MW121C-3	733.41	7.55	725.86	8.47	724.94	7.75	725.66	7.80	725.61
MW121C-4	731.24	4.41	726.83	6.84	724.40	4.49	726.75	4.70	726.54
MW121C-5	732.30	Well was Dry - Not Developed				Well was Dry		Well was Dry	
MW121C-6	734.08	4.39	729.69	6.78	727.30	6.90	727.18	7.20	726.88

Table 3-12
Summary of Survey Data: SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Location Identification	Northing (NAD 83 - ft)	Easting (NAD 83 - ft)	Ground Surface Elevation (NAVD 88 - ft)
Surface Soil			
SB121I-1	995134.62	751429.66	744.116
SB121I-2	994774.98	751398.61	741.195
SB121I-3	993858.04	751444.5	744.773
SB121I-4	993263.9	751385.07	742.38
SB121I-5	993462.77	751485.25	747.191
SS121I-1	995206.36	751476.69	
SS121I-10	994219.65	751465.5	742.601
SS121I-11	994257.88	751344.83	745.435
SS121I-12	993711.38	751512.5	745.597
SS121I-13	993688.28	751370.81	745.102
SS121I-14	993615.84	751506.74	746.386
SS121I-15	993596.98	751348.01	744.781
SS121I-16	993118.94	751551.07	749.245
SS121I-17	993055.23	751346.07	741.685
SS121I-18	995535.8	751184.74	744.894
SS121I-19	995046.39	751204.71	745.475
SS121I-2	994638.65	751531.37	
SS121I-20	994642.37	751208.02	744.269
SS121I-21	993951.98	751220.2	742.826
SS121I-22	993349.34	751238.63	741.906
SS121I-23	995265.53	751555.95	748.836
SS121I-24	994691.52	751572.55	746.111
SS121I-25	993935.49	751600.17	747.41
SS121I-26	993495.76	751618.19	748.096
SS121I-27	993363.28	751398.21	742.978
SS121I-28	994014.1	751400.37	744.774
SS121I-29	994628.57	751294.95	738.675
SS121I-3	994130.84	751494.92	
SS121I-30	995656.23	751535.71	747.866
SS121I-31	995554.62	751436.22	744.826
SS121I-32	995496.91	751254.6	745.813
SS121I-33	995248.38	751373.26	747.41
SS121I-34	995006.57	751470.02	743.415
SS121I-4	993378.24	751513.14	
SS121I-5	994982.32	751311.35	740.961
SS121I-6	994891.02	751472.32	744.032
SS121I-7	994898.23	751317.98	741.223
SS121I-8	994361.1	751494.58	743.692
SS121I-9	994351.89	751311.25	744.254

Table 3-12
Summary of Survey Data: SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Location Identification	Northing (NAD 83 - ft)	Easting (NAD 83 - ft)	Ground Surface Elevation (NAVD 88 - ft)
Surface Water and Ditch Soil			
SW/SD121I-1	992962.25	750592.66	743.255
SW/SD121I-10	995433.74	751244.74	744.035
SW/SD121I-2	994312.37	750577.55	737.467
SW/SD121I-3	995542.76	750540.98	736.6
SD121I-4	993037.94	751345.28	738.742
SW/SD121I-5	993045.44	751647.88	756.11
SW/SD121I-6	993715.11	751318.73	743.046
SW/SD121I-7	995572.01	751554.66	745.644
SD121I-8	994337.91	751299.84	741.506
SD121I-9	994342.44	751590.26	744.008
SD121I-1EBS	993741.65	751334.46	
SD121I-2EBS	995081.23	751286.55	

TABLE 3-13
SUMMARY OF SURFACE SOIL SAMPLE ANALYSES: SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Location ID	Sample ID	QC Code	Sample Date	TCL VOCs EPA SW-846 Method 8260B	TCL SVOCs EPA SW-846 Method 8270B	TAL Metals by SW-846 6010/7###	Total Petroleum Hydrocarbon - EPA 418.1	Total Organic Carbon - Lloyd Kahn	TCL Pesticides by EPA SW-846 Method 8081A	TCL PCBs by EPA SW-846 Method 8082A	Cyanide by EPA SW-846 Method 9012	Sample Depth (ft.)
SURFACE SOIL												
SS121I-1	EB147	SA	10-Mar-98		X							0 - 0.2
SS121I-2	EB150	SA	10-Mar-98		X							0 - 0.2
SS121I-3	EB149	SA	10-Mar-98		X							0 - 0.2
SS121I-4	EB148	SA	10-Mar-98		X							0 - 0.2
SB121I-1	121I-1040	SA	24-Oct-02	X	X	X	X	X	X	X	X	0 - 2
SB121I-2	121I-1043	SA	24-Oct-02	X	X	X	X	X	X	X	X	0 - 2
SB121I-2	121I-1044	SA	24-Oct-02	X	X	X	X	X	X	X	X	0 - 2
SB121I-3	121I-1047	SA	24-Oct-02	X	X	X	X	X	X	X	X	0 - 2
SB121I-4	121I-1050	SA	24-Oct-02	X	X	X	X	X	X	X	X	0 - 2
SB121I-5	121I-1053	SA	24-Oct-02	X	X	X	X	X	X	X	X	0 - 2
SS121I-10	121I-1006	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-10	121I-1031	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-11	121I-1007	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-12	121I-1008	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-13	121I-1009	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-14	121I-1010	SA	23-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-15	121I-1011	SA	23-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-16	121I-1012	SA	23-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-17	121I-1013	SA	23-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-18	121I-1014	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-19	121I-1015	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-20	121I-1016	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-21	121I-1017	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-22	121I-1018	SA	23-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-23	121I-1019	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-24	121I-1020	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-25	121I-1021	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-26	121I-1022	SA	23-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-27	121I-1023	SA	23-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2

TABLE 3-13
SUMMARY OF SURFACE SOIL SAMPLE ANALYSES: SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Location ID	Sample ID	QC Code	Sample Date	TCL VOCs EPA SW-846 Method 8260B	TCL SVOCs EPA SW-846 Method 8270B	TAL Metals by SW-846 6010/7###	Total Petroleum Hydrocarbon - EPA 418.1	Total Organic Carbon - Lloyd Kahn	TCL Pesticides by EPA SW-846 Method 8081A	TCL PCBs by EPA SW-846 Method 8082A	Cyanide by EPA SW-846 Method 9012	Sample Depth (ft.)
SS121I-28	121I-1024	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-29	121I-1025	SA	23-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-29	121I-1030	SA	23-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-30	121I-1026	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-31	121I-1027	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-32	121I-1028	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-33	121I-1029	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-34	121I-1032	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-5	121I-1000	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-6	121I-1001	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-7	121I-1002	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-8	121I-1004	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2
SS121I-9	121I-1005	SA	22-Oct-02	X	X	X	X	X	X	X	X	0 - 0.2

TABLE 3-14
SUMMARY OF DITCH SOIL SAMPLE ANALYSES: SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Location ID	Sample ID	QC Code	Sample Date	TCL VOCs EPA SW-846 Method 8260B	TCL SVOCs EPA SW-846 Method 8270B	TAL Metals by SW-846 6010/7###	Total Petroleum Hydrocarbon - EPA 418.1	Total Organic Carbon - Lloyd Kahn	TCL Pesticides by EPA SW-846 Method 8081A	TCL PCBs by EPA SW-846 Method 8082A	Cyanide by EPA SW-846 Method 9012	Sample Depth (ft.)
SD121I-1EBS	EB151	SA	10-Mar-98		X							0 - 0.2
SD121I-2EBS	EB152	SA	10-Mar-98		X							0 - 0.2
SD121I-1	121I-4000	SA	6-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SD121I-2	121I-4001	SA	6-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SD121I-3	121I-4002	SA	6-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SD121I-4	121I-4003	SA	6-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SD121I-5	121I-4004	SA	6-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SD121I-6	121I-4006	SA	6-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SD121I-7	121I-4007	SA	26-Oct-02	X	X	X	X	X	X	X	X	0 - 2
SD121I-7	121I-4005	SA	26-Oct-02	X	X	X	X	X	X	X	X	0 - 2
SD121I-8	121I-4008	SA	6-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SD121I-9	121I-4009	SA	6-Nov-02	X	X	X	X	X	X	X	X	0 - 2
SD121I-10	121I-4010	SA	6-Nov-02	X	X	X	X	X	X	X	X	0 - 2

TABLE 3-15
Summary of Ditch Soil Sample Characteristics: SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Ditch Soil Sampling Location	Ditch Soil Sample ID	Date Sampled	Sample Depth (in)	Field Description	USCS Classification
SD121I-1	121I-4000	6-Nov-02	0-2"	Light gray to brown, silt and clay, shale fragments	ML
SD121I-2	121I-4001	6-Nov-02	0-2"	Silt and clay, shale fragments	ML
SD121I-3	121I-4002	6-Nov-02	0-2"	Dark black organic matter, anerobic odor	OL

TABLE 3-16
SUMMARY OF SURFACE WATER SAMPLE ANALYSES: SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity - Romulus, New York

Location ID	Sample ID	QC Code	Sample Date	TCL VOCs EPA SW-846 Method 8260B	TCL SVOCs EPA SW-846 Method 8270B	TAL Metals by SW-846 6010/7###	TCL PCBs by EPA SW-846 Method 8082A	TCL Pesticides by EPA SW-846 Method 8081A	Total Petroleum Hydrocarbon - EPA 418.1	Cyanide by EPA SW-846 Method 9012
SW121I-1	121I-3000	SA	6-Nov-02	X	X	X	X	X	X	X
SW121I-2	121I-3001	SA	6-Nov-02	X	X	X	X	X	X	X
SW121I-3	121I-3002	SA	6-Nov-02	X	X	X	X	X	X	X
SW121I-5	121I-3004	SA	6-Nov-02	X	X	X	X	X	X	X
SW121I-6	121I-3006	SA	6-Nov-02	X	X	X	X	X	X	X
SW121I-7	121I-3007	SA	26-Oct-02	X	X	X	X	X	X	X
SW121I-7	121I-3005	SA	26-Oct-02	X	X	X	X	X	X	X
SW121I-10	121I-3010	SA	6-Nov-02	X	X	X	X	X	X	X

Table 4-1A
RPD Greater than 50%
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121I	SEAD-121I	SEAD-121I
Media	Surface Soil	Ditch Soil	Groundwater	Surface Water	Groundwater Bld 360	Surface Soil	Ditch Soil	Surface Water
Number of Samp-Dup Pairs	5	1	2	1	2	3	1	1
Volatile Organic Compounds								
Acetone	56%	110%				180%, 69%	86%	
Benzene						81%		
Chloroform	93%							
Ethyle Benzene	121%					55%, 73%		
M/P Xylenes						76%		
Methyl Ethyl Ketone						68%, 182%		
Methylene chloride	58%							
Ortho Xylenes						58%, 83%		
Toluene	86%					82%		
Semivolatile Organic Compounds								
1,2,4-Trichlorobenzene		51%						
1,2-Dichlorobenzene		51%						
1,3-Dichlorobenzene		51%						
1,4-Dichlorobenzene		51%						
2,4,6-Trichlorophenol		51%						
2,4-Dichlorophenol		51%						
2,4-Dimethylphenol		51%						
2,4-Dinitrotoluene		51%						
2,6-Dinitrotoluene		51%						
2-Chloronaphthalene		51%						
2-Chlorophenol		51%						
2-Methylnaphthalene	179%	51%					105%	
2-Methylphenol		51%						
2-Nitrophenol		51%						
3 or 4-Methylphenol		51%						
3,3'-Dichlorobenzidine		51%						
4-Bromophenyl phenyl ether		51%						
4-Chloro-3-methylphenol		51%						
4-Chloroaniline		51%						
4-Chlorophenyl phenyl ether		51%						
Acenaphthene	168%	51%					124%	
Acenaphthylene		51%					143%	
Anthracene	135%, 61%	51%				150%	128%	
Benzo(a)anthracene	57%, 62%, 53%	51%				92%	78%	
Benzo(a)pyrene	56%	51%					71%	

Table 4-1A
RPD Greater than 50%
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121I	SEAD-121I	SEAD-121I
Media	Surface Soil	Ditch Soil	Groundwater	Surface Water	Groundwater Bld 360	Surface Soil	Ditch Soil	Surface Water
Number of Samp-Dup Pairs	5	1	2	1	2	3	1	1
Benzo(b)fluoranthene	138%, 56%, 150%	51%					77%	
Benzo(ghi)perylene	60%, 79%, 63%	51%					78%	
Benzo(k)fluoranthene	55%	51%					65%	
Bis(2-Chloroethoxy)methane		51%						
Bis(2-Chloroethyl)ether		51%						
Bis(2-Chloroisopropyl)ether		51%						
Bis(2-Ethylhexyl)phthalate	140%, 69%	51%				133%, 156%		
Butylbenzylphthalate		51%						
Carbazole	128%	51%				148%	118%	
Chrysene	60%	51%					77%	
Dibenz(a,h)anthracene	115%, 86%	51%					92%	
Dibenzofuran	175%, 69%	51%					160%	
Di-n-butylphthalate	180%, 136%	51%						
Di-n-octylphthalate	152%	51%						
Diethyl phthalate	171%	51%				161%		
Dimethylphthalate		51%						
Fluoranthene	79%, 52%	51%				134%	99%	
Fluorene	163%, 56%	51%					141%	
Hexachlorobenzene		51%						
Hexachlorobutadiene		51%						
Hexachlorocyclopentadiene		51%						
Hexachloroethane		51%						
Indeno(1,2,3-cd)pyrene	62%, 79%, 141%	51%					106%	
Isophorone		51%						
N-Nitrosodiphenylamine		51%						
N-Nitrosodipropylamine		51%						
Naphthalene		51%						
Nitrobenzene		51%						
Phenanthrene	52%	51%				122%	120%	
Phenol		51%						
Pyrene	74%, 51%, 77%, 53%	51%				58%	89%	
Pesticides/PCBs								
4,4'-DDD	108%		156%					
4,4'-DDE	153%		98%				146%	
4,4'-DDT	160%							
Aldrin	63%							

Table 4-1A
RPD Greater than 50%
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121I	SEAD-121I	SEAD-121I
Media	Surface Soil	Ditch Soil	Groundwater	Surface Water	Groundwater Bld 360	Surface Soil	Ditch Soil	Surface Water
Number of Samp-Dup Pairs	5	1	2	1	2	3	1	1
Beta-BHC			141%					
Delta-BHC	71%		84%					
Dieldrin			72%					
Endosulfan I					67%	164%		
Endosulfan II			87%					
Endosulfan sulfate			67%					
Endrin aldehyde			100%					
Gamma-Chlordane			138%					
Heptachlor			119%					
Methoxychlor			164%					
Aroclor-1016		52%						
Metals & Cyanide								
Aluminum			150%, 139%		137%	52%		
Antimony	178%, 71%, 78%					131%		
Arsenic		95%				68%		
Barium	184%, 55%	51%						
Cadmium	190%							
Calcium	170%							
Chromium			122%, 67%			64%		
Cobalt		56%	70%			52%		
Copper	199%							
Cyanide, Total						74%		
Iron			192%, 122%	57%				
Lead	199%							
Magnesium	69%					75%		
Manganese		61%		77%		54%		55%
Nickel								
Selenium		52%			84%	111%		53%
Silver						75%		
Sodium	125%	51%						
Thallium						131%	70%	
Vanadium								
Zinc	176%		89%, 118%					
Other								
Total Organic Carbon	88%							
Total Petroleum Hydrocarbons	76%, 122%					148%		

Note: All parameters shown had RPD greater than 50%.

Table 4-1B
Quality Control of Field Duplicates - RPDs Greater than 50%
Surface Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121C-1			SB121C-4			SBDRMO-16			SBDRMO-6			SSDRMO-7		
Parameter	**Units**	EB231	EB014	*RPD	EB020	EB229	*RPD	DRMO-1074	DRMO-1080	RPD	DRMO-1043	DRMO-1050	*RPD	DRMO-1002	DRMO-1003	*RPD
Volatile Organic Compounds																
Acetone	UG/KG	12 U	12 J	----	10 J	11 UJ	10%	2.6 UJ	2.8 UJ	7%	2.6 UJ	4.6 U	56%	3.1 UJ	2.9 R	NA
Chloroform	UG/KG	12 U	12 U	----	11 UJ	4 J	93%	2.6 U	2.8 U	7%	2.6 UJ	2.7 U	4%	3.1 UJ	2.9 U	7%
Ethyl benzene	UG/KG	12 U	12 U	----	11 UJ	11 UJ	----	2.6 U	2.8 U	7%	0.66 J	2.7 U	121%	3.1 UJ	2.9 U	7%
Methylene chloride	UG/KG	12 U	12 U	----	11 UJ	11 UJ	----	2.6 U	2.8 U	7%	2.6 UJ	2.7 U	4%	3.1 UJ	1.7 U	58%
Toluene	UG/KG	2 J	5 J	86%	12 J	10 J	18%	2.6 U	2.8 U	7%	2.6 UJ	2.7 U	4%	3.1 UJ	2.9 U	7%
Semivolatile Organic Compounds																
2-Methylnaphthalene	UG/KG	78 U	4.3 J	179%	72 U	71 U	1%	200 J	210 J	5%	340 U	350 U	3%	140 J	110 J	24%
Acenaphthene	UG/KG	78 U	6.8 J	168%	72 U	71 U	1%	160 J	170 J	6%	340 U	350 U	3%	310 J	190 J	48%
Anthracene	UG/KG	78 U	15 J	135%	72 U	71 U	1%	1100	950	15%	340 U	350 U	3%	1600	850	61%
Benzo(a)anthracene	UG/KG	78 U	76	3%	3.9 J	7 J	57%	5500 J	2900 J	62%	340 U	350 UJ	3%	6700 J	3900 J	53%
Benzo(a)pyrene	UG/KG	78 U	57 J	31%	72 U	71 U	1%	4800 J	2700 J	56%	340 UJ	350 UJ	3%	7600 J	5000 J	41%
Benzo(b)fluoranthene	UG/KG	78 U	95	20%	13 J	71 U	138%	6600 J	3700 J	56%	50 J	350 UJ	150%	11000 J	6600 J	50%
Benzo(ghi)perylene	UG/KG	78 U	42 J	60%	72 U	71 U	1%	1700 J	740 J	79%	110 J	57 J	63%	3800 J	2500 J	41%
Benzo(k)fluoranthene	UG/KG	78 U	67 J	15%	72 U	71 U	1%	3000 J	1700 J	55%	340 UJ	350 UJ	3%	4900 J	3100 J	45%
Bis(2-Ethylhexyl)phthalate	UG/KG	13 J	73 U	140%	9.3 J	13 J	33%	97 J	74 J	27%	340 UJ	350 UJ	3%	200 J	97 J	69%
Carbazole	UG/KG	78 U	17 J	128%	72 U	71 U	1%	170 J	130 J	27%	340 U	350 U	3%	910	550	49%
Chrysene	UG/KG	78 U	90	14%	8.8 J	12 J	31%	5000 J	2700 J	60%	340 UJ	350 UJ	3%	6800 J	4300 J	45%
Di-n-butylphthalate	UG/KG	78 U	73 U	7%	72 U	3.7 J	180%	360 U	360 U	----	340 U	350 U	3%	380 U	73 J	136%
Di-n-octylphthalate	UG/KG	9.9 J	73 U	152%	72 U	71 U	1%	360 U	360 UJ	----	340 UJ	350 UJ	3%	380 UJ	380 UJ	----
Dibenz(a,h)anthracene	UG/KG	78 U	21 J	115%	72 U	71 U	1%	250 J	100 J	86%	340 UJ	350 UJ	3%	570 J	370 J	43%
Dibenzofuran	UG/KG	78 U	5.1 J	175%	72 U	71 U	1%	170 J	190 J	11%	340 U	350 U	3%	330 J	160 J	69%
Diethyl phthalate	UG/KG	5.8 J	73 U	171%	8.1 J	10 J	21%	360 U	360 U	----	340 U	350 U	3%	380 U	380 U	----
Fluoranthene	UG/KG	78 U	180	79%	7.4 J	10 J	30%	8200 J	5100 J	47%	53 J	38 J	33%	15000	8800	52%
Fluorene	UG/KG	78 U	8 J	163%	72 U	71 U	1%	650	690	6%	340 U	350 U	3%	1000	560	56%
Indeno(1,2,3-cd)pyrene	UG/KG	78 U	41 J	62%	72 U	71 U	1%	760	330 J	79%	60 J	350 UJ	141%	1100 J	840 J	27%
Phenanthrene	UG/KG	78 U	96	21%	8.8 J	7.6 J	15%	4400 J	4000 J	10%	340 U	350 U	3%	13000	7600	52%
Pyrene	UG/KG	78 U	170	74%	8.3 J	14 J	51%	12000 J	5300 J	77%	130 J	78 J	50%	24000 J	14000 J	53%
Pesticides/PCBs																
4,4'-DDD	UG/KG	3.9 U	3.7 U	5%	3.6 U	3.5 U	3%	1.8 UJ	6 J	108%	1.8 R	1.8 UJ	NA	2 UJ	1.9 UJ	5%
4,4'-DDE	UG/KG	3.9 U	29	153%	3.8	4.5	17%	1.8 UJ	41 R	NA	6.1 J	6.3 J	3%	2 UJ	1.9 UJ	5%
4,4'-DDT	UG/KG	3.9 U	35	160%	1.9 J	2.3 J	19%	19 J	21 J	10%	1.8 UJ	1.8 UJ	----	2 UJ	1.9 UJ	5%
Aldrin	UG/KG	2 U	1.8 U	11%	1.8 U	1.8 U	----	9.9 J	19 NJ	63%	1.8 UJ	1.8 UJ	----	2 U	1.9 U	5%
Delta-BHC	UG/KG	2 U	0.95 J	71%	1.8 U	1.8 U	----	1.8 UJ	1.8 UJ	----	1.8 UJ	1.8 UJ	----	2 UJ	1.9 UJ	5%
Metals																
Antimony	MG/KG	1.1 J	19.3 J	178%	1.7 J	0.81 J	71%	0.98 U	0.99	1%	1.5	0.96 U	44%	3.2 J	1.4 J	78%
Barium	MG/KG	64.9	1600	184%	86.6	69.6	22%	42	45.6	8%	37.9 J	66.7 J	55%	80.9 J	84.5 J	4%
Cadmium	MG/KG	0.07 U	2.7	190%	0.07 U	0.05 U	33%	0.56	0.49 J	13%	0.2 J	0.13 U	42%	0.57	0.44	26%
Copper	MG/KG	19.7 J	7690	199%	39.1 J	33 J	17%	28.8	34.3	17%	34.6 J	39.6 J	13%	39.8 J	32.8 J	19%
Magnesium	MG/KG	4590	6820	39%	6980	5630	21%	17900	13000	32%	5080	6940	31%	12700	6180	69%
Sodium	MG/KG	139 U	606	125%	132 U	110	18%	276	232	17%	223	277	22%	191	194	2%
Zinc	MG/KG	80.3	1280	176%	153	196	25%	130 J	135 J	4%	123	196	46%	107 J	96.8 J	10%
Other																
Total Organic Carbon	MG/KG							5200	5300	2%	3300	8500	88%	5800	6000	3%
Total Petroleum Hydrocarbons	MG/KG							2800 J	6200 J	76%	42 UJ	43 UJ	2%	190	46 U	122%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\mathbf{RPD} = \frac{|\ SR - SDR\ |\ X\ 100}{(1/2)\ (SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
NJ = reported value is estimated and tentatively identified based on Mass Spec
J = reported value is estimated
UJ = not detected to the estimated limit indicated
R = result is rejected
NA = Not Applicable, i.e. result rejected or missing result
'----- = No difference between results or both results were non-detect

Table 4-1C
Quality Control of Field Duplicates - RPDs Greater than 50%
Ditch Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	SDDRMO-8				
		DRMO-4005		DRMO-4008		*RPD
Volatile Organic Compounds						
Acetone	UG/KG	21	J	72	J	110%
Semivolatile Organic Compounds						
1,2,4-Trichlorobenzene	UG/KG	650	UJ	1100	UJ	51%
1,2-Dichlorobenzene	UG/KG	650	UJ	1100	UJ	51%
1,3-Dichlorobenzene	UG/KG	650	UJ	1100	UJ	51%
1,4-Dichlorobenzene	UG/KG	650	UJ	1100	UJ	51%
2,4,6-Trichlorophenol	UG/KG	650	UJ	1100	UJ	51%
2,4-Dichlorophenol	UG/KG	650	UJ	1100	UJ	51%
2,4-Dimethylphenol	UG/KG	650	UJ	1100	UJ	51%
2,4-Dinitrotoluene	UG/KG	650	UJ	1100	UJ	51%
2,6-Dinitrotoluene	UG/KG	650	UJ	1100	UJ	51%
2-Chloronaphthalene	UG/KG	650	UJ	1100	UJ	51%
2-Chlorophenol	UG/KG	650	UJ	1100	UJ	51%
2-Methylnaphthalene	UG/KG	650	UJ	1100	UJ	51%
2-Methylphenol	UG/KG	650	UJ	1100	UJ	51%
2-Nitrophenol	UG/KG	650	UJ	1100	UJ	51%
3 or 4-Methylphenol	UG/KG	650	UJ	1100	UJ	51%
3,3'-Dichlorobenzidine	UG/KG	650	UJ	1100	UJ	51%
4-Bromophenyl phenyl ether	UG/KG	650	UJ	1100	UJ	51%
4-Chloro-3-methylphenol	UG/KG	650	UJ	1100	UJ	51%
4-Chloroaniline	UG/KG	650	UJ	1100	UJ	51%
4-Chlorophenyl phenyl ether	UG/KG	650	UJ	1100	UJ	51%
Acenaphthene	UG/KG	650	UJ	1100	UJ	51%
Acenaphthylene	UG/KG	650	UJ	1100	UJ	51%
Anthracene	UG/KG	650	UJ	1100	UJ	51%
Benzo(a)anthracene	UG/KG	650	UJ	1100	UJ	51%
Benzo(a)pyrene	UG/KG	650	UJ	1100	UJ	51%
Benzo(b)fluoranthene	UG/KG	650	UJ	1100	UJ	51%
Benzo(ghi)perylene	UG/KG	650	UJ	1100	UJ	51%
Benzo(k)fluoranthene	UG/KG	650	UJ	1100	UJ	51%
Bis(2-Chloroethoxy)methane	UG/KG	650	UJ	1100	UJ	51%
Bis(2-Chloroethyl)ether	UG/KG	650	UJ	1100	UJ	51%
Bis(2-Chloroisopropyl)ether	UG/KG	650	UJ	1100	UJ	51%
Bis(2-Ethylhexyl)phthalate	UG/KG	650	UJ	1100	UJ	51%
Butylbenzylphthalate	UG/KG	650	UJ	1100	UJ	51%
Carbazole	UG/KG	650	UJ	1100	UJ	51%
Chrysene	UG/KG	650	UJ	1100	UJ	51%
Di-n-butylphthalate	UG/KG	650	UJ	1100	UJ	51%
Di-n-octylphthalate	UG/KG	650	UJ	1100	UJ	51%
Dibenz(a,h)anthracene	UG/KG	650	UJ	1100	UJ	51%
Dibenzofuran	UG/KG	650	UJ	1100	UJ	51%
Diethyl phthalate	UG/KG	650	UJ	1100	UJ	51%
Dimethylphthalate	UG/KG	650	UJ	1100	UJ	51%
Fluoranthene	UG/KG	650	UJ	1100	UJ	51%
Fluorene	UG/KG	650	UJ	1100	UJ	51%

Table 4-1C
Quality Control of Field Duplicates - RPDs Greater than 50%
Ditch Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SDDRMO-8				
Parameter	**Units**	DRMO-4005		DRMO-4008		*RPD
Hexachlorobenzene	UG/KG	650	UJ	1100	UJ	51%
Hexachlorobutadiene	UG/KG	650	UJ	1100	UJ	51%
Hexachlorocyclopentadiene	UG/KG	650	UJ	1100	UJ	51%
Hexachloroethane	UG/KG	650	UJ	1100	UJ	51%
Indeno(1,2,3-cd)pyrene	UG/KG	650	UJ	1100	UJ	51%
Isophorone	UG/KG	650	UJ	1100	UJ	51%
N-Nitrosodiphenylamine	UG/KG	650	UJ	1100	UJ	51%
N-Nitrosodipropylamine	UG/KG	650	UJ	1100	UJ	51%
Naphthalene	UG/KG	650	UJ	1100	UJ	51%
Nitrobenzene	UG/KG	650	UJ	1100	UJ	51%
Phenanthrene	UG/KG	650	UJ	1100	UJ	51%
Phenol	UG/KG	650	UJ	1100	UJ	51%
Pyrene	UG/KG	650	UJ	1100	UJ	51%
Pesticides/PCBs						
Aroclor-1016	UG/KG	10	UJ	17	UJ	52%
Metals						
Arsenic	MG/KG	2.1		5.9	J	95%
Barium	MG/KG	72.2	J	122	J	51%
Cobalt	MG/KG	11.4		20.2	J	56%
Manganese	MG/KG	471		885	J	61%
Selenium	MG/KG	0.82	U	1.4	UJ	52%
Sodium	MG/KG	388		656	J	51%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\mathbf{RPD} = \frac{| SR - SDR | \text{ X } 100}{(1/2)(SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
UJ = not detected to the estimated limit indicated

Table 4-1D
Quality Control of Field Duplicates - RPDs Greater than 50%
Groundwater at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		MW121C-4					MW121C-1				
Parameter	**Units**	121C-2002		121C-2004		*RPD	EB023		EB153		*RPD
Pesticides/PCBs											
4,4'-DDD	UG/L	0.01	R	0.01	R	NA	0.9		0.11	U	156%
4,4'-DDE	UG/L	0.005	UJ	0.005	UJ	----	0.27	J	0.093	J	98%
Beta-BHC	UG/L	0.01	U	0.01	U	----	0.56	J	0.096	J	141%
Delta-BHC	UG/L	0.004	UJ	0.004	UJ	----	0.23	J	0.094		84%
Dieldrin	UG/L	0.009	U	0.009	U	----	0.11	U	0.052	J	72%
Endosulfan II	UG/L	0.01	UJ	0.01	UJ	----	0.28	J	0.11	U	87%
Endosulfan sulfate	UG/L	0.02	U	0.02	U	----	0.28	J	0.14	J	67%
Endrin aldehyde	UG/L	0.02	UJ	0.02	UJ	----	0.22	J	0.073	J	100%
Gamma-Chlordane	UG/L	0.01	U	0.01	U	----	0.47		0.086	J	138%
Heptachlor	UG/L	0.007	U	0.007	U	----	0.23	J	0.058	J	119%
Methoxychlor	UG/L	0.008	UJ	0.008	UJ	----	0.57		0.057	U	164%
Metals											
Aluminum	UG/L	146	J	1030		150%	133		738	J	139%
Chromium	UG/L	1.4	U	5.8		122%	1.2		2.4		67%
Cobalt	UG/L	2.3	U	4.8	J	70%	1.4	U	1.6		13%
Iron	UG/L	34.9	U	1720		192%	346		1430		122%
Zinc	UG/L	9.2	J	24		89%	2.4		9.3		118%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

RPD = $\frac{| SR - SDR | \times 100}{(1/2)\ (SR + SDR)}$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
UJ = not detected to the estimated limit indicated
R = result is rejected
NA = Not Applicable, i.e. result rejected or missing result
----- = No difference between results or both results were non-detect

Table 4-1E
Quality Control of Field Duplicates - RPDs Greater than 50%
Surface Water at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SWDRMO-8				
Parameter	**Units**	DRMO-3008		DRMO-3005		*RPD
Metals						
Iron	UG/L	19	J	34.2	J	57%
Manganese	UG/L	11.6		26.1		77%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\mathbf{RPD} = \frac{|\,SR - SDR\,| \times 100}{(1/2)\,(SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

J = reported value is estimated

Table 4-1F
Quality Control of Field Duplicates -RPDs Greater than 50%
Groundwater at Building 360
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Location ID		MW-1					MW-1				
Sample Date		4/4/2003					5/9/2003				
Parameter	**Units**	DRMO-2005		DRMO-2008		*RPD	DRMO-2013		121C-2019		*RPD
Pesticides/PCBs											
Endosulfan I	UG/L	0.02	U	0.02	U	----	0.02	UJ	0.01	UJ	67%
Metals											
Aluminum	UG/L	150	U	28.3	J	137%	32	U	32	U	----
Selenium	UG/L	4.2	J	3.3	J	24%	1.3	U	3.2	J	84%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\textbf{RPD} = \frac{|\ SR - SDR\ |\ X\ 100}{(1/2)\ (SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
'----- = No difference between results or both results were non-detect

Table 4-1G
Quality Control of Field Duplicates - RPDs Greater than 50%
Surface Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121I-2					SS121I-10					SS121I-29				
Parameter	**Units**	121I-1043		121I-1044		*RPD	121I-1006		121I-1031		*RPD	121I-1025		121I-1030		*RPD
Volatile Organic Compounds																
Acetone	UG/KG	110	U	33	UJ	108%	4.5	J	2.2	U	69%	3.1	U	3.6	UJ	15%
Benzene	UG/KG	6.6	J	10	J	41%	2.5	U	2.2	U	13%	24		57	J	81%
Ethyl benzene	UG/KG	2	J	3.5	J	55%	2.5	U	2.2	U	13%	4.4		9.5	J	73%
Meta/Para Xylene	UG/KG	2.2	J	3.4	J	43%	2.5	U	2.2	U	13%	3.9		8.7	J	76%
Methyl ethyl ketone	UG/KG	55		27	J	68%	2.5	U	2.2	U	13%	3.1	U	67	J	182%
Ortho Xylene	UG/KG	1.1	J	2	J	58%	2.5	U	2.2	U	13%	2.1	J	5.1	J	83%
Toluene	UG/KG	6.9		11	J	46%	2.5	U	2.2	U	13%	18		43	J	82%
Semivolatile Organic Compounds																
Anthracene	UG/KG	89	J	74	J	18%	360	U	360	U	----	330	J	2300	U	150%
Benzo(a)anthracene	UG/KG	350	J	350	J	----	48	J	47	J	2%	700	J	260	J	92%
Bis(2-Ethylhexyl)phthalate	UG/KG	78	J	390	U	133%	360	UJ	360	U	----	2100	U	260	J	156%
Carbazole	UG/KG	56	J	67	J	18%	360	U	360	U	----	340	J	2300	UJ	148%
Diethyl phthalate	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	230	J	161%
Fluoranthene	UG/KG	720		920		24%	100	J	78	J	25%	2500		490	J	134%
Phenanthrene	UG/KG	450		440		2%	60	J	56	J	7%	2200		530	J	122%
Pyrene	UG/KG	1200	J	660		58%	79	J	98	J	21%	2300		1600	J	36%
Pesticides/PCBs																
Endosulfan I	UG/KG	11	J	6.9	J	46%	3.7	J	4.2	J	13%	23		2.3	U	164%
Metals & Cyanide																
Aluminum	MG/KG	9700		9020		7%	6480		7510		15%	3730		2200		52%
Antimony	MG/KG	1.8		8.6		131%	3.4		2.5		31%	1.1	U	1.2	U	9%
Arsenic	MG/KG	21.2	J	43	J	68%	5.2		5.2		----	349	R	239	R	NA
Chromium	MG/KG	25.9	J	50	J	64%	14.3		14.7		3%	516		362		35%
Cobalt	MG/KG	23.9	J	40.6	J	52%	8.4		8.9		6%	237	J	174	J	31%
Cyanide, Total	MG/KG	0.592	U	0.595	U	1%	0.556	UJ	0.551	UJ	1%	1.26		2.73		74%
Magnesium	MG/KG	6110		4240		36%	13500		9040		40%	2770	J	6090	J	75%
Manganese	MG/KG	33200	J	57800	J	54%	786		822		4%	349000		272000		25%
Selenium	MG/KG	5.1	J	17.9	J	111%	0.87		0.8		8%	160	J	131	J	20%
Silver	MG/KG	1.9	J	4.2	J	75%	1.1	U	1.1	U	----	24.1	R	18.6	R	NA
Thallium	MG/KG	3		14.4		131%	1.1	U	1.1	U	----	173	J	152	J	13%
Other																
Total Petroleum Hydrocarbons	MG/KG	47	U	48	U	2%	44	UJ	44	UJ	----	240		1600		148%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\textbf{RPD} = \frac{| SR - SDR | \times 100}{(1/2)\,(SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
UJ = not detected to the estimated limit indicated
'----- = No difference between results or both results were non-detect

Table 4-1H
Quality Control of Field Duplicates - RPDs Greater than 50%
Ditch Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SD121I-7				
Parameter	**Units**	121I-4005		121I-4007		*RPD
Volatile Organic Compounds						
Acetone	UG/KG	25	J	10	J	86%
Semivolatile Organic Compounds						
2-Methylnaphthalene	UG/KG	420	U	130	J	105%
Acenaphthene	UG/KG	280	J	1200		124%
Acenaphthylene	UG/KG	70	J	420	U	143%
Anthracene	UG/KG	420	J	1900		128%
Benzo(a)anthracene	UG/KG	2200	J	5000	J	78%
Benzo(a)pyrene	UG/KG	2800	J	5900	J	71%
Benzo(b)fluoranthene	UG/KG	3600	J	8100	J	77%
Benzo(ghi)perylene	UG/KG	1400	J	3200	J	78%
Benzo(k)fluoranthene	UG/KG	2500	J	4900	J	65%
Carbazole	UG/KG	440		1700		118%
Chrysene	UG/KG	2400	J	5400	J	77%
Dibenz(a,h)anthracene	UG/KG	130	J	350	J	92%
Dibenzofuran	UG/KG	71	J	640		160%
Fluoranthene	UG/KG	4400		13000		99%
Fluorene	UG/KG	190	J	1100		141%
Indeno(1,2,3-cd)pyrene	UG/KG	400	J	1300	J	106%
Phenanthrene	UG/KG	2500		10000		120%
Pyrene	UG/KG	6500	J	17000	J	89%
Pesticide						
4,4'-DDE	UG/KG	14	J	2.2	UJ	146%
Metal						
Thallium	MG/KG	0.71	J	0.34	U	70%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

RPD = $\frac{| SR - SDR | X 100}{(1/2) (SR + SDR)}$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
UJ = not detected to the estimated limit indicated
'----- = No difference between results or both results were non-detect

Table 4-1I
Quality Control of Field Duplicates - RPDs Greater than 50%
Surface Water at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SW121I-7				
Parameter	**Units**	121I-3007		121I-3005		*RPD
Metals						
Manganese	UG/L	5.3		3		55%
Selenium	UG/L	3.1	J	1.8	J	53%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\textbf{RPD} = \frac{| SR - SDR | \times 100}{(1/2)\ (SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

J = reported value is estimated

Table 4-2
SUMMARY STATISTICS - SURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value [1]	Number of Exceedances	Number of Detects	Number of Analyses [2]
Volatile Organic Compounds							
Acetone	UG/KG	13	28%	200	0	13	47
Benzene	UG/KG	41	2%	60	0	1	48
Carbon disulfide	UG/KG	4.7	4%	2700	0	2	48
Chloroform	UG/KG	4.8 [3]	4%	300	0	2	48
Ethyl benzene	UG/KG	3300	4%	5500	0	2	48
Meta/Para Xylene	UG/KG	4400	8%		0	3	40
Methylene chloride	UG/KG	2.6	2%	100	0	1	48
Ortho Xylene	UG/KG	16	3%		0	1	40
Toluene	UG/KG	28	19%	1500	0	9	48
Semivolatile Organic Compounds							
2,4-Dinitrotoluene	UG/KG	45	2%		0	1	48
2-Methylnaphthalene	UG/KG	610	19%	36400	0	9	48
Acenaphthene	UG/KG	2600	23%	50000	0	11	48
Acenaphthylene	UG/KG	2500	21%	41000	0	10	48
Anthracene	UG/KG	7100	42%	50000	0	20	48
Benzo(a)anthracene	UG/KG	10000	55%	224	14	26	47
Benzo(a)pyrene	UG/KG	8700	51%	61	21	24	47
Benzo(b)fluoranthene	UG/KG	12000	64%	1100	5	30	47
Benzo(ghi)perylene	UG/KG	3200 [3]	53%	50000	0	25	47
Benzo(k)fluoranthene	UG/KG	7500	47%	1100	4	22	47
Bis(2-Ethylhexyl)phthalate	UG/KG	200	56%	50000	0	27	48
Butylbenzylphthalate	UG/KG	120	13%	50000	0	6	48
Carbazole	UG/KG	4200	35%		0	17	48
Chrysene	UG/KG	9100	53%	400	10	25	47
Di-n-butylphthalate	UG/KG	132 [3]	10%	8100	0	5	48
Di-n-octylphthalate	UG/KG	23 [3]	4%	50000	0	2	48
Dibenz(a,h)anthracene	UG/KG	470 [3]	26%	14	11	12	47
Dibenzofuran	UG/KG	1700	21%	6200	0	10	48
Diethyl phthalate	UG/KG	21 [3]	13%	7100	0	6	48
Fluoranthene	UG/KG	27000	73%	50000	0	35	48
Fluorene	UG/KG	3500	27%	50000	0	13	48
Hexachlorobenzene	UG/KG	8.5	2%	410	0	1	48
Indeno(1,2,3-cd)pyrene	UG/KG	970 [3]	46%	3200	0	22	48
N-Nitrosodiphenylamine	UG/KG	4.8	2%		0	1	48
Naphthalene	UG/KG	400	19%	13000	0	9	48
Phenanthrene	UG/KG	29000	52%	50000	0	25	48
Pyrene	UG/KG	34000	67%	50000	0	32	48
Pesticides/PCBs							
4,4'-DDD	UG/KG	44	12%	2900	0	5	43
4,4'-DDE	UG/KG	69	32%	2100	0	15	47
4,4'-DDT	UG/KG	100	28%	2100	0	13	47
Aldrin	UG/KG	14 [3]	6%	41	0	3	48
Alpha-Chlordane	UG/KG	63 [3]	8%		0	4	48

Table 4-2
SUMMARY STATISTICS - SURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value [1]	Number of Exceedances	Number of Detects	Number of Analyses [2]
Delta-BHC	UG/KG	2	6%	300	0	3	48
Dieldrin	UG/KG	41 [3]	4%	44	0	2	48
Endosulfan I	UG/KG	185 [3]	38%	900	0	18	48
Endosulfan II	UG/KG	9	2%	900	0	1	47
Endrin	UG/KG	21.5	2%	100	0	1	47
Endrin ketone	UG/KG	7.5 [3]	6%		0	3	48
Gamma-Chlordane	UG/KG	1.2	2%	540	0	1	48
Heptachlor	UG/KG	14	4%	100	0	2	47
Heptachlor epoxide	UG/KG	2.8	4%	20	0	2	46
Aroclor-1242	UG/KG	58	2%		0	1	48
Aroclor-1254	UG/KG	930	19%	10000	0	9	48
Aroclor-1260	UG/KG	85	10%	10000	0	5	48
Metals							
Aluminum	MG/KG	17,000	100%	19300	0	48	48
Antimony	MG/KG	236	81%	5.9	11	39	48
Arsenic	MG/KG	11.6	100%	8.2	2	48	48
Barium	MG/KG	2,030	100%	300	7	48	48
Beryllium	MG/KG	1.2	100%	1.1	1	48	48
Cadmium	MG/KG	29.1	60%	2.3	14	29	48
Calcium	MG/KG	296,000	100%	121000	6	48	48
Chromium	MG/KG	74.8	100%	29.6	12	48	48
Cobalt	MG/KG	17	100%	30	0	35	35
Copper	MG/KG	9,750	100%	33	35	48	48
Iron	MG/KG	51,700	100%	36500	5	48	48
Lead	MG/KG	18,900	100%	24.8	40	48	48
Magnesium	MG/KG	20,700	100%	21500	0	48	48
Manganese	MG/KG	858	100%	1060	0	48	48
Mercury	MG/KG	0.47	92%	0.1	8	44	48
Nickel	MG/KG	224	100%	49	9	48	48
Potassium	MG/KG	1,990	100%	2380	0	48	48
Selenium	MG/KG	1.3	21%	2	0	10	48
Silver	MG/KG	21.8	38%	0.75	13	18	48
Sodium	MG/KG	478	88%	172	26	42	48
Thallium	MG/KG	1.1	21%	0.7	3	10	48
Vanadium	MG/KG	25.4	100%	150	0	48	48
Zinc	MG/KG	3,610	100%	110	28	48	48
Other							
Total Organic Carbon	MG/KG	9,000	100%		0	40	40
Total Petroleum Hydrocarbons	MG/KG	7,600	25%		0	10	40

NOTES:

1. The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
2. Sample-duplicate pairs were averaged and the average results were used in the summary statistics presented in this table.
3. The maximum detected concentration was obtained from the average of the sample and its duplicate.

Table 4-3
SUMMARY STATISTICS - DITCH SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value [1]	Number of Exceedances	Number of Detects	Number of Analyses [2]
Volatile Organic Compounds							
Acetone	UG/KG	150	70%	200	0	7	10
Carbon disulfide	UG/KG	12	20%	2700	0	2	10
Methyl ethyl ketone	UG/KG	130	30%	300	0	3	10
Semivolatile Organic Compounds							
3 or 4-Methylphenol	UG/KG	790	10%		0	1	10
Anthracene	UG/KG	250	20%	50000	0	2	10
Benzo(a)anthracene	UG/KG	1100	20%	224	2	2	10
Benzo(a)pyrene	UG/KG	900	20%	61	2	2	10
Benzo(b)fluoranthene	UG/KG	1100	20%	1100	0	2	10
Benzo(ghi)perylene	UG/KG	290	10%	50000	0	1	10
Benzo(k)fluoranthene	UG/KG	580	10%	1100	0	1	10
Chrysene	UG/KG	1200	20%	400	1	2	10
Fluoranthene	UG/KG	2100	20%	50000	0	2	10
Indeno(1,2,3-cd)pyrene	UG/KG	270	10%	3200	0	1	10
Phenanthrene	UG/KG	1100	20%	50000	0	2	10
Pyrene	UG/KG	2100	20%	50000	0	2	10
Metals and Cyanide							
Aluminum	MG/KG	21500	100%	19300	1	10	10
Antimony	MG/KG	4.9	50%	5.9	0	5	10
Arsenic	MG/KG	6.1	100%	8.2	0	10	10
Barium	MG/KG	291	100%	300	0	10	10
Beryllium	MG/KG	0.8 [3]	80%	1.1	0	8	10
Cadmium	MG/KG	14.3	50%	2.3	3	5	10
Calcium	MG/KG	161000	100%	121000	2	10	10
Chromium	MG/KG	29.8	100%	29.6	1	10	10
Cobalt	MG/KG	15.8 [3]	100%	30	0	10	10
Copper	MG/KG	1190	100%	33	7	10	10
Cyanide, Amenable	MG/KG	2.36	10%		0	1	10
Cyanide, Total	MG/KG	2.36	10%		0	1	10
Iron	MG/KG	27300 [3]	100%	36500	0	10	10
Lead	MG/KG	436	100%	24.8	8	10	10
Magnesium	MG/KG	17600	100%	21500	0	10	10
Manganese	MG/KG	918	100%	1060	0	10	10
Mercury	MG/KG	0.3	100%	0.1	6	10	10
Nickel	MG/KG	42.7	100%	49	0	10	10
Potassium	MG/KG	1410	100%	2380	0	10	10
Selenium	MG/KG	2.5	40%	2	2	4	10
Silver	MG/KG	2.6	50%	0.75	5	5	10
Sodium	MG/KG	1120	100%	172	9	10	10
Vanadium	MG/KG	29.1	100%	150	0	10	10
Zinc	MG/KG	566	100%	110	7	10	10
Other							
Total Organic Carbon	MG/KG	9100	100%		0	10	10
Total Petroleum Hydrocarbons	MG/KG	2600	20%		0	2	10

NOTES:
1. The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
2. Sample-duplicate pairs were averaged and the average results were used in the summary statistics presented in this table.
3. The maximum detected concentration was obtained from the average of the sample DRMO-4008 and its duplicate DRMO-4005 collected at SDDRMO-8.

Table 4-4
SUMMARY STATISTICS - SUBSURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value [1]	Number of Exceedances	Number of Detects	Number of Analyses
Volatile Organic Compounds							
Acetone	UG/KG	28	45%	200	0	9	20
Benzene	UG/KG	1800	10%	60	1	2	20
Chloroform	UG/KG	4	10%	300	0	2	20
Ethyl benzene	UG/KG	24000	5%	5500	1	1	20
Meta/Para Xylene	UG/KG	130000	6%		0	1	16
Methyl ethyl ketone	UG/KG	7.6	10%	300	0	2	20
Methylene chloride	UG/KG	3.5	10%	100	0	2	20
Ortho Xylene	UG/KG	75	6%		0	1	16
Styrene	UG/KG	2.7	5%		0	1	20
Toluene	UG/KG	84	20%	1500	0	4	20
Semivolatile Organic Compounds							
2-Methylnaphthalene	UG/KG	2500	20%	36400	0	4	20
Acenaphthene	UG/KG	50	15%	50000	0	3	20
Acenaphthylene	UG/KG	220	10%	41000	0	2	20
Anthracene	UG/KG	240	15%	50000	0	3	20
Benzo(a)anthracene	UG/KG	5200	35%	224	2	7	20
Benzo(a)pyrene	UG/KG	920	32%	61	3	6	19
Benzo(b)fluoranthene	UG/KG	1300	42%	1100	1	8	19
Benzo(ghi)perylene	UG/KG	210	37%	50000	0	7	19
Benzo(k)fluoranthene	UG/KG	490	32%	1100	0	6	19
Bis(2-Ethylhexyl)phthalate	UG/KG	87	40%	50000	0	8	20
Butylbenzylphthalate	UG/KG	39	10%	50000	0	2	20
Carbazole	UG/KG	56	15%		0	3	20
Chrysene	UG/KG	4900	35%	400	2	7	20
Di-n-butylphthalate	UG/KG	19	10%	8100	0	2	20
Di-n-octylphthalate	UG/KG	17	15%	50000	0	3	20
Dibenz(a,h)anthracene	UG/KG	33	16%	14	2	3	19
Dibenzofuran	UG/KG	45	15%	6200	0	3	20
Diethyl phthalate	UG/KG	250	25%	7100	0	5	20
Fluoranthene	UG/KG	1600	40%	50000	0	8	20
Fluorene	UG/KG	160	20%	50000	0	4	20
Indeno(1,2,3-cd)pyrene	UG/KG	150	30%	3200	0	6	20
Naphthalene	UG/KG	1900	20%	13000	0	4	20
Phenanthrene	UG/KG	1000	40%	50000	0	8	20
Pyrene	UG/KG	1700	40%	50000	0	8	20
Pesticides/PCBs							
4,4'-DDE	UG/KG	17	15%	2100	0	3	20
4,4'-DDT	UG/KG	16	15%	2100	0	3	20
Aldrin	UG/KG	11	5%	41	0	1	20
Delta-BHC	UG/KG	1.3	5%	300	0	1	20
Endosulfan I	UG/KG	78	5%	900	0	1	20
Endrin	UG/KG	23	5%	100	0	1	20
Endrin ketone	UG/KG	9.7	5%		0	1	20
Heptachlor epoxide	UG/KG	1.1	5%	20	0	1	19
Aroclor-1260	UG/KG	200	15%	10000	0	3	20
Metals							
Aluminum	MG/KG	17600	100%	19300	0	20	20
Antimony	MG/KG	11.5	20%	5.9	1	4	20
Arsenic	MG/KG	8.1	100%	8.2	0	20	20
Barium	MG/KG	1050	100%	300	1	20	20
Beryllium	MG/KG	1	100%	1.1	0	20	20
Cadmium	MG/KG	8.1	10%	2.3	1	2	20

Table 4-4
SUMMARY STATISTICS - SUBSURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value [1]	Number of Exceedances	Number of Detects	Number of Analyses
Calcium	MG/KG	97200	100%	121000	0	20	20
Chromium	MG/KG	37	100%	29.6	3	20	20
Cobalt	MG/KG	19.7	100%	30	0	20	20
Copper	MG/KG	2440	100%	33	6	20	20
Iron	MG/KG	54100	100%	36500	1	20	20
Lead	MG/KG	1780	100%	24.8	7	20	20
Magnesium	MG/KG	24900	100%	21500	1	20	20
Manganese	MG/KG	790	100%	1060	0	20	20
Mercury	MG/KG	0.07	95%	0.1	0	18	19
Nickel	MG/KG	69.7	100%	49	3	20	20
Potassium	MG/KG	1870	100%	2380	0	20	20
Silver	MG/KG	0.72	10%	0.75	0	2	20
Sodium	MG/KG	214	70%	172	2	14	20
Thallium	MG/KG	1.8	10%	0.7	2	2	20
Vanadium	MG/KG	27	100%	150	0	20	20
Zinc	MG/KG	691	100%	110	7	20	20
Other							
Total Organic Carbon	MG/KG	9500	100%		0	16	16
Total Petroleum Hydrocarbons	MG/KG	3700	25%		0	4	16

NOTE:

1. The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.

Table 4-5A
SUMMARY STATISTICS - EBS GROUNDWATER
SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value	Source of Criteria[1]	Number of Exceedances	Number of Detects	Number of Analyses [2]
Volatile Organic Compounds								
1,4-Dichlorobenzene	UG/L	36	50%	3	GA	1	1	2
Acetone	UG/L	57 [3]	50%			0	1	2
Bromochloromethane	UG/L	1	50%	5	GA	0	1	2
Bromoform	UG/L	4	50%	80	MCL	0	1	2
Carbon disulfide	UG/L	2 [3]	50%			0	1	2
Chlorobenzene	UG/L	2	50%	5	GA	0	1	2
Vinyl chloride	UG/L	1	50%	2	GA	0	1	2
Semivolatile Organic Compounds								
Bis(2-Ethylhexyl)phthalate	UG/L	0.4	100%	5	GA	0	2	2
Butylbenzylphthalate	UG/L	0.12 [3]	50%			0	1	2
Di-n-butylphthalate	UG/L	1.7 [3]	100%	50	GA	0	2	2
Diethyl phthalate	UG/L	0.057 [3]	50%			0	1	2
Fluorene	UG/L	0.48	50%			0	1	2
Hexachlorobutadiene	UG/L	0.4	100%	0.5	GA	0	2	2
Phenanthrene	UG/L	0.24	50%			0	1	2
Pyrene	UG/L	0.13	50%			0	1	2
Pesticides/PCBs								
4,4'-DDD	UG/L	0.81	100%	0.3	GA	2	2	2
4,4'-DDE	UG/L	0.3	100%	0.2	GA	1	2	2
4,4'-DDT	UG/L	0.56	100%	0.2	GA	2	2	2
Alpha-BHC	UG/L	0.059	100%	0.01	GA	2	2	2
Alpha-Chlordane	UG/L	0.082 [3]	50%			0	1	2
Beta-BHC	UG/L	0.33 [3]	100%	0.04	GA	2	2	2
Delta-BHC	UG/L	0.16 [3]	100%	0.04	GA	2	2	2
Dieldrin	UG/L	0.2	100%	0.004	GA	2	2	2
Endosulfan I	UG/L	0.10 [3]	50%			0	1	2
Endosulfan II	UG/L	0.28	100%			0	2	2
Endosulfan sulfate	UG/L	0.69	100%			0	2	2
Endrin	UG/L	0.71	50%	0	GA	0	1	2
Endrin aldehyde	UG/L	0.97	100%	5	GA	0	2	2
Endrin ketone	UG/L	0.2	50%	5	GA	0	1	2
Gamma-BHC/Lindane	UG/L	0.038	50%	0.05	GA	0	1	2
Gamma-Chlordane	UG/L	0.28 [3]	100%			0	2	2
Heptachlor	UG/L	0.14 [3]	50%	0.04	GA	1	1	2
Heptachlor epoxide	UG/L	0.11	100%	0.03	GA	2	2	2
Methoxychlor	UG/L	0.62	100%	35	GA	0	2	2
Metals								
Aluminum	UG/L	5350	100%	50	SEC	2	2	2
Arsenic	UG/L	2.8 [3]	50%	10	MCL	0	1	2
Barium	UG/L	106	100%	1000	GA	0	2	2
Beryllium	UG/L	0.1	50%	4	MCL	0	1	2
Cadmium	UG/L	0.27 [3]	50%	5	GA	0	1	2
Calcium	UG/L	167500 [3]	100%			0	2	2
Chromium	UG/L	6.5	100%	50	GA	0	2	2
Cobalt	UG/L	3.6	100%			0	2	2
Copper	UG/L	5.2	100%	200	GA	0	2	2
Iron	UG/L	5620	100%	300	GA	2	2	2
Magnesium	UG/L	23950 [3]	100%			0	2	2
Manganese	UG/L	1365 [3]	100%	50	SEC	2	2	2
Nickel	UG/L	10.6	100%	100	GA	0	2	2
Potassium	UG/L	21400	100%			0	2	2

Table 4-5A
SUMMARY STATISTICS - EBS GROUNDWATER
SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	**Units**	**Maximum Detect**	**Frequency of Detection**	**Criteria Value**	**Source of Criteria[1]**	**Number of Exceedances**	**Number of Detects**	**Number of Analyses [2]**
Selenium	UG/L	4.7 [3]	100%	10	GA	0	2	2
Sodium	UG/L	95200	100%	20000	GA	1	2	2
Vanadium	UG/L	6.5	100%			0	2	2
Zinc	UG/L	16.4	100%	5000	SEC	0	2	2

Note(s):

1. GA = NYSDEC Class GA Groundwater Standard (TOGS 1.1.1, June 1998)
   MCL = Maximum Contaminant Level - Drinking Water Standards and Health Advisory (EPA 822-B-00-001)
   SEC = Secondary Drinking Water Regulations - Drinking Water Standards and Health Advisory (EPA 82-B-00-001)
2. Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.
3. The maximum detected concentration was obtained from the average of the sample-duplicate pair EB153/EB023 at MW121C-1.

Table 4-5B
SUMMARY STATISTICS - RI GROUNDWATER
SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value	Source of Criteria[1]	Number of Exceedances	Number of Detects	Number of Analyses[2]
Semivolatile Organic Compounds								
Bis(2-Ethylhexyl)phthalate	UG/L	1.4	17%	5	GA	0	1	6
Di-n-butylphthalate	UG/L	1.6	17%	50	GA	0	1	6
Metals								
Aluminum	UG/L	588[3]	100%	50	SEC	4	6	6
Antimony	UG/L	8.4	33%	3	GA	2	2	6
Barium	UG/L	73.7	100%	1000	GA	0	6	6
Beryllium	UG/L	0.24	17%	4	MCL	0	1	6
Cadmium	UG/L	1.1	17%	5	GA	0	1	6
Calcium	UG/L	558000	100%			0	6	6
Chromium	UG/L	21.4	83%	50	GA	0	5	6
Cobalt	UG/L	3	50%			0	3	6
Copper	UG/L	17.7	50%	200	GA	0	3	6
Iron	UG/L	869[3]	50%	300	GA	3	3	6
Lead	UG/L	10.5	83%	15	MCL	0	5	6
Magnesium	UG/L	109000	100%			0	6	6
Manganese	UG/L	297	100%	50	SEC	6	6	6
Mercury	UG/L	0.2	33%	0.7	GA	0	2	6
Nickel	UG/L	2.1[3]	17%	100	GA	0	1	6
Potassium	UG/L	9400	100%			0	6	6
Selenium	UG/L	6.8	33%	10	GA	0	2	6
Sodium	UG/L	58400[3]	100%	20000	GA	3	6	6
Zinc	UG/L	96.2	100%	5000	SEC	0	6	6

Note(s):

1. GA = NYSDEC Class GA Groundwater Standard (TOGS 1.1.1, June 1998)
   MCL = Maximum Contaminant Level - Drinking Water Standards and Health Advisory (EPA 822-B-00-001)
   SEC = Secondary Drinking Water Regulations - Drinking Water Standards and Health Advisory (EPA 82-B-00-001)
2. Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.
3. The maximum detected concentration was obtained from the average of the sample-duplicate pair 121C-2004/121C-2002 at MW121C-4

Table 4-6
SUMMARY STATISTICS - GROUNDWATER
BUILDING 360
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value	Source of Criteria[1]	Number of Exceedances	Number of Detects	Number of Analyses [2]
Volatile Organic Compounds								
1,1-Dichloroethane	UG/L	4.3 [3]	67%	5	GA	0	4	6
1,2-Dichloropropane	UG/L	0.4 [3]	17%	1	GA	0	1	6
Acetone	UG/L	8.4 [3]	25%			0	1	4
Carbon disulfide	UG/L	0.6	17%			0	1	6
Cis-1,2-Dichloroethene	UG/L	1	33%	5	GA	0	2	6
Methylene chloride	UG/L	1 [3]	17%	5	GA	0	1	6
Vinyl chloride	UG/L	2.3 [3]	67%	2	GA	1	4	6
Semivolatile Organic Compounds								
Bis(2-Ethylhexyl)phthalate	UG/L	2.5	17%	5	GA	0	1	6
Metals								
Aluminum	UG/L	105	57%	50	SEC	4	4	7
Arsenic	UG/L	4.7 [3]	14%	10	MCL	0	1	7
Barium	UG/L	141 [3]	100%	1000	GA	0	7	7
Cadmium	UG/L	3.9	14%	5	GA	0	1	7
Calcium	UG/L	119149.7969	100%			0	7	7
Chromium	UG/L	84	71%	50	GA	1	5	7
Cobalt	UG/L	7.40	43%			0	3	7
Copper	UG/L	167	43%	200	GA	0	3	7
Iron	UG/L	255000	100%	300	GA	4	7	7
Lead	UG/L	204	29%	15	MCL	2	2	7
Magnesium	UG/L	27400	100%			0	7	7
Manganese	UG/L	1645 [3]	100%	50	SEC	7	7	7
Mercury	UG/L	0.28	29%	0.7	GA	0	2	7
Nickel	UG/L	38.8	86%	100	GA	0	6	7
Potassium	UG/L	12300	100%			0	7	7
Selenium	UG/L	7.5	57%	10	GA	0	4	7
Silver	UG/L	8.6	14%	50	GA	0	1	7
Sodium	UG/L	42850 [3]	100%	20000	GA	7	7	7
Thallium	UG/L	3.3 [3]	14%	2	MCL	1	1	7
Vanadium	UG/L	4.4	14%			0	1	7
Zinc	UG/L	5740	100%	5000	SEC	2	7	7
Other								
Total Petroleum Hydrocarbons	MG/L	1.52	33%			0	2	6

Note(s):

1. GA = NYSDEC Class GA Groundwater Standard (TOGS 1.1.1, June 1998)
   MCL = Maximum Contaminant Level - Drinking Water Standards and Health Advisory (EPA 822-B-00-001)
   SEC = Secondary Drinking Water Regulations - Drinking Water Standards and Health Advisory (EPA 82-B-00-001)
2. Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.
3. The maximum detected concentration was obtained from the average of the sample and its duplicate pairs:
   DRMO-2005/DRMO-2008 collected April 2003 from MW-1 and DRMO-2013/DRMO-2019 collected May 2003 from MW-1.

Table 4-7
SUMMARY STATISTICS - SURFACE WATER
SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	**Units**	**Maximum Detect**	**Frequency of Detection**	**Criteria Value[1]**	**Number of Exceedances**	**Number of Detects**	**Number of Analyses [2]**
Semivolatile Organic Compounds							
Bis(2-Ethylhexyl)phthalate	UG/L	4.2	10%	0.6	1	1	10
Metals							
Aluminum	UG/L	8760	100%	100	5	10	10
Arsenic	UG/L	50.3	10%	150	0	1	10
Barium	UG/L	423	100%		0	10	10
Beryllium	UG/L	0.86	90%	1100	0	9	10
Cadmium	UG/L	19.5	40%	3.84	2	4	10
Calcium	UG/L	166000	100%		0	10	10
Chromium	UG/L	129	80%	139.45	0	8	10
Cobalt	UG/L	47	70%	5	2	7	10
Copper	UG/L	1160	100%	17.32	2	10	10
Iron	UG/L	110000	80%	300	5	8	10
Lead	UG/L	839	100%	1.4624632	10	10	10
Magnesium	UG/L	26200	100%		0	10	10
Manganese	UG/L	2380	100%		0	10	10
Mercury	UG/L	2.1	20%	0.0007	2	2	10
Nickel	UG/L	154	30%	99.92	1	3	10
Potassium	UG/L	5350	100%		0	10	10
Selenium	UG/L	4.6	10%	4.6	0	1	10
Silver	UG/L	8	20%	0.1	2	2	10
Sodium	UG/L	123000	100%		0	10	10
Thallium	UG/L	6.3	20%	8	0	2	10
Vanadium	UG/L	233	50%	14	2	5	10
Zinc	UG/L	6910	100%	159.25	2	10	10
Other							
Total Petroleum Hydrocarbons	MG/L	8.08	11%		0	1	9

Note(s):

1. Criteria values are from the New York State Ambient Water Quality Standards, Class C for Surface Water.
2. Sample-duplicate pair (DRMO-3008/DRMO-3005 collected from SWDRMO-8) was averaged and the average results were used in the summary statistic presented in this table.

Table 4-8
SUMMARY STATISTICS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value[1]	Number of Exceedances	Number of Detects	Number of Analyses[2]
Volatile Organic Compounds							
Acetone	UG/KG	150	80%	200	0	36	45
Benzene	UG/KG	41[3]	20%	60	0	9	45
Ethyl benzene	UG/KG	7.8	13%	5500	0	6	45
Meta/Para Xylene	UG/KG	6.3[3]	13%		0	6	45
Methyl ethyl ketone	UG/KG	78	24%	300	0	11	45
Methylene chloride	UG/KG	2.8	20%	100	0	9	45
Ortho Xylene	UG/KG	3.6[3]	13%		0	6	45
Toluene	UG/KG	31[3]	18%	1500	0	8	45
Semivolatile Organic Compounds							
2-Methylnaphthalene	UG/KG	260	10%	36400	0	5	51
3,3'-Dichlorobenzidine	UG/KG	315[3]	2%		0	1	47
Acenaphthene	UG/KG	6100	51%	50000	0	26	51
Acenaphthylene	UG/KG	560	12%	41000	0	6	51
Anthracene	UG/KG	12000	58%	50000	0	29	50
Benzo(a)anthracene	UG/KG	28000	90%	224	28	46	51
Benzo(a)pyrene	UG/KG	23000	88%	61	44	45	51
Benzo(b)fluoranthene	UG/KG	29000	94%	1100	14	48	51
Benzo(ghi)perylene	UG/KG	29000	82%	50000	0	42	51
Benzo(k)fluoranthene	UG/KG	23000	74%	1100	14	37	50
Bis(2-Ethylhexyl)phthalate	UG/KG	1600	33%	50000	0	17	51
Butylbenzylphthalate	UG/KG	420[3]	6%	50000	0	3	48
Carbazole	UG/KG	6800	57%		0	29	51
Chrysene	UG/KG	32000	86%	400	25	44	51
Di-n-butylphthalate	UG/KG	45	2%	8100	0	1	50
Di-n-octylphthalate	UG/KG	420[3]	2%	50000	0	1	47
Dibenz(a,h)anthracene	UG/KG	5000	34%	14	15	15	44
Dibenzofuran	UG/KG	2000	27%	6200	0	14	51
Diethyl phthalate	UG/KG	640[3]	2%	7100	0	1	51
Fluoranthene	UG/KG	62000	94%	50000	1	48	51
Fluorene	UG/KG	4200	43%	50000	0	22	51
Indeno(1,2,3-cd)pyrene	UG/KG	12000	71%	3200	3	35	49
Isophorone	UG/KG	315[3]	2%	4400	0	1	51
Naphthalene	UG/KG	630	14%	13000	0	7	51
Nitrobenzene	UG/KG	315[3]	2%	200	1	1	51
Phenanthrene	UG/KG	52000	94%	50000	1	48	51
Phenol	UG/KG	315[3]	2%	30	1	1	51
Pyrene	UG/KG	64000	94%	50000	1	48	51
Pesticides/PCBs							
4,4'-DDE	UG/KG	34	11%	2100	0	5	45
4,4'-DDT	UG/KG	39	5%	2100	0	2	44
Aldrin	UG/KG	12	9%	41	0	4	45
Dieldrin	UG/KG	34	4%	44	0	2	45
Endosulfan I	UG/KG	95	59%	900	0	24	41

Table 4-8
SUMMARY STATISTICS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value [1]	Number of Exceedances	Number of Detects	Number of Analyses [2]
Endrin	UG/KG	30	4%	100	0	2	45
Heptachlor epoxide	UG/KG	55	21%	20	3	8	39
Aroclor-1254	UG/KG	67	4%	10000	0	2	45
Aroclor-1260	UG/KG	46	7%	10000	0	3	45
Metals and Cyanide							
Aluminum	MG/KG	13200	100%	19300	0	45	45
Antimony	MG/KG	7.5	31%	5.9	1	14	45
Arsenic	MG/KG	104	100%	8.2	8	34	34
Barium	MG/KG	207	100%	300	0	45	45
Beryllium	MG/KG	0.68	98%	1.1	0	44	45
Cadmium	MG/KG	6.6	31%	2.3	3	14	45
Calcium	MG/KG	298000	100%	121000	18	45	45
Chromium	MG/KG	439 [3]	100%	29.6	6	45	45
Cobalt	MG/KG	206 [3]	100%	30	4	45	45
Copper	MG/KG	209 [3]	100%	33	10	40	40
Cyanide, Total	MG/KG	2.00 [3]	7%		0	3	45
Iron	MG/KG	58400 [3]	100%	36500	2	45	45
Lead	MG/KG	122	100%	24.8	22	45	45
Magnesium	MG/KG	22300	100%	21500	1	45	45
Manganese	MG/KG	310500 [3]	100%	1060	15	45	45
Mercury	MG/KG	0.18	98%	0.1	1	44	45
Nickel	MG/KG	342	100%	49	7	45	45
Potassium	MG/KG	1450	100%	2380	0	45	45
Selenium	MG/KG	146 [3]	47%	2	5	21	45
Silver	MG/KG	10.5	18%	0.75	4	6	34
Sodium	MG/KG	372	82%	172	24	37	45
Thallium	MG/KG	163 [3]	20%	0.7	5	9	45
Vanadium	MG/KG	182 [3]	100%	150	1	45	45
Zinc	MG/KG	532	100%	110	14	45	45
Other							
Total Organic Carbon	MG/KG	8900	100%		0	45	45
Total Petroleum Hydrocarbons	MG/KG	2200	33%		0	15	45

Notes:

1. The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
2. Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
3. The maximum detected concentration was obtained from the average of the sample and its duplicate.

Table 4-9
SUMMARY STATISTICS - SURFACE WATER
SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	Maximum Detect	Frequency of Detection	Criteria Value[1]	Number of Exceedances	Number of Detects	Number of Analyses [2]
Semivolatile Organic Compounds							
Butylbenzylphthalate	UG/L	1.1	14%		0	1	7
Fluoranthene	UG/L	1.1	14%		0	1	7
Metals							
Aluminum	UG/L	2050	100%	100	3	7	7
Barium	UG/L	49.2	86%		0	6	7
Beryllium	UG/L	0.28	86%	1100	0	6	7
Cadmium	UG/L	0.54	14%	3.84	0	1	7
Calcium	UG/L	74200	100%		0	7	7
Chromium	UG/L	6	71%	139.45	0	5	7
Cobalt	UG/L	3	29%	5	0	2	7
Copper	UG/L	11.2	86%	17.32	0	6	7
Iron	UG/L	3410	71%	300	2	5	7
Lead	UG/L	26.3	57%	1.4624632	4	4	7
Magnesium	UG/L	11100	100%		0	7	7
Manganese	UG/L	206	100%		0	7	7
Nickel	UG/L	3.6	29%	99.92	0	2	7
Potassium	UG/L	4640	100%		0	7	7
Selenium	UG/L	2.5 [3]	14%	4.6	0	1	7
Sodium	UG/L	38500	100%		0	7	7
Vanadium	UG/L	3.9	43%	14	0	3	7
Zinc	UG/L	190	100%	159.25	1	7	7

Note(s):

1. Criteria values are from the New York State Ambient Water Quality Standards, Class C for Surface Water
2. Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.
3. The maximum detected concentration was obtained from the average of the sample (121I-3007) and its duplicate (121I-3005) collected at SW121I-7.

TABLE 5-1
Relative Relationship Between Koc and Mobility
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Koc	Class	Mobility
>2,000	I	Immobile
500-2,000	II	Low Mobility
150-500	III	Intermediate Mobility
50-150	IV	Mobile
<50	V	Very Mobile

Notes:
1) Koc = Organic carbon partition coefficient
2) Source: Dragun, 1988.

TABLE 6-1
SELECTION OF EXPOSURE PATHWAYS
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Soil	Soil	SEAD-121C/121I	Construction Worker	Adult	Dermal	On-Site	Quant	Potential construction workers will be exposed to soil at SEAD-121C and SEAD-121I.
						Ingestion	On-Site	Quant	Potential construction workers will be exposed to soil at SEAD-121C and SEAD-121I.
				Industrial Worker	Adult	Dermal	On-Site	Quant	Potential industrial workers will be exposed to soil at SEAD-121C and SEAD-121I.
						Ingestion	On-Site	Quant	Potential industrial workers will be exposed to soil at SEAD-121C and SEAD-121I.
				Trespasser	Adolescent	Dermal	On-Site	Quant	Trespasser may potentially be exposed to soil at SEAD-121C and SEAD-121I.
						Ingestion	On-Site	Quant	Trespasser may potentially be exposed to soil at SEAD-121C and SEAD-121I.
				Resident	Adult	Dermal	On-Site	None	The sites are currently not in use and no residents currently reside at SEAD-121C and SEAD-121I.
						Ingestion	On-Site	None	The sites are currently not in use and no residents currently reside at SEAD-121C and SEAD-121I.
					Adolescent	Dermal	On-Site	None	The sites are currently not in use and no residents currently reside at SEAD-121C and SEAD-121I.
						Ingestion	On-Site	None	The sites are currently not in use and no residents currently reside at SEAD-121C and SEAD-121I.
		Air	SEAD-121C/121I	Construction Worker	Adult	Inhalation	On-Site	Quant	Potential construction workers will be exposed to dust from soil.
				Industrial Worker	Adult	Inhalation	On-Site	Quant	Potential industrial workers will be exposed to dust from soil.
				Trespasser	Adolescent	Inhalation	On-Site	Quant	Potential trespasser receptor will be exposed to dust from soil.
				Resident	Adult	Inhalation	On-Site	None	The sites are currently not in use and no residents currently reside at SEAD-121C and SEAD-121I.
					Adolescent	Inhalation	On-Site	None	The sites are currently not in use and no residents currently reside at SEAD-121C and SEAD-121I.
		Produce	SEAD-121C/121I	Construction Worker	Adult	Ingestion	On-Site	None	No produce suitable for consumption is currently grown at SEAD-121C and SEAD-121I.
				Industrial Worker	Adult	Ingestion	On-Site	None	No produce suitable for consumption is currently grown at SEAD-121C and SEAD-121I.
				Trespasser	Adolescent	Ingestion	On-Site	None	No produce suitable for consumption is currently grown at SEAD-121C and SEAD-121I.
				Resident	Adult	Ingestion	On-Site	None	No produce suitable for consumption is currently grown at SEAD-121C and SEAD-121I.
					Adolescent	Ingestion	On-Site	None	No produce suitable for consumption is currently grown at SEAD-121C and SEAD-121I.

TABLE 6-1
SELECTION OF EXPOSURE PATHWAYS
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Groundwater	Groundwater	Aquifer -- Tap Water	Construction Worker	Adult	Dermal	On-Site	Quant	Construction workers may potentially be exposed to groundwater at SEAD-121C and SEAD-121I.
						Intake	On-Site	None	Groundwater is not currently used as a drinking water source.
				Industrial Worker	Adult	Dermal	On-Site	None	Groundwater is not currently used as a drinking water source.
						Intake	On-Site	None	Groundwater is not currently used as a drinking water source.
				Trespasser	Adolescent	Dermal	On-Site	None	Trespassers are not likely to contact groundwater.
						Intake	On-Site	None	Groundwater is not currently used as a drinking water source.
				Resident	Adult	Dermal	On-Site	None	The sites are currently not in use and no residents currently reside at the sites.
							Off-Site	None	Groundwater at SEDA is not used as a drinking water source and impact to groundwater beyond the Depot is minimal.
						Intake	On-Site	None	The sites are currently not in use and no residents currently reside at the sites.
							Off-Site	None	Groundwater at SEDA is not used as a drinking water source and impact to groundwater beyond the Depot is minimal.
					Adolescent	Dermal	On-Site	None	The sites are currently not in use and no residents currently reside at the sites.
							Off-Site	None	Groundwater at SEDA is not used as a drinking water source and impact to groundwater beyond the Depot is minimal.
						Intake	On-Site	None	The sites are currently not in use and no residents currently reside at the sites.
							Off-Site	None	Groundwater at SEDA is not used as a drinking water source and impact to groundwater beyond the Depot is minimal.
Current	Surface Water	Surface Water	SEAD-121C/121I	Construction Worker	Adult	Dermal	On-Site	Quant	Construction workers may potentially be exposed to surface water at SEAD-121C and SEAD-121I.
				Industrial Worker	Adult	Dermal	On-Site	None	Industrial workers are unlikely to be exposed to surface water at either SEAD-121C and SEAD-121I.
				Trespasser	Adolescent	Dermal	On-Site	Quant	Trespassers may potentially contact surface water.
				Resident	Adult	Dermal	On-Site	None	The sites are currently not in use and no residents currently reside at SEAD-121C and SEAD-121I.
					Adolescent	Dermal	On-Site	None	The sites are currently not in use and no residents currently reside at SEAD-121C and SEAD-121I.

TABLE 6-1
SELECTION OF EXPOSURE PATHWAYS
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Soil	Soil	SEAD-121C/121I	Construction Worker	Adult	Dermal	On-Site	Quant	Potential construction workers will be exposed to soil at SEAD-121C and SEAD-121I.
						Ingestion	On-Site	Quant	Potential construction workers will be exposed to soil at SEAD-121C and SEAD-121I.
				Industrial Worker	Adult	Dermal	On-Site	Quant	Potential industrial workers will be exposed to soil at SEAD-121C and SEAD-121I.
						Ingestion	On-Site	Quant	Potential industrial workers will be exposed to soil at SEAD-121C and SEAD-121I.
				Adolescent Visitor	Adolescent	Dermal	On-Site	Quant	Adolescent visitor may potentially be exposed to soil at SEAD-121C and SEAD-121I.
						Ingestion	On-Site	Quant	Adolescent visitor may potentially be exposed to soil at SEAD-121C and SEAD-121I.
				Child at Day Care Center	Child	Dermal	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
						Ingestion	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
				Resident	Adult	Dermal	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
						Ingestion	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
					Adolescent	Dermal	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
						Ingestion	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
		Air	SEAD-121C/121I	Construction Worker	Adult	Inhalation	On-Site	Quant	Potential construction workers will be exposed to dust from soil.
				Industrial Worker	Adult	Inhalation	On-Site	Quant	Potential industrial workers may be exposed to dust from soil.
				Adolescent Visitor	Adolescent	Inhalation	On-Site	Quant	Adolescent visitor may potentially be exposed to soil at SEAD-121C and SEAD-121I.
				Child at Day Care Center	Child	Inhalation	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
				Resident	Adult	Inhalation	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
					Adolescent	Inhalation	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
		Produce	SEAD-121C/121I	Construction Worker	Adult	Ingestion	On-Site	None	Produce suitable for consumption is unlikely to grow at the sites based on the future use.
				Industrial Worker	Adult	Ingestion	On-Site	None	Produce suitable for consumption is unlikely to grow at the sites based on the future use.
				Adolescent Visitor	Adolescent	Ingestion	On-Site	None	Produce suitable for consumption is unlikely to grow at the sites based on the future use.
				Child at Day Care Center	Child	Ingestion	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
				Resident	Adult	Ingestion	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
					Adolescent	Ingestion	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.

TABLE 6-1
SELECTION OF EXPOSURE PATHWAYS
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Groundwater	Groundwater	Aquifer -- Tap Water	Construction Worker	Adult	Dermal	On-Site	Quant	Potential construction workers are not likely to be exposed to groundwater at SEAD-121C and SEAD-121I.
						Intake	On-Site	Quant	Groundwater is not currently used as a drinking water source. However, as no institutional control is available to prevent future use of groundwater, groundwater is assumed to be used as tap water as a conservative step.
				Industrial Worker	Adult	Dermal	On-Site	None	Industrial workers are not assumed to shower.
						Intake	On-Site	Quant	Groundwater is not currently used as a drinking water source. However, as no institutional control is available to prevent future use of groundwater, groundwater is assumed to be used as tap water as a conservative step.
				Adolescent Visitor	Adolescent	Dermal	On-Site	None	Adolescent visitors are unlikely to contact groundwater at the sites.
						Intake	On-Site	Quant	Groundwater is not currently used as a drinking water source. However, as no institutional control is available to prevent future use of groundwater, groundwater is assumed to be used as tap water as a conservative step.
				Child at Day Care Center	Child	Dermal	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
						Intake	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
				Resident	Adult	Dermal	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
							Off-Site	None	Groundwater at SEDA is not used as a drinking water source and impact to groundwater beyond the Depot is minimal.
						Intake	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
							Off-Site	None	Groundwater at SEDA is not used as a drinking water source and impact to groundwater beyond the Depot is minimal.
					Adolescent	Dermal	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
							Off-Site	None	Groundwater at SEDA is not used as a drinking water source and impact to groundwater beyond the Depot is minimal.
						Intake	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
							Off-Site	None	Groundwater at SEDA is not used as a drinking water source and impact to groundwater beyond the Depot is minimal.
Future	Surface Water	Surface Water	SEAD-121C/121I	Construction Worker	Adult	Dermal	On-Site	Quant	Potential construction workers maybe exposed to surface water at SEAD-121C and SEAD-121I.
				Industrial Worker	Adult	Dermal	On-Site	None	Industrial workers are unlikely to be exposed to surface water at either SEAD-121C and SEAD-121I.
				Adolescent Visitor	Adolescent	Dermal	On-Site	Quant	Adolescent visitor may potentially contact surface water.
				Child at Day Care Center	Child	Dermal	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
				Resident	Adult	Dermal	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.
					Adolescent	Dermal	On-Site	None	Future land use restricts development of residential homes, primary/secondary schools, and playgrounds/child-care facilities.

Table 6-2A

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SOIL

SEAD-121C

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
Volatile Organic Compounds														
67-64-1	Acetone	0.0032	J	0.028	J	SB121C-4	22 / 67	0.0022 - 0.03	0.028		14,000	0.2	NO	BSL
71-43-2	Benzene	0.002	J	1.8	J	SBDRMO-9	3 / 68	0.0022 - 0.012	1.8		0.64	0.06	YES	ASL
75-15-0	Carbon disulfide	0.0022	J	0.0047		SBDRMO-9	2 / 68	0.0022 - 0.012	0.0047		360	2.7	NO	BSL
67-66-3	Chloroform	0.002	J	0.0048	J	SB121C-4 (dup)	4 / 68	0.0022 - 0.012	0.0048		0.22	0.3	NO	BSL
100-41-4	Ethyl benzene	0.001005	J	24	J	SBDRMO-9	3 / 68	0.0022 - 0.012	24		400	5.5	NO	BSL
SA0078	Meta/Para Xylene	0.002	J	130	J	SBDRMO-9	4 / 56	0.0022 - 0.0033	130		270		NO	BSL
78-93-3	Methyl ethyl ketone	0.0032		0.0076	J	SBDRMO-14	2 / 68	0.0022 - 0.012	0.0076		22,000	0.3	NO	BSL
75-09-2	Methylene chloride	0.0026	J	0.0035		SBDRMO-24	3 / 68	0.00084 - 0.012	0.0035		9.1	0.1	NO	BSL
95-47-6	Ortho Xylene	0.016		0.075		SBDRMO-9	2 / 56	0.0022 - 0.0033	0.075		270		NO	BSL
100-42-5	Styrene	0.0027	J	0.0027	J	SBDRMO-9	1 / 68	0.0022 - 0.012	0.0027		1,700		NO	BSL
108-88-3	Toluene	0.002	J	0.084		SBDRMO-9	13 / 68	0.0022 - 0.005	0.084		520	1.5	NO	BSL
Semivolatile Organic Compounds														
121-14-2	2,4-Dinitrotoluene	0.045	J	0.045	J	SB121C-2	1 / 68	0.069 - 1.8	0.045		120		NO	BSL
91-57-6	2-Methylnaphthalene	0.0055	J	2.5	J	SBDRMO-12	13 / 68	0.069 - 1.8	2.5		310	36.4	NO	BSL
83-32-9	Acenaphthene	0.0065	J	2.6		SSDRMO-12	14 / 68	0.0715 - 1.8	2.6		3,700	50	NO	BSL
208-96-8	Acenaphthylene	0.042	J	2.5		SBDRMO-24	12 / 68	0.069 - 1.8	2.5			41	NO	NSV
120-12-7	Anthracene	0.0065	J	7.1		SSDRMO-12	23 / 68	0.0715 - 1.8	7.1		22,000	50	NO	BSL
56-55-3	Benzo(a)anthracene	0.0046	J	10	J	SSDRMO-12	33 / 67	0.072 - 1.8	10		0.62	0.224	YES	ASL
50-32-8	Benzo(a)pyrene	0.006	J	8.7	J	SSDRMO-12	30 / 66	0.0715 - 0.43	8.7		0.062	0.061	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.0058	J	12	J	SSDRMO-12	38 / 66	0.072 - 0.43	12		0.62	1.1	YES	ASL
191-24-2	Benzo(ghi)perylene	0.0062	J	3.2	J	SSDRMO-7 (dup)	32 / 66	0.0715 - 0.43	3.2			50	NO	NSV
207-08-9	Benzo(k)fluoranthene	0.0057	J	7.5	J	SSDRMO-12	28 / 66	0.0715 - 0.43	7.5		6.2	1.1	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.0072	J	0.2		SS121C-3	35 / 68	0.073 - 1.8	0.2		35	50	NO	BSL
85-68-7	Butylbenzylphthalate	0.0064	J	0.12	J	SSDRMO-14	8 / 68	0.0715 - 1.8	0.12		12,000	50	NO	BSL
86-74-8	Carbazole	0.014	J	4.2		SSDRMO-12	20 / 68	0.0715 - 1.8	4.2		24		NO	BSL
218-01-9	Chrysene	0.0055	J	9.1	J	SSDRMO-12	32 / 67	0.072 - 1.8	9.1		62	0.4	YES	CSG
53-70-3	Dibenz(a,h)anthracene	0.0076	J	0.47	J	SSDRMO-7 (dup)	15 / 66	0.0715 - 0.43	0.47		0.062	0.014	YES	ASL
132-64-9	Dibenzofuran	0.008	J	1.7		SSDRMO-12	13 / 68	0.069 - 1.8	1.7		150	6.2	NO	BSL
84-66-2	Diethylphthalate	0.0047	J	0.25	J	SBDRMO-24	11 / 68	0.073 - 1.8	0.25		49,000	7.1	NO	BSL
84-74-2	Di-n-butylphthalate	0.0053	J	0.13	J	SSDRMO-7 (dup)	7 / 68	0.069 - 1.8	0.13		6,100	8.1	NO	BSL
117-84-0	Di-n-octylphthalate	0.0038	J	0.023	J	SB121C-1 (dup)	5 / 68	0.0715 - 1.8	0.023		2,400	50	NO	BSL
206-44-0	Fluoranthene	0.0048	J	27		SSDRMO-12	43 / 68	0.072 - 1.8	27		2,300	50	NO	BSL
86-73-7	Fluorene	0.005	J	3.5		SSDRMO-12	17 / 68	0.0715 - 1.8	3.5		2,700	50	NO	BSL
118-74-1	Hexachlorobenzene	0.0085	J	0.0085	J	SB121C-2	1 / 68	0.069 - 1.8	0.0085		0.3	0.41	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.0059	J	0.97	J	SSDRMO-7 (dup)	28 / 68	0.0715 - 1.8	0.97		0.62	3.2	YES	ASL
91-20-3	Naphthalene	0.004	J	1.9	J	SBDRMO-12	13 / 68	0.0715 - 1.8	1.9		56	13	NO	BSL

Table 6-2A
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SOIL
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe: Cuurent/Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
86-30-6	N-Nitrosodiphenylamine	0.0048	J	0.0048	J	SB121C-2	1 / 68	0.069 - 1.8	0.0048		99		NO	BSL
85-01-8	Phenanthrene	0.0059	J	29		SSDRMO-12	33 / 68	0.072 - 1.8	29			50	NO	NSV
129-00-0	Pyrene	0.0047	J	34	J	SSDRMO-12	40 / 68	0.072 - 1.8	34		2,300	50	NO	BSL
PCBs														
53469-21-9	Aroclor-1242	0.058	J	0.058	J	SS121C-4	1 / 68	0.0024 - 0.038	0.058		0.22		YES	CSG
11097-69-1	Aroclor-1254	0.044	J	0.93		SBDRMO-18	9 / 68	0.011 - 0.038	0.93		0.22	10	YES	ASL
11096-82-5	Aroclor-1260	0.009	J	0.20		SB121C-2	8 / 68	0.0021 - 0.038	0.20		0.22	10	YES	CSG
Pesticides														
72-54-8	4,4'-DDD	0.0019	J	0.044	J	SBDRMO-18	5 / 59	0.00022 - 0.0039	0.044		2.4	2.9	NO	BSL
72-55-9	4,4'-DDE	0.0025	J	0.069	J	SS121C-3	18 / 67	0.00022 - 0.0038	0.069		1.7	2.1	NO	BSL
50-29-3	4,4'-DDT	0.0021	J	0.1	J	SS121C-3	16 / 67	0.00022 - 0.0038	0.10		1.7	2.1	NO	BSL
309-00-2	Aldrin	0.0045		0.014	J	SBDRMO-16 (dup)	4 / 68	0.00011 - 0.0022	0.014		0.029	0.041	NO	BSL
5103-71-9	Alpha-Chlordane	0.001	J	0.063	J	SBDRMO-16 (dup)	4 / 68	0.00032 - 0.0022	0.063		1.6		NO	BSL
319-86-8	Delta-BHC	0.000975	J	0.002	J	SS121C-4	4 / 68	0.00022 - 0.0022	0.002		0.09	0.3	NO	BSL
60-57-1	Dieldrin	0.039	J	0.041	J	SBDRMO-16 (dup)	2 / 67	0.00011 - 0.0038	0.041		0.030	0.044	YES	ASL
959-98-8	Endosulfan I	0.0058		0.19	J	SSDRMO-7 (dup)	19 / 68	0.00054 - 0.0022	0.19		370	0.9	NO	BSL
33213-65-9	Endosulfan II	0.009		0.009		SBDRMO-24	1 / 67	0.00034 - 0.0038	0.009		370	0.9	NO	BSL
72-20-8	Endrin	0.022	J	0.023	J	SBDRMO-16	2 / 67	0.00086 - 0.0038	0.023		18	0.1	NO	BSL
53494-70-5	Endrin ketone	0.0034	NJ	0.0097	NJ	SBDRMO-16	4 / 68	0.00011 - 0.0038	0.0097		18		NO	BSL
5103-74-2	Gamma-Chlordane	0.0012	J	0.0012	J	SS121C-4	1 / 68	0.00032 - 0.0022	0.0012		1.6	0.54	NO	BSL
76-44-8	Heptachlor	0.0021	J	0.014	J	SBDRMO-18	2 / 67	0.0011 - 0.0022	0.014		0.11	0.1	NO	BSL
1024-57-3	Heptachlor epoxide	0.0011	J	0.0028	J	SS121C-3	3 / 65	0.00032 - 0.0022	0.0028		0.053	0.02	NO	BSL
Inorganics														
7429-90-5	Aluminum	1,730		17,600		SBDRMO-13	68 / 68		17,600	20,500	76,000	19,300	NO	BSL
7440-36-0	Antimony	0.32	J	236		SSDRMO-24	43 / 68	0.26 - 1.2	236	6.55	31	5.9	YES	ASL
7440-38-2	Arsenic	2.4	J	11.6		SSDRMO-24	68 / 68		11.6	21.5	0.39	8.2	YES	ASL
7440-39-3	Barium	18.1		2,030	J	SSDRMO-24	68 / 68		2,030	159	5,400	300	NO	BSL
7440-41-7	Beryllium	0.21		1.2		SBDRMO-8	68 / 68		1.2	1.4	150	1.1	NO	BSL
7440-43-9	Cadmium	0.06	J	29.1		SSDRMO-14	31 / 68	0.06 - 0.16	29.1	2.9	37	2.3	NO	BSL
7440-70-2	Calcium	2,100	J	296,000		SS121C-4	68 / 68		296,000	293,000	2,500,000	121,000	NO	NUT
7440-47-3	Chromium	3.8		74.8		SBDRMO-18	68 / 68		74.8	32.7	210	29.6	NO	BSL
7440-48-4	Cobalt	3.5		19.7		SB121C-4	55 / 55		19.7	29.1	900	30	NO	BSL
7440-50-8	Copper	8.8	J	9,750		SB121C-2	68 / 68		9,750	62.8	3,100	33	YES	ASL
7439-89-6	Iron	4,230		54,100		SB121C-2	68 / 68		54,100	38,600	23,000	36,500	YES	ASL
7439-92-1	Lead	6.2	J	18,900		SSDRMO-24	68 / 68		18,900	266	400	24.8	YES	ASL
7439-95-4	Magnesium	3,610		24,900	J	SBDRMO-23	68 / 68		24,900	29,100	400,000	21,500	NO	NUT
7439-96-5	Manganese	213		858		SSDRMO-11	68 / 68		858	2,380	1,800	1,060	NO	BSL
7439-97-6	Mercury	0.01		0.47		SBDRMO-18	62 / 67	0.04 - 0.06	0.47	0.13	23	0.1	NO	BSL
7440-02-0	Nickel	11.6		224		SS121C-2	68 / 68		224	62.3	1,600	49	NO	BSL
7440-09-7	Potassium	787	J	1,990		SB121C-2	68 / 68		1,990	3,160	5,000,000	2,380	NO	NUT

Table 6-2A

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SOIL

SEAD-121C

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
7782-49-2	Selenium	0.49	J	1.3		SSDRMO-14	10 / 68	0.36 - 1.1	1.3	1.7	390	2	NO	BSL
7440-22-4	Silver	0.34		21.8		SS121C-1	20 / 68	0.28 - 0.49	21.8	0.87	390	0.75	NO	BSL
7440-23-5	Sodium	58.2		478		SSDRMO-14	56 / 68	106 - 141	478	269	1,125,000	172	NO	NUT
7440-28-0	Thallium	0.5	J	1.8	J	SBDRMO-24	12 / 68	0.32 - 1.5	1.8	1.2	5.2	0.7	NO	BSL
7440-62-2	Vanadium	5.1		27	J	SBDRMO-13	68 / 68		27	32.7	78	150	NO	BSL
7440-66-6	Zinc	29.8		3,610		SBDRMO-15	68 / 68		3,610	126	23,000	110	NO	BSL
Other Analytes														
SA0019	Total Organic Carbon	2800		9,500		SBDRMO-7	56 / 56						NO	NSV
SA0020	Total Petroleum Hydrocarbons	43	J	7,600	J	SBDRMO-17	14 / 56	42.5 - 53					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. (dup) indicates that the maximum concentration was detected in a duplicate pair. The maximum concentration reported is the average value of the sample and its duplicate. Lab duplicates were not included in the assessment. Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. Background value is the maximum detected concentration of the Seneca background dataset.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil. On-line resources available at http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Direct contact exposure (ingestion, dermal contact, and inhalation) is evaluated to derive the PRGs.
   PRG for xylenes was used as screening value for meta/para xylenes and ortho xylene.
   EPA Region III Risk Based Concentration (RBC) for residential soil was used as screening value for 2-methylnaphthalene as no Region 9 PRG is available. EPA Region III RBC, available on-line at http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1004.XLS, was calculated based on soil ingestion exposure and a target cancer risk of 1E-6 and a target hazard quotient of 1.
   PRG for Aroclor 1254 was used as screening value for Aroclor 1260.
   PRG for gamma-chlordane was used as screening value for alpha-chlordane.
   PRG for alpha-BHC was used as screening value for delta-BHC.
   PRG for endosulfan was used as screening value for endosulfan I and endosulfan II.
   PRG for endrin was used as screening value for endrin ketone.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 200 mg/day soil ingestion and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and minimum requirements for 1 yr children (225 mg/day and 1000 mg/day for sodium and potassium) from Marilyn Wright (2001) Dietary Reference Intakes.
   PRG for total chromium (1:6 ratio Cr VI: Cr III) was used as screening value for chromium.
   PRG for nickel (soluble salts) was used as screening value for nickel.
5. Potential TBC values are from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. No ARARs were identified. (on-line resources available at http://www.dec.state.ny.us/website/der/tagms/prtg4046.html)
6. Rationale codes

6. Rationale codes	Selection Reason:	Above Screening Levels (ASL)
		Chemicals in the Same Group were retained as COPC (CSG)
	Deletion Reason:	Essential Nutrient (NUT)
		Below Screening Level (BSL)
		No Screening Value or Toxicity Value (NSV)
		Individual Chemicals Evaluated (ICE)
Definitions:	COPC = Chemical of Potential Concern	
	ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered	
	Q = Qualifier	
	J = Estimated Value	
	NJ = Presence of the analyte has been "tentatively identified" and the associated numerical value represents its approximate concentration.	

Table 6-2B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SURFACE SOIL
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
Volatile Organic Compounds														
67-64-1	Acetone	0.0032	J	0.013	J	SBDRMO-19	13 / 47	0.0025 - 0.021	0.013		14,000	0.2	NO	BSL
71-43-2	Benzene	0.041		0.041		SBDRMO-9	1 / 48	0.0025 - 0.012	0.041		0.64	0.06	NO	BSL
75-15-0	Carbon disulfide	0.0022	J	0.0047		SBDRMO-9	2 / 48	0.0025 - 0.012	0.0047		360	2.7	NO	BSL
67-66-3	Chloroform	0.004	J	0.0048	J	SB121C-4 (dup)	2 / 48	0.0025 - 0.012	0.0048		0.22	0.3	NO	BSL
100-41-4	Ethyl benzene	0.00101	J	3.3	J	SBDRMO-9	2 / 48	0.0025 - 0.012	3.3		400	5.5	NO	BSL
SA0078	Meta/Para Xylene	0.002	J	4.4	J	SBDRMO-9	3 / 40	0.0025 - 0.0033	4.4		270		NO	BSL
75-09-2	Methylene chloride	0.0026	J	0.0026	J	SSDRMO-21	1 / 48	0.00084 - 0.012	0.0026		9.1	0.1	NO	BSL
95-47-6	Ortho Xylene	0.016		0.016		SBDRMO-9	1 / 40	0.0025 - 0.0033	0.016		270		NO	BSL
108-88-3	Toluene	0.002	J	0.028	J	SS121C-2	9 / 48	0.0025 - 0.0033	0.028		520	1.5	NO	BSL
Semivolatile Organic Compounds														
121-14-2	2,4-Dinitrotoluene	0.045	J	0.045	J	SB121C-2	1 / 48	0.069 - 1.8	0.05		120		NO	BSL
91-57-6	2-Methylnaphthalene	0.0055	J	0.61		SSDRMO-12	9 / 48	0.069 - 1.8	0.61		310	36.4	NO	BSL
83-32-9	Acenaphthene	0.0065	J	2.6		SSDRMO-12	11 / 48	0.0715 - 1.8	2.6		3,700	50	NO	BSL
208-96-8	Acenaphthylene	0.042	J	2.5		SBDRMO-24	10 / 48	0.069 - 1.8	2.5			41	NO	NSV
120-12-7	Anthracene	0.0065	J	7.1		SSDRMO-12	20 / 48	0.0715 - 1.8	7.1		22,000	50	NO	BSL
56-55-3	Benzo(a)anthracene	0.00545	J	10	J	SSDRMO-12	26 / 47	0.072 - 1.8	10		0.62	0.224	YES	ASL
50-32-8	Benzo(a)pyrene	0.0081	J	8.7	J	SSDRMO-12	24 / 47	0.0715 - 0.43	8.7		0.062	0.061	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.013	J	12	J	SSDRMO-12	30 / 47	0.072 - 0.43	12		0.62	1.1	YES	ASL
191-24-2	Benzo(ghi)perylene	0.011	J	3.2	J	SSDRMO-7 (dup)	25 / 47	0.0715 - 0.43	3.2			50	NO	NSV
207-08-9	Benzo(k)fluoranthene	0.007	J	7.5	J	SSDRMO-12	22 / 47	0.0715 - 0.43	7.5		6.2	1.1	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.0072	J	0.2		SS121C-3	27 / 48	0.073 - 1.8	0.2		35	50	NO	BSL
85-68-7	Butylbenzylphthalate	0.0078	J	0.12	J	SSDRMO-14	6 / 48	0.0715 - 1.8	0.12		12,000	50	NO	BSL
86-74-8	Carbazole	0.014	J	4.2		SSDRMO-12	17 / 48	0.0715 - 1.8	4.2		24		NO	BSL
218-01-9	Chrysene	0.0104	J	9.1	J	SSDRMO-12	25 / 47	0.072 - 1.8	9.1		62	0.4	YES	CSG
53-70-3	Dibenz(a,h)anthracene	0.0076	J	0.47	J	SSDRMO-7 (dup)	12 / 47	0.0715 - 0.43	0.47		0.062	0.014	YES	ASL
132-64-9	Dibenzofuran	0.019	J	1.7		SSDRMO-12	10 / 48	0.069 - 1.8	1.7		150	6.2	NO	BSL
84-66-2	Diethylphthalate	0.0085	J	0.021	J	SB121C-1 (dup)	6 / 48	0.073 - 1.8	0.021		49,000	7.1	NO	BSL
84-74-2	Di-n-butylphthalate	0.0082	J	0.132	J	SSDRMO-7 (dup)	5 / 48	0.069 - 1.8	0.132		6,100	8.1	NO	BSL
117-84-0	Di-n-octylphthalate	0.0038	J	0.0232	J	SB121C-1 (dup)	2 / 48	0.0715 - 1.8	0.0232		2,400	50	NO	BSL
206-44-0	Fluoranthene	0.0087	J	27		SSDRMO-12	35 / 48	0.072 - 1.8	27		2,300	50	NO	BSL
86-73-7	Fluorene	0.005	J	3.5		SSDRMO-12	13 / 48	0.0715 - 1.8	3.5		2,700	50	NO	BSL
118-74-1	Hexachlorobenzene	0.0085	J	0.0085	J	SB121C-1 (dup)	1 / 48	0.069 - 1.8	0.0085		0.3	0.41	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.0086	J	0.97	J	SSDRMO-7 (dup)	22 / 48	0.0715 - 1.8	0.97		0.62	3.2	YES	ASL
91-20-3	Naphthalene	0.004	J	0.4		SSDRMO-12	9 / 48	0.0715 - 1.8	0.4		56	13	NO	BSL
86-30-6	N-Nitrosodiphenylamine	0.0048	J	0.0048	J	SB121C-2	1 / 48	0.069 - 1.8	0.0048		99	13	NO	BSL

Table 6-2B

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SURFACE SOIL

SEAD-121C

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
85-01-8	Phenanthrene	0.0082	J	29		SSDRMO-12	25 / 48	0.072 - 1.8	29			50	NO	NSV
129-00-0	Pyrene	0.01115	J	34	J	SSDRMO-12	32 / 48	0.072 - 1.8	34		2,300	50	NO	BSL
PCBs														
53469-21-9	Aroclor-1242	0.058	J	0.058	J	SS121C-4	1 / 48	0.0024 - 0.038	0.058		0.22		YES	CSG
11097-69-1	Aroclor-1254	0.044	J	0.93		SBDRMO-18	9 / 48	0.011 - 0.038	0.93		0.22	10	YES	ASL
11096-82-5	Aroclor-1260	0.009	J	0.085	J	SS121C-3	5 / 48	0.0021 - 0.037	0.085		0.22	10	YES	CSG
Pesticides														
72-54-8	4,4'-DDD	0.0019	J	0.044	J	SBDRMO-18	5 / 43	0.00022 - 0.0039	0.044		2.4	2.9	NO	BSL
72-55-9	4,4'-DDE	0.00415		0.069	J	SS121C-3	15 / 47	0.00022 - 0.0036	0.069		1.7	2.1	NO	BSL
50-29-3	4,4'-DDT	0.0021	J	0.1	J	SS121C-3	13 / 47	0.00022 - 0.0036	0.1		1.7	2.1	NO	BSL
309-00-2	Aldrin	0.0045		0.014	J	SBDRMO-16 (dup)	3 / 48	0.00011 - 0.0022	0.014		0.029	0.041	NO	BSL
5103-71-9	Alpha-Chlordane	0.001	J	0.063	J	SBDRMO-16 (dup)	4 / 48	0.00032 - 0.0022	0.063		1.6		NO	BSL
319-86-8	Delta-BHC	0.000975	J	0.002	J	SS121C-4	3 / 48	0.00022 - 0.0022	0.002		0.09	0.3	NO	BSL
60-57-1	Dieldrin	0.039	J	0.041	J	SBDRMO-16 (dup)	2 / 48	0.00011 - 0.0038	0.041		0.030	0.044	YES	ASL
959-98-8	Endosulfan I	0.0058		0.19	J	SSDRMO-7 (dup)	18 / 48	0.00054 - 0.0022	0.19		370	0.9	NO	BSL
33213-65-9	Endosulfan II	0.009		0.009		SBDRMO-24	1 / 47	0.00034 - 0.0038	0.009		370	0.9	NO	BSL
72-20-8	Endrin	0.022	J	0.0215	J	SBDRMO-16 (dup)	1 / 47	0.00086 - 0.0038	0.0215		18	0.1	NO	BSL
53494-70-5	Endrin ketone	0.0034	NJ	0.0075	J	SBDRMO-16 (dup)	3 / 48	0.00011 - 0.0038	0.0075		18		NO	BSL
5103-74-2	Gamma-Chlordane	0.0012	J	0.0012	J	SS121C-4	1 / 48	0.00032 - 0.0022	0.0012		1.6	0.54	NO	BSL
76-44-8	Heptachlor	0.0021	J	0.014	J	SBDRMO-18	2 / 47	0.0011 - 0.0022	0.014		0.11	0.1	NO	BSL
1024-57-3	Heptachlor epoxide	0.0014	J	0.0028	J	SS121C-3	2 / 46	0.00032 - 0.0022	0.0028		0.053	0.02	NO	BSL
Inorganics														
7429-90-5	Aluminum	1,730		17,000		SBDRMO-13	48 / 48		17,000	20,500	76,000	19,300	NO	BSL
7440-36-0	Antimony	0.32	J	236		SSDRMO-24	39 / 48	1 - 1.2	236	6.55	31	5.9	YES	ASL
7440-38-2	Arsenic	3.4		11.6		SSDRMO-24	48 / 48		11.6	21.5	0.39	8.2	YES	ASL
7440-39-3	Barium	18.1		2,030	J	SSDRMO-24	48 / 48		2,030	159	5,400	300	NO	BSL
7440-41-7	Beryllium	0.21		1.2		SBDRMO-8	48 / 48		1.2	1.4	150	1.1	NO	BSL
7440-43-9	Cadmium	0.13	J	29.1		SSDRMO-14	29 / 48	0.06 - 0.16	29.1	2.9	37	2.3	NO	BSL
7440-70-2	Calcium	2,100	J	296,000		SS121C-4	48 / 48		296,000	293,000	2,500,000	121,000	NO	NUT
7440-47-3	Chromium	3.8		74.8		SBDRMO-18	48 / 48		74.8	32.7	210	29.6	NO	BSL
7440-48-4	Cobalt	3.5		17		SBDRMO-8	35 / 35		17	29.1	900	30	NO	BSL
7440-50-8	Copper	8.8	J	9,750		SB121C-2	48 / 48		9,750	62.8	3,100	33	YES	ASL
7439-89-6	Iron	4,230		51,700		SB121C-18	48 / 48		51,700	38,600	23,000	36,500	YES	ASL
7439-92-1	Lead	7.3		18,900		SSDRMO-24	48 / 48		18,900	266	400	24.8	YES	ASL
7439-95-4	Magnesium	3,610		20,700		SSDRMO-5	48 / 48		20,700	29,100	400,000	21,500	NO	NUT
7439-96-5	Manganese	213		858		SSDRMO-11	48 / 48		858	2,380	1,800	1,060	NO	BSL
7439-97-6	Mercury	0.03		0.47		SBDRMO-18	44 / 48	0.04 - 0.055	0.47	0.13	23	0.1	NO	BSL
7440-02-0	Nickel	11.6		224		SS121C-2	48 / 48		224	62.3	1,600	49	NO	BSL

Table 6-2B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SURFACE SOIL
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration 1 (mg/kg)	Q	Maximum Detected Concentration 1 (mg/kg)	Q	Location of Maximum Concentration 1	Detection Frequency 1	Range of Reporting Limits 1 (mg/kg)	Concentration Used for Screening 2 (mg/kg)	Maximum Background Value 3 (mg/kg)	Screening Value 4 (mg/kg)	Potential ARAR / TBC Value 5 (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
7440-09-7	Potassium	787	J	1,990		SB121C-2	48 / 48		1,990	3,160	5,000,000	2,380	NO	NUT
7782-49-2	Selenium	0.49	J	1.3		SSDRMO-14	10 / 48	0.36 - 1.01	1.3	1.7	390	2	NO	BSL
7440-22-4	Silver	0.34		21.8		SS121C-1	18 / 48	0.28 - 0.46	21.8	0.87	390	0.75	NO	BSL
7440-23-5	Sodium	58.2		478		SSDRMO-14	42 / 48	106 - 132	478	269	1,125,000	172	NO	NUT
7440-28-0	Thallium	0.5	J	1.1	J	SBDRMO-24	10 / 48	0.32 - 1.4	1.1	1.2	5.2	0.7	NO	BSL
7440-62-2	Vanadium	5.1		25.4		SBDRMO-8	48 / 48		25.4	32.7	78	150	NO	BSL
7440-66-6	Zinc	29.8		3,610		SBDRMO-15	48 / 48		3,610	126	23,000	110	NO	BSL
Other Analytes														
SA0019	Total Organic Carbon	2,800		9,000		SBDRMO-13	40 / 40						NO	NSV
SA0020	Total Petroleum Hydrocarbons	59		7,600	J	SBDRMO-17	10 / 40	42.5 - 53					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment.
   (dup) indicates that the maximum concentration was detected in a duplicate pair. The maximum concentration reported is the average value
   of the sample and its duplicate. Range of reporting limits were presented for nondetects only.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil. On-line resources available at
   http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Direct contact exposure (ingestion, dermal contact, and inhalation) is evaluated to derive the PRGs.
   PRG for xylenes was used as screening value for meta/para xylenes and ortho xylene.
   EPA Region III Risk Based Concentration (RBC) for residential soil was used as screening value for 2-methylnaphthalene
   as no Region 9 PRG is available. EPA Region III RBC, available on-line at http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1004.XLS,
   was calculated based on soil ingestion exposure and a target cancer risk of 1E-6 and a target hazard quotient of 1.
   PRG for Aroclor 1254 was used as screening value for Aroclor 1260.
   PRG for gamma-chlordane was used as screening value for alpha-chlordane.
   PRG for alpha-BHC was used as screening value for delta-BHC.
   PRG for endosulfan was used as screening value for endosulfan I, endosulfan II, and endosulfan sulfate.
   PRG for endrin was used as screening value for endrin aldehyde and endrin ketone.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 200 mg/day soil ingestion
   and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and
   minimum requirements for 1 yr children (225 mg/day and 1000 mg/day for sodium and potassium)
   from Marilyn Wright (2001) Dietary Reference Intakes.
   PRG for total chromium (1:6 ratio Cr VI: Cr III) was used as screening value for chromium.
   PRG for nickel (soluble salts) was used as screening value for nickel.
5. Potential TBC values are from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. No ARARs were identified.
   (on-line resources available at http://www.dec.state.ny.us/website/der/tagms/prtg4046.html)
6. Rationale codes

	Selection Reason:	Above Screening Levels (ASL)
		Chemicals in the Same Group were retained as COPC (CSG)
	Deletion Reason:	Essential Nutrient (NUT)
		Below Screening Level (BSL)
		No Screening Value or Toxicity Value (NSV)
		Individual Chemicals Evaluated (ICE)

Definitions:

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value
NJ = Presence of the analyte has been "tentatively identified" and the associated numerical value represents its approximate concentration.

Table 6-2C

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C DITCH SOIL
SEAD-121C

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Ditch Soil
Exposure Medium:	Ditch Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration ^{1} (mg/kg)	Q	Maximum Detected Concentration ^{1} (mg/kg)	Q	Location of Maximum Concentration ^{1}	Detection Frequency ^{1}	Range of Reporting Limits ^{1} (mg/kg)	Concentration Used for Screening ^{2} (mg/kg)	Maximum Background Value ^{3} (mg/kg)	Screening Value ^{4} (mg/kg)	Potential ARAR / TBC Value ^{5} (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection ^{6}
Volatile Organic Compounds														
67-64-1	Acetone	0.012	J	0.15	J	SDDRMO-3	7 / 10	0.0029 - 0.01	0.15		14,000	0.2	NO	BSL
75-15-0	Carbon disulfide	0.005	J	0.012	J	SDDRMO-6	2 / 10	0.0028 - 0.03	0.012		360	2.7	NO	BSL
78-93-3	Methyl ethyl ketone	0.0036	J	0.13	J	SDDRMO-4	3 / 10	0.0029 - 0.03	0.13		22,000	0.3	NO	BSL
Semivolatile Organic Compounds														
106-44-5 108-39-4	3 or 4-Methylphenol	0.79	J	0.79	J	SDDRMO-3	1 / 10	0.36 - 1.6	0.79		180		NO	NSV
120-12-7	Anthracene	0.1	J	0.25	J	SDDRMO-2	2 / 10	0.36 1.7	0.25		22,000	50	NO	BSL
56-55-3	Benzo(a)anthracene	0.23	J	1.1	J	SDDRMO-2	2 / 10	0.36 - 1.7	1.1		0.62	0.224	YES	ASL
50-32-8	Benzo(a)pyrene	0.17	J	0.9	J	SDDRMO-2	2 / 10	0.36 - 1.7	0.9		0.062	0.061	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.18	J	1.1	J	SDDRMO-2	2 / 10	0.36 - 1.7	1.1		0.62	1.1	YES	ASL
191-24-2	Benzo(ghi)perylene	0.29	J	0.29	J	SDDRMO-2	1 / 10	0.36 - 1.7	0.29			50	NO	NSV
207-08-9	Benzo(k)fluoranthene	0.58	J	0.58	J	SDDRMO-2	1 / 10	0.36 - 1.7	0.58		6.2	1.1	YES	CSG
218-01-9	Chrysene	0.24	J	1.2	J	SDDRMO-2	2 / 10	0.36 - 1.7	1.2		62	0.4	YES	CSG
206-44-0	Fluoranthene	0.52	J	2.1	J	SDDRMO-2	2 / 10	0.36 - 1.7	2.1		2,300	50	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.27	J	0.27	J	SDDRMO-2	1 / 10	0.36 - 1.7	0.27		0.62	3.2	YES	CSG
85-01-8	Phenanthrene	0.41	J	1.1	J	SDDRMO-2	2 / 10	0.36 - 1.7	1.1			50	NO	NSV
129-00-0	Pyrene	0.44	J	2.1	J	SDDRMO-2	2 / 10	0.36 - 1.7	2.1		2,300	50	NO	BSL
Inorganics														
7429-90-5	Aluminum	2,850		21,500		SDDRMO-9	10 / 10		21,500	20,500	76,000	19,300	NO	BSL
7440-36-0	Antimony	0.97	J	4.9	J	SDDRMO-9	5 / 10	1.2 - 4.3	4.9	6.55	31	5.9	NO	BSL
7440-38-2	Arsenic	1.1		6.1	J	SDDRMO-2	10 / 10		6.1	21.5	0.39	8.2	YES	ASL
7440-39-3	Barium	36.6	J	291		SDDRMO-9	10 / 10		291	159	5,400	300	NO	BSL
7440-41-7	Beryllium	0.2		0.8	J	SDDRMO-8 (dup)	8 / 10	0.64 - 0.68	0.8	1.4	150	1.1	NO	BSL
7440-43-9	Cadmium	1.5	J	14.3		SDDRMO-9	5 / 10	0.13 - 0.33	14.3	2.9	37	2.3	NO	BSL
7440-70-2	Calcium	13,200		161,000		SDDRMO-9	10 / 10		161,000	293,000	2,500,000	121,000	NO	NUT
7440-47-3	Chromium	7.3		29.8	J	SDDRMO-2	10 / 10		29.8	32.7	210	29.6	NO	BSL
7440-48-4	Cobalt	3		15.8	J	SDDRMO-8 (dup)	10 / 10		15.8	29.1	900	30	NO	BSL
7440-50-8	Copper	16.2		1,190		SDDRMO-9	10 / 10		1,190	62.8	3,100	33	NO	BSL
PA0002	Cyanide, Amenable	2.36	J	2.36	J	SDDRMO-4	1 / 10	0.55 - 2.63	2.36		11		NO	BSL
SA0008	Cyanide, Total	2.36	J	2.36	J	SDDRMO-4	1 / 10	0.552 - 2.63	2.36		11		NO	BSL
7439-89-6	Iron	5,650		27,300	J	SDDRMO-8 (dup)	10 / 10		27,300	38,600	23,000	36,500	YES	ASL
7439-92-1	Lead	13.3		436		SDDRMO-9	10 / 10		436	266	400	24.8	YES	ASL
7439-95-4	Magnesium	3,340		17,600		SDDRMO-9	10 / 10		17,600	29,100	400,000	21,500	NO	NUT
7439-96-5	Manganese	126		918	J	SDDRMO-5	10 / 10		918	2,380	1,800	1,060	NO	BSL

Table 6-2C

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C DITCH SOIL

SEAD-121C

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Ditch Soil
Exposure Medium:	Ditch Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration ^{1} (mg/kg)	Q	Maximum Detected Concentration ^{1} (mg/kg)	Q	Location of Maximum Concentration ^{1}	Detection Frequency ^{1}	Range of Reporting Limits ^{1} (mg/kg)	Concentration Used for Screening ^{2} (mg/kg)	Maximum Background Value ^{3} (mg/kg)	Screening Value ^{4} (mg/kg)	Potential ARAR / TBC Value ^{5} (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection ^{6}
7439-97-6	Mercury	0.04		0.3	J	SDDRMO-2	10 / 10		0.3	0.13	23	0.1	NO	BSL
7440-02-0	Nickel	8.2		42.7	J	SDDRMO-5	10 / 10		42.7	62.3	1,600	49	NO	BSL
7440-09-7	Potassium	368		1,410	J	SDDRMO-5	10 / 10		1,410	3,160	5,000,000	2,380	NO	NUT
7782-49-2	Selenium	0.73		2.5	J	SDDRMO-4	4 / 10	0.55 - 2.1	2.5	1.7	390	2	NO	BSL
7440-22-4	Silver	0.83	J	2.6	J	SDDRMO-5	5 / 10	0.35 - 1.4	2.6	0.87	390	0.75	NO	BSL
7440-23-5	Sodium	167		1,120	J	SDDRMO-4	10 / 10		1,120	269	1,125,000	172	NO	NUT
7440-62-2	Vanadium	8.6		29.1	J	SDDRMO-2	10 / 10		29.1	32.7	78	150	NO	BSL
7440-66-6	Zinc	51.4	J	566		SDDRMO-5	10 / 10		566	126	23,000	110	NO	BSL
Other Analytes														
SA0019	Total Organic Carbon	4,200		9,100	J	SDDRMO-10	10 / 10						NO	NSV
SA0020	Total Petroleum Hydrocarbons	1,000		2,600	J	SDDRMO-2	2 / 10	53 - 211					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation.
   (dup) indicates that the maximum concentration was detected in a duplicate pair The maximum concentration reported is the average value
   of the sample and its duplicate. Lab duplicates were not included in the assessment. Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. Background value is the maximum detected concentration of the Seneca background dataset.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil. On-line resources available at
   http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated October 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Direct contact exposure (ingestion, dermal contact, and inhalation) is evaluated to derive the PRGs.
   EPA Region III Risk Based Concentration (RBC) for residential soil was used as screening value for 2-methylnaphthalene
   as no Region 9 PRG is available. EPA Region III RBC, available on-line at http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1004.XLS,
   was calculated based on soil ingestion exposure and a target cancer risk of 1E-6 and a target hazard quotient of 1.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 200 mg/day soil ingestion
   and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and
   minimum requirements for 1 yr children (225 mg/day and 1000 mg/day for sodium and potassium)
   from Marilyn Wright (2001) Dietary Reference Intakes.
   PRG for total chromium (1:6 ratio Cr VI: Cr III) was used as screening value for chromium.
   PRG for cyanide hydrogen was used as screening value for amenable cyanide and total cyanide.
   PRG for nickel (soluble salts) was used as screening value for nickel.
5. Potential TBC values are from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. No ARARs were identified.
   (on-line resources available at http://www.dec.state.ny.us/website/der/tagms/prtg4046.html)
6. Rationale codes

6. Rationale codes	Selection Reason:	Above Screening Levels (ASL)
		Chemicals in the Same Group were retained as COPC (CSG)
	Deletion Reason:	Essential Nutrient (NUT)
		Below Screening Level (BSL)
		No Screening Value or Toxicity Value (NSV)
		Individual Chemicals Evaluated (ICE)
Definitions:	COPC = Chemical of Potential Concern	
	ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered	
	Q = Qualifier	
	J = Estimated Value	

Table 6-2D

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C GROUNDWATER

SEAD-121C

SEAD-121C AND SEAD-121I RI REPORT

SENECA ARMY DEPOT ACTIVITY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Groundwater
Exposure Point:	Aquifer -- Tap Water

CAS Number	Chemical	Minimum Detected Concentration [1] (ug/L)	Q	Maximum Detected Concentration [1] (ug/L)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (ug/L)	Concentration Used for Screening [2] (ug/L)	Screening Value [3] (ug/L)	Potential ARAR /TBC Value (ug/L)	Potential ARAR/TBC Source [4]	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
Semivolatile Organic Compounds														
117-81-7	Bis(2-Ethylhexyl)phthalate	1.4	J	1.4	J	MW121C-4	1 / 6	1 - 1.1	1.4	4.8	5	GA	NO	BSL
84-74-2	Di-n-butylphthalate	1.6	J	1.6	J	MW121C-6	1 / 6	1.2 - 1.3	1.6	3,600	50	GA	NO	BSL
Inorganics														
7429-90-5	Aluminum	19.9	J	588	J	MW121C-4 (dup)	6 / 6		588	36,000	50	SEC	NO	BSL
7440-36-0	Antimony	7.3	J	8.4	J	MW121C-6	2 / 6	3.8 - 7.5	8.4	15	3	GA	NO	BSL
7440-39-3	Barium	18.2	J	73.7		MW121C-3	6 / 6		73.7	2,600	1,000	GA	NO	BSL
7440-41-7	Beryllium	0.24	J	0.24	J	MW121C-4	1 / 6	0.1 - 0.9	0.24	73	4	MCL	NO	
7440-43-9	Cadmium	1.1	J	1.1	J	MW121C-6	1 / 6	0.8 - 0.8	1.1	18	5	GA	NO	BSL
7440-70-2	Calcium	114,000		558,000		MW121C-6	6 / 6		558,000	250,000			NO	NUT
7440-47-3	Chromium	1.5	J	21.4		MW121C-6	5 / 6	1.4 - 1.4	21.4	110	50	GA	NO	BSL
7440-48-4	Cobalt	1.5	J	3.0	J	MW121C-4 (dup)	3 / 6	0.7 - 2.3	3.0	730			NO	BSL
7440-50-8	Copper	6.2	J	17.7	J	MW121C-6	3 / 6	2 - 2	17.7	1,500	200	GA	NO	BSL
7439-89-6	Iron	516		869	J	MW121C-4 (dup)	3 / 6	22.2 - 34.9	869	11,000	300	GA	NO	BSL
7439-92-1	Lead	3.8		10.5		MW121C-6	5 / 6	3 - 3	10.5	15	15	MCL	NO	BSL
7439-95-4	Magnesium	27,700		109,000		MW121C-6	6 / 6		109,000	40,000			NO	NUT
7439-96-5	Manganese	135		297		MW121C-6	6 / 6		297	880	50	SEC	NO	BSL
7439-97-6	Mercury	0.2		0.2		MW121C-3	2 / 6	0.2 - 0.2	0.2	11	0.7	GA	NO	BSL
7440-02-0	Nickel	2.1	J	2.1	J	MW121C-4 (dup)	1 / 6	2 - 2	2.1	730	100	GA	NO	BSL
7440-09-7	Potassium	1,790	J	9,400		MW121C-4	6 / 6		9,400	700,000			NO	BSL
7782-49-2	Selenium	1.9	J	6.8		MW121C-6	2 / 6	1.3 - 4.2	6.8	180	10	GA	NO	BSL
7440-23-5	Sodium	17,600		58,400		MW121C-4 (dup)	6 / 6		58,400	1,200,000	20,000	GA	NO	BSL
7440-66-6	Zinc	12.6	J	96.2		MW121C-6	6 / 6		96.2	11,000	5,000	SEC	NO	BSL

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment. (dup) indicates that the maximum concentration was detected in a duplicate pair The maximum concentration reported is the average value of the sample and its duplicate. Range of reporting limits were presented for nondetects only.
   To ensure a reliable dataset, only groundwater samples at the DRMO Yard collected from permanent wells using low flow sampling techniques were included in the screeing process.
2. The maximum detected concentration was used for screening.
3. EPA Region 9 Preliminary Remediation Goals (PRGs) for tap water. On-line resources available at http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Ingestion from drinking and inhalation of volatiles during showering are evaluated to derive the PRGs.
   MCL for lead was used as screening value for lead as no Region 9 PRG is available.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 2L/day water intake and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and minimum requirements for 2-5 yr children (1400 mg/day for potassium) from Marilyn Wright (2001) Dietary Reference Intakes.
   For sodium, an upper limit intake of 2,400 mg/day (http://www.mealformation.com/dailyval.html) was used.
   PRG for chromium (VI) was used as screening value for chromium.
4. ARARs or TBCs identified are Maximum Contaminant Levels (MCLs), the GA standard, or the Secondary Drinking Water Regulations (SEC).
5. Rationale codes

	Selection Reason:	Above Screening Levels (ASL)
	Deletion Reason:	Essential Nutrient (NUT)
		Below Screening Level (BSL)

Definitions:

Q = Qualifier

J = Estimated Value

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

MCL = Federal Maximum Contaminant Level

GA = New York State Class GA Groundwater Standard (TOGS 1.1.1, June 1998 with updates)

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

Table 6-2E

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SURFACE WATER

SEAD-121C

SEAD-121C AND SEAD-121I RI REPORT

SENECA ARMY DEPOT ACTIVITY

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (ug/L)	Q	Maximum Detected Concentration [1] (ug/L)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (ug/L)	Concentration Used for Screening [2] (ug/L)	Maximum Background Value [3] (ug/L)	Screening Value [4] (ug/L)	Potential ARAR /TBC Value (ug/L)	Potential ARAR/TBC Source[5]	COPC Flag	Rationale for Contaminant Deletion or Selection [6]
Semivolatile Organic Compounds															
117-81-7	Bis(2-Ethylhexyl)phthalate	4.2	J	4.2	J	SWDRMO-2	1 / 10	10 - 10	4.2		4.8	0.6	Class C	NO	BSL
Inorganics															
7429-90-5	Aluminum	14.4		8,760		SWDRMO-2	10 / 10		8,760		36,000	100	Class C	NO	BSL
7440-38-2	Arsenic	50.3		50.3		SWDRMO-2	1 / 10	2.8 - 2.8	50.3		0.045	150	Class C	YES	ASL
7440-39-3	Barium	37.2		423		SWDRMO-2	10 / 10		423		2,600			NO	BSL
7440-41-7	Beryllium	0.12	J	0.86	J	SWDRMO-2	9 / 10	0.1 - 0.1	0.86		73	1100	Class C	NO	BSL
7440-43-9	Cadmium	0.46		19.5		SWDRMO-2	4 / 10	0.4 - 0.4	19.5		18	3.84	Class C	YES	ASL
7440-70-2	Calcium	66,700		166,000		SWDRMO-3	10 / 10		166,000		250,000			NO	NUT
7440-47-3	Chromium	0.69		129		SWDRMO-2	8 / 10	0.6 - 0.6	129		110	139.45	Class C	YES	ASL
7440-48-4	Cobalt	0.6		47		SWDRMO-2	7 / 10	0.6 - 0.6	47		730	5	Class C	NO	BSL
7440-50-8	Copper	1.7		1,160		SWDRMO-2	10 / 10		1,160		1,500	17.32	Class C	NO	BSL
7439-89-6	Iron	26.6	J	110,000		SWDRMO-2	8 / 10	17.3 - 17.3	110,000		11,000	300	Class C	YES	ASL
7439-92-1	Lead	4.4	J	839		SWDRMO-2	10 / 10		839		15	1.46246	Class C	YES	ASL
7439-95-4	Magnesium	11,100		26,200		SWDRMO-2	10 / 10		26,200		40,000			NO	NUT
7439-96-5	Manganese	3.2		2,380		SWDRMO-2	10 / 10		2,380		880			YES	ASL
7439-97-6	Mercury	0.26		2.1		SWDRMO-2	2 / 10	0.2 - 0.2	2.1		11	0.0007	Class C	NO	BSL
7440-02-0	Nickel	10.6		154		SWDRMO-2	3 / 10	1.8 - 1.8	154		730	99.92	Class C	NO	BSL
7440-09-7	Potassium	2,070	J	5,350	J	SWDRMO-3	10 / 10		5,350		700,000			NO	NUT
7782-49-2	Selenium	4.6	J	4.6	J	SWDRMO-2	1 / 10	3 - 3	4.6		180	4.6	Class C	NO	BSL
7440-22-4	Silver	1.7		8		SWDRMO-2	2 / 10	1 - 1	8		182	0.1	Class C	NO	BSL
7440-23-5	Sodium	4,490		123,000	J	SWDRMO-1	10 / 10		123,000		1,200,000			NO	NUT
7440-28-0	Thallium	5.5	J	6.3		SWDRMO-4	2 / 10	5.4 - 5.4	6.3		2.4	8	Class C	YES	ASL
7440-62-2	Vanadium	0.89		233		SWDRMO-2	5 / 10	0.7 - 0.7	233		36	14	Class C	YES	ASL
7440-66-6	Zinc	15.4		6,910		SWDRMO-2	10 / 10		6,910		11,000	159.25	Class C	NO	BSL
Other Analytes															
SA0020	Total Petroleum Hydrocarbons	8,080		8,080		SWDRMO-2	1 / 9	1000 - 1000	8,080					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment.
   Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. No background data are available.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for tap water. On-line resources available at http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Ingestion from drinking and inhalation of volatiles during showering are evaluated to derive the PRGs.
   Maximum Contaminant Level (MCL) for lead was used as screening value for lead as no Region 9 PRG is available.
   PRG for endrin was used as screening value for endrin ketone.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 2L/day water intake and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and minimum requirements for 2-5 yr children (1400 mg/day for potassium) from Marilyn Wright (2001) Dietary Reference Intakes
   For sodium, an upper limit intake of 2,400 mg/day (http://www.mealformation.com/dailyval.html) was used.
   PRG for chromium (VI) was used as screening value for chromium.
5. Potential ARAR values are from the New York State Ambient Water Quality Standards, Class C for Surface Water
6. Rationale codes

Selection Reason:	Above Screening Levels (ASL)
Deletion Reason:	Essential Nutrient (NUT) Below Screening Level (BSL) Individual Chemicals Evaluated (ICE)

Definitions:

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value

Table 6-3A
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration ^{1} (mg/kg)	Q	Maximum Detected Concentration ^{1} (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency ^{1}	Range of Reporting Limits ^{1} (mg/kg)	Concentration Used for Screening ^{2} (mg/kg)	Maximum Background Value ^{3} (mg/kg)	Screening Value ^{4} (mg/kg)	Potential ARAR / TBC Value ^{5} (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
Volatile Organic Compounds														
67-64-1	Acetone	0.0022	J	0.11		SS121I-15	26 / 35	0.003 - 0.0715	0.11		14,000	0.2	NO	BSL
71-43-2	Benzene	0.0046	J	0.041	J	SS121I-29 (dup)	6 / 35	0.0023 - 0.0034	0.041		0.64	0.06	NO	BSL
100-41-4	Ethyl benzene	0.0021	J	0.0078		SS121I-15	5 / 35	0.0023 - 0.0034	0.0078		400	5.5	NO	BSL
	Meta/Para Xylene	0.0021	J	0.0063	J	SS121I-29 (dup)	5 / 35	0.0023 - 0.0034	0.0063		270		NO	BSL
78-93-3	Methyl ethyl ketone	0.0036		0.07		SS121I-15	9 / 35	0.0023 - 0.0034	0.07		22,000	0.3	NO	BSL
75-09-2	Methylene chloride	0.0016	J	0.0028	J	SB121I-4	9 / 35	0.0023 - 0.0034	0.0028		9.1	0.1	NO	BSL
95-47-6	Ortho Xylene	0.0013	J	0.0036	J	SS121I-29 (dup)	5 / 35	0.0023 - 0.0034	0.0036		270		NO	BSL
108-88-3	Toluene	0.0028	J	0.031	J	SS121I-29 (dup)	6 / 35	0.0023 - 0.0034	0.031		520	1.5	NO	BSL
Semivolatile Organic Compounds														
91-57-6	2-Methylnaphthalene	0.054	J	0.26	J	SS121I-20	3 / 39	0.35 - 7.4	0.26		310	36.4	NO	BSL
83-32-9	Acenaphthene	0.053	J	6.1		SS121I-20	17 / 39	0.36 - 2.2	6.1		3,700	50	NO	BSL
208-96-8	Acenaphthylene	0.064	J	0.56	J	SS121I-21	2 / 39	0.34 - 7.4	0.56			41	NO	NSV
120-12-7	Anthracene	0.069	J	12		SS121I-20	20 / 38	0.36 - 1.8	12		22,000	50	NO	BSL
56-55-3	Benzo(a)anthracene	0.043	J	28	J	SS121I-20	36 / 39	0.37 - 0.38	28		0.62	0.224	YES	ASL
50-32-8	Benzo(a)pyrene	0.061	J	23		SS121I-20	36 / 39	0.37 - 0.39	23		0.062	0.061	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.052	J	29		SS121I-20	37 / 39	0.37 - 0.38	29		0.62	1.1	YES	ASL
191-24-2	Benzo(ghi)perylene	0.05	J	29	J	SS121I-20	33 / 39	0.36 - 0.39	29			50	NO	NSV
207-08-9	Benzo(k)fluoranthene	0.095	J	21	J	SS121I-20	28 / 38	0.36 - 0.4	21		6.2	1.1	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.038	J	1.6		SS121I-31	14 / 39	0.13 - 8.8	1.6		35	50	NO	BSL
85-68-7	Butylbenzylphthalate	0.055	J	0.13	J	SB121I-1	2 / 36	0.35 - 8.8	0.13		12,000	50	NO	BSL
86-74-8	Carbazole	0.06	J	6.8		SS121I-20	20 / 39	0.36 - 1.8	6.8		24		NO	BSL
218-01-9	Chrysene	0.063	J	32	J	SS121I-20	35 / 39	0.37 - 0.39	32		62	0.4	YES	CSG
53-70-3	Dibenz(a,h)anthracene	0.072	J	4.6	J	SS121I-2	10 / 32	0.36 - 2.1	4.6		0.062	0.014	YES	ASL
132-64-9	Dibenzofuran	0.029	J	2		SS121I-20	9 / 39	0.35 - 2.2	2		150	6.2	NO	BSL
84-66-2	Diethylphthalate	0.64	J	0.64	J	SS121I-29 (dup)	1 / 39	0.34 - 7.4	0.64		49,000	7.1	NO	BSL
84-74-2	Di-n-butylphthalate	0.045	J	0.045	J	SS121I-1	1 / 38	0.34 - 7.4	0.045		6,100	8.1	NO	BSL
206-44-0	Fluoranthene	0.08	J	62		SS121I-20	37 / 39	0.37 - 0.38	62		2,300	50	NO	BSL
86-73-7	Fluorene	0.043	J	4.2		SS121I-20	13 / 39	0.35 - 2.2	4.2		2,700	50	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.061	J	8.1	J	SS121I-20	26 / 37	0.36 - 2.1	8.1		0.62	3.2	YES	ASL
91-20-3	Naphthalene	0.051	J	0.63	J	SS121I-21	5 / 39	0.35 - 7.4	0.63		56	13	NO	BSL
85-01-8	Phenanthrene	0.052	J	52		SS121I-20	37 / 39	0.37 - 0.38	52			50	NO	NSV
129-00-0	Pyrene	0.072	J	64	J	SS121I-23	37 / 39	0.37 - 0.38	64		2,300	50	NO	BSL
PCBs														
11097-69-1	Aroclor-1254	0.03	J	0.03	J	SS121I-22	1 / 35	0.018 - 0.022	0.03		0.22	10	NO	BSL
11096-82-5	Aroclor-1260	0.0083	J	0.046	J	SS121I-14	2 / 35	0.018 - 0.022	0.046		0.22	10	NO	BSL
Pesticides														
72-55-9	4,4'-DDE	0.011	NJ	0.034	NJ	SS121I-23	4 / 35	0.0018 - 0.0023	0.034		1.7	2.1	NO	BSL
50-29-3	4,4'-DDT	0.024	NJ	0.039	J	SS121I-21	2 / 34	0.0018 - 0.0023	0.039		1.7	2.1	NO	BSL
309-00-2	Aldrin	0.0032	J	0.012		SS121I-20	4 / 35	0.0018 - 0.0045	0.012		0.029	0.041	NO	BSL
60-57-1	Dieldrin	0.016	J	0.034	J	SS121I-21	2 / 35	0.0018 - 0.0023	0.034		0.030	0.044	YES	ASL

Table 6-3A
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration[1] (mg/kg)	Q	Maximum Detected Concentration[1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency[1]	Range of Reporting Limits[1] (mg/kg)	Concentration Used for Screening[2] (mg/kg)	Maximum Background Value[3] (mg/kg)	Screening Value[4] (mg/kg)	Potential ARAR / TBC Value[5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
959-98-8	Endosulfan I	0.0026		0.095	J	SS121I-20	24 / 35	0.0018 - 0.002	0.095		370	0.9	NO	BSL
72-20-8	Endrin	0.0065	J	0.03	J	SS121I-21	2 / 35	0.0018 - 0.0023	0.03		18	0.1	NO	BSL
1024-57-3	Heptachlor epoxide	0.0061		0.055	J	SS121I-21	8 / 33	0.0018 - 0.0023	0.055		0.053	0.02	YES	ASL
Inorganics														
7429-90-5	Aluminum	1,510		13,200		SB121I-5	35 / 35		13,200	20,500	76,000	19,300	NO	BSL
7440-36-0	Antimony	0.99		7.5		SS121I-28	14 / 35	0.96 - 7.3	7.5	6.55	31	5.9	NO	BSL
7440-38-2	Arsenic	3.5		32.1	J	SB121I-2 (dup)	24 / 24		32.1	21.5	0.39	8.2	YES	ASL
7440-39-3	Barium	38.2		207		SS121I-26	35 / 35		207	159	5,400	300	NO	BSL
7440-41-7	Beryllium	0.16		0.68		SB121I-5	34 / 35	0.17 - 0.17	0.68	1.4	150	1.1	NO	BSL
7440-43-9	Cadmium	0.15		6.6		SB121I-3	13 / 35	0.13 - 0.61	6.6	2.9	37	2.3	NO	BSL
7440-70-2	Calcium	5,370	J	298,000	J	SS121I-26	35 / 35		298,000	293,000	2,500,000	121,000	NO	NUT
7440-47-3	Chromium	3.9		439		SS121I-29 (dup)	35 / 35		439	32.7	210	29.6	YES	ASL
7440-48-4	Cobalt	4.6		205.5	J	SS121I-29 (dup)	35 / 35		205.5	29.1	900	30	NO	BSL
7440-50-8	Copper	10.4	J	209		SS121I-29 (dup)	30 / 30		209	62.8	3,100	33	NO	BSL
	Cyanide, Total	0.559	J	2.00		SS121I-29 (dup)	3 / 35	0.526 - 0.61	2.00		1,200		NO	BSL
7439-89-6	Iron	5,720		58,400		SS121I-29 (dup)	35 / 35		58,400	38,600	23,000	36,500	YES	ASL
7439-92-1	Lead	8.6	J	122		SS121I-25	35 / 35		122	266	400	24.8	NO	BSL
7439-95-4	Magnesium	4,430	J	22,300	J	SS121I-27	35 / 35		22,300	29,100	400,000	21,500	NO	NUT
7439-96-5	Manganese	377		310,500		SS121I-29 (dup)	35 / 35		310,500	2,380	1,800	1,060	YES	ASL
7439-97-6	Mercury	0.01		0.07		SB121I-1	35 / 35		0.07	0.13	23	0.1	NO	BSL
7440-02-0	Nickel	11.1		342	J	SS121I-29 (dup), SS121I-33	35 / 35		342	62.3	1,600	49	NO	BSL
7440-09-7	Potassium	634		1,300		SS121I-30	35 / 35		1,300	3,160	5,000,000	2,380	NO	NUT
7782-49-2	Selenium	0.48	J	146	J	SS121I-29 (dup)	20 / 35	0.43 - 0.61	146	1.7	390	2	NO	BSL
7440-22-4	Silver	0.29		3.1	J	SB121I-2 (dup)	4 / 24	0.3 - 1.2	3.1	0.87	390	0.75	NO	BSL
7440-23-5	Sodium	117		372		SB121I-1	29 / 35	106 - 595	372	269	1,125,000	172	NO	NUT
7440-28-0	Thallium	0.38		163	J	SS121I-29 (dup)	7 / 35	0.32 - 1.2	163	1.2	5.2	0.7	YES	ASL
7440-62-2	Vanadium	5.9		182	J	SS121I-29 (dup)	35 / 35		182	32.7	78	150	YES	ASL
7440-66-6	Zinc	42.75	J	329		SS121I-33	35 / 35		329	126	23,000	110	NO	BSL
Other Analytes														
	Total Organic Carbon	3,000		8,900		SS121I-6	35 / 35						NO	NSV
	Total Petroleum Hydrocarbons	100	J	2,200		SS121I-27	10 / 35	43 - 48					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment. (dup) indicates that the maximum concentration was detected in a duplicate pair. The maximum concentration reported is the average value of the sample and its duplicate. Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. Background value is the maximum detected concentration of the Seneca background dataset.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil. On-line resources available at http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.

Table 6-3A
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121I

CAS Number	**Chemical**	**Minimum Detected Concentration [1] (mg/kg)**	**Q**	**Maximum Detected Concentration [1] (mg/kg)**	**Q**	**Location of Maximum Concentration**	**Detection Frequency [1]**	**Range of Reporting Limits [1] (mg/kg)**	**Concentration Used for Screening [2] (mg/kg)**	**Maximum Background Value [3] (mg/kg)**	**Screening Value [4] (mg/kg)**	**Potential ARAR / TBC Value [5] (mg/kg)**	**COPC Flag**	**Rationale for Contaminant Deletion or Selection**

Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Direct contact exposure (ingestion, dermal contact, and inhalation) is evaluated to derive the PRGs.
PRG for xylenes was used as screening value for meta/para xylenes and ortho xylene.
EPA Region III Risk Based Concentration (RBC) for residential soil was used as screening value for 2-methylnaphthalene
as no Region 9 PRG is available. EPA Region III RBC, available on-line at http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1004.XLS,
was calculated based on soil ingestion exposure and a target cancer risk of 1E-6 and a target hazard quotient of 1.
PRG for Aroclor 1254 was used as screening value for Aroclor 1260.
PRG for endosulfan was used as screening value for endosulfan I.
Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 200 mg/day soil ingestion
and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and
minimum requirements for 1 yr children (225 mg/day and 1000 mg/day for sodium and potassium)
from Marilyn Wright (2001) Dietary Reference Intakes.
PRG for total chromium (1:6 ratio Cr VI: Cr III) was used as screening value for chromium.
PRG for nickel (soluble salts) was used as screening value for nickel.
PRG for cyanide hydrogen was used for total cyanide.

5. Potential TBC values are from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. No ARARs were identified.
(on-line resources available at http://www.dec.state.ny.us/website/der/tagms/prtg4046.html)

6. Rationale codes

Selection Reason:	Above Screening Levels (ASL)
	Chemicals in the Same Group were retained as COPC (CSG)
Deletion Reason:	Essential Nutrient (NUT)
	Below Screening Level (BSL)
	No Screening Value or Toxicity Value (NSV)
	Individual Chemicals Evaluated (ICE)

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value
NJ = Presence of the analyte has been "tentatively identified" and the associated numerical value represents its approximate concentration.

Table 6-3B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I DITCH SOIL
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Ditch Soil
Exposure Medium:	Ditch Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
Volatile Organic Compounds														
67-64-1	Acetone	0.008		0.15		SD121I-8	10 / 10		0.15		14,000	0.2	NO	BSL
71-43-2	Benzene	0.0012	J	0.039		SD121I-8	3 / 10	0.0032 - 0.0037	0.039		0.64	0.06	NO	BSL
100-41-4	Ethyl benzene	0.0052		0.0052		SD121I-8	1 / 10	0.0027 - 0.0044	0.0052		400	5.5	NO	BSL
SA0078	Meta/Para Xylene	0.0048		0.0048		SD121I-8	1 / 10	0.0027 - 0.0044	0.0048		270		NO	BSL
78-93-3	Methyl ethyl ketone	0.0072		0.078		SD121I-8	2 / 10	0.0031 - 0.0044	0.078		22,000	0.3	NO	BSL
95-47-6	Ortho Xylene	0.003		0.003		SD121I-8	1 / 10	0.0027 - 0.0044	0.003		270		NO	BSL
108-88-3	Toluene	0.0017	J	0.026		SD121I-8	2 / 10	0.0031 - 0.0044	0.026		520	1.5	NO	BSL
Semivolatile Organic Compounds														
91-57-6	2-Methylnaphthalene	0.033	J	0.17	J	SD121I-7 (dup)	2 / 12	0.38 - 4.4	0.17		310	36.4	NO	BSL
91-94-1	3,3'-Dichlorobenzidine	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4	0.315		1.1		NO	BSL
83-32-9	Acenaphthene	0.066	J	0.74	J	SD121I-7 (dup)	9 / 12	0.38 - 0.46	0.74		3,700	50	NO	BSL
208-96-8	Acenaphthylene	0.076	J	0.42	J	SD121I-2EBS	4 / 12	0.38 - 0.53	0.42			41	NO	NSV
120-12-7	Anthracene	0.11	J	1.8	J	SD121I-2EBS	9 / 12	0.38 - 0.46	1.8		22,000	50	NO	BSL
56-55-3	Benzo(a)anthracene	0.049	J	14		SD121I-2EBS	10 / 12	0.38 - 0.46	14		0.62	0.224	YES	ASL
50-32-8	Benzo(a)pyrene	0.29	J	16		SD121I-2EBS	9 / 12	0.38 - 0.46	16		0.062	0.061	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.044	J	22		SD121I-2EBS	11 / 12	0.46 - 0.46	22		0.62	1.1	YES	ASL
191-24-2	Benzo(ghi)perylene	0.11	J	12		SD121I-2EBS	9 / 12	0.38 - 0.46	12			50	NO	NSV
207-08-9	Benzo(k)fluoranthene	0.14	J	23		SD121I-2EBS	9 / 12	0.38 - 0.46	23		6.2	1.1	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.025	J	0.093	J	SD121I-7 (dup)	3 / 12	0.38 - 4.4	0.093		35	50	NO	BSL
85-68-7	Butylbenzylphthalate	0.42	J	0.42	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4	0.42		12,000	50	NO	BSL
86-74-8	Carbazole	0.1	J	1.6	J	SD121I-2EBS	9 / 12	0.38 - 0.46	1.6		24		NO	BSL
218-01-9	Chrysene	0.34	J	25		SD121I-2EBS	9 / 12	0.38 - 0.46	25		62	0.4	YES	CSG
53-70-3	Dibenz(a,h)anthracene	0.086	J	5	J	SD121I-2EBS	5 / 12	0.38 - 0.53	5		0.062	0.014	YES	ASL
132-64-9	Dibenzofuran	0.058	J	0.356	J	SD121I-7 (dup)	5 / 12	0.38 - 4.4	0.356		150	6.2	NO	BSL
117-84-0	Di-n-octylphthalate	0.42	J	0.42	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4	0.42		2,400	50	NO	BSL
206-44-0	Fluoranthene	0.099	J	24		SD121I-2EBS	11 / 12	0.46 - 0.46	24		2,300	50	NO	BSL
86-73-7	Fluorene	0.053	J	0.645	J	SD121I-7 (dup)	9 / 12	0.38 - 0.46	0.645		2,700	50	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.098	J	12	J	SD121I-2EBS	9 / 12	0.38 - 0.46	12		0.62	3.2	YES	ASL
78-59-1	Isophorone	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4	0.315		510	4.4	NO	BSL
91-20-3	Naphthalene	0.065	J	0.35	J	SD121I-7 (dup)	2 / 12	0.38 - 4.4	0.35		56	13	NO	BSL
98-95-3	Nitrobenzene	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4	0.315		20	0.2	NO	BSL
85-01-8	Phenanthrene	0.05	J	6.25		SD121I-7 (dup)	11 / 12	0.46 - 0.46	6.25			50	NO	NSV
108-95-2	Phenol	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.39 - 4.4	0.315		18,000	0.03	NO	BSL
129-00-0	Pyrene	0.078	J	17		SD121I-2EBS	11 / 12	0.46 - 0.46	17		2,300	50	NO	BSL
PCBs														
11097-69-1	Aroclor-1254	0.067		0.067		SD121I-5	1 / 10	0.012 - 0.022	0.067		0.22	10	NO	BSL
11096-82-5	Aroclor-1260	0.014	J	0.014	J	SD121I-7 (dup)	1 / 10	0.0023 - 0.0033	0.014		0.22	10	NO	BSL
Pesticides														
72-55-9	4,4'-DDE	0.0076	J	0.0076	J	SD121I-7 (dup)	1 / 10	0.00024 - 0.00033	0.0076		1.7	2.1	NO	BSL

Table 6-3B

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I DITCH SOIL

SEAD-121I

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Ditch Soil
Exposure Medium:	Ditch Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
Inorganics														
7429-90-5	Aluminum	4,180		10,300		SD121I-6	10 / 10		10,300	20,500	76,000	19,300	NO	BSL
7440-38-2	Arsenic	2.6		104		SD121I-8	10 / 10		104	21.5	0.39	8.2	YES	ASL
7440-39-3	Barium	44.1	J	91.1	J	SD121I-8	10 / 10		91.1	159	5,400	300	NO	BSL
7440-41-7	Beryllium	0.3		0.66		SD121I-6	10 / 10		0.66	1.4	150	1.1	NO	BSL
7440-43-9	Cadmium	0.8		0.8		SD121I-7 (dup)	1 / 10	0.14 - 0.19	0.8	2.9	37	2.3	NO	BSL
7440-70-2	Calcium	8,990		127,500		SD121I-7 (dup)	10 / 10		127,500	293,000	2,500,000	121,000	NO	NUT
7440-47-3	Chromium	8.6		83.9		SD121I-8	10 / 10		83.9	32.7	210	29.6	NO	BSL
7440-48-4	Cobalt	5.9		91.9		SD121I-8	10 / 10		91.9	29.1	900	30	NO	BSL
7440-50-8	Copper	17.1	J	130		SD121I-4	10 / 10		130	62.8	3,100	33	NO	BSL
7439-89-6	Iron	10,100		30,400		SD121I-8	10 / 10		30,400	38,600	23,000	36,500	YES	ASL
7439-92-1	Lead	11.2	J	93.3		SD121I-6	10 / 10		93.3	266	400	24.8	NO	BSL
7439-95-4	Magnesium	2,150		11,300		SD121I-5	10 / 10		11,300	29,100	400,000	21,500	NO	NUT
7439-96-5	Manganese	303		14,900		SD121I-8	10 / 10		14,900	2,380	1,800	1,060	YES	ASL
7439-97-6	Mercury	0.02		0.18		SD121I-3	9 / 10	0.12 - 0.12	0.18	0.13	23	0.1	NO	BSL
7440-02-0	Nickel	16.4		153		SD121I-8	10 / 10		153	62.3	1,600	49	NO	BSL
7440-09-7	Potassium	541		1,450		SD121I-6	10 / 10		1,450	3,160	5,000,000	2,380	NO	NUT
7782-49-2	Selenium	18		18		SD121I-8	1 / 10	0.48 - 0.68	18	1.7	390	2	NO	BSL
7440-22-4	Silver	2.5		10.5		SD121I-8	2 / 10	0.31 - 0.44	10.5	0.87	390	0.75	NO	BSL
7440-23-5	Sodium	162		266		SD121I-10	8 / 10	118 - 132	266	269	1,125,000	172	NO	NUT
7440-28-0	Thallium	0.44	J	21.5		SD121I-8	2 / 10	0.36 - 0.5	21.5	1.2	5.2	0.7	YES	ASL
7440-62-2	Vanadium	8.1		69.4		SD121I-8	10 / 10		69.4	32.7	78	150	NO	BSL
7440-66-6	Zinc	57.3	J	532		SD121I-6	10 / 10		532	126	23,000	110	NO	BSL
Other Analytes														
SA0019	Total Organic Carbon	2,800		7,200	J	SD121I-1	10 / 10		7,200				NO	NSV
SA0020	Total Petroleum Hydrocarbons	150		910		SD121I-9	5 / 10	52 - 66					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation.
   Lab duplicates were not included in the assessment. (dup) indicates that the maximum concentration was detected in a duplicate pair The
   maximum concentration reported is the average value of the sample and its duplicate. Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. Background value is the maximum detected concentration of the Seneca background dataset.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil. On-line resources available at
   http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Direct contact exposure (ingestion, dermal contact, and inhalation) is evaluated to derive the PRGs.
   PRG for xylenes was used as screening value for meta/para xylenes and ortho xylene.
   EPA Region III Risk Based Concentration (RBC) for residential soil was used as screening value for 2-methylnaphthalene
   as no Region 9 PRG is available. EPA Region III RBC, available on-line at http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1004.XLS,
   was calculated based on soil ingestion exposure and a target cancer risk of 1E-6 and a target hazard quotient of 1.
   http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.

Table 6-3B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I DITCH SOIL
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Ditch Soil
Exposure Medium:	Ditch Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection

Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 200 mg/day soil ingestion and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and minimum requirements for 1 yr children (225 mg/day and 1000 mg/day for sodium and potassium) from Marilyn Wright (2001) Dietary Reference Intakes.

PRG for total chromium (1:6 ratio Cr VI: Cr III) was used as screening value for chromium.

PRG for nickel (soluble salts) was used as screening value for nickel.

5. Potential TBC values are from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. No ARARs were identified. (on-line resources available at http://www.dec.state.ny.us/website/der/tagms/prtg4046.html)

6. Rationale codes

	Selection Reason:	Above Screening Levels (ASL)
		Chemicals in the Same Group were retained as COPC (CSG)
	Deletion Reason:	Essential Nutrient (NUT)
		Below Screening Level (BSL)
		No Screening Value or Toxicity Value (NSV)
		Individual Chemicals Evaluated (ICE)

Definitions:

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value

Table 6-3C
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE WATER
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration [1] (ug/L)	Q	Maximum Detected Concentration [1] (ug/L)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (ug/L)	Concentration Used for Screening [2] (ug/L)	Maximum Background Value [3] (ug/L)	Screening Value [4] (ug/L)	Potential ARAR /TBC Value [5] (ug/L)	COPC Flag	Rationale for Contaminant Deletion or Selection [6]
Semivolatile Organic Compounds														
85-68-7	Butylbenzylphthalate	1.1	J	1.1	J	SW121I-10	1 / 7	10 - 10	1.1		7,300		NO	BSL
206-44-0	Fluoranthene	1.1	J	1.1	J	SW121I-6	1 / 7	10 - 10	1.1		1,500		NO	BSL
Inorganics														
7429-90-5	Aluminum	23.9		2,050		SW121I-6	7 / 7		2,050		36,000	100	NO	BSL
7440-39-3	Barium	22.5		49.2		SW121I-1	6 / 7	9.9 - 9.9	49.2		2,600		NO	BSL
7440-41-7	Beryllium	0.14		0.28		SW121I-6	6 / 7	0.1 - 0.1	0.28		73	1,100	NO	BSL
7440-43-9	Cadmium	0.54		0.54		SW121I-10	1 / 7	0.4 - 0.8	0.54		18	3.84	NO	BSL
7440-70-2	Calcium	18,000		74,200		SW121I-1	7 / 7		74,200		250,000		NO	NUT
7440-47-3	Chromium	1.1		6		SW121I-6	5 / 7	0.6 - 1.4	6		110	139.45	NO	BSL
7440-48-4	Cobalt	2.8		3		SW121I-6	2 / 7	0.6 - 0.7	3		730	5	NO	BSL
7440-50-8	Copper	1.2		11.2		SW121I-6	6 / 7	3.6 - 3.6	11.2		1,500	17.32	NO	BSL
7439-89-6	Iron	32.3	J	3,410		SW121I-6	5 / 7	17.3 - 17.3	3,410		11,000	300	NO	BSL
7439-92-1	Lead	4.3	J	26.3		SW121I-6	4 / 7	2.1 - 3	26.3		15	1.46	YES	ASL
7439-95-4	Magnesium	3,635		11,100		SW121I-1	7 / 7		11,100		40,000		NO	NUT
7439-96-5	Manganese	0.8		206		SW121I-6	7 / 7		206		880		NO	BSL
7440-02-0	Nickel	3.5		3.6		SW121I-6	2 / 7	1.8 - 2	3.6		730	99.92	NO	BSL
7440-09-7	Potassium	645		4,640	J	SW121I-6	7 / 7		4,640		700,000		NO	NUT
7782-49-2	Selenium	2.5	J	2.5	J	SW121I-7 (dup)	1 / 7	3 - 3	2.5		180	4.6	NO	BSL
7440-23-5	Sodium	2,240		38,500	J	SW121I-10	7 / 7		38,500		1,200,000		NO	NUT
7440-62-2	Vanadium	2.1		3.9		SW121I-6	3 / 7	0.7 - 1.4	3.9		36	14	NO	BSL
7440-66-6	Zinc	12.5		190		SW121I-6	7 / 7		190		11,000	159.25	NO	BSL

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment.
   Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. No background values available for surface water.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for tap water. On-line resources available at
   http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Ingestion from drinking and inhalation of volatiles during showering are evaluated to derive the PRGs.
   Maximum Contaminant Level (MCL) for lead was used as screening value for lead as no Region 9 PRG is available.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 2L/day water intake
   and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and
   minimum requirements for 2-5 yr children (1400 mg/day for potassium) from Marilyn Wright (2001) Dietary Reference Intakes.
   For sodium, an upper limit intake of 2,400 mg/day (http://www.mealformation.com/dailyval.html) was used.
   PRG for chromium (VI) was used as screening value for chromium.
5. Potential ARAR values are from the New York State Ambient Water Quality Standards, Class C for Surface Water.
6. Rationale codes

	Selection Reason:	Above Screening Levels (ASL)
	Deletion Reason:	Essential Nutrient (NUT)
		Below Screening Level (BSL)

Definitions:

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value

Table 6-4A
SOIL EXPOSURE POINT CONCENTRATION SUMMARY - TOTAL SOIL AT SEAD-121C
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data	Maximum Detected Concentration (1)	Q	EPC Units	Total Soil Reasonable Maximum Exposure (2)			Total Soil Central Tendency (2)		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Volatile Organic Compounds												
Benzene	mg/kg	0.029	0.073	1.8	J	mg/kg	0.19	97.5% Chebyshev	Non-parametric, MH	0.19	97.5% Chebyshev	Non-parametric, MH
Semivolatile Organic Compounds												
Benzo(a)anthracene	mg/kg	0.58	0.90	10	J	mg/kg	1.8	97.5% Chebyshev	Non-parametric, MH	1.8	97.5% Chebyshev	Non-parametric, MH
Benzo(a)pyrene	mg/kg	0.61	0.93	8.7	J	mg/kg	1.8	97.5% Chebyshev	Non-parametric, MH	1.8	97.5% Chebyshev	Non-parametric, MH
Benzo(b)fluoranthene	mg/kg	0.84	1.2	12	J	mg/kg	2.4	97.5% Chebyshev	Non-parametric, MH	2.4	97.5% Chebyshev	Non-parametric, MH
Benzo(k)fluoranthene	mg/kg	0.46	0.68	7.5	J	mg/kg	1.3	97.5% Chebyshev	Non-parametric, MH	1.3	97.5% Chebyshev	Non-parametric, MH
Chrysene	mg/kg	0.58	0.87	9.1	J	mg/kg	1.7	97.5% Chebyshev	Non-parametric, MH	1.7	97.5% Chebyshev	Non-parametric, MH
Dibenz(a,h)anthracene	mg/kg	0.17	0.18	0.47	J	mg/kg	0.21	95% Chebyshev	Non-parametric, MO	0.21	95% Chebyshev	Non-parametric, MO
Indeno(1,2,3-cd)pyrene	mg/kg	0.20	0.24	0.97	J	mg/kg	0.30	95% Chebyshev	Non-parametric, MO	0.30	95% Chebyshev	Non-parametric, MO
Pesticides/PCBs												
Dieldrin	mg/kg	0.0021	0.0035	0.041	J	mg/kg	0.0073	97.5% Chebyshev	Non-parametric, MH	0.0073	97.5% Chebyshev	Non-parametric, MH
Aroclor-1242	mg/kg	0.010	0.012	0.058	J	mg/kg	0.014	95% Chebyshev	Non-parametric, MO	0.014	95% Chebyshev	Non-parametric, MO
Aroclor-1254	mg/kg	0.042	0.069	0.93		mg/kg	0.14	97.5% Chebyshev	Non-parametric, MH	0.14	97.5% Chebyshev	Non-parametric, MH
Aroclor-1260	mg/kg	0.014	0.019	0.20		mg/kg	0.033	97.5% Chebyshev	Non-parametric, MH	0.033	97.5% Chebyshev	Non-parametric, MH
Metals												
Antimony	mg/kg	7.52	13.5	236		mg/kg	29.9	97.5% Chebyshev	Non-parametric, MH	29.9	97.5% Chebyshev	Non-parametric, MH
Arsenic	mg/kg	5.45	5.73	11.6		mg/kg	5.73	95% Approximate Gamma	Approximate Gamma, Lognormal	5.73	95% Approximate Gamma	Approximate Gamma, Lognormal
Copper	mg/kg	408	694	9,750		mg/kg	1,477	97.5% Chebyshev	Non-parametric, MH	1,477	97.5% Chebyshev	Non-parametric, MH
Iron	mg/kg	25,557	27,489	54,100		mg/kg	27,507	Mod-t UCL (Adjusted for skewness)	Non-parametric, M	27,507	Mod-t UCL (Adjusted for skewness)	Non-parametric, M
Lead	mg/kg	550	1,033	18,900		mg/kg	550	Mean	See Note	550	Mean	See Note

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment
Non-detects were assumed to be half the reporting limit.

2.The EPCs were calculated using the ProUCL (Version 3.00.02) and the EPCs were selected in accordance with the ProUCL Version 3.0 User Guide (USEPA, 2004) and the Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, 2002). The average lead concentration was used as the lead EPC in accordance with the User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows® Version – 32 bit Version (USEPA, 2002)

HE - highly skewed to extremely highly skewed (standard deviation of log-transformed data in the interval (2.0, 3.0] data set
MH - moderately to highly skewed (standard deviation of log-transformed data in the interval (1.0, 2.0] data set
MO - moderately skewed (standard deviation of log-transformed data in the interval (0.5,1] data set
M - mildly skewed (standard deviation of log-transformed data less than or equal to 0.5) data set

Q - qualifier
J = Estimated Value

Table 6-4B
SOIL EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE SOIL AT SEAD-121C
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data	Maximum Detected Concentration (1)	Q	EPC Units	Surface Soil (0-2 ft bgs) Reasonable Maximum Exposure (2)			Surface Soil (0-2 ft bgs) Central Tendency (2)		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Semivolatile Organic Compounds												
Benzo(a)anthracene	mg/kg	0.64	1.1	10	J	mg/kg	3.1	99% Chebyshev	Non-parametric, MH	3.1	99% Chebyshev	Non-parametric, MH
Benzo(a)pyrene	mg/kg	0.78	1.2	8.7	J	mg/kg	3.4	99% Chebyshev	Non-parametric, MH	3.4	99% Chebyshev	Non-parametric, MH
Benzo(b)fluoranthene	mg/kg	1.0	1.6	12	J	mg/kg	4.5	99% Chebyshev	Non-parametric, MH	4.5	99% Chebyshev	Non-parametric, MH
Benzo(k)fluoranthene	mg/kg	0.57	0.88	7.5	J	mg/kg	2.4	99% Chebyshev	Non-parametric, MH	2.4	99% Chebyshev	Non-parametric, MH
Chrysene	mg/kg	0.64	1.0	9.1	J	mg/kg	2.9	99% Chebyshev	Non-parametric, MH	2.9	99% Chebyshev	Non-parametric, MH
Dibenz(a,h)anthracene	mg/kg	0.17	0.19	0.47	J	mg/kg	0.22	95% Chebyshev	Non-parametric, MO	0.22	95% Chebyshev	Non-parametric, MO
Indeno(1,2,3-cd)pyrene	mg/kg	0.22	0.28	0.97	J	mg/kg	0.36	95% Chebyshev	Non-parametric, MO	0.36	95% Chebyshev	Non-parametric, MO
Pesticides/PCBs												
Dieldrin	mg/kg	0.0026	0.0045	0.041	J	mg/kg	0.014	99% Chebyshev	Non-parametric, MH	0.014	99% Chebyshev	Non-parametric, MH
Aroclor-1242	mg/kg	0.010	0.012	0.058	J	mg/kg	0.016	95% Chebyshev	Non-parametric, MO	0.016	95% Chebyshev	Non-parametric, MO
Aroclor-1254	mg/kg	0.055	0.093	0.93		mg/kg	0.28	99% Chebyshev	Non-parametric, MH	0.28	99% Chebyshev	Non-parametric, MH
Aroclor-1260	mg/kg	0.012	0.015	0.085	J	mg/kg	0.030	99% Chebyshev	Non-parametric, MH	0.030	99% Chebyshev	Non-parametric, MH
Metals												
Antimony	mg/kg	10.2	18.7	236		mg/kg	60.4	99% Chebyshev	Non-parametric, MH	60.4	99% Chebyshev	Non-parametric, MH
Arsenic	mg/kg	5.46	5.81	11.6		mg/kg	5.79	95% Approximate Gamma	Approximate Gamma, Lognormal	5.79	95% Approximate Gamma	Approximate Gamma, Lognormal
Copper	mg/kg	515	912	9,750		mg/kg	2,868	99% Chebyshev	Non-parametric, MH	2,868	99% Chebyshev	Non-parametric, MH
Iron	mg/kg	24,518	26,875	51,700		mg/kg	26,903	Mod-t UCL (Adjusted for skewness)	Non-parametric, M	26,903	Mod-t UCL (Adjusted for skewness)	Non-parametric, M
Lead	mg/kg	735	1,417	18,900		mg/kg	735	Mean	See Note	735	Mean	See Note

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment.
   Non-detects were assumed to be half the reporting limit.

2.The EPCs were calculated using the ProUCL (Version 3.00.02) and the EPCs were selected in accordance with the ProUCL Version 3.0 User Guide (USEPA, 2004) and the Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, 2002). The average lead concentration was used as the lead EPC in accordance with the User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows® Version – 32 bit Version (USEPA, 2002).

HE - highly skewed to extremely highly skewed (standard deviation of log-transformed data in the interval (2.0, 3.0] data set.
MH - moderately to highly skewed (standard deviation of log-transformed data in the interval (1.0, 2.0] data set.
MO - moderately skewed (standard deviation of log-transformed data in the interval (0.5,1] data set.
M - mildly skewed (standard deviation of log-transformed data less than or equal to 0.5) data set.

Q - qualifier
J = Estimated Value

Table 6-4C
SOIL EXPOSURE POINT CONCENTRATION SUMMARY - DITCH SOIL AT SEAD-121C
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data	Maximum Detected Concentration (1)	Q	EPC Units	Ditch Soil Reasonable Maximum Exposure (2)			Ditch Soil Central Tendency (2)		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Semivolatile Organic Compounds												
Benzo(a)anthracene	mg/kg	0.49	0.68	1.1	J	mg/kg	0.68	95% Student's-t	Normal	0.68	95% Student's-t	Normal
Benzo(a)pyrene	mg/kg	0.47	0.63	0.9	J	mg/kg	0.63	95% Student's-t	Normal	0.63	95% Student's-t	Normal
Benzo(b)fluoranthene	mg/kg	0.49	0.67	1.1	J	mg/kg	0.67	95% Student's-t	Normal	0.67	95% Student's-t	Normal
Benzo(k)fluoranthene	mg/kg	0.44	0.58	0.58	J	mg/kg	0.58	95% Student's-t	Normal	0.58	95% Student's-t	Normal
Chrysene	mg/kg	0.50	0.70	1.2	J	mg/kg	0.70	95% Student's-t	Normal	0.70	95% Student's-t	Normal
Indeno(1,2,3-cd)pyrene	mg/kg	0.41	0.55	0.27	J	mg/kg	0.58	95% Approximate Gamma	Approximate Gamma, Lognormal	0.58	95% Approximate Gamma	Approximate Gamma, Lognormal
Metals												
Arsenic	mg/kg	3.3	4.3	6.1	J	mg/kg	4.3	95% Student's-t	Normal	4.3	95% Student's-t	Normal
Iron	mg/kg	18,305	21,728	27,300	J	mg/kg	21,728	95% Student's-t	Normal	21,728	95% Student's-t	Normal
Lead	mg/kg	144	218	436		mg/kg	144	Mean	See Note	144	Mean	See Note

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Non-detects were assumed to be half the reporting limit.
2. The EPCs were calculated using the ProUCL (Version 3.00.02) and the EPCs were selected in accordance with the ProUCL Version 3.0 User Guide (USEPA, 2004) and the Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, 2002). The average lead concentration was used as the lead EPC in accordance with the User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows® Version – 32 bit Version (USEPA, 2002)

HE - highly skewed to extremely highly skewed (standard deviation of log-transformed data in the interval (2.0, 3.0] data set
MH - moderately to highly skewed (standard deviation of log-transformed data in the interval (1.0, 2.0] data set
MO - moderately skewed (standard deviation of log-transformed data in the interval (0.5,1] data set.
M - mildly skewed (standard deviation of log-transformed data less than or equal to 0.5) data set.

Q - qualifier
J = Estimated Value

Table 6-4D
GROUNDWATER EXPOSURE POINT CONCENTRATION SUMMARY - GROUNDWATER AT SEAD-121C
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

No COPCs were identified based on the screening process (refer to Table 6-1d).

Table 6-4E
EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE WATER AT SEAD-121C
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Surface water
Exposure Medium:	Surface water
Exposure Point:	SEAD-121C

Chemical of Potential Concern	Units	Arithmetic Mean (1)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure (2)			Central Tendency (2)		
						Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Metals											
Arsenic	ug/L	6.3	50.3		ug/L	50.3	MDC	See note	50.3	MDC	See note
Cadmium	ug/L	2.7	19.5		ug/L	19.5	MDC	See note	19.5	MDC	See note
Chromium	ug/L	15.3	129		ug/L	129	MDC	See note	129	MDC	See note
Iron	ug/L	13,136	110,000		ug/L	110,000	MDC	See note	110,000	MDC	See note
Lead	ug/L	116	839		ug/L	839	MDC	See note	839	MDC	See note
Manganese	ug/L	394	2,380		ug/L	2,380	MDC	See note	2,380	MDC	See note
Thallium	ug/L	3.34	6.3		ug/L	6.3	MDC	See note	6.3	MDC	See note
Vanadium	ug/L	25.4	233		ug/L	233	MDC	See note	233	MDC	See note

Notes:
1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Concentrations for non-detects were assumed to be half the detection limit.
2. The maximum detected concentration was used as EPC for the RME and CT scenarios. Since the sample size was small (10 samples), the maximum detected concentration was used as the EPC as a conservative estimate.

EPC = Exposure Point Concentration
MDC = Maximum Detected Concentration
RME = Reasonable Maximum Exposure
CT = Central Tendency

TABLE 6-5A
SOIL EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE SOIL AT SEAD-121I
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121I

Chemical of Potential Concern	Arithmetic Mean Units	Arithmetic Mean (1)	95% UCL of Normal Data	Maximum Detected Concentration (1)	Q	EPC Units	Surface Soil Reasonable Maximum Exposure (2)			Surface Soil Central Tendency (2)		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Semivolatile Organic Compounds												
Benzo(a)anthracene	mg/kg	1.9	3.3	28	J	mg/kg	10	99% Chebyshev	Non-parametric, MH	10	99% Chebyshev	Non-parametric, MH
Benzo(a)pyrene	mg/kg	1.7	2.9	23		mg/kg	8.5	99% Chebyshev	Non-parametric, MH	8.5	99% Chebyshev	Non-parametric, MH
Benzo(b)fluoranthene	mg/kg	1.9	3.3	29		mg/kg	10	99% Chebyshev	Non-parametric, MH	10	99% Chebyshev	Non-parametric, MH
Benzo(k)fluoranthene	mg/kg	1.9	3.0	21	J	mg/kg	8.7	99% Chebyshev	Non-parametric, MH	8.7	99% Chebyshev	Non-parametric, MH
Chrysene	mg/kg	2.4	4.0	32	J	mg/kg	12	99% Chebyshev	Non-parametric, MH	12	99% Chebyshev	Non-parametric, MH
Dibenz(a,h)anthracene	mg/kg	0.50	0.75	4.6	J	mg/kg	1.2	95% Chebyshev	Non-parametric, MO	1.2	95% Chebyshev	Non-parametric, MO
Indeno(1,2,3-cd)pyrene	mg/kg	0.88	1.4	8.1	J	mg/kg	3.9	99% Chebyshev	Non-parametric, MH	3.9	99% Chebyshev	Non-parametric, MH
Pesticides												
Dieldrin	mg/kg	0.0023	0.0041	0.034	J	mg/kg	0.0068	95% Chebyshev	Non-parametric, MO	0.0068	95% Chebyshev	Non-parametric, MO
Heptachlor epoxide	mg/kg	0.0050	0.0081	0.055	J	mg/kg	0.023	99% Chebyshev	Non-parametric, MH	0.023	99% Chebyshev	Non-parametric, MH
Metals												
Arsenic	mg/kg	8.33	10.9	32.1	J	mg/kg	14.9	95% Chebyshev	Non-parametric, MO	14.9	95% Chebyshev	Non-parametric, MO
Chromium	mg/kg	29.3	50.0	439		mg/kg	82.7	95% Chebyshev	Non-parametric, MO	82.7	95% Chebyshev	Non-parametric, MO
Iron	mg/kg	18,569	21,554	58,400		mg/kg	21,627	95% Approximate Gamma	Approximate Gamma, Lognormal	21,627	95% Approximate Gamma	Approximate Gamma, Lognormal
Manganese	mg/kg	15,037	30,559	310,500		mg/kg	106,375	99% Chebyshev	Non-parametric, MH	106,375	99% Chebyshev	Non-parametric, MH
Thallium	mg/kg	6.51	14.5	163	J	mg/kg	53.4	99% Chebyshev	Non-parametric, MH	53.4	99% Chebyshev	Non-parametric, MH
Vanadium	mg/kg	20.6	29.1	182	J	mg/kg	42.7	95% Chebyshev	Non-parametric, MO	42.7	95% Chebyshev	Non-parametric, MO

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Non-detects were assumed to be half the reporting limit.
2. The EPCs were calculated using the ProUCL (Version 3.00.02) and the EPCs were selected in accordance with the ProUCL Version 3.0 User Guide (USEPA, 2004) and the Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, 2002).

HE - highly skewed to extremely highly skewed (standard deviation of log-transformed data in the interval (2.0, 3.0] data set
MH - moderately to highly skewed (standard deviation of log-transformed data in the interval (1.0, 2.0] data set
MO - moderately skewed (standard deviation of log-transformed data in the interval (0.5,1] data set.
M - mildly skewed (standard deviation of log-transformed data less than or equal to 0.5) data set.

Q - qualifier
J = Estimated Value

TABLE 6-5B
SOIL EXPOSURE POINT CONCENTRATION SUMMARY - DITCH SOIL AT SEAD-121I
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121I

Chemical of Potential Concern	Arithmetic Mean Units	Arithmetic Mean (1)	95% UCL of Normal Data	Maximum Detected Concentration (1)	Q	EPC Units	Ditch Soil Reasonable Maximum Exposure (2)			Ditch Soil Central Tendency (2)		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Semivolatile Organic Compounds												
Benzo(a)anthracene	mg/kg	2.5	4.6	14		mg/kg	5.9	95% Approximate Gamma	Approximate Gamma, Lognormal	5.9	95% Approximate Gamma	Approximate Gamma, Lognormal
Benzo(a)pyrene	mg/kg	2.7	5.1	16		mg/kg	6.2	95% Approximate Gamma	Approximate Gamma, Lognormal	6.2	95% Approximate Gamma	Approximate Gamma, Lognormal
Benzo(b)fluoranthene	mg/kg	3.8	7.0	22		mg/kg	11	95% Adjusted Gamma	Adjusted Gamma, Lognormal	11	95% Adjusted Gamma	Adjusted Gamma, Lognormal
Benzo(k)fluoranthene	mg/kg	3.0	6.3	23		mg/kg	8.9	95% Adjusted Gamma	Adjusted Gamma, Lognormal	8.9	95% Adjusted Gamma	Adjusted Gamma, Lognormal
Chrysene	mg/kg	3.6	7.2	25		mg/kg	8.6	95% Approximate Gamma	Approximate Gamma, Lognormal	8.6	95% Approximate Gamma	Approximate Gamma, Lognormal
Dibenz(a,h)anthracene	mg/kg	0.62	1.3	5.0	J	mg/kg	2.4	95% Chebyshev	Non-parametric, MO	2.4	95% Chebyshev	Non-parametric, MO
Indeno(1,2,3-cd)pyrene	mg/kg	1.3	3.1	12	J	mg/kg	11	99% Chebyshev	Non-parametric, MH	11.0	99% Chebyshev	Non-parametric, MH
Metals												
Arsenic	mg/kg	17.7	35.7	104		mg/kg	60.6	95% Chebyshev	Non-parametric, MH	60.6	95% Chebyshev	Non-parametric, MH
Iron	mg/kg	17,415	21,110	30,400		mg/kg	21,110	95% Student's-t	Normal	21,110	95% Student's-t	Normal
Manganese	mg/kg	3,195	6,398	14,900		mg/kg	10,811	95% Chebyshev	Non-parametric, MH	10,811	95% Chebyshev	Non-parametric, MH
Thallium	mg/kg	2.36	6.26	21.5		mg/kg	11.6	95% Chebyshev	Non-parametric,MH	11.6	95% Chebyshev	Non-parametric,MH

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Non-detects were assumed to be half the reporting limit.
2. The EPCs were calculated using the ProUCL (Version 3.00.02) and the EPCs were selected in accordance with the ProUCL Version 3.0 User Guide (USEPA, 2004) and the Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, 2002).

HE - highly skewed to extremely highly skewed (standard deviation of log-transformed data in the interval (2.0, 3.0] data set.
MH - moderately to highly skewed (standard deviation of log-transformed data in the interval (1.0, 2.0] data set.
MO - moderately skewed (standard deviation of log-transformed data in the interval (0.5,1] data set.
M - mildly skewed (standard deviation of log-transformed data less than or equal to 0.5) data set.

Q - qualifier
J = Estimated Value

TABLE 6-5C
SURFACE WATER EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE WATER AT SEAD-121I
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Lead is the only COPC identified based on the screening. Risks associated with dermal exposure to lead were not quantitatively assessed in this risk assessment. Therefore, a quantitative evaluation was not conducted for surface water exposure.

TABLE 6-6A
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR INDUSTRIAL WORKER AND ADOLESCENT TRESPASSER - SURFACE SOIL AT SEAD-121C
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C

Equation for Air EPC from Surface Soil (mg/m^3) = CSsurf x PM10 x CF

Variables:
CSsurf = Chemical Concentration in Surface Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 17 ug/m^3
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure		Central Tendency Exposure	
	EPC Data for Surface Soil (mg/kg)	Calculated Air EPC Surface Soil (mg/m^3)	EPC Data for Surface Soil (mg/kg)	Calculated Air EPC Surface Soil (mg/m^3)
Semivolatile Organic Compounds				
Benzo(a)anthracene	3.1	5.2E-08	3.1	5.2E-08
Benzo(a)pyrene	3.4	5.8E-08	3.4	5.8E-08
Benzo(b)fluoranthene	4.5	7.7E-08	4.5	7.7E-08
Benzo(k)fluoranthene	2.4	4.1E-08	2.4	4.1E-08
Chrysene	2.9	5.0E-08	2.9	5.0E-08
Dibenz(a,h)anthracene	0.22	3.8E-09	0.22	3.8E-09
Indeno(1,2,3-cd)pyrene	0.36	6.1E-09	0.36	6.1E-09
Pesticides/PCBs				
Dieldrin	0.014	2.4E-10	0.014	2.4E-10
Aroclor-1242	0.016	2.7E-10	0.016	2.7E-10
Aroclor-1254	0.28	4.8E-09	0.28	4.8E-09
Aroclor-1260	0.030	5.1E-10	0.030	5.1E-10
Metals				
Antimony	60.4	1.0E-06	60.4	1.0E-06
Arsenic	5.79	9.9E-08	5.79	9.9E-08
Copper	2,868	4.9E-05	2,868	4.9E-05
Iron	26,903	4.6E-04	26,903	4.6E-04

TABLE 6-6B
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR INDUSTRIAL WORKER AND ADOLESCENT TRESPASSER - SURFACE SOIL AT SEAD-121I
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121I

Equation for Air EPC from Surface Soil (mg/m³) = CSsurf x PM10 x CF

Variables:
CSsurf = Chemical Concentration in Surface Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 17 ug/m³
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure		Central Tendency Exposure	
	EPC Data for Surface Soil (mg/kg)	Calculated Air EPC Surface Soil (mg/m³)	EPC Data for Surface Soil (mg/kg)	Calculated Air EPC Surface Soil (mg/m³)
Semivolatile Organic Compounds				
Benzo(a)anthracene	10	1.7E-07	10	1.7E-07
Benzo(a)pyrene	8.5	1.4E-07	8.5	1.4E-07
Benzo(b)fluoranthene	10	1.7E-07	10	1.7E-07
Benzo(k)fluoranthene	8.7	1.5E-07	8.7	1.5E-07
Chrysene	12	2.0E-07	12	2.0E-07
Dibenz(a,h)anthracene	1.2	2.0E-08	1.2	2.0E-08
Indeno(1,2,3-cd)pyrene	3.9	6.6E-08	3.9	6.6E-08
Pesticides				
Dieldrin	0.0068	1.2E-10	0.0068	1.2E-10
Heptachlor epoxide	0.023	4.0E-10	0.023	4.0E-10
Metals				
Arsenic	14.9	2.5E-07	14.9	2.5E-07
Chromium	83	1.4E-06	83	1.4E-06
Iron	21627.1	3.7E-04	21627.1	3.7E-04
Manganese	106,375	1.8E-03	106,375	1.8E-03
Thallium	53.4	9.1E-07	53.4	9.1E-07
Vanadium	42.7	7.3E-07	42.7	7.3E-07

TABLE 6-6C
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR CONSTRUCTION WORKER - SURFACE SOIL AT SEAD-121I
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121I

Equation for Air EPC from Surface Soil (mg/m^3) = CSsurf x PM10 x CF

Variables:
CSsurf = Chemical Concentration in Surface Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 110 ug/m^3
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure		Central Tendency Exposure	
	EPC Data for Surface Soil (mg/kg)	Calculated Air EPC Surface Soil (mg/m^3)	EPC Data for Surface Soil (mg/kg)	Calculated Air EPC Surface Soil (mg/m^3)
Semivolatile Organic Compounds				
Benzo(a)anthracene	10	1.1E-06	10	1.1E-06
Benzo(a)pyrene	8.5	9.4E-07	8.5	9.4E-07
Benzo(b)fluoranthene	10	1.1E-06	10	1.1E-06
Benzo(k)fluoranthene	8.7	9.6E-07	8.7	9.6E-07
Chrysene	12	1.3E-06	12	1.3E-06
Dibenz(a,h)anthracene	1.2	1.3E-07	1.2	1.3E-07
Indeno(1,2,3-cd)pyrene	3.9	4.3E-07	3.9	4.3E-07
Pesticides				
Dieldrin	0.0068	7.5E-10	0.0068	7.5E-10
Heptachlor epoxide	0.023	2.6E-09	0.023	2.6E-09
Metals				
Arsenic	14.9	1.6E-06	14.9	1.6E-06
Chromium	83	9.1E-06	83	9.1E-06
Iron	21627.1	2.4E-03	21627.1	2.4E-03
Manganese	106,375	1.2E-02	106,375	1.2E-02
Thallium	53.4	5.9E-06	53.4	5.9E-06
Vanadium	42.7	4.7E-06	42.7	4.7E-06

TABLE 6-7
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR CONSTRUCTION WORKER - TOTAL SOIL AT SEAD-121C
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C

Equation for Air EPC from Total Soil (mg/m³) = CStotal x PM10 x CF

Variables:
CStotal = Chemical Concentration in Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 954 ug/m³
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure		Central Tendency Exposure	
	EPC Data for Total Soil (mg/kg)	Calculated Air EPC Total Soil (mg/m³)	EPC Data for Total Soil (mg/kg)	Calculated Air EPC Total Soil (mg/m³)
Volatile Organic Compounds				
Benzene	0.19	1.9E-07	0.19	1.9E-07
Semivolatile Organic Compounds				
Benzo(a)anthracene	1.8	1.7E-06	1.8	1.7E-06
Benzo(a)pyrene	1.8	1.7E-06	1.8	1.7E-06
Benzo(b)fluoranthene	2.4	2.3E-06	2.4	2.3E-06
Benzo(k)fluoranthene	1.3	1.2E-06	1.3	1.2E-06
Chrysene	1.7	1.6E-06	1.7	1.6E-06
Dibenz(a,h)anthracene	0.21	2.0E-07	0.21	2.0E-07
Indeno(1,2,3-cd)pyrene	0.30	2.9E-07	0.30	2.9E-07
Pesticides/PCBs				
Dieldrin	0.0073	6.9E-09	0.0073	6.9E-09
Aroclor-1242	0.014	1.4E-08	0.014	1.4E-08
Aroclor-1254	0.14	1.4E-07	0.14	1.4E-07
Aroclor-1260	0.033	3.2E-08	0.033	3.2E-08
Metals				
Antimony	29.9	2.9E-05	29.9	2.9E-05
Arsenic	5.73	5.5E-06	5.73	5.5E-06
Copper	1,477	1.4E-03	1,477	1.4E-03
Iron	27,507	2.6E-02	27,507	2.6E-02

TABLE 6-8A
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR INDUSTRIAL WORKER AND ADOLESCENT TRESPASSER - DITCH SOIL AT SEAD-121C
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C

Equation for Air EPC from Ditch Soil (mg/m³) = CSditch x PM10 x CF

Variables:
CSditch = Chemical Concentration in Ditch Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 17 ug/m³
CF = Conversion Factor = 1E-9 kg/ug

Chemicals of Potential Concern	Reasonable Maximum Exposure		Central Tendency Exposure	
	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m³)	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m³)
Semivolatile Organic Compounds				
Benzo(a)anthracene	0.7	1.1E-08	0.7	1.1E-08
Benzo(a)pyrene	0.6	1.1E-08	0.6	1.1E-08
Benzo(b)fluoranthene	0.7	1.1E-08	0.7	1.1E-08
Benzo(k)fluoranthene	0.6	9.9E-09	0.6	9.9E-09
Chrysene	0.7	1.2E-08	0.7	1.2E-08
Indeno(1,2,3-cd)pyrene	0.6	9.9E-09	0.6	9.9E-09
Metals				
Arsenic	4.3	7.2E-08	4.3	7.2E-08
Iron	21,728	3.7E-04	21,728	3.7E-04

TABLE 6-8B
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR INDUSTRIAL WORKER AND ADOLESCENT TRESPASSER - DITCH SOIL AT SEAD-121I
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121I

Equation for Air EPC from Ditch Soil (mg/m³) = CSditch x PM10 x CF

Variables:
CSditch = Chemical Concentration in Ditch Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 17 ug/m³
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure		Central Tendency Exposure	
	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m³)	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m³)
Semivolatile Organic Compounds				
Benzo(a)anthracene	5.9	1.0E-07	5.9	1.0E-07
Benzo(a)pyrene	6.2	1.1E-07	6.2	1.1E-07
Benzo(b)fluoranthene	11	1.9E-07	11	1.9E-07
Benzo(k)fluoranthene	8.9	1.5E-07	8.9	1.5E-07
Chrysene	8.6	1.5E-07	8.6	1.5E-07
Dibenz(a,h)anthracene	2.4	4.0E-08	2.4	4.0E-08
Indeno(1,2,3-cd)pyrene	11.0	1.9E-07	11.0	1.9E-07
Metals				
Arsenic	60.6	1.0E-06	60.6	1.0E-06
Iron	21,110	3.6E-04	21,110	3.6E-04
Manganese	10,811	1.8E-04	10,811	1.8E-04
Thallium	11.6	2.0E-07	11.6	2.0E-07

TABLE 6-8C
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR CONSTRUCTION WORKER - DITCH SOIL AT SEAD-121C
SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C

Equation for Air EPC from Ditch Soil (mg/m^3) = CSditch x PM10 x CF

Variables:
Csditch = Chemical Concentration in Ditch Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 110 ug/m^3
CF = Conversion Factor = 1E-9 kg/ug

Chemicals of Potential Concern	Reasonable Maximum Exposure		Central Tendency Exposure	
	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m^3)	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m^3)
Semivolatile Organic Compounds				
Benzo(a)anthracene	0.7	7.4E-08	0.7	7.4E-08
Benzo(a)pyrene	0.6	6.9E-08	0.6	6.9E-08
Benzo(b)fluoranthene	0.7	7.4E-08	0.7	7.4E-08
Benzo(k)fluoranthene	0.6	6.4E-08	0.6	6.4E-08
Chrysene	0.7	7.7E-08	0.7	7.7E-08
Indeno(1,2,3-cd)pyrene	0.6	6.4E-08	0.6	6.4E-08
Metals				
Arsenic	4.3	4.7E-07	4.3	4.7E-07
Iron	21,728	2.4E-03	21,728	2.4E-03

TABLE 6-8D
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR CONSTRUCTION WORKER - DITCH SOIL AT SEAD-121I
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121I

Equation for Air EPC from Ditch Soil (mg/m³) = CSditch x PM10 x CF

Variables:
CSditch = Chemical Concentration in Ditch Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 110 ug/m³
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure		Central Tendency Exposure	
	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m³)	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m³)
Semivolatile Organic Compounds				
Benzo(a)anthracene	5.9	6.5E-07	5.9	6.5E-07
Benzo(a)pyrene	6.2	6.9E-07	6.2	6.9E-07
Benzo(b)fluoranthene	11	1.2E-06	11	1.2E-06
Benzo(k)fluoranthene	8.9	9.8E-07	8.9	9.8E-07
Chrysene	8.6	9.5E-07	8.6	9.5E-07
Dibenz(a,h)anthracene	2.4	2.6E-07	2.4	2.6E-07
Indeno(1,2,3-cd)pyrene	11.0	1.2E-06	11.0	1.2E-06
Metals				
Arsenic	60.6	6.7E-06	60.6	6.7E-06
Iron	21,110	2.3E-03	21,110	2.3E-03
Manganese	10,811	1.2E-03	10,811	1.2E-03
Thallium	11.6	1.3E-06	11.6	1.3E-06

TABLE 6-9A
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Construction Worker
Receptor Age:	Adult

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Ingestion of Soil	EPC	Soil EPC	mg/kg		Surface and subsurface soils.	See Table 6-4A/B/C & 6-5A/B		Surface and subsurface soils.	See Table 6-4A/B/C & 6-5A/B
	BW	Body Weight	kg	70	Default value for construction worker.	USEPA, 2002.	70	Default value for construction worker.	USEPA, 2002.
	IR	Ingestion Rate	mg/day	330	Default value for construction worker.	USEPA, 2002.	100	Default value for outdoor worker.	USEPA, 2002.
	FI	Fraction Ingested	unitless	1	Assuming 100% ingestion from site.	BPJ.	1	Assuming 100% ingestion from site.	BPJ.
	EF	Exposure Frequency	days/yr	250	Default value for construction worker.	USEPA, 2002.	219	Default value for industrial worker.	USEPA, 2004.
	ED	Exposure Duration	year	1	Default value for construction worker.	USEPA, 2002.	1	Default value for construction worker.	USEPA, 2002.
	CF	Conversion Factor	kg/mg	1.E-06			1.E-06		
	AT(Nc)	Averaging Time - Nc	days	365	1 year.		365	1 year.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for construction worker.	USEPA, 2002.	25,550	70 years, default value for construction worker.	USEPA, 2002.
Dermal Contact of Soil	EPC	Soil EPC	mg/kg		Surface and subsurface soils.	See Table 6-4A/B/C & 6-5A/B		Surface and subsurface soils.	See Table 6-4A/B/C & 6-5A/B
	BW	Body Weight	kg	70	Default value for construction worker.	USEPA, 2002.	70	Default value for construction worker.	USEPA, 2002.
	SA	Skin Contact Surface Area	cm^2	3,300	Default value for construction worker.	USEPA, 2002.	3,300	Default value for construction worker.	USEPA, 2002.
	AF	Soil/Skin Adherence Factor	mg/cm^2-event	0.3	Default value for construction worker.	USEPA, 2002.	0.3	Default value for construction worker.	USEPA, 2002.
	ABS	Dermal Absorption Fraction	unitless		Chemical-specific.	USEPA, 2004.		Chemical-specific.	USEPA, 2004.
	EV	Event Frequency	events/day	1	Default value for construction worker.	USEPA, 2002.	1	Default value for construction worker.	USEPA, 2002.
	EF	Exposure Frequency	days/yr	250	Default value for construction worker.	USEPA, 2002.	219	Default value for industrial worker.	USEPA, 2004.
	ED	Exposure Duration	year	1	Default value for construction worker.	USEPA, 2002.	1	Default value for construction worker.	USEPA, 2002.
	CF	Conversion Factor	kg/mg	1.E-06			1.E-06		
	AT(Nc)	Averaging Time - Nc	days	365	1 year.		365	1 year.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for construction worker.	USEPA, 2002.	25,550	70 years, default value for construction worker.	USEPA, 2002.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
· BPJ: Best Professional Judgment.
· USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
· USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual
(Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Intake Equations:
Ingestion Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED x CF x FI / (BW x AT)
Dermal DI (mg/kg-day) = EPC x SA x AF x ABS x EV x EF x ED x CF/(BW x AT)

TABLE 6-9A
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Construction Worker
Receptor Age:	Adult

EXPOSURE ROUTE	**PARAMETER CODE**	**PARAMETER DEFINITION**	**UNITS**	**RME VALUE**	**RME RATIONALE**	**RME REFERENCE**	**CT VALUE**	**CT RATIONALE**	**CT REFERENCE**
Inhalation of Dust in Ambient Air	EPC	Air EPC	mg/m^3		Surface and subsurface soils.	See Table 6-6C, 6-7, 6-8C/D		Surface and subsurface soils.	See Table 6-6C, 6-7, 6-8C/D
	BW	Body Weight	kg	70	Default value for construction worker.	USEPA, 2002.	70	Default value for construction worker.	USEPA, 2002.
	IR	Inhalation Rate	m^3/day	20	Default value for construction worker.	USEPA, 2002.	20	Default value for construction worker.	USEPA, 2002.
	EF	Exposure Frequency	days/yr	250	Default value for construction worker.	USEPA, 2002.	219	Default value for industrial worker.	USEPA, 2004.
	ED	Exposure Duration	year	1	Default value for construction worker.	USEPA, 2002.	1	Default value for construction worker.	USEPA, 2002.
	AT(Nc)	Averaging Time - Nc	days	365	1 year.		365	1 year.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for construction worker.	USEPA, 2002.	25,550	70 years, default value for construction worker.	USEPA, 2002.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
· USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
· USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual
(Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Intake Equation:
Inhalation Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED / (BW x AT)

TABLE 6-9A
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Groundwater
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Construction Worker
Receptor Age:	Adult

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Intake of Groundwater	EPC	Groundwater EPC	mg/L		See Table 6-4D	See Table 6-4D		See Table 6-4D	See Table 6-4D
	BW	Body Weight	kg	70	Default value for construction worker.	USEPA, 2002.	70	Default value for construction worker.	USEPA, 2002.
	IR	Intake Rate	L/day	1	Default intake rate for commercial/industrial worker.	USEPA, 1991.	0.7	Average adult tap water intake is 1.41 L/day, assuming half occurs at work.	USEPA, 1997 & BPJ. USEPA, 2004.
	EF	Exposure Frequency	days/yr	250	Default value for construction worker.	USEPA, 2002.	219	Default value for industrial worker.	USEPA, 2002.
	ED	Exposure Duration	year	1	Default value for construction worker.	USEPA, 2002.	1	Default value for construction worker.	
	AT(Nc)	Averaging Time - Nc	days	365	1 year.		365	1 year.	USEPA, 2002.
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for construction worker.	USEPA, 2002.	25,550	70 years, default value for construction worker.	
Dermal Contact of Groundwater	EPC	Groundwater EPC	mg/L		See Table 6-4D	See Table 6-4D		See Table 6-4D	See Table 6-4D
	BW	Body Weight	kg	70	Default value for construction worker.	USEPA, 2002.	70	Default value for construction worker.	USEPA, 2002.
	SA	Skin Surface Area	cm^2	2490	Maximum surface area for adult male (including hands and forearms).	USEPA, 1997	1980	Average surface area for adult male (including hands and forearms).	USEPA, 1997.
	ED	Exposure Duration	years	1	Default value for construction worker.	USEPA, 2002, 2004.	1	Default value for industrial worker.	USEPA, 2004.
	EF	Exposure Frequency	days/yr	100	Assumes contact with groundwater 2 workdays each week for 50 weeks.	BPJ.	100	Assumes contact with groundwater 2 workdays each week for 50 weeks.	USEPA, 2004.
	EV	Event Frequency	events/day	1	Assumption.	BPJ.	1	Assumption.	BPJ.
	t_{event}	Event duration (hr/event)	hr/event	0.5	Assumes half hour to assemble or disassemble a pumping system.	BPJ.	0.5	Assumes half hour to assemble or disassemble a pumping system.	BPJ.
	AT(Nc)	Averaging Time - Nc	days	365	1 year	USEPA, 2002.	365	1 year	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for construction worker.		25,550	70 years, default value for construction worker.	USEPA, 2002.

Source References:
- · BPJ: Best Professional Judgment.
- · USEPA, 1997: Exposure Factors Handbook
- · USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
- · USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Intake Equation:
Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED/(BW x AT)

Dermal $DI\ (mg/kg\text{-}day) = DA_{event} \times EV \times EF \times ED \times SA/(BW \times AT)$

Where: DA_{event} = Absorbed dose per event (mg/cm^2-event)

For organic compounds: If $t_{event} <= t^*$, then: $DA_{event} = 2\ FA \times K_p \times EPC\ (\ (6\ \tau_{event} \times t_{event}) / \pi\ )^{1/2}$

If $t_{event} > t^*$, then: $DA_{event} = FA \times K_p \times EPC\ [\ (t_{event} / 1 + B) + 2\ \tau_{event}\ (\ (1 + 3\ B + 3\ B^2) / (1 + B)^2\ )\ ]$

Where: t^* = Time to reach steady - state (hr)
τ_{event} = Lag Time per event (hr / event)
B = Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (ve) (dimensionless)
FA = Fraction absorbed water (dimensionless)

For inorganic compounds: DAevent = Kp x EPC x tevent

TABLE 6-9A
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Construction Worker
Receptor Age:	Adult

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Dermal Contact of Surface Water	EPC	Surface Water EPC	mg/L		See Table 6-4E & 6-5C	See Table 6-4E & 6-5C		See Table 6-4E & 6-5C	See Table 6-4E & 6-5C
	BW	Body Weight	kg	70	Default value for construction worker.	USEPA, 2002.	70	Default value for construction worker.	USEPA, 2002.
	SA	Skin Surface Area	cm^2	2490	Maximum surface area for adult male (including hands and forearms).	USEPA, 1997	1980	Average surface area for adult male (including hands and forearms).	USEPA, 1997.
	ED	Exposure Duration	years	1	Default value for construction worker.	USEPA, 2002, 2004.	1	Default value for industrial worker.	USEPA, 2004.
	EF	Exposure Frequency	days/yr	100	Assumes contact with surface water 2 workdays each week for 50 weeks.	BPJ.	100	Assumes contact with surface water 2 workdays each week for 50 weeks.	USEPA, 2004.
	EV	Event Frequency	events/day	1	Assumption.	BPJ.	1	Assumption.	BPJ.
	t_{event}	Event Duration (hr/event)	hr/event	0.5	Assumes half hour to assemble or disassemble a pumping system.	BPJ.	0.5	Assumes half hour to assemble or disassemble a pumping system.	BPJ.
	AT(Nc)	Averaging Time - Nc	days	365	1 year		365	1 year	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for construction worker.	USEPA, 2002.	25,550	70 years, default value for construction worker.	USEPA, 2002.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
- BPJ: Best Professional Judgment.
- USEPA, 1997: Exposure Factors Handbook
- USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
- USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Dermal $DI\ (mg/kg\text{-}day) = DA_{event} \times EV \times EF \times ED \times SA/(BW \times AT)$

Where: DA_{event} = Absorbed dose per event (mg/cm^2-event)

For organic compounds: If $t_{event} <= t^*$, then: $DA_{event} = 2\ FA \times K_p \times EPC\ (\ (6\ \tau_{event} \times t_{event}) / \pi\ )^{1/2}$

If $t_{event} > t^*$, then: $DA_{event} = FA \times K_p \times EPC\ [\ (t_{event} / 1 + B) + 2\ \tau_{event}\ (\ (1 + 3\ B + 3\ B^2) / (1 + B)^2\ )\ ]$

Where: t^* = Time to reach steady - state (hr)
τ_{event} = Lag Time per event (hr / event)
B = Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (ve) (dimensionless)
FA = Fraction absorbed water (dimensionless)

For inorganic compounds: DAevent = Kp x EPC x tevent

TABLE 6-9B
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Industrial Worker
Receptor Age:	Adult

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Ingestion of Soil	EPC	Soil EPC	mg/kg		Surface soils.	See Table 6-4B & 6-5A		Surface soils.	See Table 6-4B & 6-5A
	BW	Body Weight	kg	70	Default value for industrial worker.	USEPA, 2002.	70	Default value for industrial worker.	USEPA, 2002.
	IR	Ingestion Rate	mg/day	100	Default value for outdoor worker.	USEPA, 2002.	50	Mean adult soil ingestion rate.	USEPA, 1997.
	FI	Fraction Ingested	unitless	1	Assumng 100% ingestion from site.	BPJ.	1	Assuming 100% ingestion from site.	BPJ.
	EF	Exposure Frequency	days/yr	250	Default value for industrial worker.	USEPA, 2002, 2004.	219	Default value for industrial worker.	USEPA, 2004.
	ED	Exposure Duration	year	25	Default value for industrial worker.	USEPA, 2002, 2004.	9	Default value for industrial worker.	USEPA, 2004.
	CF	Conversion Factor	kg/mg	1E-6			1E-6		
	AT(Nc)	Averaging Time - Nc	days	9,125	25 years.		3,285	9 years.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for industrial worker.	USEPA, 2002.	25,550	70 years, default value for industrial worker.	USEPA, 2002.
Dermal Contact of Soil	EPC	Soil EPC	mg/kg		Surface soils.	See Table 6-4B & 6-5A		Surface soils.	See Table 6-4B & 6-5A
	BW	Body Weight	kg	70	Default value for industrial worker.	USEPA, 2002.	70	Default value for industrial worker.	USEPA, 2002.
	SA	Skin Contact Surface Area	cm2	3,300	Default value for industrial worker.	USEPA, 2002, 2004.	3,300	Default value for industrial worker.	USEPA, 2002, 2004.
	AF	Soil/Skin Adherence Factor	mg/cm2-event	0.2	Default value for adherence factor.	USEPA, 2002, 2004.	0.02	Default value for adherence factor.	USEPA, 2004.
	ABS	Dermal Absorption Fraction	unitless		Chemical-specific	USEPA, 2004.		Chemical-specific	USEPA, 2004.
	EV	Event Frequency	events/day	1	Default value for industrial worker.	USEPA, 2004.	1	Default value for industrial worker.	USEPA, 2002, 2004.
	EF	Exposure Frequency	days/yr	250	Default value for industrial worker.	BPJ.	219	Default value for industrial worker.	USEPA, 2004.
	ED	Exposure Duration	year	25	Default value for industrial worker.	USEPA, 2002, 2004.	9	Default value for industrial worker.	USEPA, 2004.
	CF	Conversion Factor	kg/mg	1E-6			1E-6		
	AT(Nc)	Averaging Time - Nc	days	9,125	25 year.		3,285	9 years.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for industrial worker.	USEPA, 2002.	25,550	70 years, default value for industrial worker.	USEPA, 2002.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
· BPJ: Best Professional Judgment.
· USEPA, 1997: Exposure Factors Handbook
· USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
· USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual
(Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Intake Equations
Ingestion Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED x CF x FI / (BW x AT)
Dermal DI (mg/kg-day) = EPC x SA x AF x ABS x EV x EF x ED x CF/(BW x AT)

TABLE 6-9B
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

Scenario Timeframe: Future
Medium: Ditch Soil
Exposure Medium: Ditch Soil
Exposure Point: SEAD-121C and SEAD-121I
Receptor Population: Industrial Worker
Receptor Age: Adult

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Ingestion of Ditch Soil	EPC	Soil EPC	mg/kg		Surface soils.	See Table 6-4C & 6-5B		Surface soils.	See Table 6-4C & 6-5B
	BW	Body Weight	kg	70	Default value for industrial worker.	USEPA, 2002.	70	Default value for industrial worker.	USEPA, 2002.
	IR	Ingestion Rate	mg/day	100	Default value for outdoor worker.	USEPA, 2002.	50	Mean adult soil ingestion rate.	USEPA, 1997.
	FI	Fraction Ingested	unitless	1	Assumng 100% ingestion from site.	BPJ.	1	Assuming 100% ingestion from site.	BPJ.
	EF	Exposure Frequency	days/yr	50	Default value for industrial worker.	USEPA, 2002, 2004.	50	Default value for industrial worker.	USEPA, 2004.
	ED	Exposure Duration	year	25	Default value for industrial worker.	USEPA, 2002, 2004.	9	Default value for industrial worker.	USEPA, 2004.
	CF	Conversion Factor	kg/mg	1E-6			1E-6		
	AT(Nc)	Averaging Time - Nc	days	9,125	25 years.		3,285	9 years.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for industrial worker.	USEPA, 2002.	25,550	70 years, default value for industrial worker.	USEPA, 2002.
Dermal Contact of Ditch Soil	EPC	Soil EPC	mg/kg		Surface soils.	See Table 6-4C & 6-5B		Surface soils.	See Table 6-4C & 6-5B
	BW	Body Weight	kg	70	Default value for industrial worker.	USEPA, 2002.	70	Default value for industrial worker.	USEPA, 2002.
	SA	Skin Contact Surface Area	cm2	3,300	Default value for industrial worker.	USEPA, 2002, 2004.	3,300	Default value for industrial worker.	USEPA, 2002, 2004.
	AF	Soil/Skin Adherence Factor	mg/cm2-event	0.2	Default value for adherence factor.	USEPA, 2002, 2004.	0.02	Default value for adherence factor.	USEPA, 2004.
	ABS	Dermal Absorption Fraction	unitless		Chemical-specific	USEPA, 2004.		Chemical-specific	USEPA, 2004.
	EV	Event Frequency	events/day	1	Default value for industrial worker.	USEPA, 2004.	1	Default value for industrial worker.	USEPA, 2002, 2004.
	EF	Exposure Frequency	days/yr	50	Default value for industrial worker.	BPJ.	50	Default value for industrial worker.	USEPA, 2004.
	ED	Exposure Duration	year	25	Default value for industrial worker.	USEPA, 2002, 2004.	9	Default value for industrial worker.	USEPA, 2004.
	CF	Conversion Factor	kg/mg	1E-6			1E-6		
	AT(Nc)	Averaging Time - Nc	days	9,125			3,285		
	AT(Car)	Averaging Time - Car	days	25,550		USEPA, 2002.	25,550		USEPA, 2002.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
· BPJ: Best Professional Judgment.
· USEPA, 1997: Exposure Factors Handbook
· USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
· USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual
(Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Intake Equations
Ingestion Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED x CF x FI / (BW x AT)
Dermal DI (mg/kg-day) = EPC x SA x AF x ABS x EV x EF x ED x CF/(BW x AT)

TABLE 6-9B
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Industrial Worker
Receptor Age:	Adult

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Inhalation of Dust in Ambient Air	EPC	Air EPC	mg/m3		Surface soils.	See Table 6-4B/C & 6-5A/B		Surface soils.	See Table 6-4B/C & 6-5A/B
	BW	Body Weight	kg	70	Default value for industrial worker.	USEPA, 2002.	70	Default value for industrial worker.	USEPA, 2002.
	IR	Inhalation Rate	m3/day	20	Default value for industrial worker.	USEPA, 2002.	10.4	Assumes average inhalation rate of 1.3 m3/hr for outdoor worker for 8 hrs/day.	USEPA, 1997 & BPJ. USEPA, 2004.
	EF	Exposure Frequency	days/yr	250	Default value for industrial worker.	USEPA, 2002, 2004.	219	Default value for industrial worker.	USEPA, 2004.
	ED	Exposure Duration	year	25	Default value for industrial worker.	USEPA, 2002, 2004.	9	Default value for industrial worker.	
	AT(Nc)	Averaging Time - Nc	days	9,125	25 years.		3,285	9 years.	USEPA, 2002.
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for industrial worker.	USEPA, 2002.	25,550	70 years, default value for industrial worker.	

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
· BPJ: Best Professional Judgement.
· USEPA, 1997: Exposure Factors Handbook
· USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
· USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Intake Equation
Inhalation Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED / (BW x AT)

TABLE 6-9B
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Industrial Worker
Receptor Age:	Adult

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Intake of Groundwater	EPC	Groundwater EPC	mg/L		See Table 6-4D	See Table 6-4D		See Table 6-4D	See Table 6-4D
	BW	Body Weight	kg	70	Default value for industrial worker.	USEPA, 2002.	70	Default value for industrial worker.	USEPA, 2002.
	IR	Intake Rate	L/day	1	Default intake rate for commercial/industrial worker.	USEPA, 1991.	0.7	Average adult tap water intake is 1.41 L/day, assuming half occurs at work.	USEPA, 1997 & BPJ.
	EF	Exposure Frequency	days/yr	250	Default value for industrial worker.	USEPA, 2002, 2004.	219	Default value for industrial worker.	USEPA, 2004.
	ED	Exposure Duration	year	25	Default value for industrial worker.	USEPA, 2002, 2004.	9	Default value for industrial worker.	USEPA, 2004.
	AT(Nc)	Averaging Time - Nc	days	9,125	25 years.		3,285	9 years.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for industrial worker.	USEPA, 2002.	25,550	70 years, default value for industrial worker.	USEPA, 2002.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
· BPJ: Best Professional Judgment.
· USEPA, 1991: Human Health Evaluation Manual. OSWER Directive 9285.6-03. Jun 25.
· USEPA, 1997: Exposure Factors Handbook
· USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
· USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual
(Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Intake Equation:
Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED/(BW x AT)

TABLE 6-9C
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Adolescent Trespasser (11-16yr)
Receptor Age:	Adolescent (11-16yr)

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Ingestion of Soil	EPC	Soil EPC	mg/kg		Surface soils.	See Table 6-4B/C & 6-5A/B		Surface soils.	See Table 6-4B/C & 6-5A/B
	BW	Body Weight	kg	50	Average weight for adolescent ages 11-16 (Table 7-3).	USEPA, 2002.	50	Average weight for adolescent ages 11-16 (Table 7-3).	USEPA, 2002.
	IR	Ingestion Rate	mg/day	100	Default soil ingestion rate for adult	USEPA, 2002.	50	Mean soil ingestion rate for adult	USEPA, 1997.
	FI	Fraction Ingested	unitless	1	Assuming 100% ingestion from site	BPJ.	1	Assuming 100% ingestion from site	BPJ.
	EF	Exposure Frequency	days/yr	14	Assumption.	BPJ.	14	Assumption.	BPJ.
	ED	Exposure Duration	year	5	Assumption.	BPJ.	5	Assumption.	BPJ.
	CF	Conversion Factor	kg/mg	1.E-06			1.E-06		
	AT(Nc)	Averaging Time - Nc	days	1,825	5 years.		1,825	5 years.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for human life span	USEPA, 2002.	25,550	70 years, default value for human life span	USEPA, 2002.
Dermal Contact of Soil	EPC	Soil EPC	mg/kg		Surface soils.	See Table 6-4B/C & 6-5A/B		Surface soils.	See Table 6-4B/C & 6-5A/B
	BW	Body Weight	kg	50	Average weight for adolescent ages 11-16 (Table 7-3).	USEPA, 2002.	50	Average weight for adolescent ages 11-16 (Table 7-3).	USEPA, 2002.
	SA	Skin Contact Surface Area	cm^2	5,867	Average surface area for adolescent child (11-16) including head, hands, forearms, lower legs, and feet.	USEPA, 1997.	5,867	Average surface area for adolescent child (11-16) including head, hands, forearms, lower legs, and feet.	USEPA, 1997.
	AF	Soil/Skin Adherence Factor	mg/cm^2-event	0.07	Default value for adult.	USEPA, 2004.	0.01	Default value for adult.	USEPA, 2004.
	ABS	Dermal Absorption Fraction	unitless		Chemical-specific	USEPA, 2004.		Chemical-specific	USEPA, 2004.
	EV	Event Frequency	events/day	1	Default value for residential child.	USEPA, 2004.	1	Default value for residential child.	USEPA, 2004.
	EF	Exposure Frequency	days/yr	14	Assumption.	BPJ.	14	Assumption.	BPJ.
	ED	Exposure Duration	year	5	Assumption.	BPJ.	5	Assumption.	BPJ.
	CF	Conversion Factor	kg/mg	1E-06			1E-06		
	AT(Nc)	Averaging Time - Nc	days	1,825	5 years.		1,825	5 years.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for human life span.	USEPA, 2002.	25,550	70 years, default value for human life span.	USEPA, 2002.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
· BPJ: Best Professional Judgment.
· USEPA, 1997: Exposure Factors Handbook
· USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
· USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual
(Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Intake Equations:

Ingestion	Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED x CF x FI / (BW x AT)
Dermal	DI (mg/kg-day) = EPC x SA x AF x ABS x EV x EF x ED x CF/(BW x AT)

TABLE 6-9C
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Adolescent Trespasser (11-16yr)
Receptor Age:	Adolescent (11-16yr)

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Inhalation of Dust in Ambient Air	EPC	Air EPC	mg/m^3		Surface soils.	See Table 6-4B/C & 6-5A/B		Surface soils.	See Table 6-4B/C & 6-5A/B
	BW	Body Weight	kg	50	Average weight for adolescent ages 11-16 (Table 7-3)	USEPA, 2002.	50	Average weight for adolescent ages 11-16 (Table 7-3)	USEPA, 2002.
	IR	Inhalation Rate	m^3/day	1.6	Average inhalation rate for moderate activity is 1.6 m^3/hr. Assuming 1 hr/day exposure.	USEPA, 1997 & BPJ.	1.6	Average inhalation rate for moderate activity is 1.6 m^3/hr. Assuming 1 hr/day exposure.	USEPA, 1997 & BPJ.
	EF	Exposure Frequency	days/yr	14	Assumption.	BPJ.	14	Assumption.	BPJ.
	ED	Exposure Duration	year	5	Assumption.	BPJ.	5	Assumption.	BPJ.
	AT(Nc)	Averaging Time - Nc	days	1,825	6 years.		1,825	5 years.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for human life span.	USEPA, 2002.	25,550	70 years, default value for human life span.	USEPA, 2002.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
- BPJ: Best Professional Judgment.
- USEPA, 1997: Exposure Factors Handbook
- USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
- USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Intake Equation:
Inhalation Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED / (BW x AT)

TABLE 6-9C
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Groundwater
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Adolescent Trespasser (11-16yr)
Receptor Age:	Adolescent (11-16yr)

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Intake of Groundwater	EPC	Groundwater EPC	mg/L		See Table 6-4D	See Table 6-4D		See Table 6-4D	See Table 6-4D
	BW	Body Weight	kg	50	Average weight for adolescent ages 11-16 (Table 7-3).	USEPA, 2002.	50	Average weight for adolescent ages 11-16 (Table 7-3).	USEPA, 2002.
	IR	Intake Rate	L/day	2	95th percentile for 11-19 yr old.	USEPA, 1997.	0.97	Average for 11-19 yr old.	USEPA, 1997.
	EF	Exposure Frequency	days/yr	14	Assumption.	BPJ.	14	Assumption.	BPJ.
	ED	Exposure Duration	year	5	Assumption.	BPJ.	5	Assumption.	BPJ.
	AT(Nc)	Averaging Time - Nc	days	1,825	5 years.		365	5 years.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for human life span.	USEPA, 2002.	25,550	70 years, default value for human life span.	USEPA, 2002.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
· BPJ: Best Professional Judgment.
· USEPA, 1997: Exposure Factors Handbook
· USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
· USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual
(Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Intake Equation:
Ingestion Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED x CF x FI / (BW x AT)

TABLE 6-9C
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-121C AND SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water
Exposure Point:	SEAD-121C and SEAD-121I
Receptor Population:	Adolescent Trespasser (11-16yr)
Receptor Age:	Adolescent (11-16yr)

EXPOSURE ROUTE	PARAMETER CODE	PARAMETER DEFINITION	UNITS	RME VALUE	RME RATIONALE	RME REFERENCE	CT VALUE	CT RATIONALE	CT REFERENCE
Dermal Contact of Surface Water	EPC	Surface Water EPC	mg/L		See Table 6-4E	See Table 6-4E		See Table 6-4E	See Table 6-4E
	BW	Body Weight	kg	50	Average weight for adolescent ages 11-16 (T	USEPA, 2002.	50	Average weight for adolescent ages 11-16 (T	USEPA, 2002.
	SA	Skin Surface Area	cm^2	5,867	Average surface area for adolescent child (11-16) including head, hands, forearms, lower legs, and feet.	USEPA, 1997.	5,867	Average surface area for adolescent child (11-16) including head, hands, forearms, lower legs, and feet.	USEPA, 1997.
	ED	Exposure Duration	years	5	Assumption.	BPJ.	5	Assumption.	BPJ.
	EF	Exposure Frequency	days/yr	14	Assumption.	BPJ.	14	Assumption.	BPJ.
	EV	Event Frequency	events/day	1	Default RME for water contact.	USEPA, 2004.	1	Default CT for water contact.	USEPA, 2004.
	t_{event}	Event Duration (hr/event)	hr/event	0.5	Assumption.	BPJ.	0.33	Default CT for showering/bathing.	USEPA, 2004.
	AT(Nc)	Averaging Time - Nc	days	1,825	5 years.		1,825	5 years.	
	AT(Car)	Averaging Time - Car	days	25,550	70 years, default value for human life span	USEPA, 2002.	25,550	70 years, default value for human life span	USEPA, 2002.

Notes:
RME = Reasonable Maximum Exposure
CT = Central Tendency Exposure

Source References:
· BPJ: Best Professional Judgment.
· USEPA, 1997: Exposure Factors Handbook
· USEPA, 2002: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. December.
· USEPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual
(Part E, Supplemental Guidance for Dermal Risk Assessment) Final.

Intake Equations:

Ingestion: Daily Intake (DI) (mg/kg-day) = EPC x IR x EF x ED x CF x FI / (BW x AT)

DI (mg/kg-day) = EPC x SA x AF x ABS x EV x EF x ED x CF/(BW x AT)

Dermal: DI (mg/kg-day) = DA_{event} x EV x EF x ED x SA/(BW x AT)

Where: DA_{event} = Absorbed dose per event (mg/cm^2-event)

For organic compounds: If $t_{event} <= t^*$, then: $DA_{event} = 2\ FA \times K_p \times EPC\ ((6\ \tau_{event} \times t_{event}) / \pi)^{1/2}$

If $t_{event} > t^*$, then: $DA_{event} = FA \times K_p \times EPC\ [(t_{event} / 1 + B) + 2\ \tau_{event}\ ((1 + 3\ B + 3\ B^2) / (1 + B)^2)]$

Where: t^* = Time to reach steady - state (hr)
τ_{event} = Lag Time per event (hr / event)
B = Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (ve) (dimensionless)
FA = Fraction absorbed water (dimensionless)
$B = Kp\ (MW)^{1/2} / 2.6$
If $B <= 0.6$, then $t^* = 2.4\tau_{event}$
If $B > 0.6$, then $t^* = 6\tau event\ (b\text{-}SQRT(t^2\text{-}c^2))$
$\tau_{event} = 0.105 \times 10^{(0.0056MW)}$
Kp = 10^(-2.80+0.66($logK_{ow}$)-0.0056(MW))

For inorganic compounds: $DA_{event} = K_p \times EPC \times t_{event}$

TABLE 6-10
SUSPENDED PARTICULATE CONCENTRATIONS MEASURED AT SEDA
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

PARTICULATE DATA	SITE #1 PM 10	SITE #2 PM 10	SITE #3 PM 10	SITE #4 PM 10
Peak Concentration (ug/m3)	37 on 23 July 95	37 on 23 July 95	37 on 5 July 95	37 on 5 July 95
Arithmetic Mean (ug/m3)	16.9	16.6	16.4	15.8
Standard Deviation	21.4	21.1	23.0	23.0
Geometric Mean (ug/m3)	15.1	14.8	14.8	14.2
No. of 24-hr. Avgs. Above 150 ug/m3	0	0	0	0
Number of Valid Samples	29	32	29	31
Percent Data Recovery	90.6	100.0	90.6	96.9

Cumulative Summary for April 1, 1995 through July 31, 1995

Table 6-11A
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SEAD-121C and SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
1,1,2,2-Tetrachloroethane	Chronic	6.0E-02	mg/kg-day	1	6.0E-02	mg/kg-day	N/A	N/A	PPRTV	4/7/2005
1,2-Dichloropropane	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
1,4-Dichlorobenzene	Chronic	3.0E-02	N/A	1	3.0E-02	mg/kg-day	N/A	N/A	NCEA	4/7/2005
Benzene	Chronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	Blood	300	IRIS	3/24/2005
Vinyl chloride	Chronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Liver	30	IRIS	3/10/2005
2-Methylnaphthalene	Chronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	Lungs	1000	IRIS	3/10/2005
Benzo(a)anthracene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)pyrene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(b)fluoranthene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(k)fluoranthene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Chrysene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Dibenz(a,h)anthracene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Indeno(1,2,3-cd)pyrene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Naphthalene	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Body Weight	3000	IRIS	3/15/2005
Phenanthrene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Aroclor-1242	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Aroclor-1254	Chronic	2.0E-05	mg/Kg-day	1	2.0E-05	mg/kg-day	Eye, Immune System	300	IRIS	3/24/2005
Aroclor-1260	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
4,4'-DDD	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
4,4'-DDE	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
4,4'-DDT	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver	100	IRIS	12/03/2004
Alpha-BHC	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Beta-BHC	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Delta-BHC	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Dieldrin	Chronic	5.0E-05	mg/kg-day	1	5.0E-05	mg/kg-day	Liver	100	IRIS	3/15/2005
Gamma-Chlordane (4)	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver	300	IRIS	3/15/2005
Heptachlor	Chronic	1.3E-05	mg/kg-day	1	1.3E-05	mg/kg-day	Liver	1000	IRIS	12/03/2004
Heptachlor epoxide	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver	300	IRIS	3/15/2005
Antimony	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Whole Body Blood	1000	IRIS	12/03/2004

Table 6-11A
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SEAD-121C and SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Arsenic	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Skin	3	IRIS	12/03/2004
Cadmium (5)	Chronic	5.0E-04	mg/kg-day	0.05	2.5E-05	mg/kg-day	Kidney	10	IRIS	3/24/2005
Chromium (6)	Chronic	3.0E-03	mg/kg-day	0.025	7.5E-05	mg/kg-day	N/A	900	IRIS	3/24/2005
Copper	Chronic	4.0E-02	mg/kg-day	1	4.0E-02	mg/kg-day	Gastrointestinal		HEAST	3/24/2005
Cyanide, Total (7)	Subchronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Whole Body, Thyroid	500	IRIS	3/15/2005
Iron	Chronic	3.0E-01	mg/kg-day	1	3.0E-01	mg/kg-day	N/A	1	NCEA	4E+04
Manganese (8)	Chronic	2.3E-02	mg/kg-day	0.04	9.3E-04	mg/kg-day	Central Nervous System	3	IRIS	12/23/2004
Mercury (9)	Chronic	3.0E-04	mg/kg-day	0.07	2.1E-05	mg/kg-day	Immune System	1000	IRIS	3/16/2005
Nickel	Chronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	Whole Body, Organs	300	IRIS	3/15/2005
Silver	Chronic	5.0E-03	mg/kg-day	0.04	2.0E-04	mg/kg-day	Skin	3	IRIS	3/15/2005
Thallium (10)	Chronic	6.5E-04	mg/kg-day	1	6.5E-04	mg/kg-day	Liver, Blood, Hair	3000	IRIS	12/23/2004
Vanadium	Chronic	7.0E-03	mg/kg-day	0.026	1.8E-04	mg/kg-day	N/A	100	HEAST	3/15/2005

N/A = Not Applicable
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Table
NCEA = National Center for Environmental Assessmen
PPRTV = EPA's Provisional Peer Reviewed Toxicity Values

(1) Source: Supplemental Guidance for Dermal Risk Assessment. Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I). Final. USEPA. 2004.
A default value of 1 was used if no value was available in the USEPA (2004) document.

(2) Dermal RfD = Oral RfD x Adjustment Factor

(3) For IRIS values, the date was the last time IRIS was checked.
For NCEA values, the date was the date of the article provided by NCEA.
For PPRTV values, the date was the date of the Region III RBC table, where the PPRTV was cited from.

(4) The chronic oral RfD for gamma-chlordane was based on the chronic RfD of chlordane.

(5) The chronic oral RfD for cadmium was based on water, since cadmium is only a COC for surface water

(6) The chronic oral RfD for chromium was based on the chronic RfD of chromium (VI).

(7) The chronic oral RfD for cyanide was based on the chronic RfD of hydrogen cyanide.

(8) The chronic oral RfD for manganese was adjusted by using a modifying factor of 3 in accordance with the IRIS recommendation.
In addition, dietary exposure (assumed 5 mg/day) was subtracted. Thus, the RfD used in this risk assessment is 1/6 of the value listed in the IRIS.

(9) The chronic oral RfD for mercury was based on the chronic RfD of mercuric chloride.

(10) The chronic oral RfD for thallium was based on the chronic oral RfD of thallium sulfate adjusted for molecular weight differences.

Table 6-11B
NON-CANCER TOXICITY DATA -- INHALATION
SEAD-121C and SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)	Notes
1,1,2,2-Tetrachloroethane	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1,2-Dichloropropane	Chronic	4.0E-03	mg/m^3	1.1E-03	mg/kg-day	respiratory system	300	IRIS	3/10/2005	
1,4-Dichlorobenzene	Chronic	8.0E-01	mg/m^3	2.3E-01	mg/kg-day	liver	100	IRIS	3/10/2005	
Benzene	Chronic	3.0E-02	mg/m^3	8.6E-03	mg/kg-day	Blood	300	IRIS	3/24/2005	
Vinyl chloride	Chronic	1.0E-01	mg/m^3	2.9E-02	mg/kg-day	liver	30	IRIS	3/10/2005	
2-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Benzo(a)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Benzo(a)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Benzo(b)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Benzo(ghi)perylene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Benzo(k)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Chrysene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Dibenz(a,h)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Indeno(1,2,3-cd)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Napthalene	Chronic	3.0E-03	mg/m^3	8.6E-04	mg/kg-day	respiratory system	3000	IRIS	3/15/2005	
Phenanthrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Aroclor-1242	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Aroclor-1254	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Aroclor-1260	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
4,4'-DDD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
4,4'-DDE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
4,4'-DDT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Alpha-BHC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Beta-BHC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Delta-BHC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Dieldrin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Table 6-11B
NON-CANCER TOXICITY DATA -- INHALATION
SEAD-121C and SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)	Notes
Gamma-Chlordane	Chronic	7.0E-04	mg/m^3	2.0E-04	mg/kg-day	Liver	1000	IRIS	3/14/2005	
Heptachlor	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Heptachlor epoxide	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Antimony	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Arsenic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Cadmium	Chronic	2.0E-04	mg/m^3	5.7E-05	mg/kg-day	N/A	N/A	NCEA	4/7/2005	
Chromium	Chronic	1.0E-04	mg/m^3	2.9E-05	mg/kg-day	respiratory system	300	IRIS	3/24/2005	(3)
Copper	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Cyanide, Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Iron	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Manganese	Chronic	5.0E-05	mg/m^3	1.4E-05	mg/kg-day	Central Nervous System	1000	IRIS	12/23/04	
Mercury	Chronic	3.0E-04	mg/m3	8.6E-05	mg/kg-day	Body, Brain	30	IRIS	3/14/05	(4)
Nickel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Silver	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Thallium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Vanadium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Notes:
N/A = Not Applicable
IRIS = Integrated Risk Information System
PPRTV = EPA's Provisional Peer Reviewed Toxicity Values

(1) Inhalation RfD was adjusted based on the assumption of 70 kg body weight and 20 m^3/day inhalation rate.
(2) For IRIS values, the date was the last time IRIS was checked.
For PPRTV or NCEA values, the date was the date of the Region III RBC table, where the PPRTV was cited from.
(3) The chronic oral RfD for chromium was based on the chronic RfD of chromium (VI).
(4) The chronic data for mercury was based on the chronic data of elemental mercury.

Table 6-11C
CANCER TOXICITY DATA -- ORAL/DERMAL
SEAD-121C and SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral Cancer Slope Factor Source	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Weight of Evidence Source	Date (3) (MM/DD/YY)
1,1,2,2-Tetrachloroethane	2.0E-01	IRIS	1	2.0E-01	(mg/kg-day)-1	C	IRIS	3/14/2005
1,2-Dichloropropane	6.8E-02	HEAST, 1997	1	6.8E-02	(mg/kg-day)-1	B2	HEAST, 1997	3/14/2005
1,4-Dichlorobenzene	2.4E-02	HEAST, 1997	1	2.4E-02	(mg/kg-day)-1	C	HEAST, 1997	3/14/2005
Benzene	5.5E-02	IRIS	1	5.5E-02	(mg/kg-day)-1	A	IRIS	3/24/2005
Vinyl chloride	1.4E+00	IRIS	1	1.4E+00	(mg/kg-day)-1	A	IRIS	3/14/2005
2-Methylnaphthalene	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A
Acenaphthylene	N/A	N/A	1	N/A	N/A	D	IRIS	12/03/2004
Benzo(a)anthracene	7.3E-01	NCEA	1	7.3E-01	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Benzo(a)pyrene	7.3E+00	IRIS	1	7.3E+00	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Benzo(b)fluoranthene	7.3E-01	NCEA	1	7.3E-01	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Benzo(ghi)perylene	N/A	N/A	1	N/A	N/A	D	IRIS	12/03/2004
Benzo(k)fluoranthene	7.3E-02	NCEA	1	7.3E-02	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Carbazole	2.0E-02	HEAST, 1997	1	2.0E-02	(mg/kg-day)$^{-1}$	N/A	N/A	N/A
Chrysene	7.3E-03	NCEA	1	7.3E-03	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Dibenz(a,h)anthracene	7.3E+00	NCEA	1	7.3E+00	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Indeno(1,2,3-cd)pyrene	7.3E-01	NCEA	1	7.3E-01	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Naphthalene	N/A	N/A	1	N/A	N/A	C	IRIS	3/15/2005
Phenanthrene	N/A	N/A	1	N/A	N/A	D	IRIS	12/03/2004
Aroclor-1242	2.0E+00	IRIS	1	2.0E+00	(mg/kg-day)-1	B2	IRIS	3/24/2005
Aroclor-1254	2.0E+00	IRIS	1	2.0E+00	(mg/kg-day)-1	B2	IRIS	3/24/2005
Aroclor-1260	2.0E+00	IRIS	1	2.0E+00	(mg/kg-day)-1	B2	IRIS	3/24/2005
4,4'-DDD	2.4E-01	IRIS	1	2.4E-01	(mg/kg-day)-1	B2	IRIS	3/15/2005
4,4'-DDE	3.4E-01	IRIS	1	3.4E-01	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
4,4'-DDT	3.4E-01	IRIS	1	3.4E-01	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Alpha-BHC	6.3E+00	IRIS	1	6.3E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/15/2005
Beta-BHC	1.8E+00	IRIS	1	1.8E+00	(mg/kg-day)$^{-1}$	C	IRIS	3/15/2005

Table 6-11C
CANCER TOXICITY DATA -- ORAL/DERMAL
SEAD-121C and SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral Cancer Slope Factor Source	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Weight of Evidence Source	Date (3) (MM/DD/YY)
Delta-BHC	N/A	N/A	1	N/A	N/A	D	IRIS	3/15/2005
Dieldrin	1.6E+01	IRIS	1	1.6E+01	(mg/kg-day)-1	B2	IRIS	3/15/2005
Gamma-Chlordane	3.5E-01	IRIS	1	3.5E-01	(mg/kg-day)-1	B2	IRIS	3/15/2005
Heptachlor epoxide	9.1E+00	IRIS	1	9.1E+00	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Heptachlor	4.5E+00	IRIS	1	4.5E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/15/2005
Antimony	N/A	N/A	0.15	N/A	N/A	N/A	N/A	N/A
Arsenic	1.5E+00	IRIS	1	1.5E+00	(mg/kg-day)$^{-1}$	A	IRIS	12/03/2004
Cadmium	N/A	N/A	1	N/A	N/A	B1	IRIS	3/24/2005
Chromium	N/A	N/A	1	N/A	N/A	D	IRIS	3/24/2005
Copper	N/A	N/A	1	N/A	N/A	D	IRIS	3/24/2005
Cyanide, Total	N/A	N/A	1	N/A	N/A	D	IRIS	3/15/2005
Iron	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A
Manganese	N/A	N/A	0.04	N/A	N/A	D	N/A	N/A
Mercury	N/A	N/A	0.07	N/A	N/A	D	IRIS	3/15/2005
Nickel	N/A	N/A	0.04	N/A	N/A	N/A	N/A	N/A
Silver	N/A	N/A	0.04	N/A	N/A	D	N/A	N/A
Thallium	N/A	N/A	1	N/A	N/A	D	N/A	N/A
Vanadium	N/A	N/A	0.026	N/A	N/A	N/A	N/A	N/A

IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
PPRTV = EPA's Provisional Peer Reviewed Toxicity Values

EPA Group:
- A - Human carcinogen
- B1 - Probable human carcinogen - indicates that limited human data are available
- B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
- C - Possible human carcinogen
- D - Not classifiable as a human carcinogen
- E - Evidence of noncarcinogenicity

Notes:

(1) Source: USEPA (2004) Supplemental Guidance for Dermal Risk Assessment. Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I). Final. A default value of 1 was used if no value was available in the USEPA (2004) document.

(2) Dermal Cancer Slope Factor = Oral Cancer Slope Factor/Adjustment Factor

(3) For IRIS values, the date was the last time IRIS was checked.
For PPRTV values, the date was the date of the Region III RBC table, where the PPRTV was cited from.

Table 6-11D
CANCER TOXICITY DATA -- INHALATION
SEAD-121C and SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Chemical of Potential Concern	Unit Risk	Units	Unit Risk Source	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Weight of Evidence Source	Date (2) (MM/DD/YY)
1,1,2,2-Tetrachloroethane	5.8E-05	(ug/m^{3})$^{-1}$	IRIS	3500	2.0E-01	(mg/kg-day)-^{1}	C	IRIS	3/14/2005
1,2-Dichloropropane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	2.2E-02	(mg/kg-day)$^{-1}$	C	HEAST	3/14/2005
Benzene	7.8E-06	(ug/m^{3})$^{-1}$	IRIS	3500	2.7E-02	(mg/kg-day)-1	A	IRIS	3/24/2005
Vinyl chloride	8.8E-06	(ug/m^{3})$^{-1}$	IRIS	3500	3.1E-02	(mg/kg-day)$^{-1}$	A	IRIS	3/14/2005
2-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Acenaphthylene	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	12/03/2004
Benzo(a)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Benzo(a)pyrene	8.9E-04	(ug/m^{3})$^{-1}$	NCEA	3500	3.1E+00	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Benzo(b)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Benzo(ghi)perylene	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	12/03/2004
Benzo(k)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Carbazole	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chrysene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Dibenz(a,h)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Indeno(1,2,3-cd)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Napthalene	N/A	N/A	N/A	N/A	N/A	N/A	C	IRIS	3/15/2005
Phenanthrene	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	12/03/2004
Aroclor-1242	5.7E-04	N/A	N/A	3500	2.0E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/24/2005
Aroclor-1254	5.7E-04	N/A	N/A	3500	2.0E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/24/2005
Aroclor-1260	5.7E-04	N/A	N/A	3500	2.0E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/24/2005
4,4'-DDD	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	3/15/2005
4,4'-DDE	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
4,4'-DDT	9.7E-05	(ug/m^{3})$^{-1}$	IRIS	3500	3.4E-01	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Alpha-BHC	1.8E-03	(ug/m^{3})$^{-1}$	IRIS	3500	6.3E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/15/2005
Beta-BHC	5.3E-04	(ug/m^{3})$^{-1}$	IRIS	3500	1.9E+00	(mg/kg-day)$^{-1}$	C	IRIS	3/15/2005
Delta-BHC	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	3/15/2005

Table 6-11D
CANCER TOXICITY DATA -- INHALATION
SEAD-121C and SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Chemical of Potential Concern	Unit Risk	Units	Unit Risk Source	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Weight of Evidence Source	Date (2) (MM/DD/YY)
Dieldrin	4.6E-03	$(ug/m^3)^{-1}$	IRIS	3500	1.6E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	3/15/2005
Gamma-Chlordane	1.00E-04	$(ug/m^3)^{-1}$	IRIS	3500	3.5E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	3/15/2005
Heptachlor epoxide	2.6E-03	$(ug/m^3)^{-1}$	IRIS	3500	9.1E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	12/03/2004
Heptachlor	1.3E-03	$(ug/m^3)^{-1}$	IRIS	3500	4.6E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	3/15/2005
Antimony	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	IRIS	3500	1.5E+01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	12/03/2004
Cadmium	1.8E-03	$(ug/m^3)^{-1}$	IRIS	3500	6.3E+00	$(mg/kg\text{-}day)^{-1}$	B1	IRIS	3/24/2005
Chromium	1.2E-02	$(ug/m^3)^{-1}$	IRIS	3500	4.2E+01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	3/24/2005
Copper	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	3/24/2005
Cyanide, Total	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	3/15/2005
Iron	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	12/23/2004
Mercury	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	03/15/05
Nickel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	03/15/05
Thallium	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	12/23/2004
Vanadium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Notes:
(1) The adjustment was based on an assumption of 70 kg body weight and 20 m^3/day inhalation rate.
(2) The date was the last time IRIS was checked.

Table 6-12A
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS - SEAD-121C
REASONABLE MAXIMUM EXPOSURE (RME) AND CENTRAL TENDENCY (CT)
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

		REASONABLE MAXIMUM EXPOSURE (RME)				CENTRAL TENDENCY (CT)			
RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX		CANCER RISK		HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution	Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
INDUSTRIAL WORKER (Soil)	Inhalation of Dust in Ambient Air (Soil)	NQ	0%	1E-07	0%	NQ	0%	2E-08	1%
	Ingestion of Soil	3E-01	93%	1E-05	58%	1E-01	99%	2E-06	87%
	Dermal Contact to Soil	2E-02	7%	1E-05	42%	2E-03	1%	3E-07	13%
	Intake of Groundwater	ND	0%	ND	0%	ND	0%	ND	0%
	TOTAL RECEPTOR RISK (Nc & Car)	*4E-01*	100%	*3E-05*	100%	*2E-01*	100%	*3E-06*	100%
INDUSTRIAL WORKER (Ditch Soil)	Inhalation of Dust in Ambient Air (Ditch)	NQ	0%	8E-08	6%	NQ	0%	1E-08	7%
	Ingestion of Ditch Soil	2E-02	96%	9E-07	62%	8E-03	99%	2E-07	84%
	Dermal Contact to Ditch Soil	6E-04	4%	5E-07	32%	6E-05	1%	2E-08	9%
	Intake of Groundwater	ND	0%	ND	0%	ND	0%	ND	0%
	TOTAL RECEPTOR RISK (Nc & Car)	*2E-02*	100%	*1E-06*	100%	*9E-03*	100%	*2E-07*	100%
CONSTRUCTION WORKER (Soil)	Inhalation of Dust in Ambient Air (Soil)	4E-06	0%	2E-07	13%	4E-06	0%	2E-07	25%
	Ingestion of Soil	7E-01	97%	1E-06	67%	2E-01	91%	3E-07	38%
	Dermal Contact to Soil	2E-02	3%	4E-07	20%	2E-02	9%	3E-07	37%
	Intake of Groundwater	ND	0%	ND	0%	ND	0%	ND	0%
	Dermal Contact to Groundwater	ND	0%	ND	0%	ND	0%	ND	0%
	TOTAL RECEPTOR RISK (Nc & Car)	*8E-01*	100%	*2E-06*	100%	*2E-01*	100%	*9E-07*	100%
CONSTRUCTION WORKER (Ditch Soil)	Inhalation of Dust in Ambient Air (Ditch)	NQ	0%	2E-08	3%	NQ	0%	2E-08	6%
	Ingestion of Ditch Soil	3E-01	86%	6E-07	78%	7E-02	66%	2E-07	52%
	Dermal Contact to Ditch Soil	5E-03	1%	1E-07	18%	4E-03	4%	1E-07	41%
	Intake of Groundwater	ND	0%	ND	0%	ND	0%	ND	0%
	Dermal Contact to Groundwater	ND	0%	ND	0%	ND	0%	ND	0%
	Dermal Contact to Surface Water	4E-02	13%	5E-09	1%	3E-02	30%	4E-09	1%
	TOTAL RECEPTOR RISK (Nc & Car)	*3E-01*	100%	*7E-07*	100%	*1E-01*	100%	*3E-07*	100%
ADOLESCENT TRESPASSER (Soil)	Inhalation of Dust in Ambient Air (Soil)	NQ	0%	1E-10	0%	NQ	0%	1E-10	0%
	Ingestion of Soil	3E-02	96%	2E-07	69%	1E-02	99%	1E-07	89%
	Dermal Contact to Soil	1E-03	4%	1E-07	31%	2E-04	1%	1E-08	11%
	Intake of Groundwater	ND	0%	ND	0%	ND	0%	ND	0%
	TOTAL RECEPTOR RISK (Nc & Car)	*3E-02*	100%	*3E-07*	100%	*1E-02*	100%	*1E-07*	100%
ADOLESCENT TRESPASSER (Ditch Soil)	Inhalation of Dust in Ambient Air (Ditch)	NQ	0%	1E-10	0%	NQ	0%	1E-10	0%
	Ingestion of Ditch Soil	7E-03	25%	7E-08	67%	3E-03	15%	3E-08	69%
	Dermal Contact to Ditch Soil	2E-04	1%	2E-08	22%	2E-05	0%	3E-09	6%
	Intake of Groundwater	ND	0%	ND	0%	ND	0%	ND	0%
	Dermal Contact to Surface Water	2E-02	74%	1E-08	12%	2E-02	85%	1E-08	24%
	TOTAL RECEPTOR RISK (Nc & Car)	*3E-02*	100%	*1E-07*	100%	*2E-02*	100%	*5E-08*	100%

NQ= Not quantified due to lack of toxicity data.

ND = Not quantified since no COPCs were detected above screening levels.

Table 6-12B
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS - SEAD-121I
REASONABLE MAXIMUM EXPOSURE (RME) AND CENTRAL TENDENCY (CT)
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	REASONABLE MAXIMUM EXPOSURE (RME)				CENTRAL TENDENCY (CT)			
		HAZARD INDEX		CANCER RISK		HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution	Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
INDUSTRIAL WORKER (Soil)	**Inhalation of Dust in Ambient Air (Soil**	**2E+01**	82%	4E-06	6%	**1E+01**	84%	**7E-07**	9%
	Ingestion of Soil	**5E+00**	16%	4E-05	54%	**2E+00**	15%	6E-06	79%
	Dermal Contact to Soil	8E-01	2%	3E-05	39%	7E-02	0%	9E-07	11%
	TOTAL RECEPTOR RISK (Nc & Car)	***3E+01***	**100%**	***7E-05***	**100%**	***1E+01***	**100%**	***8E-06***	**100%**
INDUSTRIAL WORKER (Ditch Soil)	**Inhalation of Dust in Ambient Air (Ditch**	**3E+00**	94%	1E-06	6%	**1E+00**	94%	2E-07	7%
	Ingestion of Ditch Soil	1E-01	5%	1E-05	62%	7E-02	6%	2E-06	84%
	Dermal Contact to Ditch Soi	2E-02	1%	6E-06	32%	2E-03	0%	2E-07	9%
	TOTAL RECEPTOR RISK (Nc & Car)	***3E+00***	**100%**	***2E-05***	**100%**	***1E+00***	**100%**	***3E-06***	**100%**
CONSTRUCTION WORKER (Soil)	**Inhalation of Dust in Ambient Air (Soil**	**2E+02**	91%	1E-06	14%	**1E+02**	96%	1E-06	26%
	Ingestion of Soil	**2E+01**	9%	5E-06	64%	**4E+00**	3%	1E-06	35%
	Dermal Contact to Soil	**1E+00**	1%	2E-06	21%	1E+00	1%	1E-06	39%
	TOTAL RECEPTOR RISK (Nc & Car)	***2E+02***	**100%**	***8E-06***	**100%**	***1E+02***	**100%**	***4E-06***	**100%**
CONSTRUCTION WORKER (Ditch Soil)	**Inhalation of Dust in Ambient Air (Ditch**	**2E+01**	86%	3E-07	3%	**1E+01**	95%	3E-07	6%
	Ingestion of Ditch Soil	**2E+00**	13%	8E-06	79%	6E-01	4%	2E-06	53%
	Dermal Contact to Ditch Soi	2E-01	1%	2E-06	18%	2E-01	1%	2E-06	41%
	Dermal Contact to Surface Wate	NQ	0%	NQ	0%	NQ	0%	NQ	0%
	TOTAL RECEPTOR RISK (Nc & Car)	***2E+01***	**100%**	***1E-05***	**100%**	***2E+01***	**100%**	***4E-06***	**100%**
ADOLESCENT TRESPASSER (Soil)	**Inhalation of Dust in Ambient Air (Soil**	2E-01	28%	6E-09	1%	2E-01	45%	6E-09	2%
	Ingestion of Soil	4E-01	66%	6E-07	68%	2E-01	53%	3E-07	87%
	Dermal Contact to Soil	4E-02	7%	3E-07	31%	5E-03	2%	4E-08	11%
	TOTAL RECEPTOR RISK (Nc & Car)	***6E-01***	**100%**	***9E-07***	**100%**	***3E-01***	**100%**	***4E-07***	**100%**
ADOLESCENT TRESPASSER (Ditch Soil)	**Inhalation of Dust in Ambient Air (Ditch**	2E-02	20%	1E-09	0%	2E-02	35%	1E-09	0%
	Ingestion of Ditch Soil	6E-02	73%	1E-06	76%	3E-02	64%	5E-07	91%
	Dermal Contact to Ditch Soi	6E-03	7%	3E-07	24%	8E-04	2%	4E-08	8%
	Dermal Contact to Surface Wate	NQ	0%	NQ	0%	NQ	0%	NQ	0%
	TOTAL RECEPTOR RISK (Nc & Car)	***8E-02***	**100%**	***1E-06***	**100%**	***5E-02***	**100%**	***5E-07***	**100%**

NQ= Not quantified due to lack of toxicity data.
Shading indicates that the HQ > 1, or the cancer risk is greater than 10-4.

Table 6-13
Contributing COPCs to Human Health Risk at SEAD-121I
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Receptors	Exposure Route	Contributing COPC	Hazard Quotient	Percent Contribution
Industrial Worker	Inhalation of Dust in Ambient Air Due to Soil	Manganese	2E+01	100%
	Ingestion of Soil	Manganese	4E+00	95%
	Inhalation of Dust in Ambient Air Due to Ditch Soil	Manganese	3E+00	100%
Construction Worker	Inhalation of Dust in Ambient Air Due to Soil	Manganese	2E+02	100%
	Ingestion of Soil	Manganese	1E+01	95%
	Dermal Contact to Soil	Manganese	1E+00	97%
	Inhalation of Dust in Ambient Air Due to Ditch Soil	Manganese	2E+01	100%
	Ingestion of Ditch Soil	Arsenic	7E-01	27%
		Iron	2E-01	9%
		Manganese	1E+00	61%

TABLE 6-14A
CALCULATION OF INTAKE AND RISK FROM THE INTAKE OF GROUNDWATER
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C & SEAD-27 (low flow)
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{\text{EPC x IR x EF x ED}}{\text{BW x AT}}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):
EPC = Exposure Point Concentration in Groundwater (mg/L)
IR = Intake Rate
EF = Exposure Frequency
ED=Exposure Duration
BW=Bodyweight
AT=Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Groundwater	Industrial Worker				Construction Worker				Adolescent Trespasser			
				Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/liter)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Volatile Organic Compounds															
1,2-Dichloropropane	N/A	6.8E-02	2.9E-03	2.8E-05	1.0E-05		7E-07	2.8E-05	4.0E-07		3E-08	4.4E-06	3.1E-07		2E-08
Vinyl chloride	3.00E-03	1.4E+00	2.7E-03	2.7E-05	9.5E-06	9E-03	1E-05	2.7E-05	3.8E-07	9E-03	5E-07	4.2E-06	3.0E-07	1E-03	4E-07
Metals															
Arsenic	3.00E-04	1.5E+00	2.8E-03	2.7E-05	9.7E-06	9E-02	1E-05	2.7E-05	3.9E-07	9E-02	6E-07	4.2E-06	3.0E-07	1E-02	5E-07
Iron	3.00E-01	N/A	2.5E+02	2.4E+00	8.6E-01	8E+00		2.4E+00	3.5E-02	8E+00		3.8E-01	2.7E-02	1E+00	
Manganese	9.33E-04	N/A	9.6E-01	9.4E-03	3.4E-03	1E+01		9.4E-03	1.3E-04	1E+01		1.5E-03	1.1E-04	2E+00	
Thallium	6.47E-04	N/A	2.7E-03	2.7E-05	9.5E-06	4E-02		2.7E-05	3.8E-07	4E-02		4.2E-06	3.0E-07	6E-03	
Total Hazard Quotient and Cancer Risk:						**2E+01**	**3E-05**			**2E+01**	**1E-06**			**3E+00**	**9E-07**

Assumptions for Industrial Worker			**Assumptions for Construction Worker**			**Assumptions for Adolescent Trespasser**		
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	1	liters/day	IR =	1	liters/day	IR =	2	liters/day
EF =	250	days/year	EF =	250	days/year	EF =	14	days/year
ED =	25	years	ED =	1	years	ED =	5	years
AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
N/A= Information not available.

TABLE 6-14B
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO GROUNDWATER
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C & SEAD-27 (low flow)
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

Equation for Dermal (mg/kg-day) = $\frac{DA \times SA \times EF \times ED \times EV}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

DA = Absorbed Dose per Event, mg/cm^2-event
SA = Surface Area Contact
EF = Exposure Frequency
EV = Event Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Absorbed Dose per Event (DA):

For inorganics $DA = Kp \times EPC \times t_{event} \times C$

For organics: If $t_{event} <= t^*$, then: $DA_{event} = 2\ FA \times K_p \times EPC \times C\ ((6\ \tau_{event} \times t_{event}) / \pi)^{1/2}$

if $t_{event} > t^*$, then: $DA_{event} = FA \times K_p \times EPC \times C\ [\ (t_{event} / 1 + B) + 2\ \tau_{event}\ ((1 + 3\ B + 3\ B^2) / (1 + B)^2\ )\ ]$

B = Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (ve) (dimensionless)
FA = Fraction absorbed water (dimensionless)
$B = Kp\ (MW)^{1/2} / 2.6$
τ_{event} is Lag Time per event (hr/event) = $0.105 \times 10^{(0.0056MV}$
t* is time to reach steady-state (hr)
t_{event} = duration of event, hr/event

K_p = Permeability Coefficient,cm/hr
EPC = EPC in Groundwater, mg/L
C = Conversion Factor, 10^3 L/cm^3
If B<= 0.6, then $t^*=2.4\ \tau_{event}$
If B > 0.6, then $t^* = 6\tau_{event}\ (b\text{-SQRT}(b^2\text{-}c^2))$
$b = ((2(1+B)^2)/\pi) - c$
$c = (1+3B+3B^2)/3(1+B)$

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose (RfD)

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD (mg/kg-day)	Carc. Slope Dermal (mg/kg-day)-1	Permeability Coefficient *Kp* (cm/hr)	τ_{event} (hr/event)	Fraction Absorbed Water	B	t* (hour)	EPC Ground Water (mg/L)	Absorbed Dose/Event (mg/cm²-event)	Industrial Worker				Construction Worker				Adolescent Trespasser			
										Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
										(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Volatile Organic Compounds																					
1,2-Dichloropropane	N/A	6.8E-02	7.8.E-03	4.5.E-01	1.0.E+00	3.2.E-02	1.1.E+00	2.9.E-03	2.9.E-08	**Dermal Contact to Groundwater Not Applicable for Industrial Worker**					4.07E-09		3E-10	**Dermal Contact to Groundwater Not Applicable for Adolescent Trespasser**			
Vinyl chloride	3.E-03	1.4E+00	5.6.E-03	2.4.E-01	1.0.E+00	1.7.E-02	5.6.E-01	2.7.E-03	1.4.E-08					1.41E-07	2.01E-09	5E-05	3E-09				
Metals																					
Arsenic	3.E-04	1.5E+00	1.9.E-03	2.8.E-01	---	---	---	2.8.E-03	2.7.E-09					2.60E-08	3.72E-10	9E-05	6E-10				
Iron	3.0.E-01	N/A	2.5.E-04	2.2.E-01	---	---	---	2.5.E+02	3.1.E-05					2.97E-04		1E-03					
Manganese	9.3.E-04	N/A	1.3.E-03	2.1.E-01	---	---	---	9.6.E-01	6.1.E-07					5.99E-06		6E-03					
Thallium	6.5.E-04	N/A	1.6.E-04	1.5.E+00	---	---	---	2.7.E-03	2.1.E-10					2.08E-09		3E-06					
Total Hazard Quotient and Cancer Risk:																**8E-03**	**4E-09**				

Assumptions for Construction Worker

BW =	70	kg
SA =	2,490	cm2
EV=	1	event/day
EF =	100	days/yeaı
ED =	1	year
t_{event} =	0.5	hr/event
AT (Nc) =	365	days
AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity dat
NA= Information not available
Kp value from Exhibit B1 or B-2 of "Supplemental Guidance for Dermal Risk Assessment", Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume 1), August 16, 2004. For chemicals that did not have a Kp value listed in Exibit B-1 or B-2, Kp was calculated using:
Kp = 10^(-2.80+0.66(logKow)-0.0056(MW))

Table 6-15
Comparison of Risk Due to Dermal Contact to Wet vs. Dry Ditch Soil (RME)
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

	Industrial Worker		Constr. Worker		Adolescent Trespasser	
	HI	Cancer	HI	Cancer	HI	Cancer
SEAD-121C dry	6E-04	5E-07	2E-04	2E-08	2E-04	2E-08
SEAD-121C wet	3E-03	2E-06	2E-02	5E-07	2E-03	3E-07
SEAD-121I dry	2E-02	6E-06	2E-01	2E-06	6E-03	3E-07
SEAD-121I wet	1E-01	3E-05	6E-01	6E-06	8E-02	4E-06

Table 7-1A
OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SOIL
SEAD-121C
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration[1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
Volatile Organic Compounds													
67-64-1	Acetone	0.0032	J	0.028	J	SB121C-4	22 / 67	0.0022 - 0.03		2.5	Region 5 - Ecological Screening Value	NO	BSL
71-43-2	Benzene	0.002	J	1.8	J	SBDRMO-9	3 / 68	0.0022 - 0.012		0.1	Region III BTAG - soil fauna	YES	ASL
75-15-0	Carbon disulfide	0.0022	J	0.0047		SBDRMO-9	2 / 68	0.0022 - 0.012		0.094	Region 5 - Ecological Screening Value	NO	BSL
67-66-3	Chloroform	0.002	J	0.0048	J	SB121C-4 (dup)	4 / 68	0.0022 - 0.012		0.3	Region III BTAG - soil fauna	NO	BSL
100-41-4	Ethyl benzene	0.001005	J	24	J	SBDRMO-9	3 / 68	0.0022 - 0.012		0.1	Region III BTAG - soil fauna	YES	ASL
SA0078	Meta/Para Xylene	0.002	J	130	J	SBDRMO-9	4 / 56	0.0022 - 0.0033		0.1	Region III BTAG - soil fauna for xylene	YES	ASL
78-93-3	Methyl ethyl ketone	0.0032		0.0076	J	SBDRMO-14	2 / 68	0.0022 - 0.012		35	Dutch - Indicative Level	NO	BSL
75-09-2	Methylene chloride	0.0026	J	0.0035		SBDRMO-24	3 / 68	0.00084 - 0.012		0.3	Region III BTAG - soil fauna	NO	BSL
95-47-6	Ortho Xylene	0.016		0.075		SBDRMO-9	2 / 56	0.0022 - 0.0033		0.1	Region III BTAG - soil fauna for xylene	NO	BSL
100-42-5	Styrene	0.0027	J	0.0027	J	SBDRMO-9	1 / 68	0.0022 - 0.012		0.1	Region III BTAG - soil fauna	NO	BSL
108-88-3	Toluene	0.002	J	0.084		SBDRMO-9	13 / 68	0.0022 - 0.005		0.1	Region III BTAG - soil fauna	NO	BSL
Semivolatile Organic Compounds													
121-14-2	2,4-Dinitrotoluene	0.045	J	0.045	J	SB121C-2	1 / 68	0.069 - 1.8		1.28	Region 5 - Ecological Screening Value	NO	BSL
91-57-6	2-Methylnaphthalene	0.0055	J	2.5	J	SBDRMO-12	13 / 68	0.069 - 1.8		3.24	Region 5 - Ecological Screening Value	NO	BSL
83-32-9	Acenaphthene	0.0065	J	2.6		SSDRMO-12	14 / 68	0.0715 - 1.8		20	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	IBC
208-96-8	Acenaphthylene	0.042	J	2.5		SBDRMO-24	12 / 68	0.069 - 1.8		0.1	Region III BTAG - soil fauna	YES	ASL
120-12-7	Anthracene	0.0065	J	7.1		SSDRMO-12	23 / 68	0.0715 - 1.8		0.1	Region III BTAG - soil fauna	YES	ASL
56-55-3	Benzo(a)anthracene	0.0046	J	10	J	SSDRMO-12	33 / 67	0.072 - 1.8		0.1	Region III BTAG - soil fauna	YES	ASL
50-32-8	Benzo(a)pyrene	0.006	J	8.7	J	SSDRMO-12	30 / 66	0.0715 - 0.43		0.1	Region III BTAG - soil fauna	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.0058	J	12	J	SSDRMO-12	38 / 66	0.072 - 0.43		0.1	Region III BTAG - soil fauna	YES	ASL
191-24-2	Benzo(ghi)perylene	0.0062	J	3.2	J	SSDRMO-7 (dup)	32 / 66	0.0715 - 0.43		0.1	Region III BTAG - soil fauna	YES	ASL
207-08-9	Benzo(k)fluoranthene	0.0057	J	7.5	J	SSDRMO-12	28 / 66	0.0715 - 0.43		0.1	Region III BTAG - soil fauna	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.0072	J	0.2		SS121C-3	35 / 68	0.073 - 1.8		0.925	Region 5 - Ecological Screening Value	NO	BSL
85-68-7	Butylbenzylphthalate	0.0064	J	0.12	J	SSDRMO-14	8 / 68	0.0715 - 1.8		0.239	Region 5 - Ecological Screening Value	NO	BSL
86-74-8	Carbazole	0.014	J	4.2		SSDRMO-12	20 / 68	0.0715 - 1.8		NA		YES	NSV
218-01-9	Chrysene	0.0055	J	9.1	J	SSDRMO-12	32 / 67	0.072 - 1.8		0.1	Region III BTAG - soil fauna	YES	ASL
53-70-3	Dibenz(a,h)anthracene	0.0076	J	0.47	J	SSDRMO-7 (dup)	15 / 66	0.0715 - 0.43		0.1	Region III BTAG - soil fauna	YES	ASL
132-64-9	Dibenzofuran	0.008	J	1.7		SSDRMO-12	13 / 68	0.069 - 1.8		NA		YES	NSV

Table 7-1A
OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SOIL
SEAD-121C
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration[1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
84-66-2	Diethylphthalate	0.0047	J	0.25	J	SBDRMO-24	11 / 68	0.073 - 1.8		100	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	NO	BSL
84-74-2	Di-n-butylphthalate	0.0053	J	0.13	J	SSDRMO-7 (dup)	7 / 68	0.069 - 1.8		200	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	NO	BSL
117-84-0	Di-n-octylphthalate	0.0038	J	0.023	J	SB121C-1 (dup)	5 / 68	0.0715 - 1.8		NA		YES	NSV
206-44-0	Fluoranthene	0.0048	J	27		SSDRMO-12	43 / 68	0.072 - 1.8		0.1	Region III BTAG - soil fauna	YES	ASL
86-73-7	Fluorene	0.005	J	3.5		SSDRMO-12	17 / 68	0.0715 - 1.8		30	Oak Ridge - Benchmark concentrations for earthworms, Table 1	YES	IBC
118-74-1	Hexachlorobenzene	0.0085	J	0.0085	J	SB121C-2	1 / 68	0.069 - 1.8		0.199	Region 5 - Ecological Screening Value	YES	IBC
193-39-5	Indeno(1,2,3-cd)pyrene	0.0059	J	0.97	J	SSDRMO-7 (dup)	28 / 68	0.0715 - 1.8		0.1	Region III BTAG - soil fauna	YES	ASL
91-20-3	Naphthalene	0.004	J	1.9	J	SBDRMO-12	13 / 68	0.0715 - 1.8		0.1	Region III BTAG - soil fauna	YES	ASL
86-30-6	N-Nitrosodiphenylamine	0.0048	J	0.0048	J	SB121C-2	1 / 68	0.069 - 1.8		20	Oak Ridge - Benchmark concentrations for earthworms, Table 1	NO	BSL
85-01-8	Phenanthrene	0.0059	J	29		SSDRMO-12	33 / 68	0.072 - 1.8		0.1	Region III BTAG - soil fauna	YES	ASL
129-00-0	Pyrene	0.0047	J	34	J	SSDRMO-12	40 / 68	0.072 - 1.8		0.1	Region III BTAG - soil fauna	YES	ASL
PCBs													
53469-21-9	Aroclor-1242	0.058	J	0.058	J	SS121C-4	1 / 68	0.0024 - 0.038		0.1	Region III BTAG - soil flora	YES	IBC
11097-69-1	Aroclor-1254	0.044	J	0.93		SBDRMO-18	9 / 68	0.011 - 0.038		0.1	Region III BTAG - soil flora	YES	ASL
11096-82-5	Aroclor-1260	0.009	J	0.20		SB121C-2	8 / 68	0.0021 - 0.038		0.1	Region III BTAG - soil flora	YES	ASL
Pesticides													
72-54-8	4,4'-DDD	0.0019	J	0.044	J	SBDRMO-18	5 / 59	0.00022 - 0.0039		0.1	Region III BTAG - soil fauna	YES	IBC
72-55-9	4,4'-DDE	0.0025	J	0.069	J	SS121C-3	18 / 67	0.00022 - 0.0038		0.1	Region III BTAG - soil fauna	YES	IBC
50-29-3	4,4'-DDT	0.0021	J	0.1	J	SS121C-3	16 / 67	0.00022 - 0.0038		0.1	Region III BTAG - soil fauna	YES	IBC
309-00-2	Aldrin	0.0045		0.014	J	SBDRMO-16 (dup)	4 / 68	0.00011 - 0.0022		0.1	Region III BTAG - soil fauna	YES	IBC
5103-71-9	Alpha-Chlordane	0.001	J	0.063	J	SBDRMO-16 (dup)	4 / 68	0.00032 - 0.0022		0.1	Region III BTAG for chlordane	YES	IBC
319-86-8	Delta-BHC	0.000975	J	0.002	J	SS121C-4	4 / 68	0.00022 - 0.0022		0.00398	Region 5 - Ecological Screening Value	YES	IBC
60-57-1	Dieldrin	0.039	J	0.041	J	SBDRMO-16 (dup)	2 / 67	0.00011 - 0.0038		0.00003	USEPA 2005 mammalian	YES	ASL
959-98-8	Endosulfan I	0.00575		0.19	J	SSDRMO-7 (dup)	19 / 68	0.00054 - 0.0022		0.119	Region 5 - Ecological Screening Value	YES	ASL
33213-65-9	Endosulfan II	0.009		0.009		SBDRMO-24	1 / 67	0.00034 - 0.0038		0.119	Region 5 - Ecological Screening Value	YES	IBC
72-20-8	Endrin	0.0215	J	0.023	J	SBDRMO-16	2 / 67	0.00086 - 0.0038		0.1	Region III BTAG for chlordane	YES	IBC
53494-70-5	Endrin ketone	0.0034	NJ	0.0097	NJ	SBDRMO-16	4 / 68	0.00011 - 0.0038		NA		YES	NSV

Table 7-1A

OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SOIL

SEAD-121C

SEAD-121C and SEAD-121I Remedial Investigation

Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration[1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
5103-74-2	Gamma-Chlordane	0.0012	J	0.0012	J	SS121C-4	1 / 68	0.00032 - 0.0022		0.1	Region III BTAG for chlordane	YES	IBC
76-44-8	Heptachlor	0.0021	J	0.014	J	SBDRMO-18	2 / 67	0.0011 - 0.0022		0.00598	Region 5 - Ecological Screening Value	YES	ASL
1024-57-3	Heptachlor epoxide	0.0011	J	0.0028	J	SS121C-3	3 / 65	0.00032 - 0.0022		0.1	Region III BTAG for chlordane	YES	IBC
Metals													
7429-90-5	Aluminum	1,730		17,600		SBDRMO-13	68 / 68		20,500	NA		NO	NPH
7440-36-0	Antimony	0.32	J	236		SSDRMO-24	43 / 68	0.26 - 1.2	6.55	0.27	USEPA, 2005, mammalian	YES	ASL
7440-38-2	Arsenic	2.4	J	11.6		SSDRMO-24	68 / 68		21.5	18	USEPA, 2005, plants	YES	IBC
7440-39-3	Barium	18.1		2,030	J	SSDRMO-24	68 / 68		159	330	USEPA, 2005, soil invertebrates	YES	ASL
7440-41-7	Beryllium	0.21		1.2		SBDRMO-8	68 / 68		1.4	21	USEPA, 2005, mammalian	NO	BSL
7440-43-9	Cadmium	0.06	J	29.1		SSDRMO-14	31 / 68	0.06 - 0.16	2.9	0.36	USEPA, 2005, mammalian	YES	ASL
7440-70-2	Calcium	2,100	J	296,000		SS121C-4	68 / 68		293,000	NA		NO	NUT
7440-47-3	Chromium	3.8		74.8		SBDRMO-18	68 / 68		32.7	26	USEPA, 2005, avian, Cr (IV)	YES	ASL
7440-48-4	Cobalt	3.5		19.7		SB121C-4	55 / 55		29.1	13	USEPA, 2005, plants	YES	ASL
7440-50-8	Copper	8.8	J	9,750		SB121C-2	68 / 68		62.8	61	USEPA, 2005, soil invertebrates	YES	ASL
7439-89-6	Iron	4,230		54,100		SB121C-2	68 / 68		38,600	NA		NO	NPH
7439-92-1	Lead	6.2	J	18,900		SSDRMO-24	68 / 68		266	11	USEPA, 2005, avian	YES	ASL
7439-95-4	Magnesium	3,610		24,900	J	SBDRMO-23	68 / 68		29,100	4,400	Region III BTAG	NO	NUT
7439-96-5	Manganese	213		858		SSDRMO-11	68 / 68		2,380	100	Oak Ridge - microorganisms and microbial process	YES	ASL
7439-97-6	Mercury	0.01		0.47		SBDRMO-18	62 / 67	0.04 - 0.06	0.13	0.1	Oak Ridge - Benchmark concentrations for earthworms, Table 1	YES	ASL
7440-02-0	Nickel	11.6		224		SS121C-2	68 / 68		62.3	30	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-09-7	Potassium	787	J	1,990		SB121C-2	68 / 68		3,160	NA		NO	NUT
7782-49-2	Selenium	0.49	J	1.3		SSDRMO-14	10 / 68	0.36 - 1.1	1.7	1	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-22-4	Silver	0.34		21.8		SS121C-1	20 / 68	0.28 - 0.49	0.87	2	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-23-5	Sodium	58.2		478		SSDRMO-14	56 / 68	106 - 141	269	NA		NO	NUT
7440-28-0	Thallium	0.5	J	1.8	J	SBDRMO-24	12 / 68	0.32 - 1.5	1.2	1	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-62-2	Vanadium	5.1		27	J	SBDRMO-13	68 / 68		32.7	2	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-66-6	Zinc	29.8		3,610		SBDRMO-15	68 / 68		126	120	USEPA, 2000, soil invertebrate	YES	ASL
Other Analytes													

Table 7-1A

OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SOIL

SEAD-121C

SEAD-121C and SEAD-121I Remedial Investigation

Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration[1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
SA0019	Total Organic Carbon	2800		9,500		SBDRMO-7	56 / 56			NA		NO	ICE
SA0020	Total Petroleum Hydrocar	43	J	7,600	J	SBDRMO-17	14 / 56	42.5 - 53		NA		NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. (dup) indicates that the maximum concentration was detected in a duplicate pair. The maximum concentration reported is the average value of the sample and its duplicate. Lab duplicates were not included in the assessment. Range of reporting limits were presented for non-detects only. The maximum detected concentration was used for screening.
2. Background value is the maximum detected concentration of the Seneca background dataset.
3. Source of Screening Values:
    - USEPA Ecological Soil Screen Levels, 2000, 2003, 2005
    - USEPA Region III BTAG Screen levels
    - USEPA Region 5 Ecological Soil Screening Levels, December 2003
    - Oak Ridge, R.A. Efroymson, G.W. Suter II, B.E. Sample, and D.S. Jones, Preliminary Remediation Goals for Ecological Endpoints, August 1997
        - Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, 1997 Revision
        - Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on terrestrial Plants, 1997 Revisions
    - CCME - Canadian Environmental Quality Guidelines, December 2003
    - Dutch, Annexes Circular on target values and intervention values for soil remediation, February 2000
4. Rationale codes
    - Selection Reason:
        - Above Screening Levels (ASL)
        - No Screening Value (NSV)
        - Important Bioaccumulative Compounds (IBC)
    - Deletion Reason:
        - Essential Nutrient (NUT)
        - Below Screening Level (BSL)
        - Individual Chemicals Evaluated (ICE)
        - Neutral pH Value Expected for Soil (NPH)

Definitions:
COPC = Chemical of Potential Concern
Q = Qualifier
J = Estimated Value
NJ = Presence of the analyte has been "tentatively identified" and the associated numerical value represents its approximate concentration.

Table 7-1B
OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C DITCH SOIL
SEAD-121C
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
Volatile Organic Compounds													
67-64-1	Acetone	0.012	J	0.15	J	SDDRMO-3	7 / 10	0.0029 - 0.012		2.5	Region 5 - Ecological Screening Value	NO	BSL
75-15-0	Carbon disulfide	0.005	J	0.012	J	SDDRMO-6	2 / 10	0.0028 - 0.026		0.1	Region 5 - Ecological Screening Value	NO	BSL
78-93-3	Methyl ethyl ketone	0.0036	J	0.13	J	SDDRMO-4	3 / 10	0.0029 - 0.026		35	Dutch - Indicative Level	NO	BSL
Semivolatile Organic Compounds													
106-44-5 108-39-4	3 or 4-Methylphenol	0.79	J	0.79	J	SDDRMO-3	1 / 10	0.36 - 1.6		0.1	Region III BTAG - soil fauna	YES	ASL
120-12-7	Anthracene	0.1	J	0.25	J	SDDRMO-2	2 / 10	0.36 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
56-55-3	Benzo(a)anthracene	0.23	J	1.1	J	SDDRMO-2	2 / 10	0.36 - 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
50-32-8	Benzo(a)pyrene	0.17	J	0.9	J	SDDRMO-2	2 / 10	0.36 - 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.18	J	1.1	J	SDDRMO-2	2 / 10	0.36 - 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
191-24-2	Benzo(ghi)perylene	0.29	J	0.29	J	SDDRMO-2	1 / 10	0.36 - 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
207-08-9	Benzo(k)fluoranthene	0.58	J	0.58	J	SDDRMO-2	1 / 10	0.36 - 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
218-01-9	Chrysene	0.24	J	1.2	J	SDDRMO-2	2 / 10	0.36 - 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
206-44-0	Fluoranthene	0.52	J	2.1	J	SDDRMO-2	2 / 10	0.36 - 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
193-39-5	Indeno(1,2,3-cd)pyrene	0.27	J	0.27	J	SDDRMO-2	1 / 10	0.36 - 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
85-01-8	Phenanthrene	0.41	J	1.1	J	SDDRMO-2	2 / 10	0.36 - 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
129-00-0	Pyrene	0.44	J	2.1	J	SDDRMO-2	2 / 10	0.36 - 1.7		0.1	Region III BTAG - soil fauna	YES	ASL
Metals													
7429-90-5	Aluminum	2,850		21,500		SDDRMO-9	10 / 10		20,500	NA		NO	NPH
7440-36-0	Antimony	0.97	J	4.9	J	SDDRMO-9	5 / 10	1.2 - 4.3	6.55	0.3	USEPA, 2005, mammalian	YES	ASL
7440-38-2	Arsenic	1.1		6.1	J	SDDRMO-2	10 / 10		21.5	18	USEPA, 2005, plants	YES	IBC
7440-39-3	Barium	36.6	J	291		SDDRMO-9	10 / 10		159	330	USEPA, 2005, soil invertebrates	NO	BSL
7440-41-7	Beryllium	0.2		0.8	J	SDDRMO-8 (dup)	8 / 10	0.64 - 0.68	1.4	21	USEPA, 2005, mammalian	NO	BSL
7440-43-9	Cadmium	1.5	J	14.3		SDDRMO-9	5 / 10	0.13 - 0.33	2.9	0.36	USEPA, 2005, mammalian	YES	ASL
7440-70-2	Calcium	13,200		161,000		SDDRMO-9	10 / 10		293,000	NA		NO	NUT
7440-47-3	Chromium	7.3		29.8	J	SDDRMO-2	10 / 10		32.7	26	USEPA, 2005, avian, Cr (IV)	YES	ASL
7440-48-4	Cobalt	3		15.8	J	SDDRMO-8 (dup)	10 / 10		29.1	13	USEPA, 2005, plants	YES	ASL

Table 7-1B

OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C DITCH SOIL

SEAD-121C

SEAD-121C and SEAD-121I Remedial Investigation

Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
7440-50-8	Copper	16.2		1,190		SDDRMO-9	10 / 10		62.8	61	USEPA, 2005, soil invertebrates	YES	ASL
PA0002	Cyanide, Amenable	2.36	J	2.36	J	SDDRMO-4	1 / 10	0.55 - 2.63		0.005	Region III BTAG for cyanide	YES	ASL
SA0008	Cyanide, Total	2.36	J	2.36	J	SDDRMO-4	1 / 10	0.552 - 2.63		0.005	Region III BTAG for cyanide	YES	ASL
7439-89-6	Iron	5,650		27,300	J	SDDRMO-8 (dup)	10 / 10		38,600	NA		YES	NSV
7439-92-1	Lead	13.3		436		SDDRMO-9	10 / 10		266	11	USEPA, 2005, avian	YES	ASL
7439-95-4	Magnesium	3,340		17,600		SDDRMO-9	10 / 10		29,100	4,400	Region III BTAG	NO	NUT
7439-96-5	Manganese	126		918	J	SDDRMO-5	10 / 10		2,380	100	Oak Ridge - microorganisms and microbial process	YES	ASL
7439-97-6	Mercury	0.04		0.3	J	SDDRMO-2	10 / 10		0.13	0.1	Oak Ridge - Benchmark concentrations for earthworms, Table 1	YES	ASL
7440-02-0	Nickel	8.2		42.7	J	SDDRMO-5	10 / 10		62.3	30	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-09-7	Potassium	368		1,410	J	SDDRMO-5	10 / 10		3,160	NA		NO	NUT
7782-49-2	Selenium	0.73		2.5	J	SDDRMO-4	4 / 10	0.55 - 2.1	1.7	1	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-22-4	Silver	0.825	J	2.6	J	SDDRMO-5	5 / 10	0.35 - 1.4	0.87	2	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-23-5	Sodium	167		1,120	J	SDDRMO-4	10 / 10		269	NA		NO	NUT
7440-62-2	Vanadium	8.6		29.1	J	SDDRMO-2	10 / 10		32.7	2	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-66-6	Zinc	51.4	J	566		SDDRMO-5	10 / 10		126	120	USEPA, 2000, soil invertebrate	YES	ASL
Other Analytes													
SA0019	Total Organic Carbon	4,200		9,100	J	SDDRMO-10	10 / 10			NA		NO	ICE
SA0020	Total Petroleum Hydrocarbons	1,000		2,600	J	SDDRMO-2	2 / 10	53 - 211		NA		NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. (dup) indicates that the maximum concentration was detected in a duplicate pair The maximum concentration reported is the average value of the sample and its duplicate. Lab duplicates were not included in the assessment. Range of reporting limits were presented for non-detects only. The maximum detected concentration was used for screening.
2. Background value is the maximum detected concentration of the Seneca background dataset.
3. Source of Screening Values: USEPA Ecological Soil Screen Levels, 2000, 2003, 2005
   USEPA Region III BTAG Screen levels
   USEPA Region 5 Ecological Soil Screening Levels, December 2003

Table 7-1B

OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C DITCH SOIL

SEAD-121C

SEAD-121C and SEAD-121I Remedial Investigation

Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]

Oak Ridge, R.A. Efroymson, G.W. Suter II, B.E. Sample, and D.S. Jones, Preliminary Remediation Goals for Ecological Endpoints, August 1997
Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, 1997 Revision
Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on terrestrial Plants, 1997 Revisions
CCME - Canadian Environmental Quality Guidelines, December 2003
Dutch, Annexes Circular on target values and intervention values for soil remediation, February 200

4. Rationale codes

Selection Reason: Above Screening Levels (ASL)
No Screening Value (NSV)
Important Bioaccumulative Compounds (IBC)
Deletion Reason: Essential Nutrient (NUT)
Below Screening Level (BSL)
Individual Chemicals Evaluated (ICE)
Neutral pH Value Expected for Soil (NPH)

Definitions:

COPC = Chemical of Potential Concern
Q = Qualifier
J = Estimated Value

Table 7-1C

OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SURFACE WATER

SEAD-121C

SEAD-121C and SEAD-121I Remedial Investigation

SENECA ARMY DEPOT ACTIVITY

CAS Number	Chemical	Minimum Detected Concentration [1] (ug/L)	Q	Maximum Detected Concentration [1] (ug/L)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (ug/L)	Screening Value (ug/L)	Source of Screening Value [2]	COPC Flag	Rationale for Contaminant Deletion or Selection [3]
Semivolatile Organic Compounds												
117-81-7	Bis(2-Ethylhexyl)phthalate	4.2	J	4.2	J	SWDRMO-2	1 / 10	10 - 10	0.6	NYSDEC Class C	YES	ASL
Metals												
7429-90-5	Aluminum	14.4		8,760		SWDRMO-2	10 / 10		100	NYSDEC Class C	YES	ASL
7440-38-2	Arsenic	50.3		50.3		SWDRMO-2	1 / 10	2.8 - 2.8	150	NYSDEC Class C	YES	IBC
7440-39-3	Barium	37.2		423		SWDRMO-2	10 / 10		10,000	Region III BTAG	NO	BSL
7440-41-7	Beryllium	0.12	J	0.86	J	SWDRMO-2	9 / 10	0.1 - 0.1	1,100	NYSDEC Class C	NO	BSL
7440-43-9	Cadmium	0.46		19.5		SWDRMO-2	4 / 10	0.4 - 0.4	0.42	NRWQC, CCC	YES	ASL
7440-70-2	Calcium	66,700		166,000		SWDRMO-3	10 / 10		NA		NO	NUT
7440-47-3	Chromium	0.69		129		SWDRMO-2	8 / 10	0.6 - 0.6	11	NRWQC, CCC for Cr(VI)	YES	ASL
7440-48-4	Cobalt	0.6		47		SWDRMO-2	7 / 10	0.6 - 0.6	5	NYSDEC Class C	YES	ASL
7440-50-8	Copper	1.7		1,160		SWDRMO-2	10 / 10		17	NRWQC, CCC NYSDEC Class C	YES	ASL
7439-89-6	Iron	26.6	J	110,000		SWDRMO-2	8 / 10	17.3 - 17.3	300	NYSDEC Class C	YES	ASL
7439-92-1	Lead	4.4	J	839		SWDRMO-2	10 / 10		5.8	NRWQC, CCC	YES	ASL
7439-95-4	Magnesium	11,100		26,200		SWDRMO-2	10 / 10		NA		NO	NUT
7439-96-5	Manganese	3.2		2,380		SWDRMO-2	10 / 10		14,500	Region III BTAG (@hardness=36 mg/L)	NO	BSL
7439-97-6	Mercury	0.26		2.1		SWDRMO-2	2 / 10	0.2 - 0.2	0.0007	NYSDEC Class C	YES	ASL
7440-02-0	Nickel	10.6		154		SWDRMO-2	3 / 10	1.8 - 1.8	100	NRWQC, CCC NYSDEC, Class C	YES	ASL
7440-09-7	Potassium	2,070	J	5,350	J	SWDRMO-3	10 / 10		NA		NO	NUT
7782-49-2	Selenium	4.6	J	4.6	J	SWDRMO-2	1 / 10	3 - 3	4.6	NYSDEC Class C	YES	IBC
7440-22-4	Silver	1.7		8		SWDRMO-2	2 / 10	1 - 1	0.1	NYSDEC Class C	YES	ASL
7440-23-5	Sodium	4,490		123,000	J	SWDRMO-1	10 / 10		NA		NO	NUT
7440-28-0	Thallium	5.5	J	6.3		SWDRMO-4	2 / 10	5.4 - 5.4	8	NYSDEC Class C	NO	BSL
7440-62-2	Vanadium	0.89		233		SWDRMO-2	5 / 10	0.7 - 0.7	14	NYSDEC Class C	YES	ASL
7440-66-6	Zinc	15.4		6,910		SWDRMO-2	10 / 10		159	NYSDEC Class C	YES	ASL
Other Analytes												
SA0020	Total Petroleum Hydrocarbons	8,080		8,080		SWDRMO-2	1 / 9	1000 - 1000	NA		NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation.
   Lab duplicates were not included in the assessment. Range of reporting limits were presented for non-detects only.
   The maximum detected concentration was used for screening.
2. Source of Screening Values:
   NYSDEC. 1998 with addendum. New York State Ambient Water Quality Standards, Class C for Surface Water
   USEPA. 2002. National Recommended Water Quality Criteria (NRWQC): 2002.
   USEPA Region III. 1995. Region III BTAG Screening Levels.
3. Rationale codes
   Selection Reason:
   Above Screening Levels (ASL)
   No Screening Value (NSV)
   Important Bioaccumulative Compounds (IBC)
   Deletion Reason:
   Essential Nutrient (NUT)
   Below Screening Level (BSL)
   Individual Chemicals Evaluated (ICE)
   Neutral pH Value Expected for Soil (NPH)

Hardness for surface water was assumed to be 100 mg/L ($CaCO_3$).

Definitions:
COPC = Chemical of Potential Concern
Q = Qualifier
CCC = Criterion Continuous Concentration
J = Estimated Value

Table 7-2A

OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL

SEAD-121I

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
Volatile Organic Compounds													
67-64-1	Acetone	0.0022	J	0.11		SS121I-15	26 / 35	0.003 - 0.0715		2.5	Region 5 - Ecological Screening Value	NO	BSL
71-43-2	Benzene	0.0046	J	0.0405	J	SS121I-29 (dup)	6 / 35	0.0023 - 0.0034		0.1	Region III BTAG - soil fauna	NO	BSL
100-41-4	Ethyl benzene	0.0021	J	0.0078		SS121I-15	5 / 35	0.0023 - 0.0034		0.1	Region III BTAG - soil fauna	NO	BSL
	Meta/Para Xylene	0.0021	J	0.0063	J	SS121I-29 (dup)	5 / 35	0.0023 - 0.0034		0.1	Region III BTAG - soil fauna for xylene	NO	BSL
78-93-3	Methyl ethyl ketone	0.0036		0.07		SS121I-15	9 / 35	0.0023 - 0.0034		35	Dutch - Indicative Level	NO	BSL
75-09-2	Methylene chloride	0.0016	J	0.0028	J	SB121I-4	9 / 35	0.0023 - 0.0034		0.3	Region III BTAG - soil fauna	NO	BSL
95-47-6	Ortho Xylene	0.0013	J	0.0036	J	SS121I-29 (dup)	5 / 35	0.0023 - 0.0034		0.1	Region III BTAG - soil fauna for xylene	NO	BSL
108-88-3	Toluene	0.0028	J	0.0305	J	SS121I-29 (dup)	6 / 35	0.0023 - 0.0034		0.1	Region III BTAG - soil fauna	NO	BSL
Semivolatile Organic Compounds													
91-57-6	2-Methylnaphthalene	0.054	J	0.26	J	SS121I-20	3 / 39	0.35 - 7.4		3.24	Region 5 - Ecological Screening Value	NO	BSL
83-32-9	Acenaphthene	0.053	J	6.1		SS121I-20	17 / 39	0.36 - 2.2		20	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	IBC
208-96-8	Acenaphthylene	0.064	J	0.56	J	SS121I-21	2 / 39	0.34 - 7.4		0.1	Region III BTAG - soil fauna	YES	ASL
120-12-7	Anthracene	0.069	J	12		SS121I-20	20 / 38	0.36 - 1.8		0.1	Region III BTAG - soil fauna	YES	ASL
56-55-3	Benzo(a)anthracene	0.043	J	28	J	SS121I-20	36 / 39	0.37 - 0.38		0.1	Region III BTAG - soil fauna	YES	ASL
50-32-8	Benzo(a)pyrene	0.061	J	23		SS121I-20	36 / 39	0.37 - 0.39		0.1	Region III BTAG - soil fauna	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.052	J	29		SS121I-20	37 / 39	0.37 - 0.38		0.1	Region III BTAG - soil fauna	YES	ASL
191-24-2	Benzo(ghi)perylene	0.05	J	29	J	SS121I-20	33 / 39	0.36 - 0.39		0.1	Region III BTAG - soil fauna	YES	ASL
207-08-9	Benzo(k)fluoranthene	0.095	J	21	J	SS121I-20	28 / 38	0.36 - 0.4		0.1	Region III BTAG - soil fauna	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.038	J	1.6		SS121I-31	14 / 39	0.13 - 8.8		0.925	Region 5 - Ecological Screening Value	YES	ASL
85-68-7	Butylbenzylphthalate	0.055	J	0.13	J	SB121I-1	2 / 36	0.35 - 8.8		0.239	Region 5 - Ecological Screening Value	NO	BSL
86-74-8	Carbazole	0.06	J	6.8		SS121I-20	20 / 39	0.36 - 1.8		NA		YES	NSV
218-01-9	Chrysene	0.0625	J	32	J	SS121I-20	35 / 39	0.37 - 0.39		0.1	Region III BTAG - soil fauna	YES	ASL
53-70-3	Dibenz(a,h)anthracene	0.072	J	4.6	J	SS121I-2	10 / 32	0.36 - 2.1		0.1	Region III BTAG - soil fauna	YES	ASL
132-64-9	Dibenzofuran	0.029	J	2		SS121I-20	9 / 39	0.35 - 2.2		NA		YES	NSV
84-66-2	Diethylphthalate	0.64	J	0.64	J	SS121I-29 (dup)	1 / 39	0.34 - 7.4		100	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	NO	BSL
84-74-2	Di-n-butylphthalate	0.045	J	0.045	J	SS121I-1	1 / 38	0.34 - 7.4		200	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	NO	BSL
206-44-0	Fluoranthene	0.08	J	62		SS121I-20	37 / 39	0.37 - 0.38		0.1	Region III BTAG - soil fauna	YES	ASL
86-73-7	Fluorene	0.043	J	4.2		SS121I-20	13 / 39	0.35 - 2.2		30	Oak Ridge - Benchmark concentrations for earthworms, Table 1	YES	IBC

Table 7-2A

OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL

SEAD-121I

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
193-39-5	Indeno(1,2,3-cd)pyrene	0.061	J	8.1	J	SS121I-20	26 / 37	0.36 - 2.1		0.1	Region III BTAG - soil fauna	YES	ASL
91-20-3	Naphthalene	0.051	J	0.63	J	SS121I-21	5 / 39	0.35 - 7.4		0.1	Region III BTAG - soil fauna	YES	ASL
85-01-8	Phenanthrene	0.052	J	52		SS121I-20	37 / 39	0.37 - 0.38		0.1	Region III BTAG - soil fauna	YES	ASL
129-00-0	Pyrene	0.072	J	64	J	SS121I-23	37 / 39	0.37 - 0.38		0.1	Region III BTAG - soil fauna	YES	ASL
PCBs													
11097-69-1	Aroclor-1254	0.03	J	0.03	J	SS121I-22	1 / 35	0.018 - 0.022		0.1	Region III BTAG - soil flora	YES	IBC
11096-82-5	Aroclor-1260	0.0083	J	0.046	J	SS121I-14	2 / 35	0.018 - 0.022		0.1	Region III BTAG - soil flora	YES	IBC
Pesticides													
72-55-9	4,4'-DDE	0.011	NJ	0.034	NJ	SS121I-23	4 / 35	0.0018 - 0.0023		0.1	Region III BTAG - soil fauna	YES	IBC
50-29-3	4,4'-DDT	0.024	NJ	0.039	J	SS121I-21	2 / 34	0.0018 - 0.0023		0.1	Region III BTAG - soil fauna	YES	IBC
309-00-2	Aldrin	0.0032	J	0.012		SS121I-20	4 / 35	0.0018 - 0.0045		0.1	Region III BTAG - soil fauna	YES	IBC
60-57-1	Dieldrin	0.016	J	0.034	J	SS121I-21	2 / 35	0.0018 - 0.0023		0.00003	USEPA 2005 mammalian	YES	ASL
959-98-8	Endosulfan I	0.0026		0.095	J	SS121I-20	24 / 35	0.0018 - 0.002		0.1	Region 5 - Ecological Screening Value	YES	IBC
72-20-8	Endrin	0.0065	J	0.03	J	SS121I-21	2 / 35	0.0018 - 0.0023		0.1	Region III BTAG for chlordane	YES	IBC
1024-57-3	Heptachlor epoxide	0.0061		0.055	J	SS121I-21	8 / 33	0.0018 - 0.0023		0.1	Region III BTAG for chlordane	YES	IBC
Metals													
7429-90-5	Aluminum	1,510		13,200		SB121I-5	35 / 35		20,500	NA		NO	NPH
7440-36-0	Antimony	0.99		7.5		SS121I-28	14 / 35	0.96 - 7.3	6.55	0.27	USEPA, 2005, mammalian	YES	ASL
7440-38-2	Arsenic	3.5		32.1	J	SB121I-2 (dup)	24 / 24		21.5	18	USEPA, 2005, plants	YES	ASL
7440-39-3	Barium	38.2		207		SS121I-26	35 / 35		159	330	USEPA, 2005, soil invertebrates	NO	BSL
7440-41-7	Beryllium	0.16		0.68		SB121I-5	34 / 35	0.17 - 0.17	1.4	21	USEPA, 2005, mammalian	NO	BSL
7440-43-9	Cadmium	0.15		6.6		SB121I-3	13 / 35	0.13 - 0.61	2.9	0.36	USEPA, 2005, mammalian	YES	IBC
7440-70-2	Calcium	5,370	J	298,000	J	SS121I-26	35 / 35		293,000	NA		NO	NUT
7440-47-3	Chromium	3.9		439		SS121I-29 (dup)	35 / 35		32.7	26	USEPA, 2005, avian, Cr (IV)	YES	ASL
7440-48-4	Cobalt	4.6		205.5	J	SS121I-29 (dup)	35 / 35		29.1	13	USEPA, 2005, plants	YES	ASL
7440-50-8	Copper	10.4	J	209		SS121I-29 (dup)	30 / 30		62.8	61	USEPA, 2005, soil invertebrates	YES	ASL
	Cyanide, Total	0.559	J	2.00		SS121I-29 (dup)	3 / 35	0.526 - 0.61		0.005	Region III BTAG for cyanide	YES	ASL
7439-89-6	Iron	5,720		58,400		SS121I-29 (dup)	35 / 35		38,600	NA		NO	NPH
7439-92-1	Lead	8.6	J	122		SS121I-25	35 / 35		266	11	USEPA, 2005, avian	YES	ASL
7439-95-4	Magnesium	4,430	J	22,300	J	SS121I-27	35 / 35		29,100	4,400	Region III BTAG	NO	NUT
7439-96-5	Manganese	377		310,500		SS121I-29 (dup)	35 / 35		2,380	100	Oak Ridge - microorganisms and microbial process	YES	ASL
7439-97-6	Mercury	0.01		0.07		SB121I-1	35 / 35		0.13	0.1	Oak Ridge - Benchmark concentrations for earthworms, Table 1	NO	BSL

Table 7-2A

OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL

SEAD-121I

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
7440-02-0	Nickel	11.1		342	J	SS121I-29 (dup), SS121I-33	35 / 35		62.3	30	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-09-7	Potassium	634		1,300		SS121I-30	35 / 35		3,160	NA		NO	NUT
7782-49-2	Selenium	0.48	J	146	J	SS121I-29 (dup)	20 / 35	0.43 - 0.61	1.7	1	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-22-4	Silver	0.29		3.1	J	SB121I-2 (dup)	4 / 24	0.3 - 1.2	0.87	2	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-23-5	Sodium	117		372		SB121I-1	29 / 35	106 - 595	269	NA		NO	NUT
7440-28-0	Thallium	0.38		163	J	SS121I-29 (dup)	7 / 35	0.32 - 1.2	1.2	1	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-62-2	Vanadium	5.9		182	J	SS121I-29 (dup)	35 / 35		32.7	2	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-66-6	Zinc	42.75	J	329		SS121I-33	35 / 35		126	120	USEPA, 2000, soil invertebrate	YES	ASL
Other Analytes													
	Total Organic Carbon	3,000		8,900		SS121I-6	35 / 35			NA		NO	ICE
	Total Petroleum Hydrocarbons	100	J	2,200		SS121I-27	10 / 35	43 - 48		NA		NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment. (dup) indicates that the maximum concentration was detected in a duplicate pair. The maximum concentration reported is the average value of the sample and its duplicate. Range of reporting limits were presented for nondetects only. The maximum detected concentration was used for screening.
2. Background value is the maximum detected concentration of the Seneca background dataset.
3. Source of Screening Values:
   USEPA Ecological Soil Screen Levels, 2000, 2003, 2005
   USEPA Region III BTAG Screen levels
   USEPA Region 5 Ecological Soil Screening Levels, December 2003
   Oak Ridge, R.A. Efroymson, G.W. Suter II, B.E. Sample, and D.S. Jones, Preliminary Remediation Goals for Ecological Endpoints, August 1997
     Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, 1997 Revision
     Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on terrestrial Plants, 1997 Revisions
   CCME - Canadain Environmental Quality Guidelines, December 2003
   Dutch, Annexes Circular on target values and intervention values for soil remediation, February 2000
4. Rationale codes
   Selection Reason: Above Screening Levels (ASL)
   No Screening Value (NSV)
   Important Bioaccumulative Compounds (IBC)
   Deletion Reason: Essential Nutrient (NUT)
   Below Screening Level (BSL)
   Individual Chemicals Evaluated (ICE)

Table 7-2A

OCCURRENCE, DISTRIBUTION AND SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL

SEAD-121I

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3]	COPC Flag	Rationale for Contaminant Deletion or Selection [4]

Neutral pH Value Expected for Soil (NPH)

Definitions:
COPC = Chemical of Potential Concern
Q = Qualifier
J = Estimated Value
NJ = Presence of the analyte has been "tentatively identified" and the associated numerical value represents its approximate concentration.

Table 7-2B

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF ECOLOGICAL POTENTIAL CONCERN IN SEAD-121I DITCH SOIL

SEAD-121I

SEAD-121C AND SEAD-121I RI REPORT

Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
Volatile Organic Compounds													
67-64-1	Acetone	0.008		0.15		SD121I-8	10 / 10			2.5	Region 5 - Ecological Screening Value	NO	BSL
71-43-2	Benzene	0.0012	J	0.039		SD121I-8	3 / 10	0.0032 - 0.0037		0.1	Region III BTAG - soil fauna	NO	BSL
100-41-4	Ethyl benzene	0.0052		0.0052		SD121I-8	1 / 10	0.0027 - 0.0044		0.1	Region III BTAG - soil fauna	NO	BSL
SA0078	Meta/Para Xylene	0.0048		0.0048		SD121I-8	1 / 10	0.0027 - 0.0044		0.1	Region III BTAG - soil fauna for xylene	NO	BSL
78-93-3	Methyl ethyl ketone	0.0072		0.078		SD121I-8	2 / 10	0.0031 - 0.0044		35	Dutch - Indicative Level	NO	BSL
95-47-6	Ortho Xylene	0.003		0.003		SD121I-8	1 / 10	0.0027 - 0.0044		0.1	Region III BTAG - soil fauna for xylene	NO	BSL
108-88-3	Toluene	0.0017	J	0.026		SD121I-8	2 / 10	0.0031 - 0.0044		0.1	Region III BTAG - soil fauna	NO	BSL
Semivolatile Organic Compounds													
91-57-6	2-Methylnaphthalene	0.033	J	0.17	J	SD121I-7 (dup)	2 / 12	0.38 - 4.4		3.24	Region 5 - Ecological Screening Value	NO	BSL
91-94-1	3,3'-Dichlorobenzidine	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4		0.646	Region 5 - Ecological Screening Value	NO	BSL
83-32-9	Acenaphthene	0.066	J	0.74	J	SD121I-7 (dup)	9 / 12	0.38 - 0.46		20	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	IBC
208-96-8	Acenaphthylene	0.076	J	0.42	J	SD121I-2EBS	4 / 12	0.38 - 0.53		0.1	Region III BTAG - soil fauna	YES	ASL
120-12-7	Anthracene	0.11	J	1.8	J	SD121I-2EBS	9 / 12	0.38 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
56-55-3	Benzo(a)anthracene	0.049	J	14		SD121I-2EBS	10 / 12	0.38 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
50-32-8	Benzo(a)pyrene	0.29	J	16		SD121I-2EBS	9 / 12	0.38 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.044	J	22		SD121I-2EBS	11 / 12	0.46 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
191-24-2	Benzo(ghi)perylene	0.11	J	12		SD121I-2EBS	9 / 12	0.38 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
207-08-9	Benzo(k)fluoranthene	0.14	J	23		SD121I-2EBS	9 / 12	0.38 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.025	J	0.093	J	SD121I-7 (dup)	3 / 12	0.38 - 4.4		0.925	Region 5 - Ecological Screening Value	NO	BSL
85-68-7	Butylbenzylphthalate	0.42	J	0.42	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4		0.239	Region 5 - Ecological Screening Value	YES	ASL

Table 7-2B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF ECOLOGICAL POTENTIAL CONCERN IN SEAD-121I DITCH SOIL
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
86-74-8	Carbazole	0.1	J	1.6	J	SD121I-2EBS	9 / 12	0.38 - 0.46		NA		YES	NSV
218-01-9	Chrysene	0.34	J	25		SD121I-2EBS	9 / 12	0.38 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
53-70-3	Dibenz(a,h)anthracene	0.086	J	5	J	SD121I-2EBS	5 / 12	0.38 - 0.53		0.1	Region III BTAG - soil fauna	YES	ASL
132-64-9	Dibenzofuran	0.058	J	0.356	J	SD121I-7 (dup)	5 / 12	0.38 - 4.4		NA		YES	NSV
117-84-0	Di-n-octylphthalate	0.42	J	0.42	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4		709	Region 5 - Ecological Screening Value	NO	BSL
206-44-0	Fluoranthene	0.099	J	24		SD121I-2EBS	11 / 12	0.46 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
86-73-7	Fluorene	0.053	J	0.645	J	SD121I-7 (dup)	9 / 12	0.38 - 0.46		30	Oak Ridge - Benchmark concentrations for earthworms, Table 1	YES	IBC
193-39-5	Indeno(1,2,3-cd)pyrene	0.098	J	12	J	SD121I-2EBS	9 / 12	0.38 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
78-59-1	Isophorone	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4		139	Region 5 - Ecological Screening Value	NO	BSL
91-20-3	Naphthalene	0.065	J	0.35	J	SD121I-7 (dup)	2 / 12	0.38 - 4.4		0.1	Region III BTAG - soil fauna	YES	ASL
98-95-3	Nitrobenzene	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4		1.31	Region 5 - Ecological Screening Value	NO	BSL
85-01-8	Phenanthrene	0.05	J	6.25		SD121I-7 (dup)	11 / 12	0.46 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
108-95-2	Phenol	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.39 - 4.4		0.1	Region III BTAG - soil fauna	YES	ASL
129-00-0	Pyrene	0.078	J	17		SD121I-2EBS	11 / 12	0.46 - 0.46		0.1	Region III BTAG - soil fauna	YES	ASL
PCBs													
11097-69-1	Aroclor-1254	0.067		0.067		SD121I-5	1 / 10	0.012 - 0.022		0.1	Region III BTAG - soil flora	YES	IBC
11096-82-5	Aroclor-1260	0.014	J	0.014	J	SD121I-7 (dup)	1 / 10	0.0023 - 0.0033		0.1	Region III BTAG - soil flora	YES	IBC
Pesticides													
72-55-9	4,4'-DDE	0.0076	J	0.0076	J	SD121I-7 (dup)	1 / 10	0.00024 - 0.00033		0.1	Region III BTAG - soil fauna	YES	IBC
Metals													
7429-90-5	Aluminum	4,180		10,300		SD121I-6	10 / 10		20,500	NA		NO	NPH
7440-38-2	Arsenic	2.6		104		SD121I-8	10 / 10		21.5	18	USEPA, 2005, plants	YES	ASL
7440-39-3	Barium	44.1	J	91.1	J	SD121I-8	10 / 10		159	330	USEPA, 2005, soil invertebrates	NO	BSL

Table 7-2B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF ECOLOGICAL POTENTIAL CONCERN IN SEAD-121I DITCH SOIL
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
7440-41-7	Beryllium	0.3		0.66		SD121I-6	10 / 10		1.4	21	USEPA, 2005, mammalian	NO	BSL
7440-43-9	Cadmium	0.8		0.8		SD121I-7 (dup)	1 / 10	0.14 - 0.19	2.9	0.36	USEPA, 2005, mammalian	YES	ASL
7440-70-2	Calcium	8,990		127,500		SD121I-7 (dup)	10 / 10		293,000	NA		NO	NUT
7440-47-3	Chromium	8.6		83.9		SD121I-8	10 / 10		32.7	26	USEPA, 2005, avian, Cr (IV)	YES	ASL
7440-48-4	Cobalt	5.9		91.9		SD121I-8	10 / 10		29.1	13	USEPA, 2005, plants	YES	ASL
7440-50-8	Copper	17.1	J	130		SD121I-4	10 / 10		62.8	61	USEPA, 2005, soil invertebrates	YES	ASL
7439-89-6	Iron	10,100		30,400		SD121I-8	10 / 10		38,600	NA		NO	NPH
7439-92-1	Lead	11.2	J	93.3		SD121I-6	10 / 10		266	11	USEPA, 2005, avian	YES	ASL
7439-95-4	Magnesium	2,150		11,300		SD121I-5	10 / 10		29,100	4,400	Region III BTAG	NO	NUT
7439-96-5	Manganese	303		14,900		SD121I-8	10 / 10		2,380	100	Oak Ridge - microorganisms and microbial process	YES	ASL
7439-97-6	Mercury	0.02		0.18		SD121I-3	9 / 10	0.12 - 0.12	0.13	0.1	Oak Ridge - Benchmark concentrations for earthworms, Table 1	YES	ASL
7440-02-0	Nickel	16.4		153		SD121I-8	10 / 10		62.3	30	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-09-7	Potassium	541		1,450		SD121I-6	10 / 10		3,160	NA		NO	NUT
7782-49-2	Selenium	18		18		SD121I-8	1 / 10	0.48 - 0.68	1.7	1	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-22-4	Silver	2.5		10.5		SD121I-8	2 / 10	0.31 - 0.44	0.87	2	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-23-5	Sodium	162		266		SD121I-10	8 / 10	118 - 132	269	NA		NO	NUT
7440-28-0	Thallium	0.44	J	21.5		SD121I-8	2 / 10	0.36 - 0.5	1.2	1	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-62-2	Vanadium	8.1		69.4		SD121I-8	10 / 10		32.7	2	Oak Ridge - Effects on Terrestrial Plants 1997 Rev, Table 1	YES	ASL
7440-66-6	Zinc	57.3	J	532		SD121I-6	10 / 10		126	120	USEPA, 2000, soil invertebrate	YES	ASL
Other Analytes													
SA0019	Total Organic Carbon	2,800		7,200	J	SD121I-1	10 / 10			NA		NO	ICE

Table 7-2B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF ECOLOGICAL POTENTIAL CONCERN IN SEAD-121I DITCH SOIL
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Maximum Background Value [2] (mg/kg)	Screening Value (mg/kg)	Source of Screening Value [3] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection [4]
SA0020	Total Petroleum Hydrocarbons	150		910		SD121I-9	5 / 10	52 - 66		NA		NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation.
   Lab duplicates were not included in the assessment. (dup) indicates that the maximum concentration was detected in a duplicate pair The
   maximum concentration reported is the average value of the sample and its duplicate. Range of reporting limits were presented for nondetects only.
   The maximum detected concentration was used for screening.
2. Background value is the maximum detected concentration of the Seneca background dataset.
3. Source of Screening Values: USEPA Ecological Soil Screen Levels, 2000, 2003, 2005
   USEPA Region III BTAG Screen levels
   USEPA Region 5 Ecological Soil Screening Levels, December 2003
   Oak Ridge, R.A. Efroymson, G.W. Suter II, B.E. Sample, and D.S. Jones, Preliminary Remediation Goals for Ecological Endpoints, August 1997
   Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, 1997 Revision
   Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on terrestrial Plants, 1997 Revisions
   CCME - Canadain Environmental Quality Guidelines, December 2003
   Dutch, Annexes Circular on target values and intervention values for soil remediation, February 2000
4. Rationale codes Selection Reason: Above Screening Levels (ASL)
   No Screening Value (NSV)
   Important Bioaccumulative Compounds (IBC)
   Deletion Reason: Essential Nutrient (NUT)
   Below Screening Level (BSL)
   Individual Chemicals Evaluated (ICE)
   Neutral pH Value Expected for Soil (NPH)

Definitions: COPC = Chemical of Potential Concern
Q = Qualifier
J = Estimated Value
NJ = Presence of the analyte has been "tentatively identified" and the associated numerical value represents its approximate concentration.

Table 7-2C
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE WATER
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

CAS Number	Chemical	Minimum Detected Concentration [1] (ug/L)	Q	Maximum Detected Concentration [1] (ug/L)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (ug/L)	Screening Value (ug/L)	Source of Screening Value [2]	COPC Flag	Rationale for Contaminant Deletion or Selection [3]
Semivolatile Organic Compounds												
85-68-7	Butylbenzylphthalate	1.1	J	1.1	J	SW121I-10	1 / 7	10 - 10	3.0	Region III BTAG	NO	BSL
206-44-0	Fluoranthene	1.1	J	1.1	J	SW121I-6	1 / 7	10 - 10	3,980.0	Region III BTAG	NO	BSL
Metals												
7429-90-5	Aluminum	23.9		2,050		SW121I-6	7 / 7		100	NYSDEC Class C	YES	ASL
7440-39-3	Barium	22.5		49.2		SW121I-1	6 / 7	9.9 - 9.9	10,000	Region III BTAG	NO	BSL
7440-41-7	Beryllium	0.14		0.28		SW121I-6	6 / 7	0.1 - 0.1	1,100	NYSDEC Class C	NO	BSL
7440-43-9	Cadmium	0.54		0.54		SW121I-10	1 / 7	0.4 - 0.8	0.42	NRWQC, CCC	YES	ASL
7440-70-2	Calcium	18,000		74,200		SW121I-1	7 / 7		NA		NO	NUT
7440-47-3	Chromium	1.1		6		SW121I-6	5 / 7	0.6 - 1.4	11	NRWQC, CCC for	YES	IBC
7440-48-4	Cobalt	2.8		3		SW121I-6	2 / 7	0.6 - 0.7	5	NYSDEC Class C	NO	BSL
7440-50-8	Copper	1.2		11.2		SW121I-6	6 / 7	3.6 - 3.6	17	NRWQC, CCC NYSDEC Class C	YES	IBC
7439-89-6	Iron	32.3	J	3,410		SW121I-6	5 / 7	17.3 - 17.3	300	NYSDEC Class C	YES	ASL
7439-92-1	Lead	4.3	J	26.3		SW121I-6	4 / 7	2.1 - 3	5.8	NRWQC, CCC	YES	ASL
7439-95-4	Magnesium	3,635		11,100		SW121I-1	7 / 7		NA		NO	NUT
7439-96-5	Manganese	0.8		206		SW121I-6	7 / 7		14,500	Region III BTAG	NO	BSL
7440-02-0	Nickel	3.5		3.6		SW121I-6	2 / 7	1.8 - 2	100	NRWQC, CCC NYSDEC, Class C	YES	IBC
7440-09-7	Potassium	645		4,640	J	SW121I-6	7 / 7		NA		NO	NUT
7782-49-2	Selenium	2.45	J	2.45	J	SW121I-7 (dup)	1 / 7	3 - 3	4.6	NYSDEC Class C	YES	IBC
7440-23-5	Sodium	2,240		38,500	J	SW121I-10	7 / 7		NA		NO	NUT
7440-62-2	Vanadium	2.1		3.9		SW121I-6	3 / 7	0.7 - 1.4	14	NYSDEC Class C	NO	BSL
7440-66-6	Zinc	12.5		190		SW121I-6	7 / 7		159	NYSDEC Class C	YES	ASL

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation.
Range of reporting limits were presented for nondetects only.
Laboratory duplicates were not included in the assessment. The maximum detected concentration was used for screening.

2. Source of Screening Values: NYSDEC. 1998 with addendum. New York State Ambient Water Quality Standards, Class C for Surface Water.
USEPA. 2002. National Recommended Water Quality Criteria: 2002.
USEPA Region III. 1995. Region III BTAG Screening Levels
Hardness for surface water was assumed to be 100 mg/L (CaCO3).

3. Rationale codes
Selection Reason: Above Screening Levels (ASL)
No Screening Value (NSV)
Important Bioaccumulative Compounds (IBC)
Deletion Reason: Essential Nutrient (NUT)
Below Screening Level (BSL)
Individual Chemicals Evaluated (ICE)
Neutral pH Value Expected for Soil (NPH)

Definitions:
COPC = Chemical of Potential Concern
Q = Qualifier
J = Estimated Value

Table 7-3
Policy Goals, Ecological Assessment and Measurement Endpoints, and Decision Rules
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Policy Goals	Assessment Endpoint	Measurement Endpoint	Decision Rule
Policy Goal: The protection of ecological species in undeveloped areas capable of sustaining wildlife populations in the vicinity of the sites.	**Assessment Endpoint**: Survival and reproduction of wildlife populations in the area of the sites. Four mammalian receptors (deer mouse, short-tailed shrew, meadow vole, and red fox) and one avian receptor (American robin) were selected to represent terrestrial populations at the sites. An additional avian receptor (great blue heron) was selected to evaluate potential exposure to ditch soil and surface water.	**Measurement Endpoint**: Chronic no-observed-adverse-effect-level (NOAEL) of COPCs on survival and reproduction of identified receptors.	**Decision Rule for Assessment Endpoint**: If ratios of estimated exposure dose predicted from COPC EPCs to NOAEL screening ecotoxicity values for adverse effects on identified receptors (HQs) are <1, then Assessment Endpoint is met and ecological species are not at risk. If ratios are > 1, the COPC is retained as a preliminary COC for further evaluation. Final COCs are recommended based on an evaluation of the available weight of evidence.

COPC = Chemical of potential concern
COC = Chemical of concern
EPC = Exposure point concentration
HQ = Hazard quotient
NOAEL = No observed adverse effect level

Table 7-4
CONVERSION FACTORS
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Category of Uncertainty	Conversion Factor[1]
Study Duration Conversion Factor[a]	
Chronic studies, equilibrium attained	1
Subchronic studies	10
Subacute studies	10
Acute studies	10
Single dose	10
Unknown	10
Endpoint Conversion Factor (for NOAEL endpoint)	
No-observed-effect level	1
No-observed-adverse-effect level	1
Lowest-observed-effect level	10
Lowest-observed-adverse-effect level	10
Effective concentration lethal to 50 percent of test population	10
Unknown	10
Endpoint Conversion Factor (for LOAEL endpoint)	
No-observed-effect level	0.1
No-observed-adverse-effect level	0.1
Lowest-observed-effect level	1
Lowest-observed-adverse-effect level	1
Effective concentration lethal to 50 percent of test population	10
Unknown	10

SEV = Screening Ecotoxicity Values
NOAEL = No Observed Adverse Effect Level
LOAEL = Lowest Observed Adverse Effect Level

(1) The product of the appropriate conversion factor from each uncertainty category becomes the conversion factor applied to develop the constituent-specific SEV.

(a) For the purposes of the Ecological Screening Level Risk Assessment, the following study duration definitions were applied:

Chronic - Greater than 90 days (gestation day studies considered chronic exposure).
Subchronic - From 30 to 90 days.
Subacute - From 7 to 29 days.
Acute - Less than 7 days.

TABLE 7-5A
NOAEL SCREENING ECOTOXICITY VALUES - DEER MOUSE
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF$^{(1)}$	SEV (mg/kg/day)$^{(2)}$
Volatile Organic Compounds						
Benzene	mouse	LOAEL/oral gavage/days6-12 of gestation/reproduction	Sample et al., 1996	263.6	10	2.75E+01
Ethyl benzene	rat	NOAEL/oral gavage/182 days/oral bioassay	Wolf et al., 1956, as cited in IRIS, 1991	97.1	1	1.17E+02
Meta/Para Xylene	mouse	NOAEL/oral gavage/days 6-15 of gestation/reproduction	Sample et al., 1996	2.1	1	2.19E+00
Semivolatile Organic Compounds						
3 or 4-methylphenol	mink	NOAEL/food consumption/6 months/reproduction for 2-methylphenol	Sample et al., 1996	219.2	1	2.82E+02
Acenaphthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Acenaphthylene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Benzo(a)anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Benzo(a)pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction	Sample et al., 1996	10	10	1.04E+00
Benzo(b)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Benzo(ghi)perylene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Benzo(k)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Bis(2-Ethylhexyl)phthalate	mouse	NOAEL/food consumption/105 days/reproduction	Sample et al., 1996	18.3	1	1.91E+01
Butylbenzylphthalate	rat	NOAEL/diet, 6 months/body weight	NTP, 1985, as cited in IRIS, 1993	159	1	1.92E+02
Carbazole	rat	LD50/oral	Sax, 1984	500	100	6.05E+00
Chrysene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Dibenz(a,h)anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction	Sample et al., 1996	10	10	1.04E+00
Dibenzofuran	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Di-n-octylphthalate	mouse	NOAEL/105 days	USEPA, 1999	7500	1	7.82E+03

TABLE 7-5A
NOAEL SCREENING ECOTOXICITY VALUES - DEER MOUSE
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)
Fluoranthene	mouse	LOAEL/13 wks/hepatic effects	ATSDR, 1995	125	10	1.30E+01
Fluorene	mouse	LOAEL/13 wks/hepatic effects	ATSDR, 1995	125	10	1.30E+01
Hexachlorobenzene	rat	NOAEL/chronic(>247days)	USEPA, 1999	1.6	1	1.93E+00
Indeno(1,2,3-cd)pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Naphthalene	mouse	LOAEL/diet, 81 wks/respiratory	ATSDR, 1995	71.6	10	7.47E+00
Phenanthrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Phenol	rat	NOAEL/oral gavage, gestation/developmental	NTP, 1983, as cited in IRIS, 2002	60	1	7.25E+01
Pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
PCBs						
Aroclor-1242	mink	LOAEL/diet, 7 months/reproduction	Sample et al., 1996	0.69	10	8.88E-02
Aroclor-1254	mink	NOAEL/diet, 4.5 months/reproduction	Sample et al., 1996	0.137	1	1.76E-01
Aroclor-1260	mink	NOAEL/diet, 4.5 months/reproduction, Aroclor-1254 used as a surrogate	Sample et al., 1996	0.137	1	1.76E-01
Pesticides						
4,4'-DDD	mouse	NOAEL/78 weeks, respiratory, female	ATSDR, 2002	142	1	1.48E+02
4,4'-DDE	rat	NOAEL/5 weeks	USEPA, 1999	10	10	1.21E+00
4,4'-DDT	rat	NOAEL/2 yr reproduction, oral	Sample et al., 1996	0.8	1	9.67E-01
Aldrin	rat	NOAEL/diet, 3 generations/reproduction	Sample et al., 1996	0.2	1	2.42E-01
Alpha-Chlordane	mouse	NOAEL/diet, 6 generations/reproduction, chlordane used as a surrogate	Sample et al., 1996	4.58	1	4.78E+00
Delta-BHC	rat	NOAEL/diet, 13 weeks/growth, blood chemistry, organic histology, beta-BHC used as a surrogate	Sample et al., 1996	4	1	4.84E+00
Dieldrin	rat	LOAEL/diet, 3 generations/reproduction	Sample et al., 1996	0.2	10	2.42E-02
Endosulfan I	rat	NOAEL/30 days, reproduction, blood chemistry, endosulfan used as surrogate	Sample et al., 1996	1.5	10	1.81E-01
Endosulfan II	rat	NOAEL/30 days, reproduction, blood chemistry, endosulfan used as surrogate	Sample et al., 1996	1.5	10	1.81E-01
Endrin	mouse	LOAEL/120 d, reproduction	Sample et al., 1996	0.92	10	9.60E-02
Endrin ketone	mouse	LOAEL/120 d, reproduction, endrin used as surrogate	Sample et al., 1996	0.92	10	9.60E-02
Gamma-Chlordane	mouse	NOAEL/diet, 6 generations/reproduction, chlordane used as a surrogate	Sample et al., 1996	4.58	1	4.78E+00

TABLE 7-5A
NOAEL SCREENING ECOTOXICITY VALUES - DEER MOUSE
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF$^{(1)}$	SEV (mg/kg/day)$^{(2)}$
Heptachlor	mink	LOAEL/181 d, reproduction	Sample et al., 1996	1	10	1.29E-01
Heptachlor epoxide	mink	LOAEL/181 d, reproduction, heptachlor used as a surrogate	Sample et al., 1996	1	10	1.29E-01
Inorganics						
Aluminum	mouse	LOAEL/mouse over 3 generations, >1 yr/reproduction	Sample et al., 1996	19.3	10	2.01E+00
Antimony	mouse	LOAEL/lifetime/lifespan, longevity	Sample et al., 1996	1.25	10	1.30E-01
Arsenic		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	1.04	1	1.04E+00
Barium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	51.8	1	5.18E+01
Cadmium	rat	NOAEL/6 wks through mating and gestation/reproduction	Sample et al., 1996	1	1	1.21E+00
Chromium	rat	NOAEL/90 d and 2 yr/reproduction, longevity, Cr(III)	Sample et al., 1996	2737	1	3.31E+03
Chromium, Hexavalent	rat	NOAEL/1 yr/body weight and food consumption	Sample et al., 1996	3.28	1	3.97E+00
Cobalt	rabbit	LOAEL/over 2 wks/cardiac, for cobalt sulfate	RTECS, 2004	140	100	1.95E+00
Copper	mink	NOAEL/357 d/reproduction	Sample et al., 1996	11.7	1	1.51E+01
Cyanide	rat	NOAEL/diet, gestation and lactation/reproduction	Sample et al., 1996	68.7	1	8.31E+01
Iron	Child	Based on the dietary reference intake for a child	Marilyn 2001	0.67	1	1.01E+00
Lead	Rat	Reproductive / 3 generations oral / NOAEL	Sample et al. 1996	8	1	9.67E+00
Manganese	rat	NOAEL/through gestation for 224 day/reproduction	Sample et al. 1996	88	1	1.06E+02
Mercury	mink	NOAEL/1 yr/reproduction, mercuric sulfide	Sample et al. 1996	1.0	1	1.29E+00
Nickel	Rat	Reproduction / 3 generations diet / NOAEL	Sample et al. 1996	40	1	4.84E+01
Selenium	rat	NOAEL/1yr through 2 generations/reproduction	Sample et al. 1996	0.20	1	2.42E-01
Silver	mouse	LOAEL/125 days/hypoactivity	USEPA, 1999	3.75	10	3.91E-01
Thallium	rat	LOAEL/60 days/testicular function	USEPA, 1999	1.31	10	1.58E-01
Vanadium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	4.16	1	4.16E+00
Zinc	Rat	Reproduction / day 1-16 of gestation diet / NOAEL	Sample et al. 1996	160	1	1.93E+02

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
CF = Conversion Factor
SEV = Screening Ecotoxicity Values
(1) For CFs, see Table 7-4
(2) SEV = Effective Dose x Scaling Factor / Total CF

TABLE 7-5A
NOAEL SCREENING ECOTOXICITY VALUES - DEER MOUSE
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)

Scaling Factors for Toxicity Values:

$SEV_w = SEV_t * (bw_t / bw_w)$ ^(1-b)

Where bw is the body weight, and t and w represent the test and wildlife species, respectively,
and b is the allometric scaling factor (b=0.94 for mammals, Sample et al., 1999)
For birds, the scaling factor was 1.

From Test Species	To: Deer Mouse	Body Weight (kg)
Lab Mouse	1.04	0.03
Rat	1.21	0.35
Mink	1.29	1
Rabbit	1.39	3.8
Child	1.51	15
Hamster	1.13	0.11
Deer Mouse	1.00	0.0148

References:
Agency for Toxic Substances and Disease Registry (ATSDR). On-line resources available at http://www.atsdr.cdc.gov/toxpro2.html.
Eisler, R. 1985-1995. Contaminant Hazards Review Series, Biological Report Series, US Fish and Wildlife Service, Patuxent Wildlife Research Center, Laurel, MD.
Sample et al., 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.
Sax, N.I. 1984. Dangerous Properties of Industrial Chemicals. 6th Ed.
Marilyn et al., 2001. Dietary Reference Intakes.
USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. 1999.
Registry of Toxic Effects of Chemical Substances (RTECS). On-line resources available at http://www.cdc.gov/niosh/rtecs.html
Sample, B.E., and C.A. Arenal. 1999. Allometric Models for Inter-species Extrapolation of Wildlife Toxicity Data. Bull Environ Contam Toxicol. 62:653-663.
National Research Council. 1994. Nutrient Requirements of Poultry.
USEPA. 2005. Ecological Soil Screening Levels.
USEPA. Integrated Risk Information System (IRIS). On-line database available at http://www.epa.gov/iris/.

TABLE 7-5B
NOAEL SCREENING ECOTOXICITY VALUES - SHORT-TAILED SHREW
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Volatile Organic Compounds						
Benzene	mouse	LOAEL/oral gavage/days6-12 of gestation/reproduction	Sample et al., 1996	263.6	10	2.75E+01
Ethyl benzene	rat	NOAEL/oral gavage/182 days/oral bioasay	Wolf et al., 1956, as cited in IRIS, 1991	97.1	1	1.17E+02
Meta/Para Xylene	mouse	NOAEL/oral gavage/days 6-15 of gestation/reproduction	Sample et al., 1996	2.1	1	2.19E+00
Semivolatile Organic Compounds						
3 or 4-methylphenol	mink	NOAEL/food consumption/6 months/reproduction for 2-methylphenol	Sample et al., 1996	219.2	1	2.82E+02
Acenaphthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Acenaphthylene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Benzo(a)anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Benzo(a)pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction	Sample et al., 1996	10	10	1.04E+00
Benzo(b)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Benzo(ghi)perylene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00

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NOAEL SCREENING ECOTOXICITY VALUES - SHORT-TAILED SHREW
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Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)
Benzo(k)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Bis(2-Ethylhexyl)phthalate	mouse	NOAEL/food consumption/105 days/reproduction	Sample et al., 1996	18.3	1	1.91E+01
Butylbenzylphthalate	rat	NOAEL/diet, 6 months/body weight	NTP, 1985, as cited in IRIS, 1993	159	1	1.92E+02
Carbazole	rat	LD50/oral	Sax, 1984	500	100	6.04E+00
Chrysene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Dibenz(a,h)anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Dibenzofuran	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Di-n-octylphthalate	mouse	NOAEL/105 days	USEPA, 1999	7500	1	7.82E+03
Fluoranthene	mouse	LOAEL/13 wks/hepatic effects	ATSDR, 1995	125	10	1.30E+01
Fluorene	mouse	LOAEL/13 wks/hepatic effects	ATSDR, 1995	125	10	1.30E+01
Hexachlorobenzene	rat	NOAEL/chronic(>247days)	USEPA, 1999	1.6	1	1.93E+00
Indeno(1,2,3-cd)pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Naphthalene	mouse	LOAEL/diet, 81 wks/respiratory	ATSDR, 1995	71.6	10	7.46E+00
Phenanthrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00
Phenol	rat	NOAEL/oral gavage, gestation/developmental	NTP, 1983, as cited in IRIS, 2002	60	1	7.25E+01
Pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	1.04E+00

TABLE 7-5B
NOAEL SCREENING ECOTOXICITY VALUES - SHORT-TAILED SHREW
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Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)
PCBs						
Aroclor-1242	mink	LOAEL/diet, 7 months/reproduction	Sample et al., 1996	0.69	10	8.88E-02
Aroclor-1254	mink	NOAEL/diet, 4.5 months/reproduction	Sample et al., 1996	0.137	1	1.76E-01
Aroclor-1260	mink	NOAEL/diet, 4.5 months/reproduction, Aroclor-1254 used as a surrogate	Sample et al., 1996	0.137	1	1.76E-01
Pesticides						
4,4'-DDD	mouse	NOAEL/78 weeks, respiratory, female	ATSDR, 2002	142	1	1.48E+02
4,4'-DDE	rat	NOAEL/5 weeks	USEPA, 1999	10	10	1.21E+00
4,4'-DDT	rat	NOAEL/2 yr reproduction, oral	Sample et al., 1996	0.8	1	9.66E-01
Aldrin	rat	NOAEL/diet, 3 generations/reproduction	Sample et al., 1996	0.2	1	2.42E-01
Alpha-Chlordane	mouse	NOAEL/diet, 6 generations/reproduction, chlordane used as a surrogate	Sample et al., 1996	4.58	1	4.77E+00
Delta-BHC	rat	NOAEL/diet, 13 weeks/growth, blood chemistry, organi histology, beta-BHC used as a surrogate	Sample et al., 1996	4	1	4.83E+00
Dieldrin	rat	LOAEL/diet, 3 generations/reproduction	Sample et al., 1996	0.2	10	2.42E-02
Endosulfan I	rat	NOAEL/30 days, reproduction, blood chemistry, endosulfan used as surrogate	Sample et al., 1996	1.5	10	1.81E-01
Endosulfan II	rat	NOAEL/30 days, reproduction, blood chemistry, endosulfan used as surrogate	Sample et al., 1996	1.5	10	1.81E-01
Endrin	mouse	LOAEL/120 d, reproduction	Sample et al., 1996	0.92	10	9.59E-02
Endrin ketone	mouse	LOAEL/120 d, reproduction, endrin used as surrogate	Sample et al., 1996	0.92	10	9.59E-02
Gamma-Chlordane	mouse	NOAEL/diet, 6 generations/reproduction, chlordane used as a surrogate	Sample et al., 1996	4.58	1	4.77E+00
Heptachlor	mink	LOAEL/181 d, reproduction	Sample et al., 1996	1	10	1.29E-01

TABLE 7-5B
NOAEL SCREENING ECOTOXICITY VALUES - SHORT-TAILED SHREW
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Heptachlor epoxide	mink	LOAEL/181 d, reproduction, heptachlor used as a surrogate	Sample et al., 1996	1	10	1.29E-01
Inorganics						
Aluminum	mouse	LOAEL/mouse over 3 generations, >1 yr/reproduction	Sample et al., 1996	19.3	10	2.01E+00
Antimony	mouse	LOAEL/lifetime/lifespan, longevity	Sample et al., 1996	1.25	10	1.30E-01
Arsenic		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	1.04	1	1.04E+00
Barium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	51.8	1	5.18E+01
Cadmium	rat	NOAEL/6 wks through mating and gestation/reproduction	Sample et al., 1996	1	1	1.21E+00
Chromium	rat	NOAEL/90 d and 2 yr/reproduction, longevity, Cr(III)	Sample et al., 1996	2737	1	3.31E+03
Chromium, Hexavalent	rat	NOAEL/1 yr/body weight and food consumption	Sample et al., 1996	3.28	1	3.96E+00
Cobalt	rabbit	LOAEL/over 2 wks/cardiac, for cobalt sulfate	RTECS, 2004	140	100	1.95E+00
Copper	mink	NOAEL/357 d/reproduction	Sample et al., 1996	11.7	1	1.51E+01
Cyanide	rat	NOAEL/diet, gestation and lactation/reproduction	Sample et al., 1996	68.7	1	8.30E+01
Iron	Child	Based on the dietary reference intake for a child	Marilyn 2001	0.67	1	1.01E+00
Lead	Rat	Reproductive / 3 generations oral / NOAEL	Sample et al. 1996	8	1	9.66E+00
Manganese	rat	NOAEL/through gestation for 224 day/reproduction	Sample et al. 1996	88	1	1.06E+02
Mercury	mink	NOAEL/1 yr/reproduction, mercuric sulfide	Sample et al. 1996	1.0	1	1.29E+00
Nickel	Rat	Reproduction / 3 generations diet / NOAEL	Sample et al. 1996	40	1	4.83E+01
Selenium	rat	NOAEL/1yr through 2 generations/reproduction	Sample et al. 1996	0.20	1	2.42E-01

TABLE 7-5B
NOAEL SCREENING ECOTOXICITY VALUES - SHORT-TAILED SHREW
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)
Silver	mouse	LOAEL/125 days/hypoactivity	USEPA, 1999	3.75	10	3.91E-01
Thallium	rat	LOAEL/60 days/testicular function	USEPA, 1999	1.31	10	1.58E-01
Vanadium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	4.16	1	4.16E+00
Zinc	Rat	Reproduction / day 1-16 of gestation diet / NOAEL	Sample et al. 1996	160	1	1.93E+02

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
CF = Conversion Factor
SEV = Screening Ecotoxicity Values
(1) For CFs, see Table 7-4
(2) SEV = Effective Dose x Scaling Factor / Total CF

Scaling Factors for Toxicity Values:

$SEV_w = SEV_t * (bw_t / bw_w)$ ^(1-b)

Where bw is the body weight, and t and w represent the test and wildlife species, respectively, and b is the allometric scaling factor (b=0.94 for mammals, Sample et al., 1999)

From Test Species	To: Short-Tailed Shrew	Body Weight (kg)
Lab Mouse	1.04	0.03
Rat	1.21	0.35
Mink	1.29	1
Rabbit	1.39	3.8
Child	1.51	15
Hamster	1.13	0.11
Short-Tailed Shrew	1.00	0.015

References:

Agency for Toxic Substances and Disease Registry (ATSDR). On-line resources available at http://www.atsdr.cdc.gov/toxpro2.html.
Sample et al., 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.

TABLE 7-5B
NOAEL SCREENING ECOTOXICITY VALUES - SHORT-TAILED SHREW
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)

Sax, N.I. 1984. Dangerous Properties of Industrial Chemicals. 6th Ed.

Marilyn et al., 2001. Dietary Reference Intakes.

USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. 1999.

Registry of Toxic Effects of Chemical Substances (RTECS). On-line resources available at http://www.cdc.gov/niosh/rtecs.html

Sample, B.E., and C.A. Arenal. 1999. Allometric Models for Inter-species Extrapolation of Wildlife Toxicity Data. Bull Environ Contam Toxicol. 62:653-663.

USEPA. 2005. Ecological Soil Screening Levels.

USEPA. Integrated Risk Information System (IRIS). On-line database available at http://www.epa.gov/iris/.

TABLE 7-5C
NOAEL SCREENING ECOTOXICITY VALUES - AMERICAN ROBIN AND GREAT BLUE HERON
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)
Volatile Organic Compounds						
Benzene	Ecotoxicity values not identified					
Ethyl benzene	Ecotoxicity values not identified					
Meta/Para Xylene	Japanese quail	NOAEL/diet, 5 days	Hill and Camardese, 1986	667	1	6.67E+02
Semivolatile Organic Compounds						
3 or 4-Methylphenol	red-winged blackbird	LD50/diet, 18 hours/mortality	Schafer et al., 1983	96	100	9.60E-01
Acenaphthene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Acenaphthylene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Anthracene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Benzo(a)anthracene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Benzo(a)pyrene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Benzo(b)fluoranthene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Benzo(ghi)perylene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Benzo(k)fluoranthene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Bis(2-Ethylhexyl)phthalate	ringed dove	NOAEL/diet 4 weeks/reproduction	Sample et al., 1996	1.1	1	1.10E+00
Butylbenzylphthalate	ringed dove	NOAEL/diet 4 weeks/reproduction, bis(2-ethylhexyl)phthalate used as a surrogate	Sample et al., 1996	1.1	1	1.10E+00
Carbazole	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Chrysene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01

TABLE 7-5C
NOAEL SCREENING ECOTOXICITY VALUES - AMERICAN ROBIN AND GREAT BLUE HERON
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Dibenz(a,h)anthracene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Dibenzofuran	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Di-n-octylphthalate	ring-necked pheasant	LD50/oral in diet, 5-days exposure; 3-days observation	Hill et al., 1975	1160	100	1.16E+01
Fluoranthene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Fluorene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Hexachlorobenzene	coturnix quail	NOAEL/5 days	USEPA, 1999	22.5	10	2.25E+00
Indeno(1,2,3-cd)pyrene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Naphthalene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Phenanthrene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
Phenol	red-winged blackbird	LD50/oral, 18 hrs/mortality	Schafer et al., 1983	113	100	1.13E+00
Pyrene	mallard	LOAEL/diet 7 months/physiological for mixed PAHs	Eisler, 1987	285	10	2.85E+01
PCBs						
Aroclor-1242	screech owl	NOAEL/diet, 2 generations/reproduction	Sample et al., 1996	0.41	1	4.10E-01
Aroclor-1254	ring-necked pheasant	LOAEL/oral via gelatin capsule, 17 weeks/reproduction	Sample et al., 1996	1.8	10	1.80E-01
Aroclor-1260	ring-necked pheasant	LOAEL/oral via gelatin capsule, 17 weeks/reproduction, Aroclor-1254 used as a surrogate	Sample et al., 1996	1.8	10	1.80E-01
Pesticides						
4,4'-DDD	Coturnix quail	Acute (5 days) LOAEL (mortality), 4,4'-DDE used as surrogate	USEPA, 1999	84.5	100	8.45E-01
4,4'-DDE	Coturnix quail	Acute (5 days) LOAEL (mortality)	USEPA, 1999	84.5	100	8.45E-01

TABLE 7-5C
NOAEL SCREENING ECOTOXICITY VALUES - AMERICAN ROBIN AND GREAT BLUE HERON
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)
4,4'-DDT	brown pelican	LOAEL/diet, 5 yr, reproduction	Sample et al., 1996	0.028	10	2.80E-03
Aldrin	starling	LD50/oral, 18 hours/mortality	Schafer et al., 1983	5	100	5.00E-02
Alpha-Chlordane	red-winged blackbird	NOAEL/diet, 84 days/mortality	Sample et al., 1996	2.14	1	2.14E+00
Delta-BHC	Japanese quail	NOAEL/diet, 90 days/reproduction for BHC mixed isomers	Sample et al., 1996	0.563	1	5.63E-01
Dieldrin	barn owl	NOAEL/diet, 2 years/reproductions	Sample et al., 1996	0.077	1	7.70E-02
Endosulfan I	gray patridge	NOAEL/4 weeks critical lifestage, reproduction, endosulfan used as surrogate	Sample et al., 1996	10	1	1.00E+01
Endosulfan II	gray patridge	NOAEL/4 weeks critical lifestage, reproduction, endosulfan used as surrogate	Sample et al., 1996	10	1	1.00E+01
Endrin	mallard duck	NOAEL/>200d, reproduction	Sample et al., 1996	0.3	1	3.00E-01
Endrin ketone	mallard duck	NOAEL/>200d, reproduction, endrin used as a surrogate	Sample et al., 1996	0.3	1	3.00E-01
Gamma-Chlordane	red-winged blackbird	NOAEL/diet, 84 days/mortality	Sample et al., 1996	2.14	1	2.14E+00
Heptachlor	quail	heptachlor used as a surrogate	USEPA, 1999	6.5	100	6.50E-02
Heptachlor epoxide	quail	LOAEL/5 days, mortality, heptachlor used as a surrogate	USEPA, 1999	6.5	100	6.50E-02
Inorganics						
Aluminum	ringed dove	NOAEL/4 months/reproduction	Sample et al., 1996	109.7	1	1.10E+02
Antimony	Screening Ecological Value not available					
Arsenic	cowbird	NOAEL/7 months/mortality	Sample et al., 1996	2.46	1	2.46E+00
Barium	chick	NOAEL/4 wk/mortality	Sample et al., 1996	208.26	10	2.08E+01
Cadmium	mallard ducks	NOAEL/90 d/reproduction	Sample et al., 1996	1.45	1	1.45E+00

TABLE 7-5C
NOAEL SCREENING ECOTOXICITY VALUES - AMERICAN ROBIN AND GREAT BLUE HERON
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Chromium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	2.66	1	2.66E+00
Chromium, Hexavalent	black duck	NOAEL/10 month/reproduction for Cr(III)	Sample et al., 1996	1	1	1.00E+00
Cobalt	chicken	Toxic dietary concentration	NRC 1994	100	1	1.00E+02
Copper	chick	NOAEL/10 weeks/growth, mortality	Sample et al., 1996	47	1	4.70E+01
Cyanide	day-old chick	NOAEL/diet, 8 weeks/survival, growth, histology, hemoglobin, hematocrit, and lymphocyte number	Gomez et al. 1988, as cited in Eisler, 1987	4	10	4.00E-01
Iron	Chicken	Toxic dietary concentration	NRC, 1994	4500	1	4.50E+03
Lead	American Kestrels	NOAEL/7 months/reproduction	Sample et al. 1996	3.85	1	3.85E+00
Manganese	Japanese quail	NOAEL/75 d/growth, aggressive behavior	Sample et al. 1996	977	10	9.77E+01
Mercury	Japanese quail	NOAEL/1 yr/reproduction, mercuric chloride	Sample et al. 1996	0.45	1	4.50E-01
Nickel	mallard duckling	NOAEL/90 d/mortality, growth, behavior	Sample et al. 1996	77.4	1	7.74E+01
Selenium	mallard duck	NOAEL/78 days/reproduction	Sample et al. 1996	0.5	1	5.00E-01
Silver	mallard	NOAEL/14 days	USEPA, 1999	1780	10	1.78E+02
Thallium	wild bird	Lowest lethal dose to wild bird	RTECS, 2004	37	100	3.70E-01
Vanadium	mallard duck	NOAEL/12 wks/mortality, body weight, blood chemistry	Sample et al. 1996	11.4	1	1.14E+01
Zinc	Leghorn hen and New Hampshire rooster	NOAEL/44 wks	USEPA, 1999	130.9	1	1.31E+02

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
CF = Conversion Factor
SEV = Screening Ecotoxicity Values
(1) For CFs, see Table 7-4

TABLE 7-5C
NOAEL SCREENING ECOTOXICITY VALUES - AMERICAN ROBIN AND GREAT BLUE HERON
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Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)

(2) SEV = Effective Dose x Scaling Factor / Total CF

References:
Eisler, R. 1985-1995. Contaminant Hazards Review Series, Biological Report Series, US Fish and Wildlife Service, Patuxent Wildlife Research Center, Laurel, MD.
Sample et al., 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.
USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. 1999.
Registry of Toxic Effects of Chemical Substances (RTECS). On-line resources available at http://www.cdc.gov/niosh/rtecs.html
National Research Council. 1994. Nutrient Requirements of Poultry.
USEPA. ECOTOX Database. On-line resources available at http://www.epa.gov/ecotox/

TABLE 7-5D
NOAEL SCREENING ECOTOXICITY VALUES - MEADOW VOLE
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF$^{(1)}$	SEV (mg/kg/day)$^{(2)}$
Volatile Organic Compounds						
Benzene	mouse	LOAEL/oral gavage/days6-12 of gestation/reproduction	Sample et al., 1996	263.6	10	2.59E+01
Ethyl benzene	rat	NOAEL/oral gavage/182 days/oral bioasay	Wolf et al., 1956, as cited in IRIS, 1991	97.1	1	1.11E+02
Meta/Para Xylene	mouse	NOAEL/oral gavage/days 6-15 of gestation/reproduction	Sample et al., 1996	2.1	1	2.07E+00
Semivolatile Organic Compounds						
3 or 4-methylphenol	mink	NOAEL/food consumption/6 months/reproduction for 2-methylphenol	Sample et al., 1996	219.2	1	2.66E+02
Acenaphthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Acenaphthylene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Benzo(a)anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Benzo(a)pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction	Sample et al., 1996	10	10	9.84E-01
Benzo(b)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Benzo(ghi)perylene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Benzo(k)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Bis(2-Ethylhexyl)phthalate	mouse	NOAEL/food consumption/105 days/reproduction	Sample et al., 1996	18.3	1	1.80E+01

TABLE 7-5D
NOAEL SCREENING ECOTOXICITY VALUES - MEADOW VOLE
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Butylbenzylphthalate	rat	NOAEL/diet, 6 months/body weight	NTP, 1985, as cited in IRIS, 1993	159	1	1.81E+02
Carbazole	rat	LD50/oral	Sax, 1984	500	100	5.70E+00
Chrysene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Dibenz(a,h)anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Dibenzofuran	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Di-n-octylphthalate	mouse	NOAEL/105 days	USEPA, 1999	7500	1	7.38E+03
Fluoranthene	mouse	LOAEL/13 wks/hepatic effects	ATSDR, 1995	125	10	1.23E+01
Fluorene	mouse	LOAEL/13 wks/hepatic effects	ATSDR, 1995	125	10	1.23E+01
Hexachlorobenzene	rat	NOAEL/chronic(>247days)	USEPA, 1999	1.6	1	1.83E+00
Indeno(1,2,3-cd)pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Naphthalene	mouse	LOAEL/diet, 81 wks/respiratory	ATSDR, 1995	71.6	10	7.05E+00
Phenanthrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
Phenol	rat	NOAEL/oral gavage, gestation/developmental	NTP, 1983, as cited in IRIS, 2002	60	1	6.84E+01
Pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	9.84E-01
PCBs						
Aroclor-1242	mink	LOAEL/diet, 7 months/reproduction	Sample et al., 1996	0.69	10	8.38E-02
Aroclor-1254	mink	NOAEL/diet, 4.5 months/reproduction	Sample et al., 1996	0.137	1	1.66E-01
Aroclor-1260	mink	NOAEL/diet, 4.5 months/reproduction, Aroclor-1254 used as a surrogate	Sample et al., 1996	0.137	1	1.66E-01
Pesticides						
4,4'-DDD	mouse	NOAEL/78 weeks, respiratory, female	ATSDR, 2002	142	1	1.40E+02
4,4'-DDE	rat	NOAEL/5 weeks	USEPA, 1999	10	10	1.14E+00

TABLE 7-5D
NOAEL SCREENING ECOTOXICITY VALUES - MEADOW VOLE
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
4,4'-DDT	rat	NOAEL/2 yr reproduction, oral	Sample et al., 1996	0.8	1	9.13E-01
Aldrin	rat	NOAEL/diet, 3 generations/reproduction	Sample et al., 1996	0.2	1	2.28E-01
Alpha-Chlordane	mouse	NOAEL/diet, 6 generations/reproduction, chlordane used as a surrogate	Sample et al., 1996	4.58	1	4.51E+00
Delta-BHC	rat	NOAEL/diet, 13 weeks/growth, blood chemistry, organi histology, beta-BHC used as a surrogate	Sample et al., 1996	4	1	4.56E+00
Dieldrin	rat	LOAEL/diet, 3 generations/reproduction	Sample et al., 1996	0.2	10	2.28E-02
Endosulfan I	rat	NOAEL/30 days, reproduction, blood chemistry, endosulfan used as surrogate	Sample et al., 1996	1.5	10	1.71E-01
Endosulfan II	rat	NOAEL/30 days, reproduction, blood chemistry, endosulfan used as surrogate	Sample et al., 1996	1.5	10	1.71E-01
Endrin	mouse	LOAEL/120 d, reproduction	Sample et al., 1996	0.92	10	9.06E-02
Endrin ketone	mouse	LOAEL/120 d, reproduction, endrin used as surrogate	Sample et al., 1996	0.92	10	9.06E-02
Gamma-Chlordane	mouse	NOAEL/diet, 6 generations/reproduction, chlordane used as a surrogate	Sample et al., 1996	4.58	1	4.51E+00
Heptachlor	mink	LOAEL/181 d, reproduction	Sample et al., 1996	1	10	1.21E-01
Heptachlor epoxide	mink	LOAEL/181 d, reproduction, heptachlor used as a surrogate	Sample et al., 1996	1	10	1.21E-01
Inorganics						
Aluminum	mouse	LOAEL/mouse over 3 generations, >1 yr/reproduction	Sample et al., 1996	19.3	10	1.90E+00
Antimony	mouse	LOAEL/lifetime/lifespan, longevity	Sample et al., 1996	1.25	10	1.23E-01
Arsenic		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	1.04	1	1.04E+00
Barium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2003	51.8	1	5.18E+01
Cadmium	rat	NOAEL/6 wks through mating and gestation/reproduction	Sample et al., 1996	1	1	1.14E+00
Chromium	rat	NOAEL/90 d and 2 yr/reproduction, longevity, Cr(III)	Sample et al., 1996	2737	1	3.12E+03

TABLE 7-5D
NOAEL SCREENING ECOTOXICITY VALUES - MEADOW VOLE
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)
Chromium, Hexavalent	rat	NOAEL/1 yr/body weight and food consumption	Sample et al., 1996	3.28	1	3.74E+00
Cobalt	rabbit	LOAEL/over 2 wks/cardiac, for cobalt sulfate	RTECS, 2004	140	100	1.84E+00
Copper	mink	NOAEL/357 d/reproduction	Sample et al., 1996	11.7	1	1.42E+01
Cyanide	rat	NOAEL/diet, gestation and lactation/reproduction	Sample et al., 1996	68.7	1	7.84E+01
Iron	Child	Based on the dietary reference intake for a child	Marilyn 2001	0.67	1	9.58E-01
Lead	Rat	Reproductive / 3 generations oral / NOAEL	Sample et al. 1996	8	1	9.13E+00
Manganese	rat	NOAEL/through gestation for 224 day/reproduction	Sample et al. 1996	88	1	1.00E+02
Mercury	mink	NOAEL/1 yr/reproduction, mercuric sulfide	Sample et al. 1996	1.0	1	1.21E+00
Nickel	Rat	Reproduction / 3 generations diet / NOAEL	Sample et al. 1996	40	1	4.56E+01
Selenium	rat	NOAEL/1yr through 2 generations/reproduction	Sample et al. 1996	0.20	1	2.28E-01
Silver	mouse	LOAEL/125 days/hypoactivity	USEPA, 1999	3.75	10	3.69E-01
Thallium	rat	LOAEL/60 days/testicular function	USEPA, 1999	1.31	10	1.49E-01
Vanadium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	4.16	1	4.16E+00
Zinc	Rat	Reproduction / day 1-16 of gestation diet / NOAEL	Sample et al. 1996	160	1	1.83E+02

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
CF = Conversion Factor
SEV = Screening Ecotoxicity Values
(1) For CFs, see Table 7-4
(2) SEV = Effective Dose x Scaling Factor / Total CF

Scaling Factors for Toxicity Values:

$SEV_w = SEV_t * (bw_t / bw_w)$ ^(1-b)

Where bw is the body weight, and t and w represent the test and wildlife species, respectively, and b is the allometric scaling factor (b=0.94 for mammals, Sample et al., 1999)

TABLE 7-5D
NOAEL SCREENING ECOTOXICITY VALUES - MEADOW VOLE
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COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)

From Test Species	**To: Red Fox**	**Weight (kg)**
Lab Mouse	0.98	0.03
Rat	1.14	0.35
Mink	1.21	1
Rabbit	1.32	3.8
Child	1.43	15
Hamster	1.06	0.11
Meadow Vole	1.00	3.90E-02

References:

Agency for Toxic Substances and Disease Registry (ATSDR). On-line resources available at http://www.atsdr.cdc.gov/toxpro2.html.

Sample et al., 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.

Sax, N.I. 1984. Dangerous Properties of Industrial Chemicals. 6th Ed.

Marilyn et al., 2001. Dietary Reference Intakes.

USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. 1999.

Registry of Toxic Effects of Chemical Substances (RTECS). On-line resources available at http://www.cdc.gov/niosh/rtecs.html

Sample, B.E., and C.A. Arenal. 1999. Allometric Models for Inter-species Extrapolation of Wildlife Toxicity Data. Bull Environ Contam Toxicol. 62:653-663.

USEPA. Integrated Risk Information System (IRIS). On-line database available at http://www.epa.gov/iris/.

TABLE 7-5E
NOAEL SCREENING ECOTOXICITY VALUES - RED FOX
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Volatile Organic Compounds						
Benzene	mouse	LOAEL/oral gavage/days6-12 of gestation/reproduction	Sample et al., 1996	263.6	10	1.97E+01
Ethyl benzene	rat	NOAEL/oral gavage/182 days/oral bioasay	Wolf et al., 1956, as cited in IRIS, 1991	97.1	1	8.40E+01
Meta/Para Xylene	mouse	NOAEL/oral gavage/days 6-15 of gestation/reproduction	Sample et al., 1996	2.1	1	1.57E+00
Semivolatile Organic Compounds						
3 or 4-methylphenol	mink	NOAEL/food consumption/6 months/reproduction for 2-methylphenol	Sample et al., 1996	219.2	1	2.02E+02
Acenaphthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Acenaphthylene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Benzo(a)anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Benzo(a)pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction	Sample et al., 1996	10	10	7.46E-01
Benzo(b)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Benzo(ghi)perylene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01

TABLE 7-5E
NOAEL SCREENING ECOTOXICITY VALUES - RED FOX
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Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Benzo(k)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Bis(2-Ethylhexyl)phthalate	mouse	NOAEL/food consumption/105 days/reproduction	Sample et al., 1996	18.3	1	1.37E+01
Butylbenzylphthalate	rat	NOAEL/diet, 6 months/body weight	NTP, 1985, as cited in IRIS, 1993	159	1	1.38E+02
Carbazole	rat	LD50/oral	Sax, 1984	500	100	4.32E+00
Chrysene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Dibenz(a,h)anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Dibenzofuran	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Di-n-octylphthalate	mouse	NOAEL/105 days	USEPA, 1999	7500	1	5.60E+03
Fluoranthene	mouse	LOAEL/13 wks/hepatic effects	ATSDR, 1995	125	10	9.33E+00
Fluorene	mouse	LOAEL/13 wks/hepatic effects	ATSDR, 1995	125	10	9.33E+00
Hexachlorobenzene	rat	NOAEL/chronic(>247days)	USEPA, 1999	1.6	1	1.38E+00
Indeno(1,2,3-cd)pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Naphthalene	mouse	LOAEL/diet, 81 wks/respiratory	ATSDR, 1995	71.6	10	5.34E+00
Phenanthrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01
Phenol	rat	NOAEL/oral gavage, gestation/developmental	NTP, 1983, as cited in IRIS, 2002	60	1	5.19E+01
Pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	10	7.46E-01

TABLE 7-5E
NOAEL SCREENING ECOTOXICITY VALUES - RED FOX
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF$^{(1)}$	SEV (mg/kg/day)$^{(2)}$
PCBs						
Aroclor-1242	mink	LOAEL/diet, 7 months/reproduction	Sample et al., 1996	0.69	10	6.36E-02
Aroclor-1254	mink	NOAEL/diet, 4.5 months/reproduction	Sample et al., 1996	0.137	1	1.26E-01
Aroclor-1260	mink	NOAEL/diet, 4.5 months/reproduction, Aroclor-1254 used as a surrogate	Sample et al., 1996	0.137	1	1.26E-01
Pesticides						
4,4'-DDD	mouse	NOAEL/78 weeks, respiratory, female	ATSDR, 2002	142	1	1.06E+02
4,4'-DDE	rat	NOAEL/5 weeks	USEPA, 1999	10	10	8.65E-01
4,4'-DDT	rat	NOAEL/2 yr reproduction, oral	Sample et al., 1996	0.8	1	6.92E-01
Aldrin	rat	NOAEL/diet, 3 generations/reproduction	Sample et al., 1996	0.2	1	1.73E-01
Alpha-Chlordane	mouse	NOAEL/diet, 6 generations/reproduction, chlordane used as a surrogate	Sample et al., 1996	4.58	1	3.42E+00
Delta-BHC	rat	NOAEL/diet, 13 weeks/growth, blood chemistry, organi histology, beta-BHC used as a surrogate	Sample et al., 1996	4	1	3.46E+00
Dieldrin	rat	LOAEL/diet, 3 generations/reproduction	Sample et al., 1996	0.2	10	1.73E-02
Endosulfan I	rat	NOAEL/30 days, reproduction, blood chemistry, endosulfan used as surrogate	Sample et al., 1996	1.5	10	1.30E-01
Endosulfan II	rat	NOAEL/30 days, reproduction, blood chemistry, endosulfan used as surrogate	Sample et al., 1996	1.5	10	1.30E-01
Endrin	mouse	LOAEL/120 d, reproduction	Sample et al., 1996	0.92	10	6.87E-02
Endrin ketone	mouse	LOAEL/120 d, reproduction, endrin used as surrogate	Sample et al., 1996	0.92	10	6.87E-02
Heptachlor epoxide	mink	LOAEL/181 d, reproduction, heptachlor used as a surrogate	Sample et al., 1996	1	10	9.21E-02
Gamma-Chlordane	mouse	NOAEL/diet, 6 generations/reproduction, chlordane used as a surrogate	Sample et al., 1996	4.58	1	3.42E+00

TABLE 7-5E
NOAEL SCREENING ECOTOXICITY VALUES - RED FOX
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF$^{(1)}$	SEV (mg/kg/day)$^{(2)}$
Heptachlor	mink	LOAEL/181 d, reproduction	Sample et al., 1996	1	10	9.21E-02
Heptachlor epoxide	mink	LOAEL/181 d, reproduction, heptachlor used as a surrogate	Sample et al., 1996	1	10	9.21E-02
Inorganics						
Aluminum	mouse	LOAEL/mouse over 3 generations, >1 yr/reproduction	Sample et al., 1996	19.3	10	1.44E+00
Antimony	mouse	LOAEL/lifetime/lifespan, longevity	Sample et al., 1996	1.25	10	9.33E-02
Arsenic		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	1.04	1	1.04E+00
Barium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2003	51.8	1	5.18E+01
Cadmium	rat	NOAEL/6 wks through mating and gestation/reproduction	Sample et al., 1996	1	1	8.65E-01
Chromium	rat	NOAEL/90 d and 2 yr/reproduction, longevity, Cr(III)	Sample et al., 1996	2737	1	2.37E+03
Chromium, Hexavalent	rat	NOAEL/1 yr/body weight and food consumption	Sample et al., 1996	3.28	1	2.84E+00
Cobalt	rabbit	LOAEL/over 2 wks/cardiac, for cobalt sulfate	RTECS, 2004	140	100	1.40E+00
Copper	mink	NOAEL/357 d/reproduction	Sample et al., 1996	11.7	1	1.08E+01
Cyanide	rat	NOAEL/diet, gestation and lactation/reproduction	Sample et al., 1996	68.7	1	5.94E+01
Iron	Child	Based on the dietary reference intake for a child	Marilyn 2001	0.67	1	7.26E-01
Lead	Rat	Reproductive / 3 generations oral / NOAEL	Sample et al. 1996	8	1	6.92E+00
Manganese	rat	NOAEL/through gestation for 224 day/reproduction	Sample et al. 1996	88	1	7.61E+01
Mercury	mink	NOAEL/1 yr/reproduction, mercuric sulfide	Sample et al. 1996	1.0	1	9.21E-01
Nickel	Rat	Reproduction / 3 generations diet / NOAEL	Sample et al. 1996	40	1	3.46E+01

TABLE 7-5E
NOAEL SCREENING ECOTOXICITY VALUES - RED FOX
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Selenium	rat	NOAEL/1yr through 2 generations/reproduction	Sample et al. 1996	0.20	1	1.73E-01
Silver	mouse	LOAEL/125 days/hypoactivity	USEPA, 1999	3.75	10	2.80E-01
Thallium	rat	LOAEL/60 days/testicular function	USEPA, 1999	1.31	10	1.13E-01
Vanadium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	4.16	1	4.16E+00
Zinc	Rat	Reproduction / day 1-16 of gestation diet / NOAEL	Sample et al. 1996	160	1	1.38E+02

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
CF = Conversion Factor
SEV = Screening Ecotoxicity Values
(1) For CFs, see Table 7-4
(2) SEV = Effective Dose x Scaling Factor / Total CF

Scaling Factors for Toxicity Values:

$SEV_w = SEV_t * (bw_t / bw_w)$ ^(1-b)

Where bw is the body weight, and t and w represent the test and wildlife species, respectively, and b is the allometric scaling factor (b=0.94 for mammals, Sample et al., 1999)

From Test Species	**To: Red Fox**	**Weight (kg)**
Lab Mouse	0.75	0.03
Rat	0.86	0.35
Mink	0.92	1
Rabbit	1.00	3.8
Child	1.08	15
Hamster	0.81	0.11
Red Fox	1.00	3.94

TABLE 7-5E
NOAEL SCREENING ECOTOXICITY VALUES - RED FOX
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]

References:

Agency for Toxic Substances and Disease Registry (ATSDR). On-line resources available at http://www.atsdr.cdc.gov/toxpro2.html.

Sample et al., 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.

Sax, N.I. 1984. Dangerous Properties of Industrial Chemicals. 6th Ed.

Marilyn et al., 2001. Dietary Reference Intakes.

USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. 1999.

Registry of Toxic Effects of Chemical Substances (RTECS). On-line resources available at http://www.cdc.gov/niosh/rtecs.html

Sample, B.E., and C.A. Arenal. 1999. Allometric Models for Inter-species Extrapolation of Wildlife Toxicity Data. Bull Environ Contam Toxicol. 62:653-663.

USEPA. Integrated Risk Information System (IRIS). On-line database available at http://www.epa.gov/iris/.

TABLE 7-6A
LOAEL SCREENING ECOTOXICITY VALUES - DEER MOUSE
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)
Volatile Organic Compounds						
Meta/Para Xylene	rat	LOAEL/oral gavage, 103 weeks/decreased body weight and decreased survival	NTP, 1986 as cited in IRIS, 2003	500	1	6.05E+02
Semivolatile Organic Compounds						
Phenanthrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	1.04E+01
Pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	1.04E+01
PCBs						
Aroclor-1254	mink	LOAEL/diet, 4.5 months/reproduction	Sample et al., 1996	0.685	1	8.82E-01
Inorganics						
Aluminum	mouse	LOAEL/mouse over 3 generations, >1 yr/reproduction	Sample et al., 1996	19.3	1	2.01E+01
Antimony	mouse	LOAEL/lifetime/lifespan, longevity	Sample et al., 1996	1.25	1	1.30E+00
Arsenic	mouse	LOAEL/3 generations >1 yr/reproduction	Sample et al., 1996	1.26	1	1.31E+00
Barium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	51.8	0.1	5.18E+02
Cadmium	rat	LOAEL/6 weeks critical lifestage	Sample et al., 1996	10	1	1.21E+01
Cobalt	rabbit	LOAEL/over 2 wks/cardiac, for cobalt sulfate	RTECS, 2004	140	10	1.95E+01
Copper	mink	LOAEL/357 d/reproduction	Sample et al., 1996	15.14	1	1.95E+01
Iron	Child	Based on the dietary reference intake for a child	Marilyn 2001	0.67	0.1	1.01E+01
Lead	rat	Reproductive / 3 generations oral / LOAEL	Sample et al. 1996	80	1	9.67E+01
Manganese	rat	LOAEL/through gestation for 224 day/reproduction	Sample et al. 1996	284	1	3.43E+02
Selenium	rat	LOAEL/1yr through 2 generations/reproduction	Sample et al. 1996	0.33	1	3.99E-01
Silver	mouse	LOAEL/125 days/hypoactivity	USEPA, 1999	3.75	1	3.91E+00
Thallium	rat	LOAEL/60 days/testicular function	USEPA, 1999	1.31	1	1.58E+00
Vanadium	rat	LOAEL/60 d prior to gestation, plus through gestation, delivery, and lactation/reproduction	Sample et al. 1996	2.1	1	2.54E+00

TABLE 7-6A
LOAEL SCREENING ECOTOXICITY VALUES - DEER MOUSE
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total $CF^{(1)}$	SEV $(mg/kg/day)^{(2)}$
Zinc	rat	Reproduction / day 1-16 of gestation diet / LOAEL	Sample et al. 1996	320	1	3.87E+02

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
CF = Conversion Factor
SEV = Screening Ecotoxicity Values
(1) For CFs, see Table 7-4
(2) SEV = Effective Dose x Scaling Factor / Total CF

Scaling Factors for Toxicity Values:

$SEV_w = SEV_t * (bw_t / bw_w)$ ^(1-b)

Where bw is the body weight, and t and w represent the test and wildlife species, respectively, and b is the allometric scaling factor (b=0.94 for mammals, Sample et al., 1999)

From Test Species	To: Deer Mouse	Body Weight (kg)
Lab Mouse	1.04	0.03
Rat	1.21	0.35
Mink	1.29	1
Rabbit	1.39	3.8
Child	1.51	15
Hamster	1.13	0.11
Deer Mouse	1.00	0.0148

References:
Agency for Toxic Substances and Disease Registry (ATSDR). On-line resources available at http://www.atsdr.cdc.gov/toxpro2.html.
Sample et al., 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.
USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. 1999.
Registry of Toxic Effects of Chemical Substances (RTECS). On-line resources available at http://www.cdc.gov/niosh/rtecs.html
Sample, B.E., and C.A. Arenal. 1999. Allometric Models for Inter-species Extrapolation of Wildlife Toxicity Data. Bull Environ Contam Toxicol. 62:653-663.
USEPA. 2005. Ecological Soil Screening Levels.
USEPA. Integrated Risk Information System (IRIS). On-line database available at http://www.epa.gov/iris/.

TABLE 7-6B
LOAEL SCREENING ECOTOXICITY VALUES - SHORT-TAILED SHREW
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Volatile Organic Compounds						
Meta/Para Xylene	rat	LOAEL/oral gavage, 103 weeks/decreased body weight and decreased survival	NTP, 1986 as cited in IRIS, 2003	500	1	6.04E+02
Semivolatile Organic Compounds						
Benzo(a)anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	1.04E+01
Benzo(a)pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction	Sample et al., 1996	10	1	1.04E+01
Benzo(b)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	1.04E+01
Benzo(ghi)perylene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	1.04E+01
Benzo(k)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	1.04E+01
Chrysene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	1.04E+01
Phenanthrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	1.04E+01
Pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	1.04E+01
PCBs						
Aroclor-1254	mink	LOAEL/diet, 4.5 months/reproduction	Sample et al., 1996	0.685	1	8.81E-01
Inorganics						
Antimony	mouse	LOAEL/lifetime/lifespan, longevity	Sample et al., 1996	1.25	1	1.30E+00

TABLE 7-6B
LOAEL SCREENING ECOTOXICITY VALUES - SHORT-TAILED SHREW
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Arsenic	mouse	LOAEL/3 generations >1 yr/reproduction	Sample et al., 1996	1.26	1	1.31E+00
Barium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	51.8	0.1	5.18E+02
Cadmium	rat	LOAEL/6 weeks critical lifestage	Sample et al., 1996	10	1	1.21E+01
Cobalt	rabbit	LOAEL/over 2 wks/cardiac, for cobalt sulfate	RTECS, 2004	140	10	1.95E+01
Copper	mink	LOAEL/357 d/reproduction	Sample et al., 1996	15.14	1	1.95E+01
Iron	Child	Based on the dietary reference intake for a child	Marilyn 2001	0.67	0.1	1.01E+01
Lead	rat	Reproductive / 3 generations oral / LOAEL	Sample et al. 1996	80	1	9.66E+01
Manganese	rat	LOAEL/through gestation for 224 day/reproduction	Sample et al. 1996	284	1	3.43E+02
Selenium	rat	LOAEL/1yr through 2 generations/reproduction	Sample et al. 1996	0.33	1	3.99E-01
Silver	mouse	LOAEL/125 days/hypoactivity	USEPA, 1999	3.75	1	3.91E+00
Thallium	rat	LOAEL/60 days/testicular function	USEPA, 1999	1.31	1	1.58E+00
Vanadium	rat	LOAEL/60 d prior to gestation, plus through gestation, delivery, and lactation/reproduction	Sample et al. 1996	2.1	1	2.54E+00
Zinc	rat	Reproduction / day 1-16 of gestation diet / LOAEL	Sample et al. 1996	320	1	3.87E+02

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
CF = Conversion Factor
SEV = Screening Ecotoxicity Values
(1) For CFs, see Table 7-4
(2) SEV = Effective Dose x Scaling Factor / Total CF

TABLE 7-6B
LOAEL SCREENING ECOTOXICITY VALUES - SHORT-TAILED SHREW
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[1]	SEV (mg/kg/day)[2]

Scaling Factors for Toxicity Values:

$SEV_w = SEV_t * (bw_t / bw_w)$ ^(1-b)

Where bw is the body weight, and t and w represent the test and wildlife species, respectively, and b is the allometric scaling factor (b=0.94 for mammals, Sample et al., 1999)

From Test Species	To: Short-Tailed Shrew	Body Weight (kg)
Lab Mouse	1.04	0.03
Rat	1.21	0.35
Mink	1.29	1
Rabbit	1.39	3.8
Child	1.51	15
Hamster	1.13	0.11
Short-Tailed Shrew		0.015

References:

Sample et al., 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.

USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. 1999.

Registry of Toxic Effects of Chemical Substances (RTECS). On-line resources available at http://www.cdc.gov/niosh/rtecs.html

Sample, B.E., and C.A. Arenal. 1999. Allometric Models for Inter-species Extrapolation of Wildlife Toxicity Data. Bull Environ Contam Toxicol. 62:653-663.

USEPA. Integrated Risk Information System (IRIS). On-line database available at http://www.epa.gov/iris/.

TABLE 7-6C

LOAEL SCREENING ECOTOXICITY VALUES - AMERICAN ROBIN AND GREAT BLUE HERON

SEAD-121C and SEAD-121I RI Report

Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)
PCBs						
Aroclor-1254	ring-necked pheasant	LOAEL/oral via gelatin capsule, 17 weeks/reproduction	Sample et al., 1996	1.8	1	1.80E+00
Pesticides						
4,4'-DDT	brown pelican	LOAEL/diet, 5 yr, reproduction	Sample et al., 1996	0.028	1	2.80E-02
Inorganics						
Antimony	Screening Ecological Value not available					
Arsenic	cowbird	LOAEL/7 months/mortality	Sample et al., 1996	7.38	1	7.38E+00
Barium	chick	LOAEL/4 wk/mortality	Sample et al., 1996	416.53	10	4.17E+01
Cadmium	mallard ducks	LOAEL/90 d/reproduction	Sample et al., 1996	20.03	1	2.00E+01
Chromium	black duck	LOAEL/10 month/reproduction for Cr(III)	Sample et al., 1996	5	1	5.00E+00
Copper	chick	LOAEL/10 weeks/growth, mortality	Sample et al., 1996	61.7	1	6.17E+01
Cyanide	chick	LOAEL/diet, 20 days/growth, HCN	Eisler	135	10	1.35E+01
Iron	Chicken	Toxic dietary concentration	NRC, 1994	4500	1	4.50E+03
Lead	American Kestrels	NOAEL/7 months/reproduction	Sample et al. 1996	3.85	0.1	3.85E+01
Manganese	Japanese quail	NOAEL/75 d/growth, aggressive behavior	Sample et al. 1996	977	1	9.77E+02
Selenium	mallard duck	LOAEL/78 days/reproduction	Sample et al. 1996	1	1	1.00E+00
Thallium	starling	LOAEL/diet, acute/survivalship	Schafer, 1972	5.3	10	5.30E-01
Vanadium	mallard duck	NOAEL/12 wks/mortality, body weight, blood chemistry	Sample et al. 1996	11.4	0.1	1.14E+02
Zinc	white Leghorn hen	LOAEL/44 wks, reproduction	Sample et al. 1996	130.9	1	1.31E+02

NOAEL = No Observed Adverse Effect Level

COPC = Chemical of Potential Concern

CF = Conversion Factor

TABLE 7-6C
LOAEL SCREENING ECOTOXICITY VALUES - AMERICAN ROBIN AND GREAT BLUE HERON
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)

SEV = Screening Ecotoxicity Values

(1) For CFs, see Table 7-4

(2) SEV = Effective Dose x Scaling Factor / Total CF

References:

Agency for Toxic Substances and Disease Registry (ATSDR). On-line resources available at http://www.atsdr.cdc.gov/toxpro2.html.

Eisler, R. 1985-1995. Contaminant Hazards Review Series, Biological Report Series, US Fish and Wildlife Service, Patuxent Wildlife Research Center, Laurel, MD.

Sample et al., 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.

Sax, N.I. 1984. Dangerous Properties of Industrial Chemicals. 6th Ed.

Marilyn et al., 2001. Dietary Reference Intakes.

USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. 1999.

Registry of Toxic Effects of Chemical Substances (RTECS). On-line resources available at http://www.cdc.gov/niosh/rtecs.html

Sample, B.E., and C.A. Arenal. 1999. Allometric Models for Inter-species Extrapolation of Wildlife Toxicity Data. Bull Environ Contam Toxicol. 62:653-663.

National Research Council. 1994. Nutrient Requirements of Poultry.

National Research Council. 1994. Nutrient Requirements of Poultry.

TABLE 7-6D
LOAEL SCREENING ECOTOXICITY VALUES - MEADOW VOLE
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[1]	SEV (mg/kg/day)[2]
Volatile Organic Compounds						
Meta/Para Xylene	rat	LOAEL/oral gavage, 103 weeks/decreased body weight and decreased survival	NTP, 1986 as cited in IRIS, 2003	500	1	5.70E+02
Semivolatile Organic Compounds						
Anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	9.84E+00
Benzo(a)anthracene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	9.84E+00
Benzo(a)pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction	Sample et al., 1996	10	1	9.84E+00
Benzo(b)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	9.84E+00
Benzo(ghi)perylene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	9.84E+00
Benzo(k)fluoranthene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	9.84E+00
Chrysene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	9.84E+00
Phenanthrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	9.84E+00
Pyrene	mouse	LOAEL/gestation days 7-16 crit. Lifestage/Reproduction, benzo(a)pyrene used as surrogate	Sample et al., 1996	10	1	9.84E+00

TABLE 7-6D
LOAEL SCREENING ECOTOXICITY VALUES - MEADOW VOLE
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Inorganics						
Aluminum	mouse	LOAEL/mouse over 3 generations, >1 yr/reproduction	Sample et al., 1996	19.3	1	1.90E+01
Antimony	mouse	LOAEL/lifetime/lifespan, longevity	Sample et al., 1996	1.25	1	1.23E+00
Arsenic	mouse	LOAEL/3 generations >1 yr/reproduction	Sample et al., 1996	1.26	1	1.24E+00
Barium		The geometric mean of the NOAEL values for reproduction and growth	USEPA, 2005	51.8	0.1	5.18E+02
Cadmium	rat	LOAEL/6 weeks critical lifestage	Sample et al., 1996	10	1	1.14E+01
Cobalt	rabbit	LOAEL/over 2 wks/cardiac, for cobalt sulfate	RTECS, 2004	140	10	1.84E+01
Copper	mink	LOAEL/357 d/reproduction	Sample et al., 1996	15.14	1	1.84E+01
Iron	Child	Based on the dietary reference intake for a child	Marilyn 2001	0.67	0.1	9.58E+00
Lead	rat	Reproductive / 3 generations oral / LOAEL	Sample et al. 1996	80	1	9.13E+01
Manganese	rat	LOAEL/through gestation for 224 day/reproduction	Sample et al. 1996	284	1	3.24E+02
Selenium	rat	LOAEL/1yr through 2 generations/reproduction	Sample et al. 1996	0.33	1	3.76E-01
Silver	mouse	LOAEL/125 days/hypoactivity	USEPA, 1999	3.75	1	3.69E+00
Thallium	rat	LOAEL/60 days/testicular function	USEPA, 1999	1.31	1	1.49E+00
Vanadium	rat	LOAEL/60 d prior to gestation, plus through gestation, delivery, and lactation/reproduction	Sample et al. 1996	2.1	1	2.40E+00
Zinc	rat	Reproduction / day 1-16 of gestation diet / LOAEL	Sample et al. 1996	320	1	3.65E+02

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
CF = Conversion Factor
SEV = Screening Ecotoxicity Values

TABLE 7-6D
LOAEL SCREENING ECOTOXICITY VALUES - MEADOW VOLE
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF(1)	SEV (mg/kg/day)(2)

(1) For CFs, see Table 7-4

(2) SEV = Effective Dose x Scaling Factor / Total CF

Scaling Factors for Toxicity Values:

$SEV_w = SEV_t * (bw_t / bw_w)$ ^(1-b)

Where bw is the body weight, and t and w represent the test and wildlife species, respectively, and b is the allometric scaling factor (b=0.94 for mammals, Sample et al., 1999)

From Test Species	To: Red Fox	Weight (kg)
Lab Mouse	0.98	0.03
Rat	1.14	0.35
Mink	1.21	1
Rabbit	1.32	3.8
Child	1.43	15
Hamster	1.06	0.11
rat	1.14	0.35
Meadow Vole	1.00	3.90E-02

References:

Agency for Toxic Substances and Disease Registry (ATSDR). On-line resources available at http://www.atsdr.cdc.gov/toxpro2.html.

Sample et al., 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.

Sample, B.E., and C.A. Arenal. 1999. Allometric Models for Inter-species Extrapolation of Wildlife Toxicity Data. Bull Environ Contam Toxicol. 62:653-663.

USEPA. Integrated Risk Information System (IRIS). On-line database available at http://www.epa.gov/iris/.

TABLE 7-6E
LOAEL SCREENING ECOTOXICITY VALUES - RED FOX
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total CF[(1)]	SEV (mg/kg/day)[(2)]
Volatile Organic Compounds						
Meta/Para Xylene	rat	LOAEL/oral gavage, 103 weeks/decreased body weight and decreased survival	NTP, 1986 as cited in IRIS, 2003	500	1	4.32E+02
Inorganics						
Antimony	mouse	LOAEL/lifetime/lifespan, longevity	Sample et al., 1996	1.25	1	9.33E-01
Arsenic	mouse	LOAEL/3 generations >1 yr/reproduction	Sample et al., 1996	1.26	1	9.40E-01
Copper	mink	LOAEL/357 d/reproduction	Sample et al., 1996	15.14	1	1.39E+01
Iron	Child	Based on the dietary reference intake for a child	Marilyn 2001	0.67	0.1	7.26E+00
Lead	rat	Reproductive / 3 generations oral / LOAEL	Sample et al. 1996	80	1	6.92E+01
Manganese	rat	LOAEL/through gestation for 224 day/reproduction	Sample et al. 1996	284	1	2.46E+02
Selenium	rat	LOAEL/1yr through 2 generations/reproduction	Sample et al. 1996	0.33	1	2.85E-01
Thallium	rat	LOAEL/60 days/testicular function	USEPA, 1999	1.31	1	1.13E+00
Vanadium	rat	LOAEL/60 d prior to gestation, plus through gestation, delivery, and lactation/reproduction	Sample et al. 1996	2.1	1	1.82E+00

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
CF = Conversion Factor
SEV = Screening Ecotoxicity Values
(1) For CFs, see Table 7-4
(2) SEV = Effective Dose x Scaling Factor / Total CF

Scaling Factors for Toxicity Values:

$SEV_w = SEV_t * (bw_t / bw_w)$ ^(1-b)

TABLE 7-6E
LOAEL SCREENING ECOTOXICITY VALUES - RED FOX
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Test Organism	Endpoint / Duration / Effect (survival, growth, reproduction)	Source	Effect Dose (mg/kg/day)	Total $CF^{(1)}$	SEV $(mg/kg/day)^{(2)}$

Where bw is the body weight, and t and w represent the test and wildlife species, respectively, and b is the allometric scaling factor (b=0.94 for mammals, Sample et al., 1999)

From Test Species	To: Red Fox	Weight (kg)
Lab Mouse	0.75	0.03
Mink	0.92	1
Rabbit	1.00	3.8
Child	1.08	15
Hamster	0.81	0.11
Rat	0.86	0.35
Red Fox		3.94

References:

Agency for Toxic Substances and Disease Registry (ATSDR). On-line resources available at http://www.atsdr.cdc.gov/toxpro2.html.

Sample et al., 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.

Sample, B.E., and C.A. Arenal. 1999. Allometric Models for Inter-species Extrapolation of Wildlife Toxicity Data. Bull Environ Contam Toxicol. 62:653-663.

Table 7-7A
Exposure Point Concentration for SEAD-121C Soil
SEAD-121C
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs.) Maximum Detected Concentration (mg/kg)	Surface Soil (0-4 ft bgs.) Maximum Detected Concentration (mg/kg)
Volatile Organic Compounds		
Benzene	0.041	1.8
Ethyl benzene	3.3	24
Meta/Para Xylene	4.4	130
Semivolatile Organic Compounds		
Acenaphthene	2.6	2.6
Acenaphthylene	2.5	2.5
Anthracene	7.1	7.1
Benzo(a)anthracene	10	10
Benzo(a)pyrene	8.7	8.7
Benzo(b)fluoranthene	12	12
Benzo(ghi)perylene	3.2	3.2
Benzo(k)fluoranthene	7.5	7.5
Carbazole	4.2	4.2
Chrysene	9.1	9.1
Dibenz(a,h)anthracene	0.47	0.47
Dibenzofuran	1.7	1.7
Di-n-octylphthalate	0.023	0.023
Fluoranthene	27	27
Fluorene	3.5	3.5
Hexachlorobenzene	0.0085	0.0085
Indeno(1,2,3-cd)pyrene	0.97	0.97
Naphthalene	0.4	1.9
Phenanthrene	29	29
Pyrene	34	34
PCBs		
Aroclor-1242	0.058	0.058
Aroclor-1254	0.93	0.93
Aroclor-1260	0.085	0.20
Pesticides		
4,4'-DDD	0.044	0.044
4,4'-DDE	0.069	0.069
4,4'-DDT	0.1	0.1
Aldrin	0.014	0.014
Alpha-Chlordane	0.063	0.063
Delta-BHC	0.002	0.002
Dieldrin	0.041	0.041
Endosulfan I	0.19	0.19
Endosulfan II	0.009	0.009
Endrin	0.022	0.023
Endrin ketone	0.0075	0.0097
Gamma-Chlordane	0.0012	0.0012
Heptachlor	0.014	0.014
Heptachlor epoxide	0.0028	0.0028
Metals		
Antimony	236	236
Arsenic	11.6	11.6
Barium	2,030	2,030
Cadmium	29.1	29.1
Chromium	74.8	74.8
Cobalt	17	19.7
Copper	9,750	9,750
Lead	18,900	18,900
Manganese	858	858
Mercury	0.47	0.47
Nickel	224	224

Table 7-7A
Exposure Point Concentration for SEAD-121C Soil
SEAD-121C
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs.) Maximum Detected Concentration (mg/kg)	Surface Soil (0-4 ft bgs.) Maximum Detected Concentration (mg/kg)
Selenium	1.3	1.3
Silver	21.8	21.8
Thallium	1.1	1.8
Vanadium	25.4	27
Zinc	3,610	3,610

COPC = Chemical of Potential Concern

Table 7-7B
Exposure Point Concentration for SEAD-121C Ditch Soil
SEAD-121C
SEAD-121C and SEAD-121I Remedial Investigation
Seneca Army Depot Activity

COPC	Ditch Soil Maximum Detected Concentration (mg/kg)
Semivolatile Organic Compounds	
3 or 4-Methylphenol	0.79
Anthracene	0.25
Benzo(a)anthracene	1.1
Benzo(a)pyrene	0.9
Benzo(b)fluoranthene	1.1
Benzo(ghi)perylene	0.29
Benzo(k)fluoranthene	0.58
Chrysene	1.2
Fluoranthene	2.1
Indeno(1,2,3-cd)pyrene	0.27
Phenanthrene	1.1
Pyrene	2.1
Inorganics	
Antimony	4.9
Arsenic	6.1
Cadmium	14.3
Chromium	29.8
Cobalt	15.8
Copper	1,190
Cyanide	2.36
Lead	436
Manganese	918
Mercury	0.3
Nickel	42.7
Selenium	2.5
Silver	2.6
Vanadium	29.1
Zinc	566

COPC = Chemical of Potential Concern

Table 7-7C
Exposure Point Concentration for SEAD-121C Surface Water
SEAD-121C
SEAD-121C and SEAD-121I Remedial Investigation
SENECA ARMY DEPOT ACTIVITY

COPC	Surface Water Maximum Detected Concentration (ug/L)
Semivolatile Organic Compounds	
Bis(2-Ethylhexyl)phthalate	4.2
Metals	
Aluminum	8,760
Arsenic	50.3
Cadmium	19.5
Chromium	129
Cobalt	47
Copper	1,160
Iron	110,000
Lead	839
Mercury	2.1
Nickel	154
Selenium	4.6
Silver	8
Vanadium	233
Zinc	6,910

COPC = Chemical of Potential Concern

Table 7-8A
Exposure Point Concentration for SEAD-121I Surface Soil
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs.) Maximum Detected Concentration (mg/kg)
Semivolatile Organic Compounds	
Acenaphthene	6.1
Acenaphthylene	0.56
Anthracene	12
Benzo(a)anthracene	28
Benzo(a)pyrene	23
Benzo(b)fluoranthene	29
Benzo(ghi)perylene	29
Benzo(k)fluoranthene	21
Bis(2-Ethylhexyl)phthalate	1.6
Carbazole	6.8
Chrysene	32
Dibenz(a,h)anthracene	4.6
Dibenzofuran	2
Fluoranthene	62
Fluorene	4.2
Indeno(1,2,3-cd)pyrene	8.1
Naphthalene	0.63
Phenanthrene	52
Pyrene	64
PCBs	
Aroclor-1254	0.03
Aroclor-1260	0.046
Pesticides	
4,4'-DDE	0.034
4,4'-DDT	0.039
Aldrin	0.012
Dieldrin	0.034
Endosulfan I	0.095
Endrin	0.03
Heptachlor epoxide	0.055
Inorganics	
Antimony	7.5
Arsenic	32.1
Cadmium	6.6
Chromium	439
Cobalt	205.5
Copper	209
Cyanide, Total	2.00
Lead	122
Manganese	310,500
Nickel	342
Selenium	146
Silver	3.1
Thallium	163
Vanadium	182
Zinc	329

COPC = Chemical of Potential Concern

Table 7-8B
Exposure Point Concentration for SEAD-121I Ditch Soil
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

COPC	Ditch Soil Maximum Detected Concentration (mg/kg)
Semivolatile Organic Compounds	
Acenaphthene	0.74
Acenaphthylene	0.42
Anthracene	1.8
Benzo(a)anthracene	14
Benzo(a)pyrene	16
Benzo(b)fluoranthene	22
Benzo(ghi)perylene	12
Benzo(k)fluoranthene	23
Butylbenzylphthalate	0.42
Carbazole	1.6
Chrysene	25
Dibenz(a,h)anthracene	5
Dibenzofuran	0.356
Fluoranthene	24
Fluorene	0.645
Indeno(1,2,3-cd)pyrene	12
Naphthalene	0.35
Phenanthrene	6.25
Phenol	0.315
Pyrene	17
PCBs	
Aroclor-1254	0.067
Aroclor-1260	0.014
Pesticides	
4,4'-DDE	0.0076
Metals	
Arsenic	104
Cadmium	0.8
Chromium	83.9
Cobalt	91.9
Copper	130
Lead	93.3
Manganese	14,900
Mercury	0.18
Nickel	153
Selenium	18
Silver	10.5
Thallium	21.5
Vanadium	69.4
Zinc	532

COPC = Chemical of Potential Concern

Table 7-8C
Exposure Point Concentration for SEAD-121I Surface Water
SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

COPC	Surface Water Maximum Detected Concentration (ug/L)
Metals	
Aluminum	2,050
Cadmium	0.54
Chromium	6
Copper	11.2
Iron	3,410
Lead	26.3
Nickel	3.6
Selenium	2.45
Zinc	190

COPC = Chemical of Potential Concern

Table 7-9

Receptor Intake Rates and Dietary Fractions

SEAD-121C and SEAD-121I RI Report

Seneca Army Depot Activity

Receptor	Foraging Range (acres)	Food Intake Rate (IR) (kg wet/day)	Plant Diet Fraction	Invertebrate Diet Fraction	Small Animal Diet Fraction	Soil/Sediment Ingestion Rate (kg DW/day)	Water Intake Rate (L/day)	Body Weight (kg)	Source
Deer Mouse (a)	1.50E-01	8.87E-03	37%	61%	0%	2.13E-05	2.23E-03	1.48E-02	USEPA,1999; USEPA, 1993
American Robin (b)	2.72E-01	3.55E-02	7%	93%	0%	1.14E-03	1.10E-02	8.00E-02	USEPA,1999; USEPA, 1993
Short-tailed Shrew (c)	7.41E-02	9.30E-03	5%	87%	8%	2.04E-04	2.27E-03	1.50E-02	USEPA,1999; USEPA, 1993
Meadow Vole (d)	9.14E-02	1.71E-02	100%	0%	0%	2.80E-03	8.19E-03	3.90E-02	USEPA, 2005, 2000, 1993
Red Fox (e)	2.37E+02	6.62E-01	7%	7%	86%	5.95E-03	3.40E-01	3.94E+00	USEPA,1999; USEPA, 1993
Great Blue Heron (f)	1.48E+00	4.01E-01	0%	2%	98%	1.96E-02	1.00E-01	2.23E+00	USEPA, 1993

Notes:

(a) Deer mouse body weight, Food IR, water IR, and soil IR from USEPA, 1999. Others from USEPA, 1993. Foraging range based on average of adult M/F in Virginia.
Dietary fractions based on summer months in Virginia.

(b) For purposes of this assessment, the American robin dietary composition was assumed to be insectivorous. Body weight, Food IR, water IR, and soil IR from USEPA, 1999. Others from USEPA, 1993.
Feeding rate was based on spring diet for birds of eastern U.S. Foraging range is larger than its territory, which is the range given above.

(c) Short-tailed shrew body weight, Food IR, water IR, and soil IR from USEPA, 1999. Others from USEPA, 1993. Foraging range based on the lower range of New York/old field location.
Dietary fractions based on summer months in Virginia.

(d) Meadow vole body weight from USEPA, 2000. Feeding rate, diet fractions, and soil ingestion rate from USEPA, 2005.
Feeding rate was converted to wet weight based on the assumption of 80% moisture in plants. Others from USEPA, 1993. Foraging range for meadow vole in Massachusetts/grassy meadow.

(e) Red Fox body weight, Food IR, water IR, and soil IR from USEPA, 1999. Others from USEPA, 1993. Winter dietary fractions for red fox in Maryland were used.
Foraging range based on adult female all year (mean). Dietary fractions based on average for the year.

(f) Great blue heron parameters from USEPA, 1993. Sediment ingestion rate was assumed 2% of diet (dry weight).
Diet (dry weight) was calculated using equation provided in USEPA, 1993. Diet (kg/day, dry) = 0.0582xBody Weight$^{0.651}$

Sources:

1. USEPA. 2005. Guidance for Developing Ecological Soil Screening Levels. Revised February 2005.
2. USEPA 2000. Guidance for Developing Ecological Soil Screening Levels. Draft.
3. USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. November.
4. USEPA. 1993. Wildlife Exposure Factors Handbook.
5. Nagy. 1999. Energetics of Free-ranging Mammals, Reptiles, and Birds. Ann. Rev. Nutr. 19: 247-277.

TABLE 7-10A
RECEPTOR NOAEL HAZARD QUOTIENTS FOR SOIL EXPOSURE- SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Preliminary COC[(1)] Y/N	Deer Mouse Surface Soil NOAEL HQ	Deer Mouse Total Soil NOAEL HQ	American Robin Surface Soil NOAEL HQ	American Robin Total Soil NOAEL HQ	Short-Tailed Shrew Surface Soil NOAEL HQ	Short-Tailed Shrew Total Soil NOAEL HQ	Meadow Vole Surface Soil NOAEL HQ	Meadow Vole Total Soil NOAEL HQ	Red Fox Surface Soil NOAEL HQ	Red Fox Total Soil NOAEL HQ
Volatile Organic Compounds											
Benzene	N	3.E-04	1.E-02	N/A	N/A	3.E-04	1.E-02	4.E-04	2.E-02	3.E-04	2.E-02
Ethyl benzene	N	3.E-03	2.E-02	N/A	N/A	5.E-03	4.E-02	4.E-03	3.E-02	5.E-03	3.E-02
Meta/Para Xylene	Y	2.E-01	**7.E+00**	8.E-04	2.E-02	4.E-01	**1.E+01**	3.E-01	**8.E+00**	3.E-01	**9.E+00**
Semivolatile Organic Compounds											
Acenaphthene	N	9.E-02	9.E-02	4.E-03	4.E-03	1.E-01	1.E-01	2.E-01	2.E-01	1.E-02	1.E-02
Acenaphthylene	N	8.E-02	8.E-02	4.E-03	4.E-03	1.E-01	1.E-01	2.E-01	2.E-01	9.E-03	9.E-03
Anthracene	N	2.E-01	2.E-01	1.E-02	1.E-02	4.E-01	4.E-01	6.E-01	6.E-01	2.E-02	2.E-02
Benzo(a)anthracene	N	1.E-01	1.E-01	9.E-03	9.E-03	3.E-01	3.E-01	7.E-01	7.E-01	3.E-02	3.E-02
Benzo(a)pyrene	N	2.E-01	2.E-01	1.E-02	1.E-02	4.E-01	4.E-01	6.E-01	6.E-01	3.E-02	3.E-02
Benzo(b)fluoranthene	N	3.E-01	3.E-01	2.E-02	2.E-02	6.E-01	6.E-01	9.E-01	9.E-01	4.E-02	4.E-02
Benzo(ghi)perylene	N	8.E-02	8.E-02	5.E-03	5.E-03	2.E-01	2.E-01	2.E-01	2.E-01	1.E-02	1.E-02
Benzo(k)fluoranthene	N	2.E-01	2.E-01	1.E-02	1.E-02	4.E-01	4.E-01	6.E-01	6.E-01	3.E-02	3.E-02
Bis(2-Ethylhexyl)phthalate	N	3.E-05	3.E-05	5.E-04	5.E-04	3.E-05	3.E-05	5.E-05	5.E-05	3.E-05	3.E-05
Carbazole	N	2.E-02	2.E-02	6.E-03	6.E-03	6.E-02	6.E-02	7.E-02	7.E-02	9.E-02	9.E-02
Chrysene	N	1.E-01	1.E-01	1.E-02	1.E-02	3.E-01	3.E-01	7.E-01	7.E-01	2.E-02	2.E-02
Dibenz(a,h)anthracene	N	1.E-02	1.E-02	7.E-04	7.E-04	2.E-02	2.E-02	3.E-02	3.E-02	2.E-03	2.E-03
Dibenzofuran	N	4.E-02	4.E-02	2.E-03	2.E-03	1.E-01	1.E-01	1.E-01	1.E-01	2.E-01	2.E-01
Di-n-octylphthalate	N	2.E-08	2.E-08	4.E-05	4.E-05	2.E-07	2.E-07	2.E-07	2.E-07	4.E-07	4.E-07
Fluoranthene	N	6.E-02	6.E-02	4.E-02	4.E-02	1.E-01	1.E-01	2.E-01	2.E-01	7.E-03	7.E-03
Fluorene	N	9.E-03	9.E-03	5.E-03	5.E-03	1.E-02	1.E-02	2.E-02	2.E-02	1.E-03	1.E-03
Hexachlorobenzene	N	8.E-05	8.E-05	1.E-04	1.E-04	2.E-04	2.E-04	3.E-04	3.E-04	1.E-05	1.E-05
Indeno(1,2,3-cd)pyrene	N	3.E-02	3.E-02	2.E-03	2.E-03	5.E-02	5.E-02	7.E-02	7.E-02	4.E-03	4.E-03
Naphthalene	N	2.E-03	1.E-02	6.E-04	3.E-03	3.E-03	1.E-02	6.E-03	3.E-02	3.E-04	1.E-03
Phenanthrene	Y	9.E-01	9.E-01	4.E-02	4.E-02	**1.E+00**	**1.E+00**	**2.E+00**	**2.E+00**	1.E-01	1.E-01
Pyrene	Y	9.E-01	9.E-01	5.E-02	5.E-02	**2.E+00**	**2.E+00**	**3.E+00**	**3.E+00**	1.E-01	1.E-01
PCBs		4.E+00	4.E+00	2.E-01							
Aroclor-1242	N	3.E-01	3.E-01	7.E-02	7.E-02	4.E-01	4.E-01	5.E-02	5.E-02	1.E-02	1.E-02
Aroclor-1254	Y	**2.E+00**	**2.E+00**	**2.E+00**	**2.E+00**	**3.E+00**	**3.E+00**	4.E-01	4.E-01	1.E-01	1.E-01
Aroclor-1260	N	2.E-01	5.E-01	2.E-01	5.E-01	3.E-01	7.E-01	4.E-02	9.E-02	1.E-02	2.E-02
Pesticides											
4,4'-DDD	N	1.E-04	1.E-04	3.E-02	3.E-02	2.E-04	2.E-04	2.E-05	2.E-05	7.E-06	7.E-06
4,4'-DDE	N	3.E-02	3.E-02	4.E-02	4.E-02	4.E-02	4.E-02	4.E-03	4.E-03	1.E-03	1.E-03
4,4'-DDT	Y	5.E-02	5.E-02	**2.E+01**	**2.E+01**	7.E-02	7.E-02	8.E-03	8.E-03	2.E-03	2.E-03
Aldrin	N	3.E-03	3.E-03	1.E-02	1.E-02	6.E-03	6.E-03	8.E-03	8.E-03	1.E-02	1.E-02
Alpha-Chlordane	N	2.E-04	2.E-04	9.E-04	9.E-04	7.E-04	7.E-04	1.E-03	1.E-03	1.E-03	1.E-03
Delta-BHC	N	1.E-05	1.E-05	1.E-04	1.E-04	3.E-05	3.E-05	4.E-05	4.E-05	5.E-05	5.E-05
Dieldrin	N	4.E-02	4.E-02	2.E-02	2.E-02	1.E-01	1.E-01	1.E-01	1.E-01	2.E-01	2.E-01
Endosulfan I	N	4.E-02	4.E-02	8.E-04	8.E-04	8.E-02	8.E-02	1.E-01	1.E-01	1.E-01	1.E-01
Endosulfan II	N	2.E-03	2.E-03	4.E-05	4.E-05	4.E-03	4.E-03	5.E-03	5.E-03	6.E-03	6.E-03
Endrin	N	5.E-03	6.E-03	3.E-03	3.E-03	1.E-02	2.E-02	2.E-02	2.E-02	2.E-02	2.E-02
Endrin ketone	N	2.E-03	2.E-03	9.E-04	1.E-03	5.E-03	7.E-03	7.E-03	9.E-03	8.E-03	1.E-02
Gamma-Chlordane	N	4.E-06	4.E-06	2.E-05	2.E-05	1.E-05	1.E-05	2.E-05	2.E-05	2.E-05	2.E-05
Heptachlor	N	6.E-02	6.E-02	1.E-01	1.E-01	8.E-02	8.E-02	9.E-03	9.E-03	3.E-03	3.E-03
Heptachlor epoxide	N	1.E-02	1.E-02	3.E-02	3.E-02	2.E-02	2.E-02	2.E-03	2.E-03	5.E-04	5.E-04

TABLE 7-10A
RECEPTOR NOAEL HAZARD QUOTIENTS FOR SOIL EXPOSURE- SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Preliminary COC[(1)] Y/N	Deer Mouse Surface Soil NOAEL HQ	Deer Mouse Total Soil NOAEL HQ	American Robin Surface Soil NOAEL HQ	American Robin Total Soil NOAEL HQ	Short-Tailed Shrew Surface Soil NOAEL HQ	Short-Tailed Shrew Total Soil NOAEL HQ	Meadow Vole Surface Soil NOAEL HQ	Meadow Vole Total Soil NOAEL HQ	Red Fox Surface Soil NOAEL HQ	Red Fox Total Soil NOAEL HQ
Metals											
Aluminum	Y	7.E-01	7.E-01	1.E-02	1.E-02	7.E-01	7.E-01	**1.E+00**	**1.E+00**	5.E-01	5.E-01
Antimony	Y	**2.E+02**	**2.E+02**	N/A	N/A	**2.E+02**	**2.E+02**	**2.E+02**	**2.E+02**	**1.E+01**	**1.E+01**
Arsenic	N	5.E-01	5.E-01	3.E-01	3.E-01	8.E-01	8.E-01	8.E-01	8.E-01	4.E-02	4.E-02
Barium	Y	**2.E+00**	**2.E+00**	**5.E+00**	**5.E+00**	**2.E+00**	**2.E+00**	**3.E+00**	**3.E+00**	1.E-01	1.E-01
Cadmium	Y	**9.E+00**	**9.E+00**	**8.E+00**	**8.E+00**	**1.E+01**	**1.E+01**	**3.E+00**	**3.E+00**	5.E-01	5.E-01
Chromium	N	1.E-04	1.E-04	5.E-01	5.E-01	4.E-04	4.E-04	2.E-03	2.E-03	8.E-05	8.E-05
Cobalt	N	4.E-01	5.E-01	1.E-02	1.E-02	7.E-01	8.E-01	7.E-01	8.E-01	8.E-02	9.E-02
Copper	Y	**2.E+01**	**2.E+01**	**7.E+00**	**7.E+00**	**2.E+01**	**2.E+01**	**7.E+01**	**7.E+01**	**4.E+00**	**4.E+00**
Iron	Y	**2.E+01**	**2.E+01**	3.E-03	3.E-03	**2.E+01**	**2.E+01**	**2.E+01**	**2.E+01**	**1.E+01**	**1.E+01**
Lead	Y	**3.E+01**	**3.E+01**	**1.E+02**	**1.E+02**	**6.E+01**	**6.E+01**	**2.E+02**	**2.E+02**	**5.E+00**	**5.E+00**
Manganese	N	3.E-01	3.E-01	3.E-01	3.E-01	4.E-01	4.E-01	8.E-01	8.E-01	3.E-02	3.E-02
Mercury	N	7.E-03	7.E-03	3.E-02	3.E-02	2.E-02	2.E-02	3.E-02	3.E-02	2.E-02	2.E-02
Nickel	N	5.E-02	5.E-02	7.E-02	7.E-02	1.E-01	1.E-01	4.E-01	4.E-01	2.E-02	2.E-02
Selenium	N	4.E-01	4.E-01	3.E-01	3.E-01	7.E-01	7.E-01	4.E-01	4.E-01	5.E-02	5.E-02
Silver	Y	**6.E+00**	**6.E+00**	1.E-02	1.E-02	**7.E+00**	**7.E+00**	**6.E+00**	**6.E+00**	4.E-01	4.E-01
Thallium	Y	6.E-01	9.E-01	3.E-01	5.E-01	9.E-01	**2.E+00**	5.E-01	9.E-01	1.E-01	2.E-01
Vanadium	N	5.E-01	5.E-01	2.E-01	3.E-01	8.E-01	9.E-01	5.E-01	5.E-01	3.E-02	3.E-02
Zinc	Y	**4.E+00**	**4.E+00**	**7.E+00**	**7.E+00**	**6.E+00**	**6.E+00**	**1.E+00**	**1.E+00**	6.E-01	6.E-01

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
SEV = Screening Ecotoxicity Value
HQ = Hazard Quotient (Exposure/SEV)
COC = Chemical of Concern
(1) COPC considered a preliminary COC if NOAEL HQ > 1 or HQ=1 for any recepto
(2) HQs based on the maximum detected concentrations
Note: HQ>1 and HQ=1 are in bold.

TABLE 7-10B
RECEPTOR NOAEL HAZARD QUOTIENTS FOR DITCH SOIL EXPOSURE- SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Preliminary COC$^{(1)}$ Y/N	Deer Mouse Ditch Soil NOAEL HQ	American Robin Ditch Soil NOAEL HQ	Short-Tailed Shrew Ditch Soil NOAEL HQ	Meadow Vole Ditch Soil NOAEL HQ	Red Fox Ditch Soil NOAEL HQ	Great Blue Heron Ditch Soil NOAEL HQ
Semivolatile Organic Compounds							
3 or 4-Methylphenol	N	5.E-04	6.E-02	4.E-04	1.E-03	7.E-04	2.E-01
Anthracene	N	8.E-03	4.E-04	1.E-02	2.E-02	9.E-04	8.E-05
Benzo(a)anthracene	N	1.E-02	1.E-03	3.E-02	8.E-02	3.E-03	3.E-04
Benzo(a)pyrene	N	2.E-02	1.E-03	4.E-02	7.E-02	3.E-03	3.E-04
Benzo(b)fluoranthene	N	3.E-02	2.E-03	5.E-02	8.E-02	4.E-03	4.E-04
Benzo(ghi)perylene	N	8.E-03	4.E-04	1.E-02	2.E-02	9.E-04	9.E-05
Benzo(k)fluoranthene	N	2.E-02	1.E-03	3.E-02	4.E-02	2.E-03	2.E-04
Bis(2-Ethylhexyl)phthalate	N	3.E-05	5.E-04	3.E-05	5.E-05	3.E-05	2.E-04
Chrysene	N	2.E-02	1.E-03	4.E-02	9.E-02	3.E-03	4.E-04
Fluoranthene	N	5.E-03	3.E-03	8.E-03	1.E-02	6.E-04	7.E-04
Indeno(1,2,3-cd)pyrene	N	8.E-03	4.E-04	1.E-02	2.E-02	1.E-03	9.E-05
Phenanthrene	N	3.E-02	2.E-03	5.E-02	9.E-02	4.E-03	4.E-04
Pyrene	N	6.E-02	3.E-03	1.E-01	2.E-01	7.E-03	7.E-04
Metals							
Aluminum	Y	7.E-01	1.E-02	7.E-01	**1.E+00**	5.E-01	4.E-03
Antimony	Y	**3.E+00**	N/A	**5.E+00**	**4.E+00**	2.E-01	N/A
Arsenic	N	3.E-01	2.E-01	4.E-01	4.E-01	2.E-02	2.E-02
Cadmium	Y	**4.E+00**	**4.E+00**	**6.E+00**	**1.E+00**	2.E-01	1.E-01
Chromium	N	5.E-05	2.E-01	2.E-04	7.E-04	4.E-05	1.E-01
Cobalt	N	4.E-01	1.E-02	7.E-01	7.E-01	7.E-02	2.E-03
Copper	Y	**3.E+00**	8.E-01	**3.E+00**	**9.E+00**	5.E-01	3.E-01
Cyanide	Y	1.E-02	**3.E+00**	2.E-02	5.E-03	6.E-03	**1.E+00**
Iron	Y	**2.E+01**	3.E-03	**2.E+01**	**2.E+01**	**1.E+01**	1.E-03
Lead	Y	7.E-01	**3.E+00**	**1.E+00**	**4.E+00**	1.E-01	**1.E+00**
Manganese	N	3.E-01	4.E-01	4.E-01	9.E-01	3.E-02	9.E-02
Mercury	N	4.E-03	2.E-02	1.E-02	2.E-02	1.E-02	4.E-02
Nickel	N	9.E-03	1.E-02	2.E-02	7.E-02	4.E-03	6.E-03
Selenium	Y	9.E-01	5.E-01	**1.E+00**	8.E-01	9.E-02	6.E-02
Silver	N	7.E-01	2.E-03	9.E-01	8.E-01	5.E-02	1.E-04
Vanadium	N	6.E-01	3.E-01	9.E-01	5.E-01	4.E-02	3.E-02
Zinc	Y	6.E-01	**1.E+00**	9.E-01	2.E-01	1.E-01	1.E-01

NOAEL = No Observed Adverse Effect Level

COPC = Chemical of Potential Concern

SEV = Screening Ecotoxicity Value

HQ = Hazard Quotient (Exposure/SEV)

COC = Chemical of Concern

(1) COPC considered a preliminary COC if NOAEL HQ > 1 or HQ=1 for any recepto

(2) HQs based on the maximum detected concentrations.

Note: HQ>1 and HQ=1 are in bold.

TABLE 7-11A
RECEPTOR NOAEL HAZARD QUOTIENTS FOR SOIL EXPOSURE- SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Preliminary COC(1) Y/N	Deer Mouse Surface Soil NOAEL HQ	American Robin Surface Soil NOAEL HQ	Short-Tailed Shrew Surface Soil NOAEL HQ	Meadow Vole Surface Soil NOAEL HQ	Red Fox Surface Soil NOAEL HQ
Semivolatile Organic Compounds						
Acenaphthene	N	2.E-01	1.E-02	3.E-01	6.E-01	2.E-02
Acenaphthylene	N	2.E-02	9.E-04	3.E-02	5.E-02	2.E-03
Anthracene	Y	4.E-01	2.E-02	6.E-01	**1.E+00**	4.E-02
Benzo(a)anthracene	Y	4.E-01	3.E-02	8.E-01	**2.E+00**	7.E-02
Benzo(a)pyrene	Y	6.E-01	3.E-02	**1.E+00**	**2.E+00**	7.E-02
Benzo(b)fluoranthene	Y	8.E-01	4.E-02	**1.E+00**	**2.E+00**	9.E-02
Benzo(ghi)perylene	Y	8.E-01	4.E-02	**1.E+00**	**2.E+00**	9.E-02
Benzo(k)fluoranthene	Y	6.E-01	3.E-02	**1.E+00**	**2.E+00**	7.E-02
Bis(2-Ethylhexyl)phthalate	N	1.E-03	5.E-02	3.E-03	7.E-03	2.E-04
Carbazole	N	4.E-02	1.E-02	9.E-02	1.E-01	1.E-01
Chrysene	Y	5.E-01	3.E-02	**1.E+00**	**2.E+00**	9.E-02
Dibenz(a,h)anthracene	N	1.E-01	7.E-03	2.E-01	3.E-01	2.E-02
Dibenzofuran	N	5.E-02	3.E-03	1.E-01	2.E-01	2.E-01
Fluoranthene	N	1.E-01	9.E-02	2.E-01	4.E-01	2.E-02
Fluorene	N	1.E-02	7.E-03	2.E-02	3.E-02	1.E-03
Indeno(1,2,3-cd)pyrene	N	2.E-01	1.E-02	4.E-01	6.E-01	3.E-02
Naphthalene	N	4.E-03	1.E-03	5.E-03	1.E-02	4.E-04
Phenanthrene	Y	**2.E+00**	8.E-02	**3.E+00**	**4.E+00**	2.E-01
Pyrene	Y	**2.E+00**	1.E-01	**3.E+00**	**5.E+00**	2.E-01
PCBs						
Aroclor-1254	N	7.E-02	8.E-02	1.E-01	1.E-02	3.E-03
Aroclor-1260	N	1.E-01	1.E-01	2.E-01	2.E-02	5.E-03
Pesticides						
4,4'-DDE	N	1.E-02	2.E-02	2.E-02	2.E-03	6.E-04
4,4'-DDT	Y	2.E-02	**7.E+00**	3.E-02	3.E-03	9.E-04
Aldrin	N	3.E-03	1.E-02	5.E-03	7.E-03	8.E-03
Dieldrin	N	3.E-02	2.E-02	9.E-02	1.E-01	1.E-01
Endosulfan I	N	2.E-02	4.E-04	4.E-02	5.E-02	7.E-02
Endrin	N	7.E-03	4.E-03	2.E-02	3.E-02	3.E-02
Heptachlor epoxide	N	2.E-01	5.E-01	3.E-01	3.E-02	1.E-02
Metals						
Aluminum	N	2.E-01	3.E-03	2.E-01	2.E-01	1.E-01
Antimony	Y	**5.E+00**	N/A	**8.E+00**	**5.E+00**	4.E-01
Arsenic	Y	**1.E+00**	8.E-01	**2.E+00**	**2.E+00**	1.E-01
Cadmium	Y	**2.E+00**	**2.E+00**	**3.E+00**	6.E-01	1.E-01
Chromium	Y	7.E-04	**3.E+00**	3.E-03	1.E-02	5.E-04
Cobalt	Y	**5.E+00**	1.E-01	**8.E+00**	**9.E+00**	9.E-01
Copper	Y	5.E-01	1.E-01	5.E-01	**2.E+00**	8.E-02
Cyanide	Y	1.E-02	**2.E+00**	2.E-02	4.E-03	5.E-03
Iron	N	5.E-01	1.E-04	5.E-01	7.E-01	4.E-01
Lead	Y	2.E-01	9.E-01	4.E-01	**1.E+00**	4.E-02
Manganese	Y	**9.E+01**	**1.E+02**	**1.E+02**	**3.E+02**	**1.E+01**
Nickel	N	7.E-02	1.E-01	2.E-01	6.E-01	3.E-02
Selenium	Y	**5.E+01**	**3.E+01**	**8.E+01**	**5.E+01**	**5.E+00**
Silver	Y	8.E-01	2.E-03	**1.E+00**	9.E-01	6.E-02
Thallium	Y	**8.E+01**	**5.E+01**	**1.E+02**	**8.E+01**	**1.E+01**
Vanadium	Y	**4.E+00**	**2.E+00**	**6.E+00**	**3.E+00**	2.E-01
Zinc	N	3.E-01	6.E-01	5.E-01	1.E-01	5.E-02

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
SEV = Screening Ecotoxicity Value
HQ = Hazard Quotient (Exposure/SEV)
COC = Chemical of Concern
(1) COPC considered a preliminary COC if NOAEL HQ > 1 or HQ=1 for any recepto
(2) HQs based on the maximum detected concentrations.
Note: HQ>1 and HQ=1 are in bold.

TABLE 7-11B
RECEPTOR NOAEL HAZARD QUOTIENTS FOR DITCH SOIL EXPOSURE- SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Preliminary COC$^{(1)}$ Y/N	Deer Mouse Ditch Soil NOAEL HQ	American Robin Ditch Soil NOAEL HQ	Short-Tailed Shrew Ditch Soil NOAEL HQ	Meadow Vole Ditch Soil NOAEL HQ	Red Fox Ditch Soil NOAEL HQ	Great Blue Heron Ditch Soil NOAEL HQ
Semivolatile Organic Compounds							
Acenaphthene	N	3.E-02	1.E-03	4.E-02	7.E-02	3.E-03	2.E-04
Acenaphthylene	N	1.E-02	7.E-04	2.E-02	4.E-02	2.E-03	1.E-04
Anthracene	N	5.E-02	3.E-03	9.E-02	1.E-01	6.E-03	6.E-04
Benzo(a)anthracene	Y	2.E-01	1.E-02	4.E-01	**1.E+00**	4.E-02	4.E-03
Benzo(a)pyrene	Y	4.E-01	2.E-02	8.E-01	**1.E+00**	5.E-02	5.E-03
Benzo(b)fluoranthene	Y	6.E-01	3.E-02	**1.E+00**	**2.E+00**	7.E-02	7.E-03
Benzo(ghi)perylene	N	3.E-01	2.E-02	6.E-01	9.E-01	4.E-02	4.E-03
Benzo(k)fluoranthene	Y	7.E-01	4.E-02	**1.E+00**	**2.E+00**	8.E-02	7.E-03
Butylbenzylphthalate	N	5.E-05	1.E-02	1.E-04	2.E-04	2.E-04	3.E-02
Carbazole	N	9.E-03	2.E-03	2.E-02	3.E-02	3.E-02	7.E-03
Chrysene	Y	4.E-01	3.E-02	8.E-01	**2.E+00**	7.E-02	8.E-03
Dibenz(a,h)anthracene	N	1.E-01	8.E-03	2.E-01	4.E-01	2.E-02	2.E-03
Dibenzofuran	N	9.E-03	4.E-04	2.E-02	3.E-02	4.E-02	1.E-03
Fluoranthene	N	5.E-02	4.E-02	9.E-02	1.E-01	6.E-03	8.E-03
Fluorene	N	2.E-03	1.E-03	3.E-03	4.E-03	2.E-04	2.E-04
Indeno(1,2,3-cd)pyrene	N	4.E-01	2.E-02	7.E-01	9.E-01	5.E-02	4.E-03
Naphthalene	N	2.E-03	6.E-04	3.E-03	5.E-03	2.E-04	1.E-04
Phenanthrene	N	2.E-01	1.E-02	3.E-01	5.E-01	2.E-02	2.E-03
Phenol	N	1.E-03	3.E-02	8.E-04	3.E-03	1.E-03	7.E-02
Pyrene	Y	5.E-01	3.E-02	8.E-01	**1.E+00**	6.E-02	5.E-03
PCBs							
Aroclor-1254	N	2.E-01	2.E-01	2.E-01	3.E-02	8.E-03	5.E-03
Aroclor-1260	N	3.E-02	4.E-02	5.E-02	6.E-03	2.E-03	1.E-03
Pesticides							
4,4'-DDE	N	3.E-03	5.E-03	4.E-03	5.E-04	1.E-04	1.E-04
Metals							
Aluminum	N	2.E-01	3.E-03	2.E-01	2.E-01	1.E-01	8.E-04
Arsenic	Y	**4.E+00**	**3.E+00**	**7.E+00**	**7.E+00**	3.E-01	4.E-01
Cadmium	N	2.E-01	2.E-01	4.E-01	7.E-02	1.E-02	7.E-03
Chromium	N	1.E-04	6.E-01	5.E-04	2.E-03	9.E-05	3.E-01
Cobalt	Y	**2.E+00**	6.E-02	**4.E+00**	**4.E+00**	4.E-01	1.E-02
Copper	N	3.E-01	9.E-02	3.E-01	1.E+00	5.E-02	3.E-02
Iron	N	5.E-01	1.E-04	5.E-01	7.E-01	4.E-01	3.E-05
Lead	N	1.E-01	7.E-01	3.E-01	8.E-01	3.E-02	2.E-01
Manganese	Y	**5.E+00**	**6.E+00**	**6.E+00**	**1.E+01**	5.E-01	**1.E+00**
Mercury	N	2.E-03	1.E-02	7.E-03	1.E-02	7.E-03	2.E-02
Nickel	N	3.E-02	4.E-02	8.E-02	3.E-01	1.E-02	2.E-02
Selenium	Y	**6.E+00**	**4.E+00**	**1.E+01**	**6.E+00**	6.E-01	4.E-01
Silver	Y	**3.E+00**	6.E-03	**4.E+00**	**3.E+00**	2.E-01	6.E-04
Thallium	Y	**1.E+01**	**6.E+00**	**2.E+01**	**1.E+01**	**2.E+00**	**1.E+00**
Vanadium	Y	**1.E+00**	6.E-01	**2.E+00**	**1.E+00**	7.E-02	6.E-02
Zinc	Y	6.E-01	**1.E+00**	9.E-01	2.E-01	9.E-02	1.E-01

NOAEL = No Observed Adverse Effect Level

COPC = Chemical of Potential Concern

SEV = Screening Ecotoxicity Value

HQ = Hazard Quotient (Exposure/SEV)

COC = Chemical of Concern

(1) COPC considered a preliminary COC if NOAEL HQ > 1 or HQ=1 for any receptor

(2) HQs based on the maximum detected concentrations.

Note: HQ>1 and HQ=1 are in bold.

Table 7-12A
Average Concentration for Preliminary COCs In SEAD-121C Soil
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Preliminary COC	Average Concentration	
	Surface Soil 0-2 ft bgs. (mg/kg)	Surface Soil & Subsurface Soil 0-4 ft bgs. (mg/kg)
Volatile Organic Compounds		
Meta/Para Xylene	0.11	2.4
Semivolatile Organic Compounds		
Phenanthrene	1.3	0.95
Pyrene	1.9	1.4
PCBs		
Aroclor-1254	0.055	0.042
Pesticides		
4,4'-DDT	0.0065	0.0054
Metals		
Antimony	10	7.5
Arsenic	5.5	5.4
Barium	231	199
Cadmium	4.1	3.0
Copper	515	408
Lead	735	550
Silver	1.6	1.2
Thallium	0.4	0.4
Zinc	450	355

COC = Chemical of Concern

Table 7-12B
Average Concentration for Preliminary COCs In SEAD-121C Ditch Soil
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Preliminary COC	Average Concentration Ditch Soil (mg/kg)
Metals	
Antimony	2.3
Cadmium	2.8
Copper	177
Cyanide	0.83
Lead	144
Selenium	1.0
Zinc	291

COC = Chemical of Concern

Table 7-13A
Average Concentration for Preliminary COCs In SEAD-121I Soil
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Preliminary COC	Average Concentration Surface Soil 0-2 ft bgs. (mg/kg)
Semivolatile Organic Compounds	
Anthracene	0.70
Benzo(a)anthracene	1.9
Benzo(a)pyrene	1.7
Benzo(b)fluoranthene	1.9
Benzo(ghi)perylene	1.7
Benzo(k)fluoranthene	1.9
Chrysene	2.4
Phenanthrene	2.9
Pyrene	5.0
Pesticides	
4,4'-DDT	0.0028
Metals	
Antimony	2.5
Arsenic	8.3
Cadmium	0.65
Chromium	29
Cobalt	18
Copper	32
Cyanide	0.36
Lead	30
Manganese	15037
Selenium	6.3
Silver	0.64
Thallium	6.5
Vanadium	21

COC = Chemical of Concern

Table 7-13B

Average Concentration for Preliminary COCs In SEAD-121I Ditch Soil
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Preliminary COC	Ditch Soil Average Concentration (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)anthracene	2.5
Benzo(a)pyrene	2.7
Benzo(b)fluoranthene	3.8
Benzo(k)fluoranthene	3.0
Chrysene	3.6
Pyrene	5.1
Metals	
Arsenic	18
Cobalt	19
Manganese	3195
Selenium	2.0
Silver	1.4
Thallium	2.4
Vanadium	21
Zinc	142

COC = Chemical of Concern

TABLE 7-14A
RECEPTOR LOAEL HAZARD QUOTIENTS BASED ON MAXIMUM CONCENTRATION - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Final COC[1] Y/N	Deer Mouse Surface Soil LOAEL HQ	Deer Mouse Mixed Surface and Subsurface Soil LOAEL HQ	American Robin Surface Soil LOAEL HQ	American Robin Mixed Surface and Subsurface Soil LOAEL HQ	Short-Tailed Shrew Surface Soil LOAEL HQ	Short-Tailed Shrew Total Soil LOAEL HQ	Meadow Vole Surface Soil LOAEL HQ	Meadow Vole Total Soil LOAEL HQ	Red Fox Surface Soil LOAEL HQ	Red Fox Total Soil LOAEL HQ
Volatile Organic Compounds											
Meta/Para Xylene	N		2.E-02				4.E-02		3.E-02		3.E-02
Semivolatile Organic Compounds											
Phenanthrene	N					1.E-01	1.E-01	2.E-01	2.E-01		
Pyrene	N					2.E-01	2.E-01	3.E-01	3.E-01		
PCBs											
Aroclor-1254	N	4.E-01	4.E-01	2.E-01	2.E-01	7.E-01	7.E-01				
Pesticides											
4,4'-DDT	N			**2.E+00**	**2.E+00**						
Metals											
Aluminum	N							1.E-01	1.E-01		
Antimony	N	**2.E+01**	**2.E+01**	N/A	N/A	**2.E+01**	**2.E+01**	**2.E+01**	**2.E+01**	**1.E+00**	**1.E+00**
Barium	N	2.E-01	2.E-01	**3.E+00**	**3.E+00**	2.E-01	2.E-01	3.E-01	3.E-01		
Cadmium	N	9.E-01	9.E-01	6.E-01	6.E-01	**1.E+00**	**1.E+00**	3.E-01	3.E-01		
Copper	N	**2.E+01**	**2.E+01**	**5.E+00**	**5.E+00**	**2.E+01**	**2.E+01**	**6.E+01**	**6.E+01**	**3.E+00**	**3.E+00**
Iron	N	**2.E+00**	**2.E+00**			**2.E+00**	**2.E+00**	**2.E+00**	**2.E+00**	**1.E+00**	**1.E+00**
Lead	N	**3.E+00**	**3.E+00**	**1.E+01**	**1.E+01**	**6.E+00**	**6.E+00**	**2.E+01**	**2.E+01**	5.E-01	5.E-01
Silver	N	6.E-01	6.E-01			7.E-01	7.E-01	6.E-01	6.E-01		
Thallium	N						9.E-02				
Zinc	N	**2.E+00**	**2.E+00**	**7.E+00**	**7.E+00**	**3.E+00**	**3.E+00**	7.E-01	7.E-01		

LOAEL = Lowest Observed Adverse Effect Level
COPC = Chemical of Potential Concern
SEV = Screening Ecotoxicity Value
HQ = Hazard Quotient (Exposure/SEV)
COC = Chemical of Concern
(1) See text for the rationale.
(2) HQs based on the maximum detected concentrations
Note: HQ>1 and HQ=1 are in bold.

TABLE 7-14B
RECEPTOR NOAEL HAZARD QUOTIENTS BASED ON MEAN CONCENTRATION - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Final COC$^{(1)}$ Y/N	Deer Mouse Surface Soil NOAEL HQ	Deer Mouse Mixed Surface and Subsurface Soil NOAEL HQ	American Robin Surface Soil NOAEL HQ	American Robin Mixed Surface and Subsurface Soil NOAEL HQ	Short-Tailed Shrew Surface Soil NOAEL HQ	Short-Tailed Shrew Total Soil NOAEL HQ	Meadow Vole Surface Soil NOAEL HQ	Meadow Vole Total Soil NOAEL HQ	Red Fox Surface Soil NOAEL HQ	Red Fox Total Soil NOAEL HQ
Volatile Organic Compounds											
Meta/Para Xylene	N		1.E-01				2.E-01		1.E-01		2.E-01
Semivolatile Organic Compounds											
Phenanthrene	N					6.E-02	5.E-02	1.E-01	8.E-02		
Pyrene	N					1.E-01	1.E-01	1.E-01	1.E-01		
PCBs											
Aroclor-1254	N	1.E-01	1.E-01	1.E-01	1.E-01	2.E-01	2.E-01				
Pesticides											
4,4'-DDT	N			**1.E+00**	**1.E+00**						
Metals											
Antimony	N	**7.E+00**	**5.E+00**	N/A	N/A	**1.E+01**	**1.E+01**	**7.E+00**	**5.E+00**	5.E-01	4.E-01
Barium	N	2.E-01	2.E-01	6.E-01	5.E-01	3.E-01	3.E-01	4.E-01	3.E-01		
Cadmium	N	**1.E+00**	9.E-01	**1.E+00**	9.E-01	**2.E+00**	**2.E+00**	4.E-01	3.E-01		
Copper	N	**1.E+00**	9.E-01	4.E-01	3.E-01	**1.E+00**	**1.E+00**	**4.E+00**	**3.E+00**	2.E-01	2.E-01
Lead	N	**1.E+00**	8.E-01	**5.E+00**	**4.E+00**	**2.E+00**	**2.E+00**	**6.E+00**	**5.E+00**	2.E-01	2.E-01
Silver	N	4.E-01	3.E-01			6.E-01	6.E-01	5.E-01	4.E-01		
Thallium	N						3.E-01				
Zinc	N	5.E-01	4.E-01	9.E-01	7.E-01	7.E-01	7.E-01	2.E-01	1.E-01		

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
SEV = Screening Ecotoxicity Value
HQ = Hazard Quotient (Exposure/SEV)
COC = Chemical of Concern
(1) See text for the rationale.
(2) HQs based on the mean concentrations
Note: HQ>1 and HQ=1 are in bold.

TABLE 7-14C
RECEPTOR LOAEL HAZARD QUOTIENTS BASED ON MEAN CONCENTRATION - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Final COC[1] Y/N	Deer Mouse Surface Soil LOAEL HQ	Deer Mouse Mixed Surface and Subsurface Soil LOAEL HQ	American Robin Surface Soil LOAEL HQ	American Robin Mixed Surface and Subsurface Soil LOAEL HQ	Short-Tailed Shrew Surface Soil LOAEL HQ	Short-Tailed Shrew Total Soil LOAEL HQ	Meadow Vole Surface Soil LOAEL HQ	Meadow Vole Total Soil LOAEL HQ	Red Fox Surface Soil LOAEL HQ	Red Fox Total Soil LOAEL HQ
Volatile Organic Compounds											
Meta/Para Xylene	N		4.E-04				7.E-04		5.E-04		6.E-04
Semivolatile Organic Compounds											
Phenanthrene	N					6.E-03	5.E-03	1.E-02	8.E-03		
Pyrene	N					1.E-02	1.E-02	1.E-02	1.E-02		
PCBs											
Aroclor-1254	N	3.E-02	2.E-02	1.E-02	1.E-02	4.E-02	4.E-02				
Pesticides											
4,4'-DDT	N			1.E-01	1.E-01						
Metals											
Antimony	N	7.E-01	5.E-01	N/A	N/A	**1.E+00**	**1.E+00**	7.E-01	5.E-01	5.E-02	4.E-02
Barium	N	2.E-02	2.E-02	3.E-01	3.E-01	3.E-02	3.E-02	4.E-02	3.E-02		
Cadmium	N	1.E-01	9.E-02	8.E-02	6.E-02	2.E-01	2.E-01	4.E-02	3.E-02		
Copper	N	9.E-01	7.E-01	3.E-01	2.E-01	**1.E+00**	**1.E+00**	**3.E+00**	**2.E+00**	2.E-01	1.E-01
Lead	N	1.E-01	8.E-02	5.E-01	4.E-01	2.E-01	2.E-01	6.E-01	5.E-01	2.E-02	2.E-02
Silver	N	4.E-02	3.E-02			6.E-02	6.E-02	5.E-02	4.E-02		
Thallium	N						3.E-02				
Zinc	N	2.E-01	2.E-01	9.E-01	7.E-01	4.E-01	4.E-01	9.E-02	7.E-02		

LOAEL = Lowest Observed Adverse Effect Level
COPC = Chemical of Potential Concern
SEV = Screening Ecotoxicity Value
HQ = Hazard Quotient (Exposure/SEV)
COC = Chemical of Concern
(1) See text for the rationale.
(2) HQs based on the mean concentrations
Note: HQ>1 and HQ=1 are in bold.

TABLE 7-15A
RECEPTOR LOAEL HAZARD QUOTIENTS BASED ON MAXIMUM CONCENTRATION - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Final COC(1) Y/N	Deer Mouse Ditch Soil LOAEL HQ	American Robin Ditch Soil LOAEL HQ	Short-Tailed Shrew Ditch Soil LOAEL HQ	Meadow Vole Ditch Soil LOAEL HQ	Red Fox Ditch Soil LOAEL HQ	Great Blue Heron Ditch Soil LOAEL HQ
Metals							
Aluminum	N				1.E-01		
Antimony	N	3.E-01		5.E-01	4.E-01		
Cadmium	N	4.E-01	3.E-01	6.E-01	1.E-01		
Copper	N	**2.E+00**		**2.E+00**	**7.E+00**		
Cyanide	N		8.E-02				3.E-02
Iron	N	**2.E+00**		**2.E+00**	**2.E+00**	**1.E+00**	
Lead	N		3.E-01	1.E-01	4.E-01		1.E-01
Selenium	N			8.E-01			
Zinc	N		**1.E+00**				

LOAEL = Lowest Observed Adverse Effect Level

COPC = Chemical of Potential Concern

SEV = Screening Ecotoxicity Value

HQ = Hazard Quotient (Exposure/SEV)

COC = Chemical of Concern

(1) COPC considered a preliminary COC if NOAEL HQ > 1 or HQ=1 for any receptor

(2) HQs based on the maximum detected concentrations.

Note: HQ>1 and HQ=1 are in bold.

TABLE 7-15B
RECEPTOR NOAEL HAZARD QUOTIENTS BASED ON MEAN CONCENTRATION - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Final COC(1) Y/N	Deer Mouse Ditch Soil NOAEL HQ	American Robin Ditch Soil NOAEL HQ	Short-Tailed Shrew Ditch Soil NOAEL HQ	Meadow Vole Ditch Soil NOAEL HQ	Red Fox Ditch Soil NOAEL HQ	Great Blue Heron Ditch Soil NOAEL HQ
Metals							
Antimony	N	**2.E+00**		**2.E+00**	**2.E+00**		
Cadmium	N	8.E-01	8.E-01	**1.E+00**	3.E-01		
Copper	N	4.E-01		5.E-01	**1.E+00**		
Cyanide	N		**1.E+00**				**4.E-01**
Lead	N		**1.E+00**	5.E-01	**1.E+00**		3.E-01
Selenium	N			6.E-01			
Zinc	N		6.E-01				

NOAEL = No Observed Adverse Effect Level

COPC = Chemical of Potential Concern

SEV = Screening Ecotoxicity Value

HQ = Hazard Quotient (Exposure/SEV)

COC = Chemical of Concern
(1) COPC considered a preliminary COC if NOAEL HQ > 1 or HQ=1 for any receptor
(2) HQs based on the mean concentrations.

Note: HQ>1 and HQ=1 are in bold.

TABLE 7-15C
RECEPTOR LOAEL HAZARD QUOTIENTS BASED ON MEAN CONCENTRATION - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Final COC[(1)] Y/N	Deer Mouse Ditch Soil LOAEL HQ	American Robin Ditch Soil LOAEL HQ	Short-Tailed Shrew Ditch Soil LOAEL HQ	Meadow Vole Ditch Soil LOAEL HQ	Red Fox Ditch Soil LOAEL HQ	Great Blue Heron Ditch Soil LOAEL HQ
Metals							
Antimony	N	2.E-01		2.E-01	2.E-01		
Cadmium	N	8.E-02	6.E-02	1.E-01	3.E-02		
Copper	N	3.E-01		4.E-01	**1.E+00**		
Cyanide	N		3.E-02				1.E-02
Lead	N		1.E-01	5.E-02	1.E-01		3.E-02
Selenium	N			3.E-01			
Zinc	N		6.E-01				

LOAEL = No Observed Adverse Effect Level

COPC = Chemical of Potential Concern

SEV = Screening Ecotoxicity Value

HQ = Hazard Quotient (Exposure/SEV)

COC = Chemical of Concern

(1) COPC considered a preliminary COC if NOAEL HQ > 1 or HQ=1 for any receptor

(2) HQs based on the mean concentrations.

Note: HQ>1 and HQ=1 are in bold.

TABLE 7-16A
RECEPTOR LOAEL HAZARD QUOTIENTS BASED ON MAXIMUM CONCENTRATION - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Final COC(1) Y/N	Deer Mouse Surface Soil LOAEL HQ	American Robin Surface Soil LOAEL HQ	Short-Tailed Shrew Surface Soil LOAEL HQ	Meadow Vole Surface Soil LOAEL HQ	Red Fox Surface Soil LOAEL HQ
Semivolatile Organic Compounds						
Anthracene	N				1.E-01	
Benzo(a)anthracene	N				2.E-01	
Benzo(a)pyrene	N			1.E-01	2.E-01	
Benzo(b)fluoranthene	N			1.E-01	2.E-01	
Benzo(ghi)perylene	N			1.E-01	2.E-01	
Benzo(k)fluoranthene	N			1.E-01	2.E-01	
Chrysene	N			1.E-01	2.E-01	
Phenanthrene	N	2.E-01		3.E-01	4.E-01	
Pyrene	N	2.E-01		3.E-01	5.E-01	
Pesticides						
4,4'-DDT	N		7.E-01			
Metals						
Antimony	N	5.E-01		8.E-01	5.E-01	
Arsenic	N	**1.E+00**		**2.E+00**	**2.E+00**	1.E-01
Cadmium	N	2.E-01	1.E-01	3.E-01		
Chromium	N		**2.E+00**			
Cobalt	N	5.E-01		8.E-01	9.E-01	
Copper	N				**1.E+00**	
Cyanide	N		7.E-02			
Lead	N				1.E-01	
Manganese	N	**3.E+01**	**1.E+01**	**4.E+01**	**9.E+01**	**4.E+00**
Selenium	N	**3.E+01**	**2.E+01**	**5.E+01**	**3.E+01**	**3.E+00**
Silver	N			1.E-01		
Thallium	N	**8.E+00**	**3.E+01**	**1.E+01**	**8.E+00**	**1.E+00**
Vanadium	N	**6.E+00**	2.E-01	**9.E+00**	**5.E+00**	4.E-01

LOAEL = Lowest Observed Adverse Effect Level
COPC = Chemical of Potential Concern
SEV = Screening Ecotoxicity Value
HQ = Hazard Quotient (Exposure/SEV)
COC = Chemical of Concern
(1) See text for the rationale.
(2) HQs based on the maximum detected concentrations
Note: HQ>1 and HQ=1 are in bold.

TABLE 7-16B
RECEPTOR NOAEL HAZARD QUOTIENTS BASED ON MEAN CONCENTRATION - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Final COC[1] Y/N	Deer Mouse Surface Soil NOAEL HQ	American Robin Surface Soil NOAEL HQ	Short-Tailed Shrew Surface Soil NOAEL HQ	Meadow Vole Surface Soil NOAEL HQ	Red Fox Surface Soil NOAEL HQ
Semivolatile Organic Compounds						
Anthracene	N				6.E-02	
Benzo(a)anthracene	N				1.E-01	
Benzo(a)pyrene	N			9.E-02	1.E-01	
Benzo(b)fluoranthene	N			1.E-01	1.E-01	
Benzo(ghi)perylene	N			9.E-02	1.E-01	
Benzo(k)fluoranthene	N			1.E-01	1.E-01	
Chrysene	N			8.E-02	2.E-01	
Phenanthrene	N	9.E-02		1.E-01	2.E-01	
Pyrene	N	1.E-01		2.E-01	4.E-01	
Pesticides						
4,4'-DDT	N		5.E-01			
Metals						
Antimony	N	**2.E+00**		**3.E+00**	**2.E+00**	
Arsenic	N	3.E-01		6.E-01	6.E-01	3.E-02
Cadmium	N	2.E-01	2.E-01	3.E-01		
Chromium	N		2.E-01			
Cobalt	N	4.E-01		7.E-01	8.E-01	
Copper	N				2.E-01	
Cyanide	N		4.E-01			
Lead	N				2.E-01	
Manganese	N	**5.E+00**	**6.E+00**	**6.E+00**	**1.E+01**	5.E-01
Selenium	N	**2.E+00**	**1.E+00**	**3.E+00**	**2.E+00**	2.E-01
Silver	N			2.E-01		
Thallium	N	**3.E+00**	**2.E+00**	**5.E+00**	**3.E+00**	6.E-01
Vanadium	Y	4.E-01	2.E-01	7.E-01	4.E-01	2.E-02

NOAEL = No Observed Adverse Effect Level
COPC = Chemical of Potential Concern
SEV = Screening Ecotoxicity Value
HQ = Hazard Quotient (Exposure/SEV)
COC = Chemical of Concern
(1) See text for the rationale.
(2) HQs based on the mean concentrations
Note: HQ>1 and HQ=1 are in bold.

TABLE 7-16C
RECEPTOR LOAEL HAZARD QUOTIENTS BASED ON MEAN CONCENTRATION - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Final COC(1) Y/N	Deer Mouse Surface Soil LOAEL HQ	American Robin Surface Soil LOAEL HQ	Short-Tailed Shrew Surface Soil LOAEL HQ	Meadow Vole Surface Soil LOAEL HQ	Red Fox Surface Soil LOAEL HQ
Semivolatile Organic Compounds						
Anthracene	N				6.E-03	
Benzo(a)anthracene	N				1.E-02	
Benzo(a)pyrene	N			9.E-03	1.E-02	
Benzo(b)fluoranthene	N			1.E-02	1.E-02	
Benzo(ghi)perylene	N			9.E-03	1.E-02	
Benzo(k)fluoranthene	N			1.E-02	1.E-02	
Chrysene	N			8.E-03	2.E-02	
Phenanthrene	N	9.E-03		1.E-02	2.E-02	
Pyrene	N	1.E-02		2.E-02	4.E-02	
Pesticides						
4,4'-DDT	N		5.E-02			
Metals						
Antimony	N	2.E-01		3.E-01	2.E-01	
Arsenic	N	3.E-01		5.E-01	5.E-01	3.E-02
Cadmium	N	2.E-02	1.E-02	3.E-02		
Chromium	N		1.E-01			
Cobalt	N	4.E-02		7.E-02	8.E-02	
Copper	N				2.E-01	
Cyanide	N		1.E-02			
Lead	N				2.E-02	
Manganese	N	**1.E+00**	6.E-01	**2.E+00**	**4.E+00**	2.E-01
Selenium	N	**1.E+00**	7.E-01	**2.E+00**	**1.E+00**	1.E-01
Silver	N			2.E-02		
Thallium	N	3.E-01	**1.E+00**	5.E-01	3.E-01	6.E-02
Vanadium	N	7.E-01	2.E-02	**1.E+00**	6.E-01	5.E-02

LOAEL = Lowest Observed Adverse Effect Level

COPC = Chemical of Potential Concern

SEV = Screening Ecotoxicity Value

HQ = Hazard Quotient (Exposure/SEV)

COC = Chemical of Concern

(1) See text for the rationale.

(2) HQs based on the mean concentrations

Note: HQ>1 and HQ=1 are in bold.

TABLE 7-17A
RECEPTOR LOAEL HAZARD QUOTIENTS BASED ON MAXIMUM CONCENTRATION - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as final COC(1) Y/N	Deer Mouse Ditch Soil LOAEL HQ	American Robin Ditch Soil LOAEL HQ	Short-Tailed Shrew Ditch Soil LOAEL HQ	Meadow Vole Ditch Soil LOAEL HQ	Red Fox Ditch Soil LOAEL HQ	Great Blue Heron Ditch Soil LOAEL HQ
Semivolatile Organic Compounds							
Benzo(a)anthracene	N				1.E-01		
Benzo(a)pyrene	N				1.E-01		
Benzo(b)fluoranthene	N			1.E-01	2.E-01		
Benzo(k)fluoranthene	N			1.E-01	2.E-01		
Chrysene	N				2.E-01		
Pyrene	N				1.E-01		
Metals							
Arsenic	N	**3.E+00**	8.E-01	**6.E+00**	**6.E+00**	3.E-01	
Cobalt	N	2.E-01		4.E-01	4.E-01		
Manganese	N	**1.E+00**	6.E-01	**2.E+00**	**4.E+00**		1.E-01
Selenium	N	**4.E+00**	**2.E+00**	**6.E+00**	**4.E+00**		
Silver	N	3.E-01		4.E-01	3.E-01		
Thallium	N	**1.E+00**	**4.E+00**	**2.E+00**	**1.E+00**	2.E-01	7.E-01
Vanadium	N	**2.E+00**		**4.E+00**	**2.E+00**	2.E-01	
Zinc	N		**1.E+00**				

LOAEL = Lowest Observed Adverse Effect Level

COPC = Chemical of Potential Concern

SEV = Screening Ecotoxicity Value

HQ = Hazard Quotient (Exposure/SEV)

COPC = Chemical of Potential Concern

(1) COPC considered a preliminary COC if NOAEL HQ > 1 or HQ=1 for any recepto

(2) HQs based on the maximum detected concentrations

Note: HQ>1 and HQ=1 are in bold.

TABLE 7-17B
RECEPTOR NOAEL HAZARD QUOTIENTS BASED ON MEAN CONCENTRATIONS - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Preliminary COC(1) Y/N	Deer Mouse Ditch Soil NOAEL HQ	American Robin Ditch Soil NOAEL HQ	Short-Tailed Shrew Ditch Soil NOAEL HQ	Meadow Vole Ditch Soil NOAEL HQ	Red Fox Ditch Soil NOAEL HQ	Great Blue Heron Ditch Soil NOAEL HQ
Semivolatile Organic Compounds							
Benzo(a)anthracene	N				2.E-01		
Benzo(a)pyrene	N				2.E-01		
Benzo(b)fluoranthene	N			2.E-01	3.E-01		
Benzo(k)fluoranthene	N			2.E-01	2.E-01		
Chrysene	N				3.E-01		
Pyrene	N				4.E-01		
Metals							
Arsenic	N	7.E-01	4.E-01	**1.E+00**	**1.E+00**	5.E-02	
Cobalt	N	5.E-01		8.E-01	8.E-01		
Manganese	N	**1.E+00**	**1.E+00**	**1.E+00**	**3.E+00**		3.E-01
Selenium	N	7.E-01	4.E-01	**1.E+00**	7.E-01		
Silver	N	4.E-01		5.E-01	4.E-01		
Thallium	N	**1.E+00**	7.E-01	**2.E+00**	**1.E+00**	2.E-01	1.E-01
Vanadium	N	4.E-01		7.E-01	4.E-01	2.E-02	
Zinc	N		3.E-01				

NOAEL = No Observed Adverse Effect Level

COPC = Chemical of Potential Concern

SEV = Screening Ecotoxicity Value

HQ = Hazard Quotient (Exposure/SEV)

COC = Chemical of Concern

(1) COPC considered a preliminary COC if NOAEL HQ > 1 or HQ=1 for any recepto

(2) HQs based on the mean concentrations.

Note: HQ>1 and HQ=1 are in bold.

TABLE 7-17C
RECEPTOR LOAEL HAZARD QUOTIENTS BASED ON MEAN CONCENTRATIONS - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Retained as Preliminary COC[1] Y/N	Deer Mouse Ditch Soil LOAEL HQ	American Robin Ditch Soil LOAEL HQ	Short-Tailed Shrew Ditch Soil LOAEL HQ	Meadow Vole Ditch Soil LOAEL HQ	Red Fox Ditch Soil LOAEL HQ	Great Blue Heron Ditch Soil LOAEL HQ
Semivolatile Organic Compounds							
Benzo(a)anthracene	N				2.E-02		
Benzo(a)pyrene	N				2.E-02		
Benzo(b)fluoranthene	N			2.E-02	3.E-02		
Benzo(k)fluoranthene	N			2.E-02	2.E-02		
Chrysene	N				3.E-02		
Pyrene	N				4.E-02		
Metals							
Arsenic	N	6.E-01	1.E-01	**1.E+00**	**1.E+00**	6.E-02	
Cobalt	N	5.E-02		8.E-02	8.E-02		
Manganese	N	3.E-01	1.E-01	4.E-01	9.E-01		3.E-02
Selenium	N	4.E-01	2.E-01	7.E-01	4.E-01		
Silver	N	4.E-02		5.E-02	4.E-02		
Thallium	N	1.E-01	5.E-01	2.E-01	1.E-01	2.E-02	7.E-02
Vanadium	N	7.E-01		**1.E+00**	6.E-01	5.E-02	
Zinc	N		3.E-01				

LOAEL = Lowest Observed Adverse Effect Level

COPC = Chemical of Potential Concern

SEV = Screening Ecotoxicity Value

HQ = Hazard Quotient (Exposure/SEV)

COC = Chemical of Concern

(1) COPC considered a preliminary COC if NOAEL HQ > 1 or HQ=1 for any recepto

(2) HQs based on the mean concentrations.

Note: HQ>1 and HQ=1 are in bold.

TABLE 7-18A
Comparison of Site Concentrations with Background - SEAD-121C Soil
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

Preliminary COC	Maximum Detected Concentration		Average Concentration		Background (mg/kg)		
	Surface Soil 0-2 ft bgs. (mg/kg)	Total Soil 0-4 ft bgs. (mg/kg)	Surface Soil 0-2 ft bgs. (mg/kg)	Total Soil 0-4 ft bgs. (mg/kg)	Maximum	Average	95% UCL
Inorganics							
Antimony	236	236	10	7.5	6.55	2.7	3.3
Barium	2030	2030	231	199	159	79	86
Cadmium	29.1	29.1	4.1	3.0	2.9	0.54	0.74
Chromium	74.8	74.8	25	25	32.7	20	22
Copper	9750	9750	515	408	62.8	21	23
Lead	18900	18900	735	550	266	17.7	27.6
Silver	21.8	21.8	1.6	1.2	0.87	0.38	0.45
Thallium	1.1	1.8	0.4	0.4	1.2	0.255	0.32
Zinc	3610	3610	450	355	126	71.7	77.5

COC = Chemical of concern

TABLE 7-18B
Comparison of Site Concentrations with Background - SEAD-121C Ditch Soil
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

Preliminary COC	Maximum Detected Concentration	Average Concentration	Background (mg/kg)		
	Stockpile Soil (mg/kg)	Stockpile Soil (mg/kg)	Maximum	Average	95% UCL
Inorganics					
Antimony	4.9	2.3	6.55	2.7	3.3
Cadmium	14.3	2.8	2.9	0.54	0.74
Copper	1190	177	62.8	21	23
Cyanide	2.36	0.83	0.39	0.29	0.30
Lead	436	144	266	17.7	27.6
Selenium	2.5	1.0	1.7	0.36	0.45
Zinc	566	291	126	71.7	77.5

COC = Chemical of concern

TABLE 7-19A
Comparison of Site Concentrations with Background - SEAD-121I Soil
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

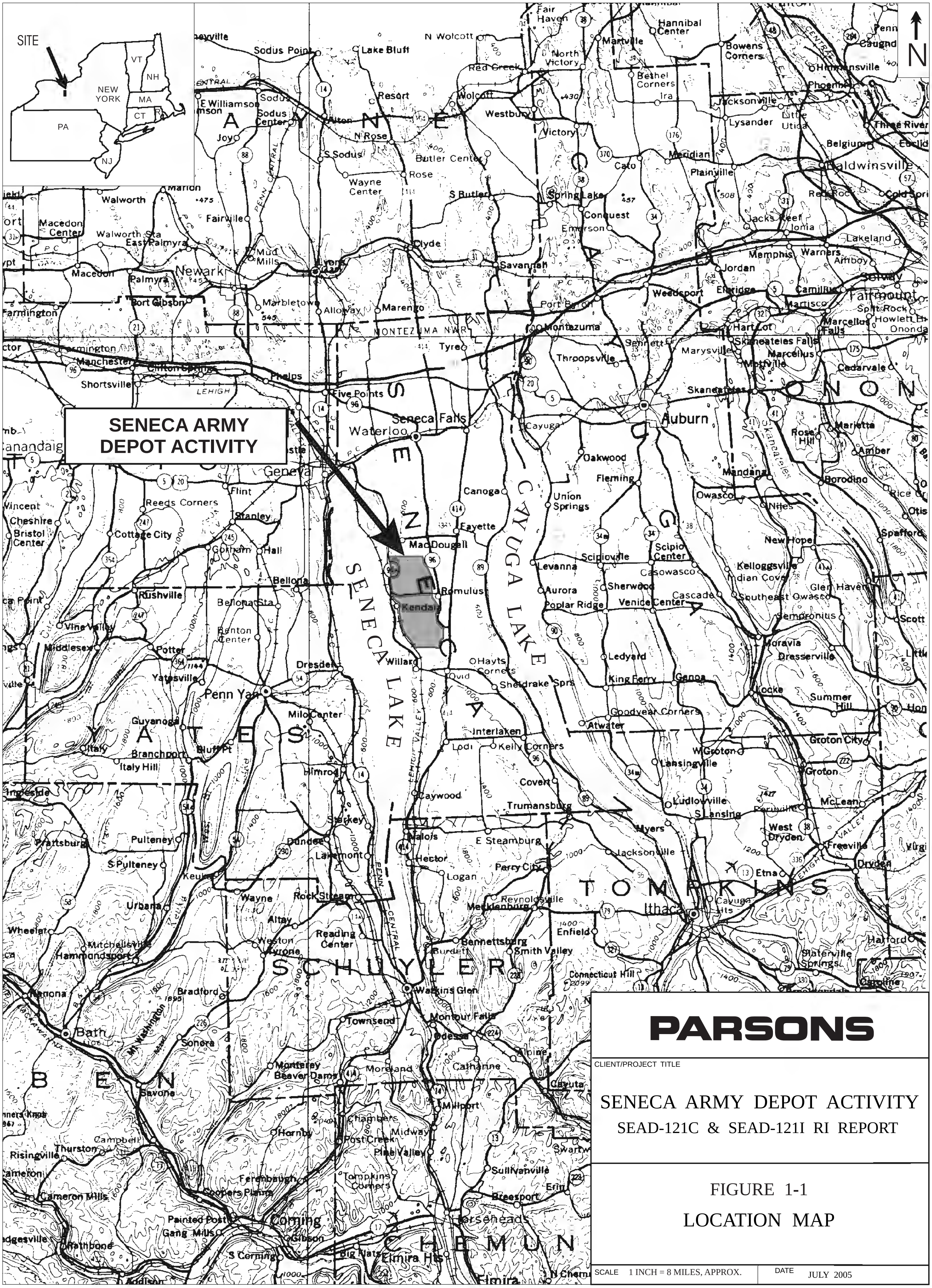
Preliminary COC	Maximum Detected Concentration	Average Concentration	Background (mg/kg)		
	Surface Soil 0-2 ft bgs. (mg/kg)	Surface Soil 0-2 ft bgs. (mg/kg)	Maximum	Average	95% UCL
Inorganics					
Antimony	7.5	2.5	6.55	2.7	3.3
Arsenic	32.1	8.3	21.5	5.2	5.97
Cadmium	6.6	0.65	2.9	0.54	0.74
Chromium	439	29	32.7	20	22
Cobalt	205.5	18	29.1	11.5	12.66
Copper	209	32	62.8	21	23
Cyanide	2	0.36	0.39	0.29	0.30
Lead	122	30	266	17.7	27.6
Manganese	310500	15037	2380	609	701
Silver	3.65	0.64	0.87	0.38	0.45
Thallium	162.5	6.5	1.2	0.255	0.32
Vanadium	182	21	32.7	21.2	22.9

COC = Chemical of concern

TABLE 7-19B
Comparison of Site Concentrations with Background - SEAD-121I Ditch Soil
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

Preliminary COC	Maximum Detected Concentration	Average Concentration	Background (mg/kg)		
	Stockpile Soil (mg/kg)	Stockpile Soil (mg/kg)	Maximum	Average	95% UCL
Inorganics					
Arsenic	104	18	21.5	5.2	5.97
Cobalt	91.9	19	29.1	11.5	12.66
Manganese	14900	3195	2380	609	701
Selenium	18	2.0	1.7	0.36	0.45
Silver	10.5	1.4	0.87	0.38	0.45
Thallium	21.5	2.4	1.2	0.255	0.32
Vanadium	69.4	21	32.7	21.2	22.9
Zinc	532	142	126	71.7	77.5

COC = Chemical of concern



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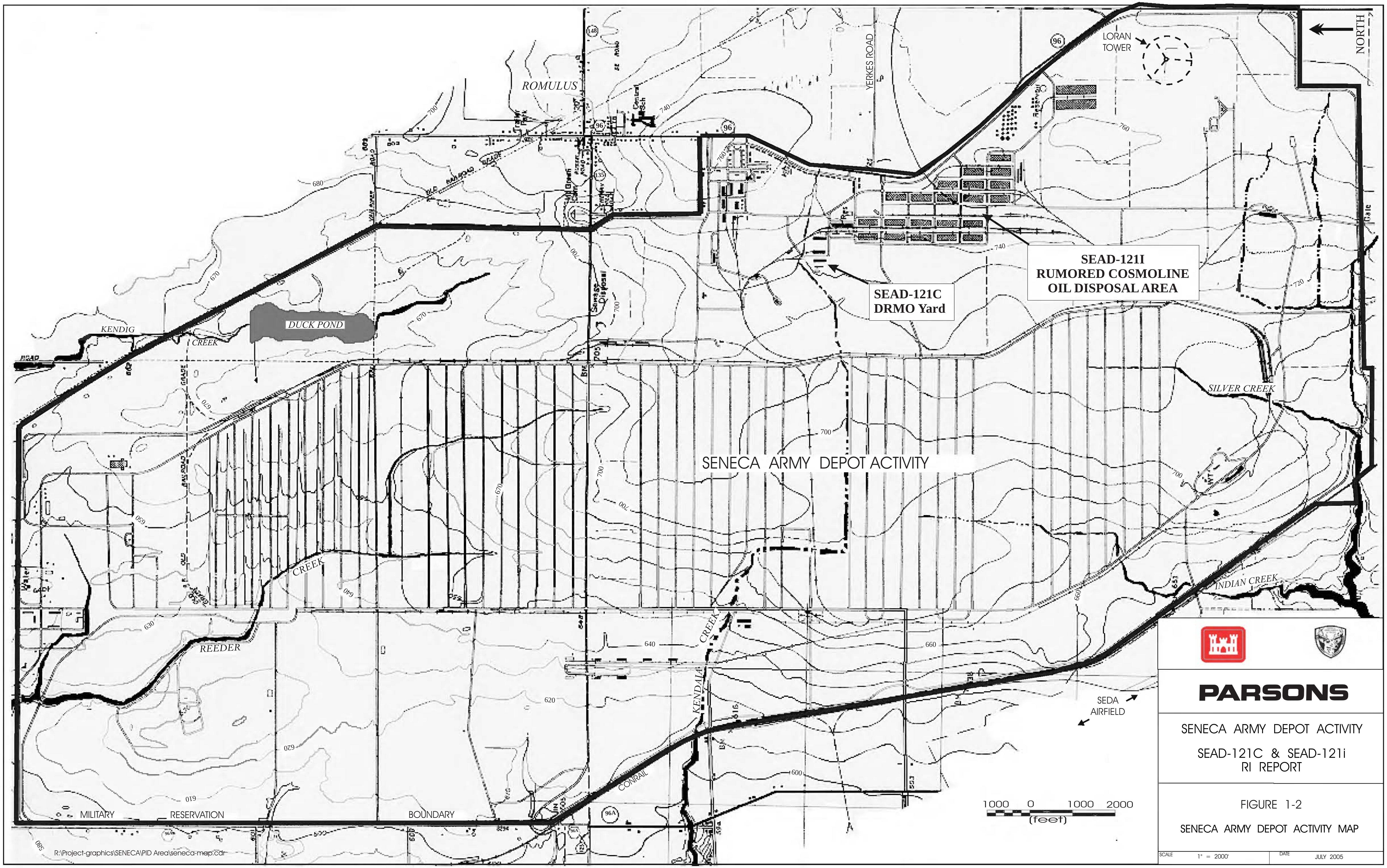
CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
SEAD-121C & SEAD-121I RI REPORT

FIGURE 1-1
LOCATION MAP

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

R:\PROJECT_GRAPHICS\SENECA\PID AREA\LOCMAP1.CDR(CLD)



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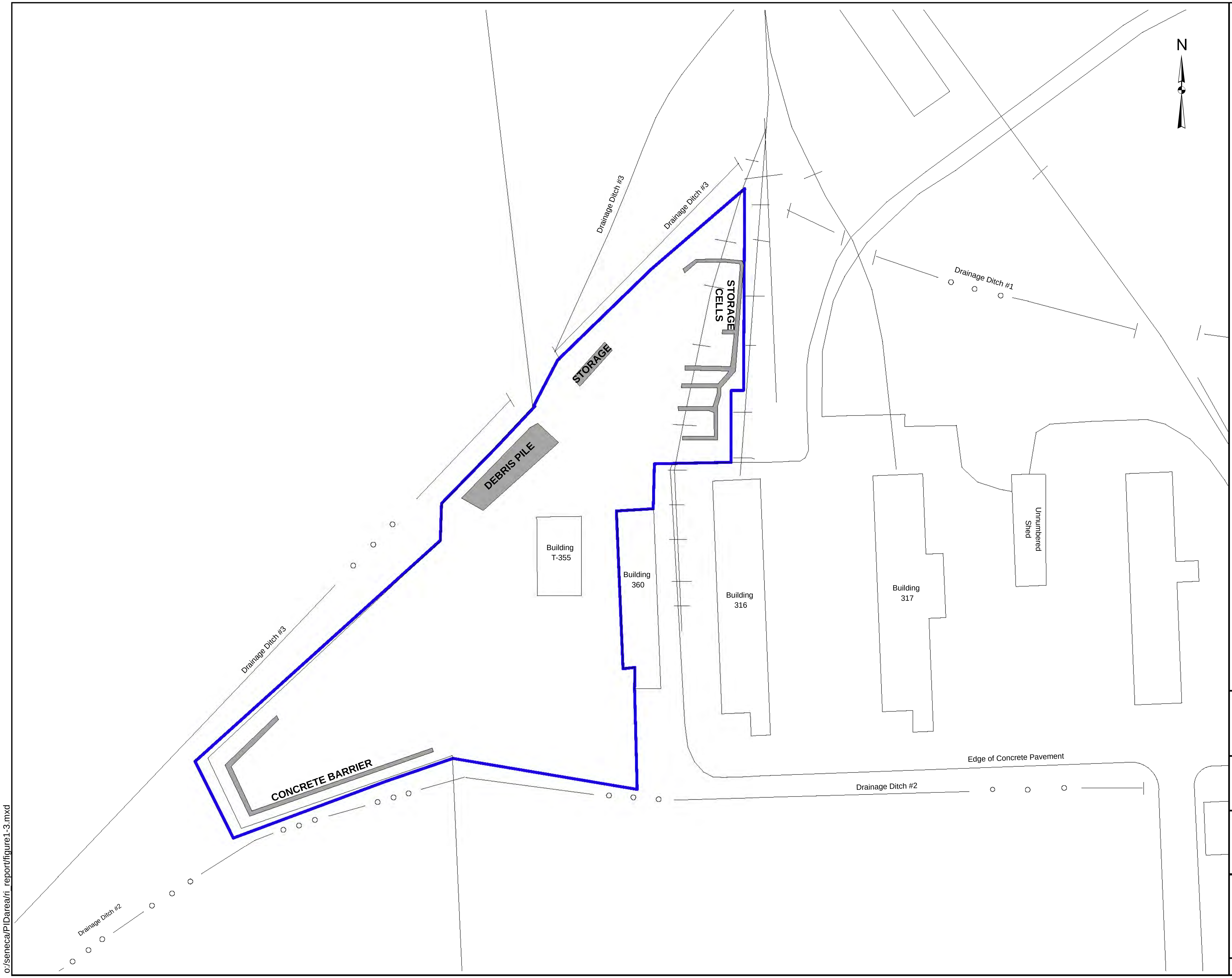
SENECA ARMY DEPOT ACTIVITY

SEAD-121C & SEAD-121i
RI REPORT

FIGURE 1-2

SENECA ARMY DEPOT ACTIVITY MAP

SCALE	DATE
1" = 2000'	JULY 2005



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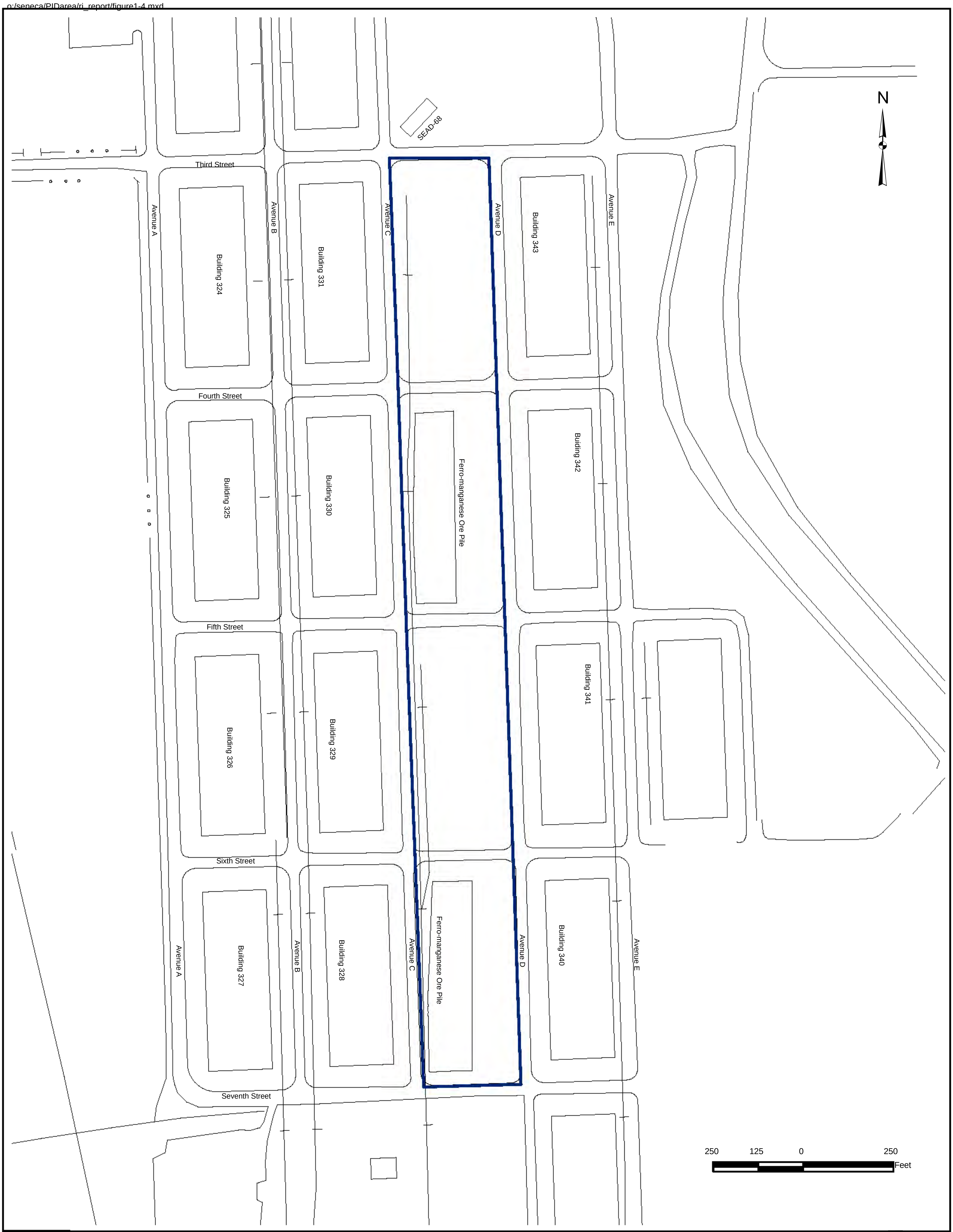
SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 1-3
DRMO YARD - SEAD-121C
SITE MAP

Job #: 741175-07000
Date: JULY 2005

o:/seneca/PIDarea/ri report/figure1-3.mxd

o:/seneca/PIDarea/ri_report/figure1-4.mxd



LEGEND:

Railroad Tracks

Site Boundary

Surface Water

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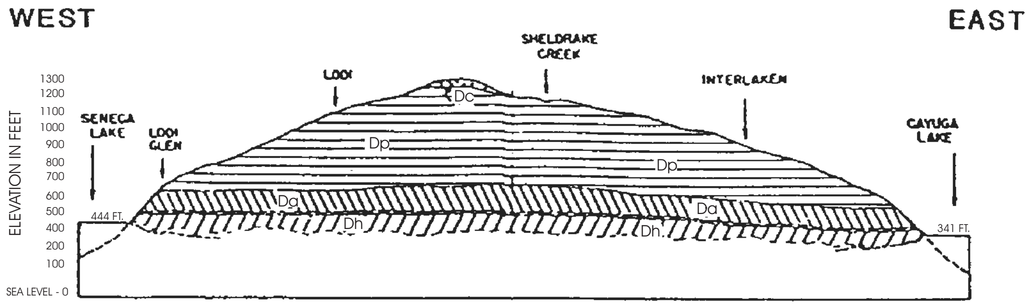
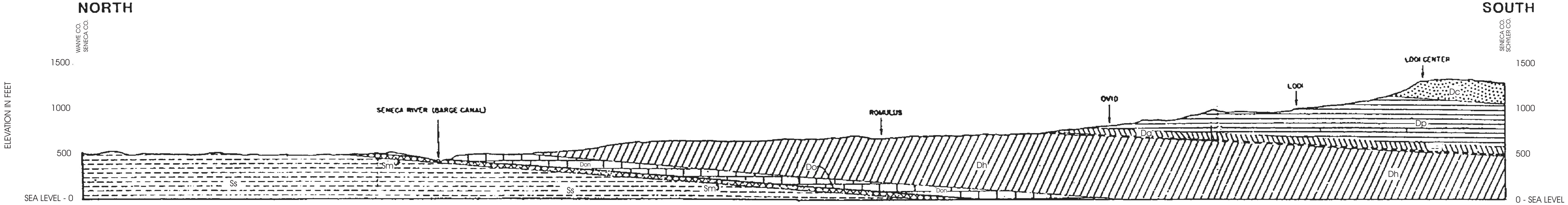
SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 1-4
RUMORED COSMOLINE
OIL DISPOSAL AREA - SEAD-121I
SITE MAP

Job #: 741175-07000
Date: JULY 2005



EAST-WEST SECTION ALONG A- A'

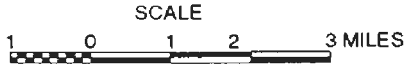


NORTH-SOUTH SECTION ALONG 76° 50' (B-B')

LEGEND

UPPER DEVONIAN	Dc		WISCOY SHALE NUNDA SANDSTONE WEST HILL FORMATION GRIMES SANDSTONE	DEVONIAN
	Dp		HATCH SHALE CASHAQUA SHALE	
	Da	GENESEE GROUP	WEST RIVER SHALE GENESEO SHALE	
MIDDLE DEVONIAN			TULLY LIMESTONE	
	Dh	HAMILTON GROUP	MOSCOW SHALE LUDLOWVILLE SHALE SKANEATELES SHALE MARCELLUS SHALE	
MIDDLE OR LOWER DEVONIAN	Don		ONONDAGA LIMESTONE	
LOWER DEVONIAN	Do		ORISKANY SANDSTONE	
SILURIAN (UPPER)	Sm		MANLIUS AND RONDOUT LIMESTONES AND COBLESKILL DOLOMITE	SILURIAN
	Ss		SALINA FORMATION INCLUDING BERTIE LIMESTONE MEMBER AND CAMILLUSSHALE MEMBER	

SOURCE:MODIFIED FROM-THE GROUND WATER RESOURCES
OF SENECA COUNTY, NEW YORK: MOZOLA, A.J.,
BULLETIN GW-26, ALBANY, NY, 1951



PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY

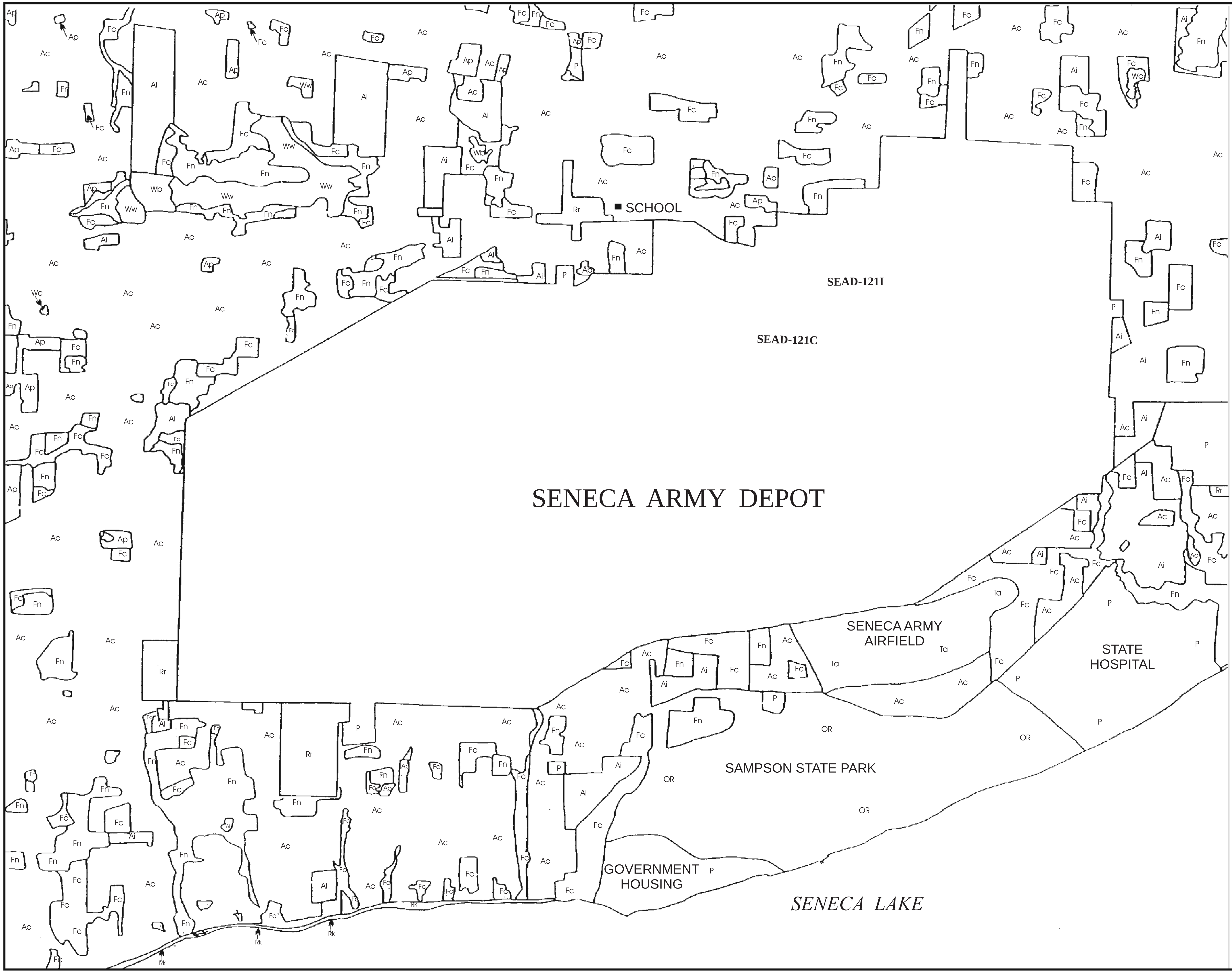
SEAD-121C & SEAD-121I RI REPORT

FIGURE 1-5

REGIONAL GEOLOGIC CROSS SECTIONS

Job # **741175-07000**
DATE JULY 2005

O:\Seneca\PIDarea\ri_report\GEOXSEC.CDR



LEGEND

Active

- Ac Cropland/cropland pasture
- Ap Permanent pasture

Inactive

- Ai Agriculture inactive

Forestland

- Fc Brush cover up to fully stocked poles less than 30 feet
- Fn Forest over 30 feet

Water

- Wn Natural, any size
- Wc Artificial, one acre

Wetlands

- Wb Bogs, shrub wetlands
- Ww Wooded wetlands

Public

- P All Categories

Residential

- Rr Rural hamlet

Shoreline

- Rk Shoreline developed

Outdoor Recreation

- OR All categories

Transportation

- Ta Airport

Source: New York Land Use and Natural Resource Inventory

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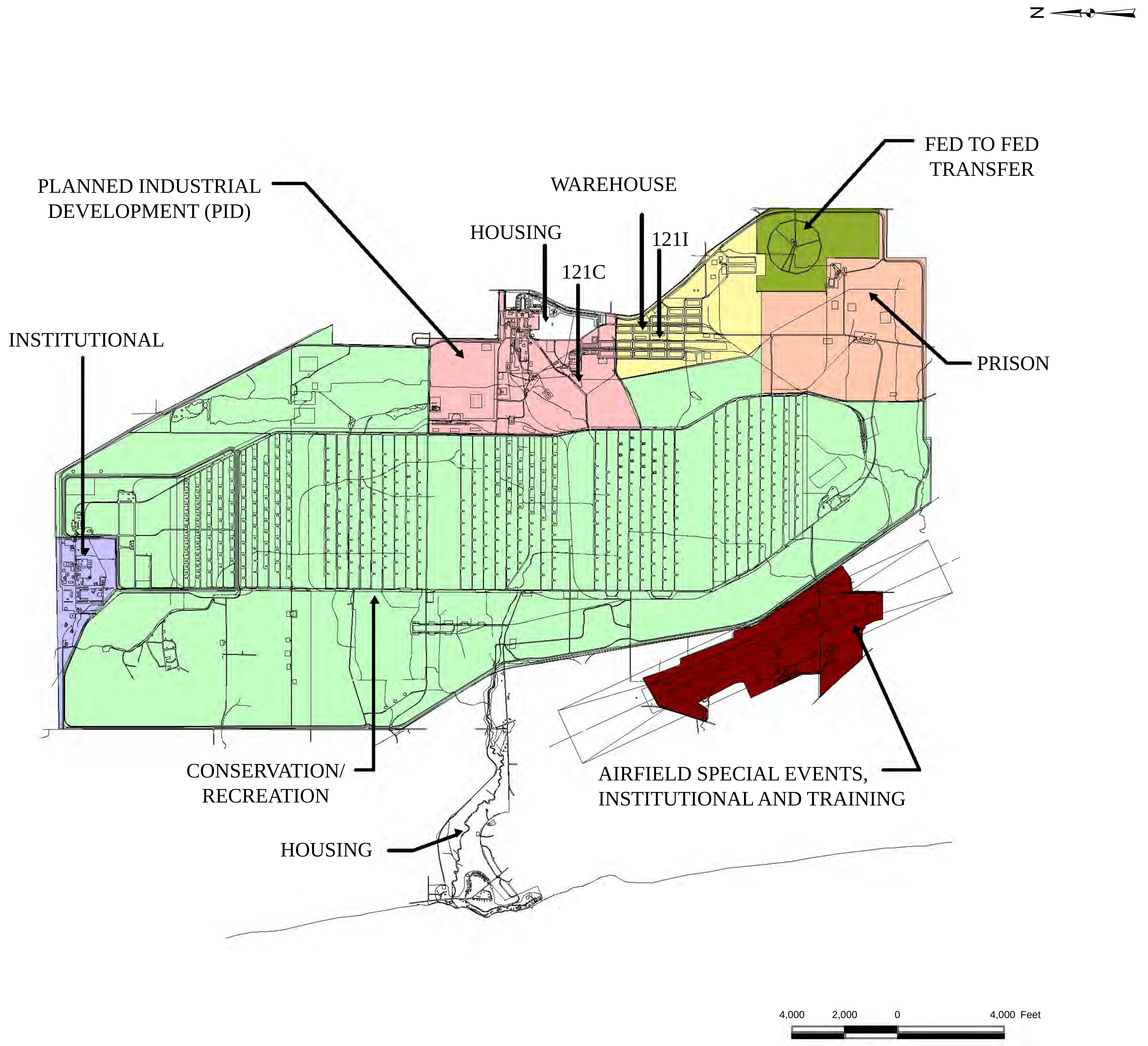
SENECA ARMY DEPOT ACTIVITY

SEAD-121C & SEAD-121I
RI REPORT

FIGURE 1-6
REGIONAL/LOCAL
LAND USE MAP

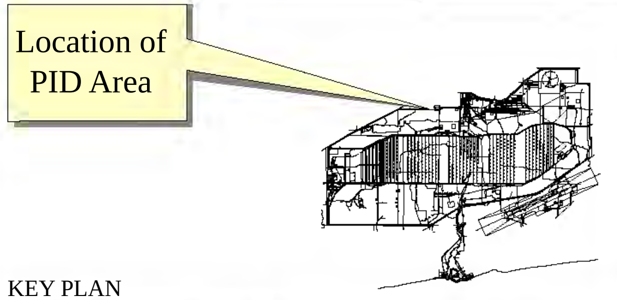
SCALE 1" = 2000'
DATE JULY 2005

O:\Seneca\PIDarea\ri_report\F1-7luse.cdr



LEGEND:

- 🟥 Airfield
- 🟩 Conservation
- 🟩 Federal
- 🟥 PID Area
- 🟦 Institutional
- 🟧 Prison
- 🟨 Warehouse
- ☐ Housing



KEY PLAN

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SENECA ARMY DEPOT ACTIVITY

SEAD-121C & 121I RI REPORT

FIGURE 1-7
FUTURE LAND USE PLAN

Job #: 741175-07000

Date: JULY 2005

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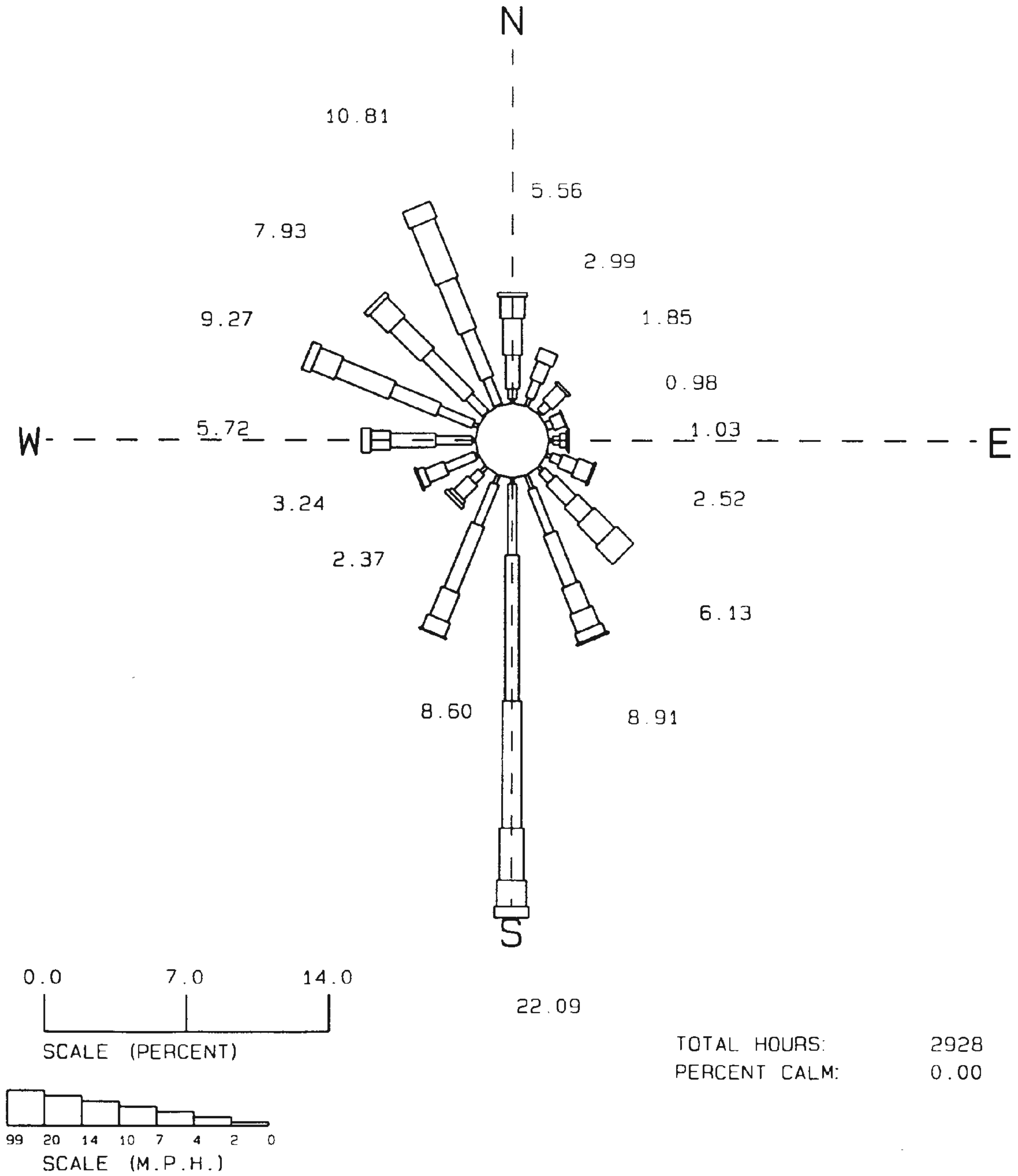
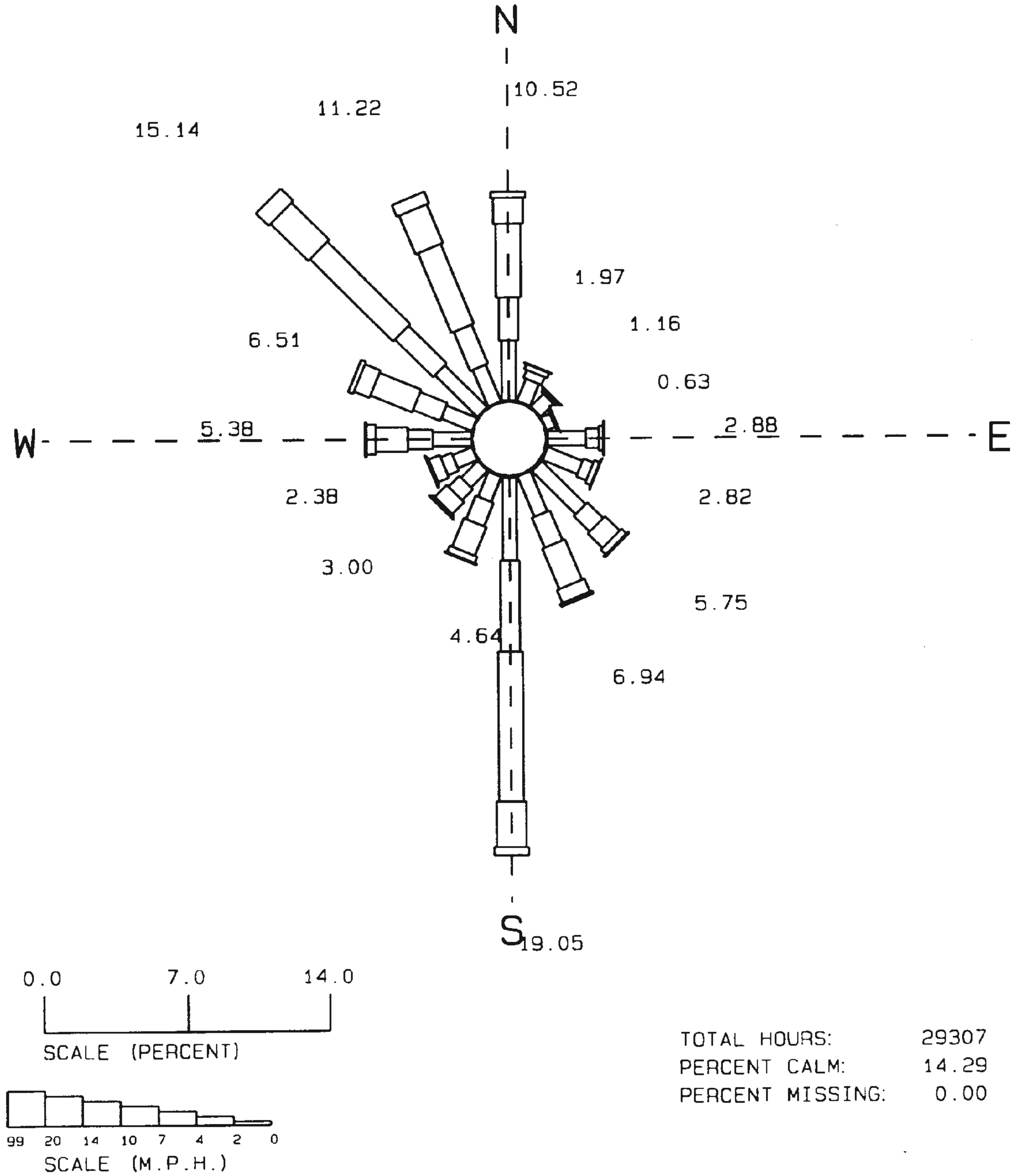


SENECA ARMY DEPOT
SENECA 10-M MET. TOWER
SEASONAL WIND ROSE
10 METER LEVEL APRIL 24 - JULY 14 1995



SENECA ARMY DEPOT
ITHACA AIRPORT
ANNUAL WIND ROSE
20 FOOT LEVEL FOR: 1989-1993

PARSONS

CLIENT/PROJECT TITLE

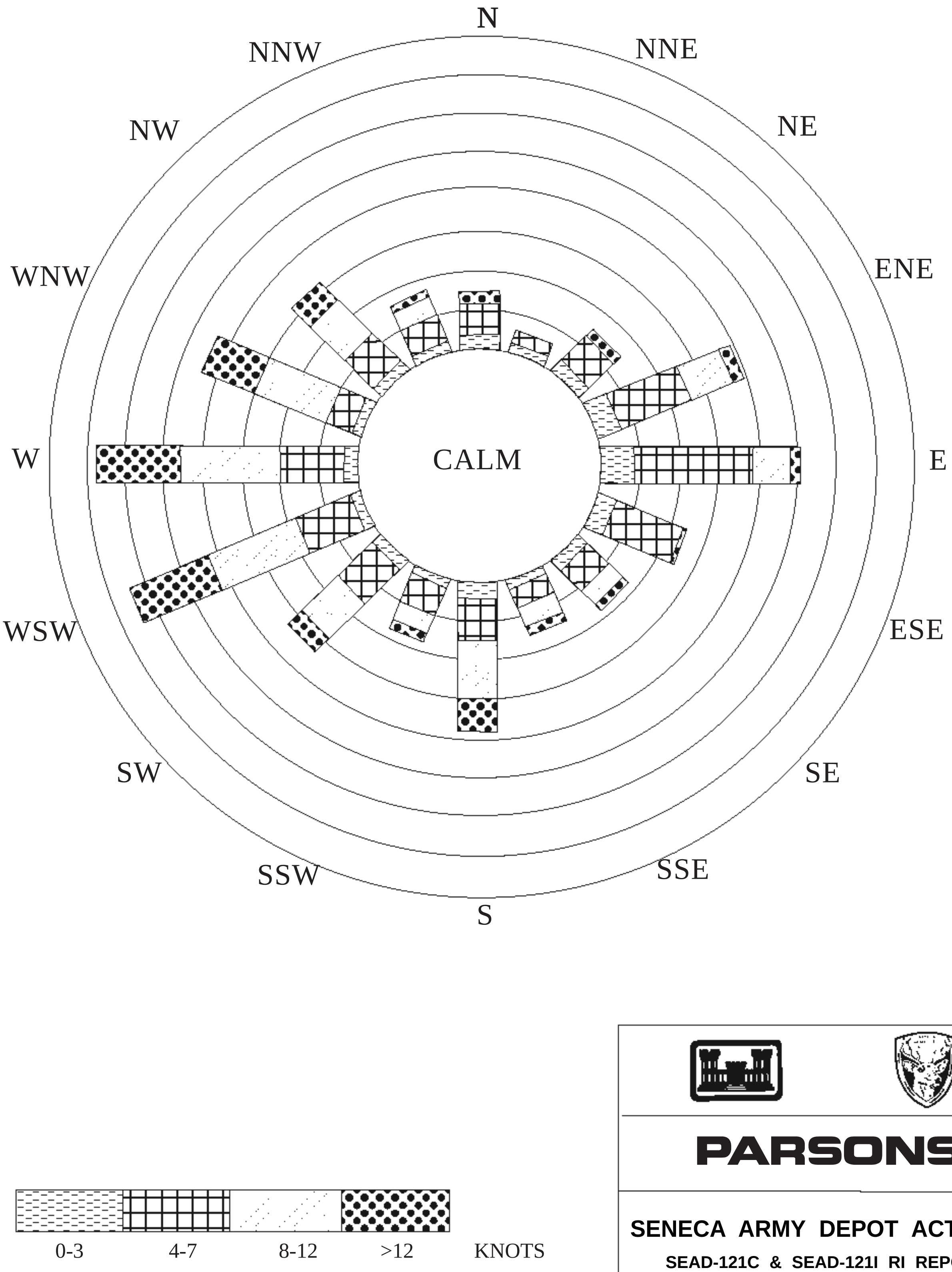
SENECA ARMY DEPOT ACTIVITY

SEAD-121C & SEAD-121I
RI REPORT

FIGURE 1-8
WIND ROSES

SCALE NA
DATE JULY 2005

O:\Seneca\PIDarea\ri_report2WROSES.CDR



NOTE: EACH DIVISION IS 2% OF TOTAL TIME

INSTALLATION: SENECA ARMY DEPOT
LOCATION OF DATA: SYRACUSE, NEW YORK
SOURCE: MODIFIED FROM:
US ARMY ENVIRONMENTAL
HYGIENE AGENCY

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SENECA ARMY DEPOT ACTIVITY
SEAD-121C & SEAD-121I RI REPORT

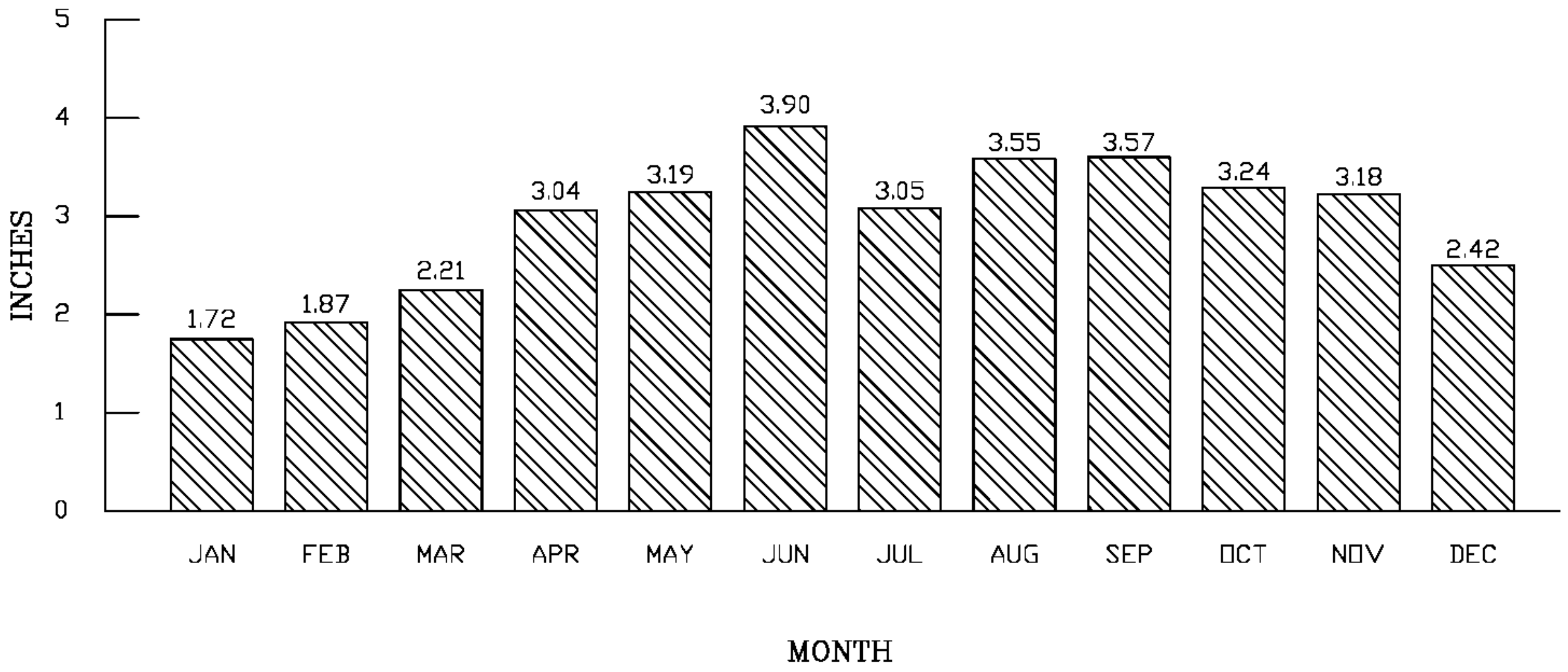
FIGURE 1-9

WIND ROSE,
SYRACUSE, NEW YORK

SCALE NA

DATE JULY 2005

O:\seneca\PIDarea\ri_report\F1-6windrose.cdr



DATA IS FROM THE NORTHEAST REGIONAL CLIMATE CENTER, CORNELL UNIVERSITY, ITHACA, NY AND IS GIVEN A MONTHLY AVERAGE PRECIPITATION AVERAGED OVER THE YEARS 1957 THROUGH 1991.

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SENECA ARMY DEPOT ACTIVITY
SEAD-121C AND SEAD-121I RI REPORT

FIGURE 1-10
AVERAGE MONTHLY PRECIPITATION IN
PROXIMITY OF SENECA ARMY DEPOT ACTIVITY

Job #: 741176-07000
Date: JULY 2005

p:\seneca\PIDarea\rl_report\figure1-10.dwg

LEGEND:

- ◬ Dwelling with Drinking Water Well
- ○ One mile radius outline from center of SEAD

2,000 1,000 0 2,000
Feet

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SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 1-11
DISTRIBUTION OF KNOWN
PRIVATE WELLS NEAR SEDA

Job #: 741175-07000	Date: JULY 2005

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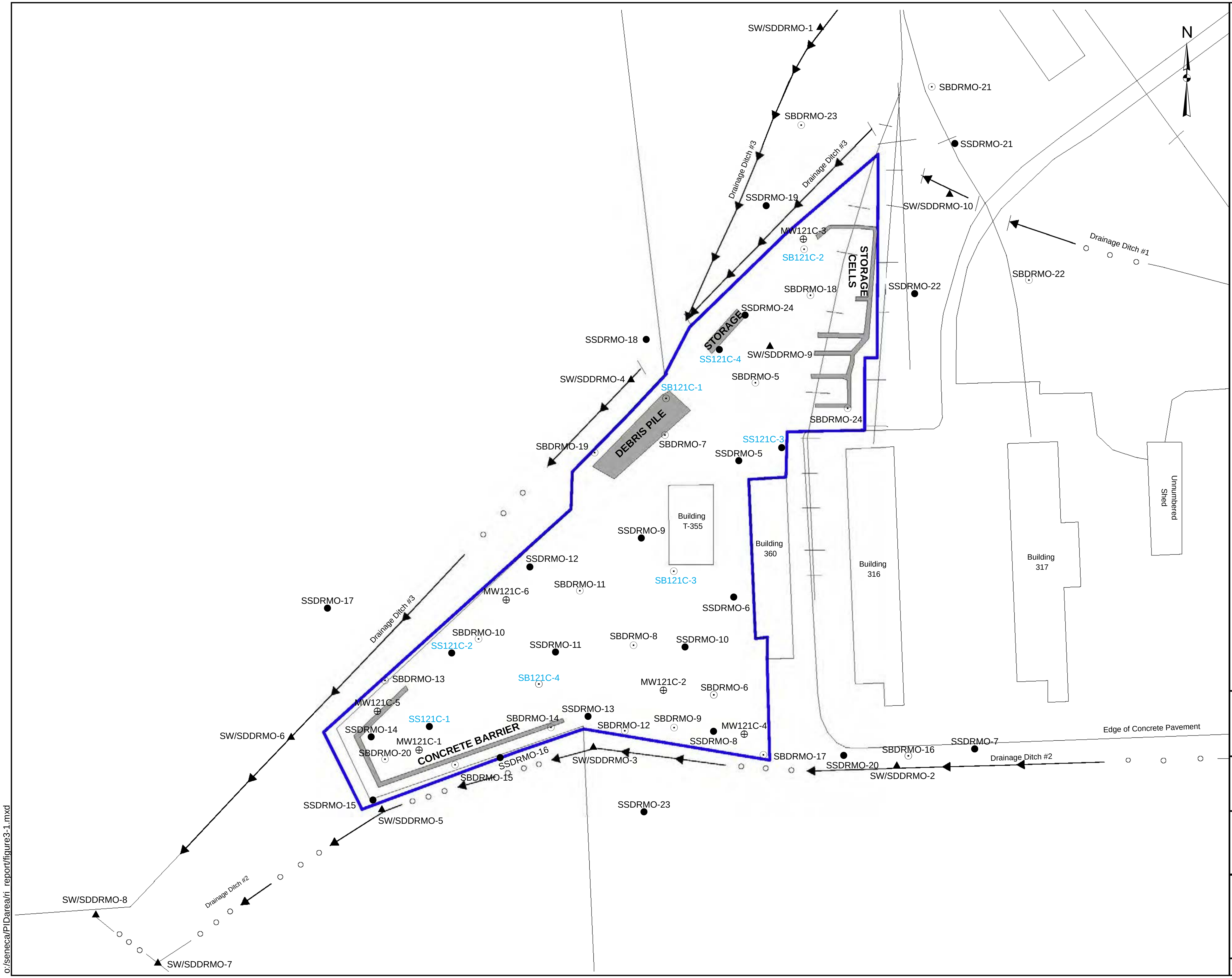

LEGEND:

●	Surface Soil Location
⊙	Soil Boring Location
⊕	Groundwater Location
▲	Surface Water/Ditch Soil Location
┼┼	Railroad Tracks
▢	Site Boundary
←	Surface Water Flow Direction
─○○○─	Surface Water
▭	Misc. Site Feature

NOTE:
Samples labeled in BLUE were collected during EBS incestigation. Samples labeled in BLACK were collected during RI sampling.

120 60 0 120 Feet

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SENECA ARMY DEPOT ACTIVITY

SEAD-121C & 121I RI REPORT

FIGURE 3-1
DRMO YARD - SEAD-121C
EBS AND RI SAMPLING LOCATIONS

Job #: 741175-07000

Date: JULY 2005

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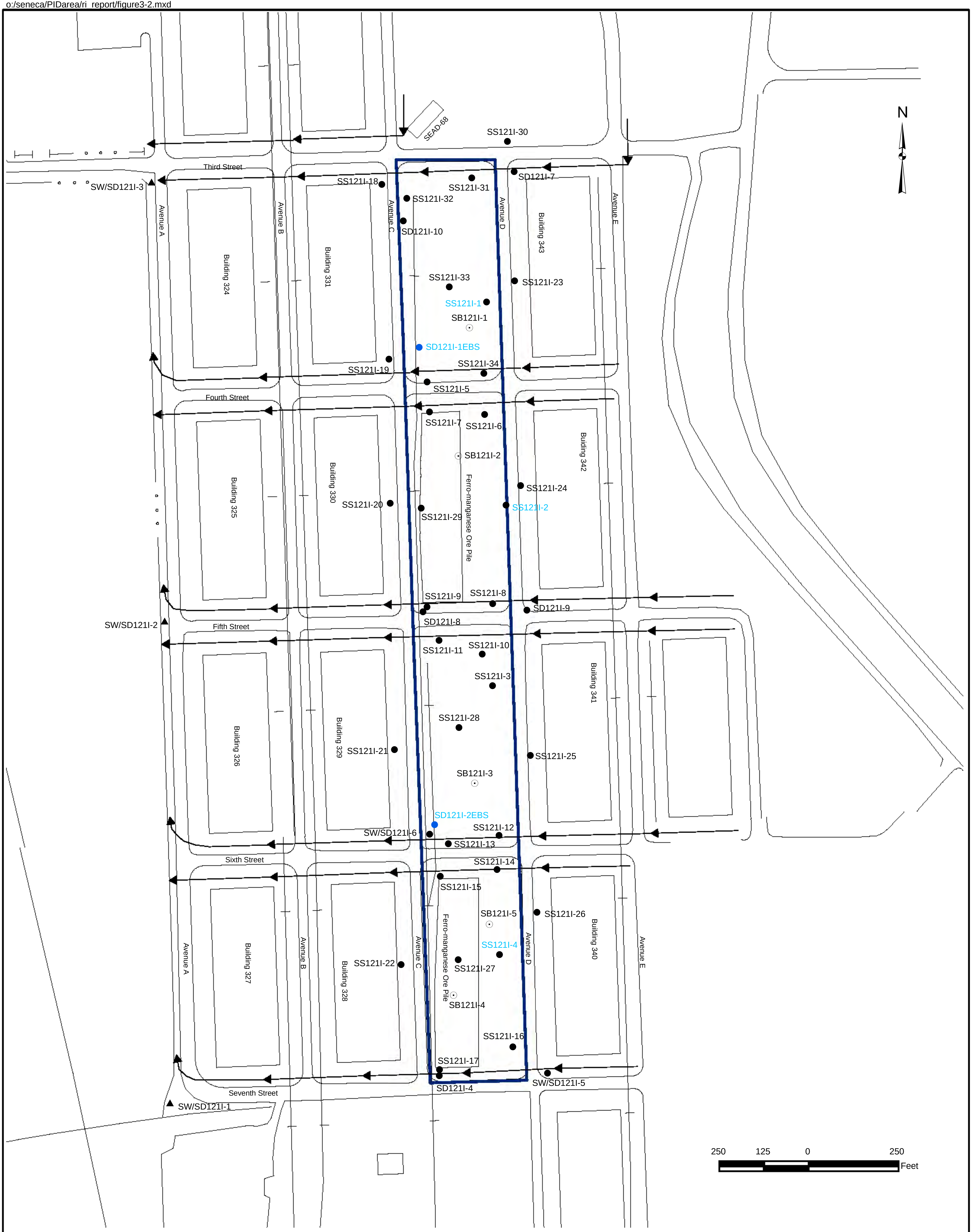
o:/seneca/PIDarea/ri_report/figure3-2.mxd



LEGEND:

●	Surface Soil Location
⊙	Soil Boring Location
▲	Surface Water/Ditch Soil Location
●	Ditch Soil Location EBS
✕	Railroad Tracks
☐	Site Boundary
—○○○—	Surface Water
←	Surface Water Flow Direction

NOTE:

Samples labeled in BLUE were col lected during EBS investigation. Samples labeled in BLACK were collected during RI sampling.

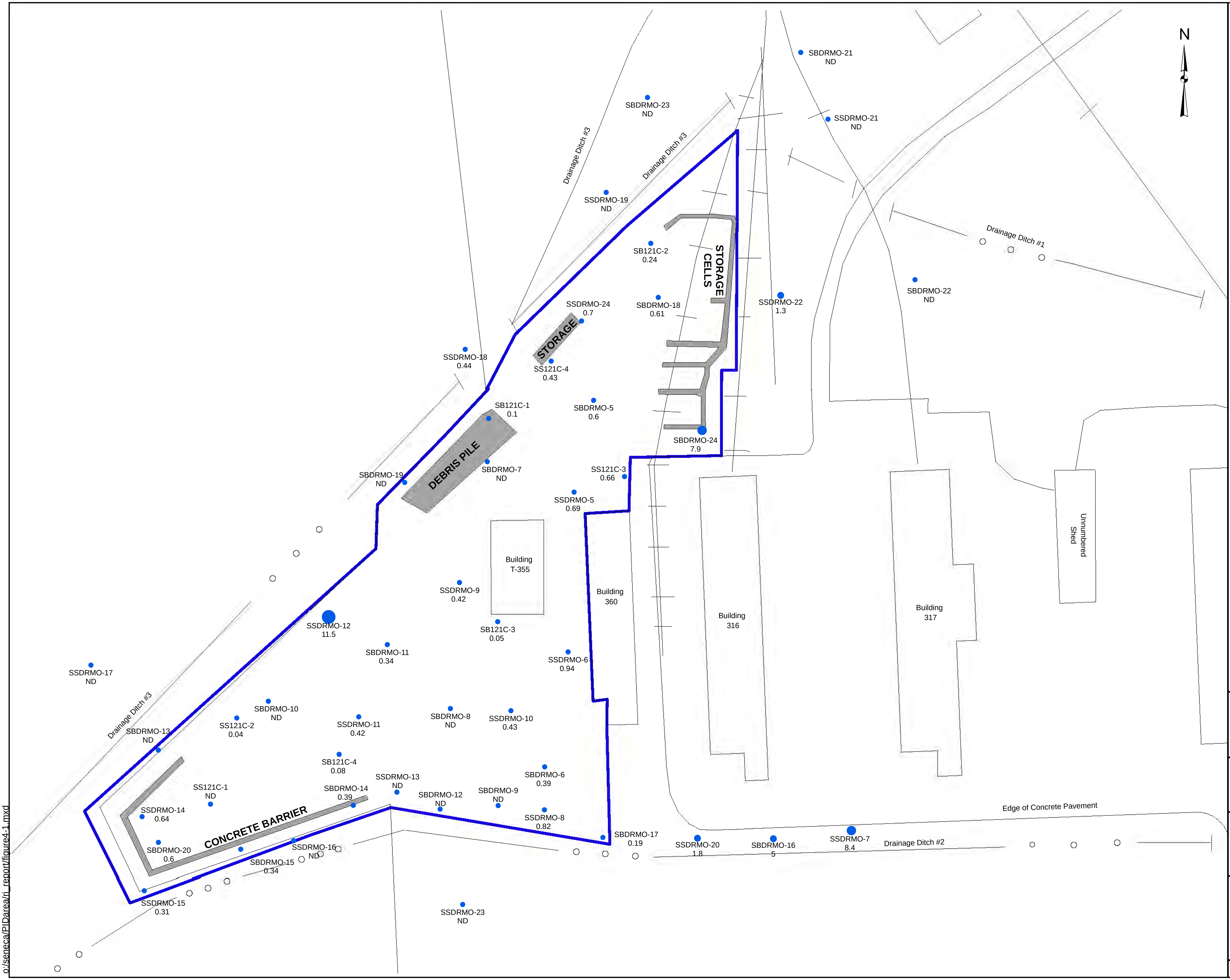
PARSONS

SENECA ARMY DEPOT ACTIVITY

SEAD-121C & 121I RI REPORT

FIGURE 3-2
RUMORED COSMOLINE
OIL DISPOSAL AREA - SEAD-121I
EBS AND RI SAMPLING LOCATIONS

Job #: 741175-07000 Date: JULY 2005



LEGEND:

SBDRMO-21 ● 8.5	Surface Soil Sample with Benzo(a)pyrene Toxicity Equivalence (BTE) Concentration (mg/Kg)
✕	Railroad Tracks
☐	Site Boundary
ND	Not Detected
NS	Not Sampled
—○○○—	Surface Water
▬	Misc. Site Feature

Concentrations (mg/Kg)

●	< 1
●	1 - 5
●	5 - 10
●	> 10

Note:
At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented. Surface soil samples were collected at depths extending from 0 to 2 inches below ground surface.

Benzo(a)pyrene Toxicity Equivalence Includes:

	BTE Ratio
Benzo (a) anthracene	0.1
Benzo (a) pyrene	1
Benzo (a) fluoranthene	0.1
Benzo (k) fluoranthene	0.01
Chrysene	0.01
Dibenz (a,h) anthracene	1
Indeno (1,2,3-cd) pyrene	0.1

PARSONS

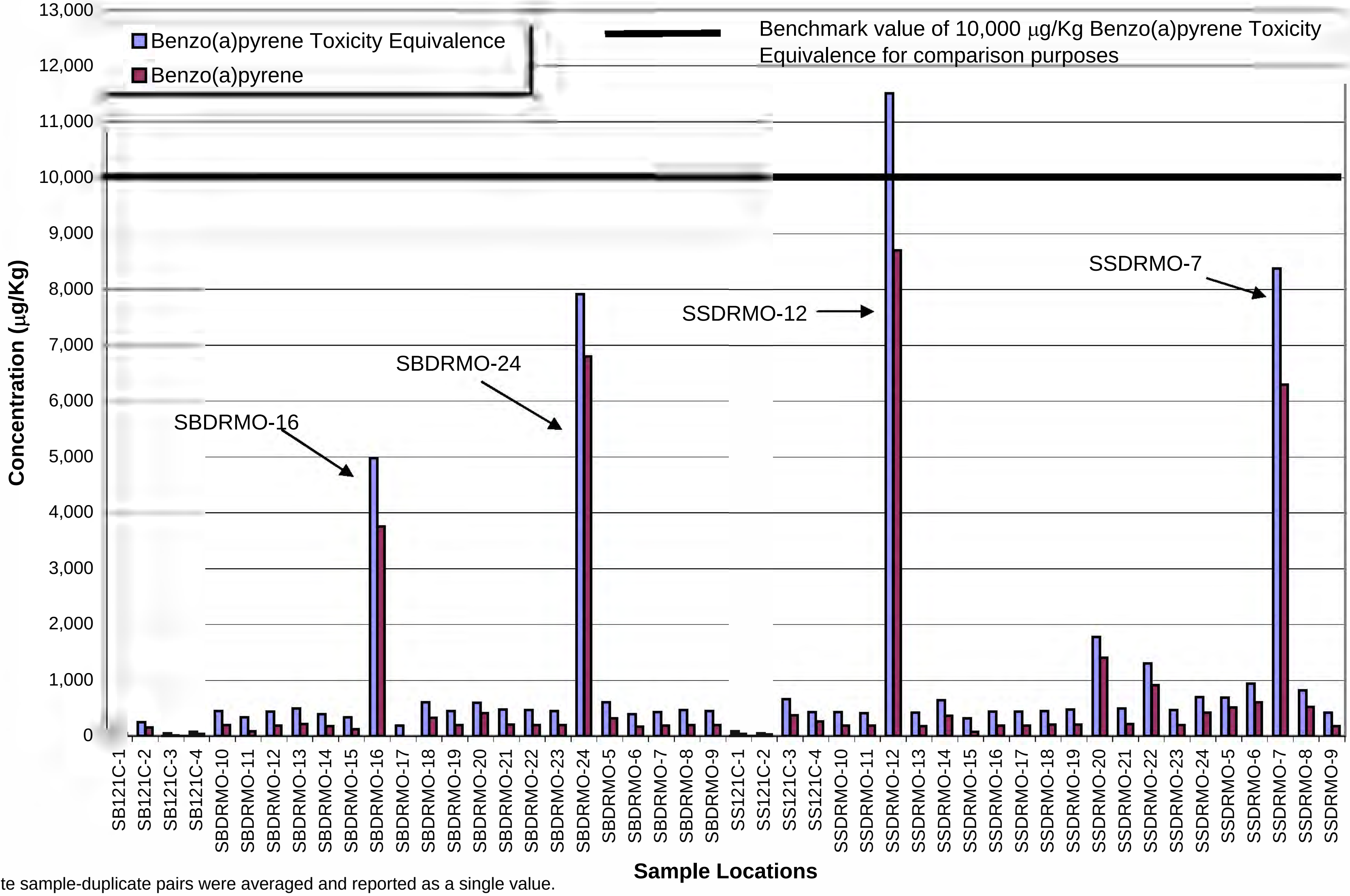
SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 4-1
DRMO YARD - SEAD-121C
BENZO(A)PYRENE TOXICITY EQUIVALENCE
CONCENTRATIONS IN SURFACE SOIL

Job #: 741175-07000
Date: JULY 2005

o:/seneca/PIDarea/ri_report/figure4-1.mxd

FIGURE 4-2
Benzo(a)pyrene Toxicity Equivalence in Surface Soil at the DRMO Yard
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



Note sample-duplicate pairs were averaged and reported as a single value.

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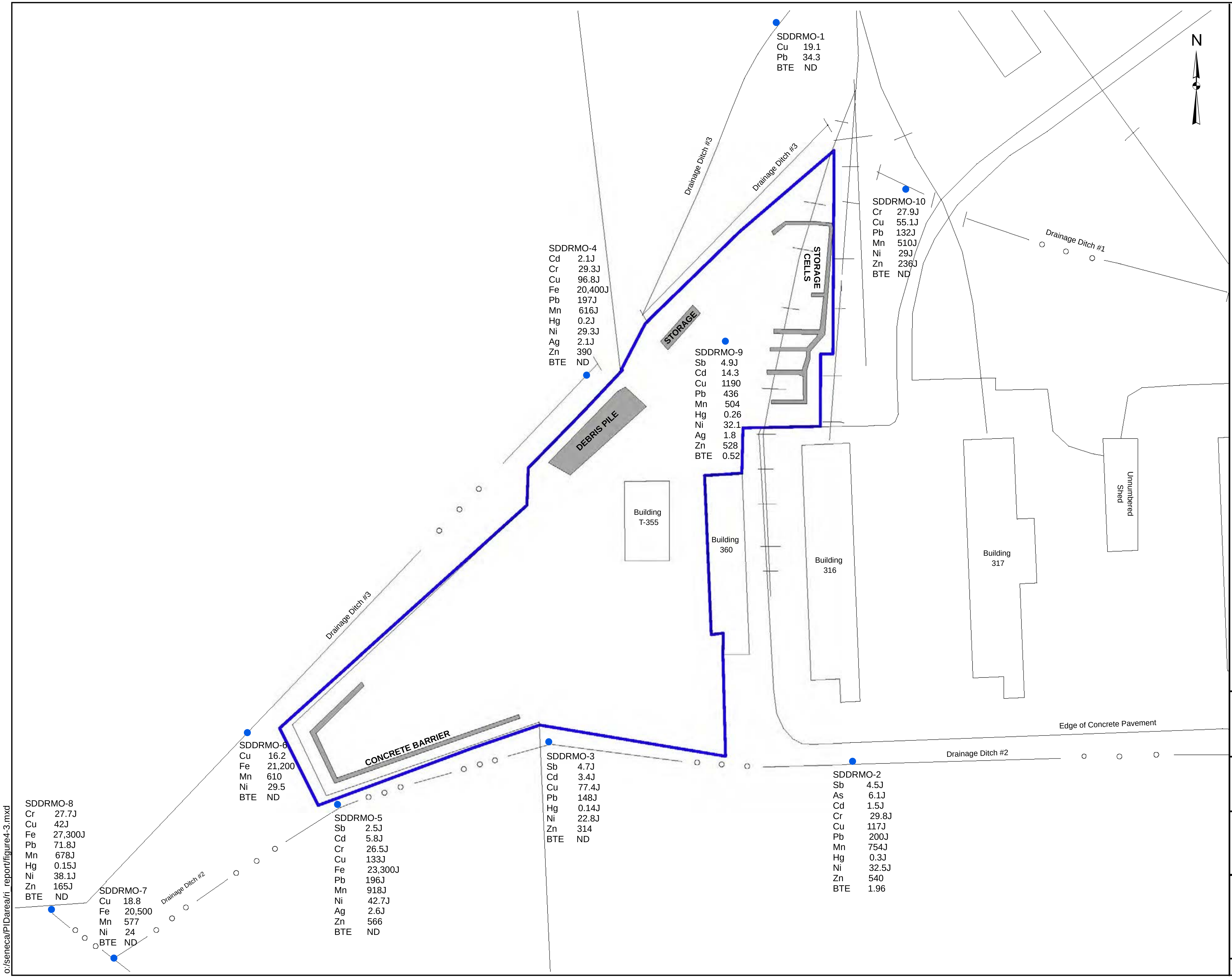

LEGEND:

SDDRMO-2 ●	Ditch Soil Location with Metals (mg/Kg) and Benzo(a)pyrene Toxicity Equivalence (BTE) Concentrations (mg/Kg)
	Railroad Tracks
▭	Site Boundary
ND	Not Detected
NS	Not Sampled
— ○ ○ ○ —	Surface Water
▭	Misc. Site Feature

NOTE:
At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented.

Benzo(a)pyrene Toxicity Equivalence Includes:

	BTE Ratio
Benzo (a) anthracene	0.1
Benzo (a) pyrene	1
Benzo (a) fluoranthene	0.1
Benzo (k) fluoranthene	0.01
Chrysene	0.01
Dibenz (a,h) anthracene	1
Indeno (1,2,3-cd) pyrene	0.1

120 60 0 120 Feet

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SENECA ARMY DEPOT ACTIVITY

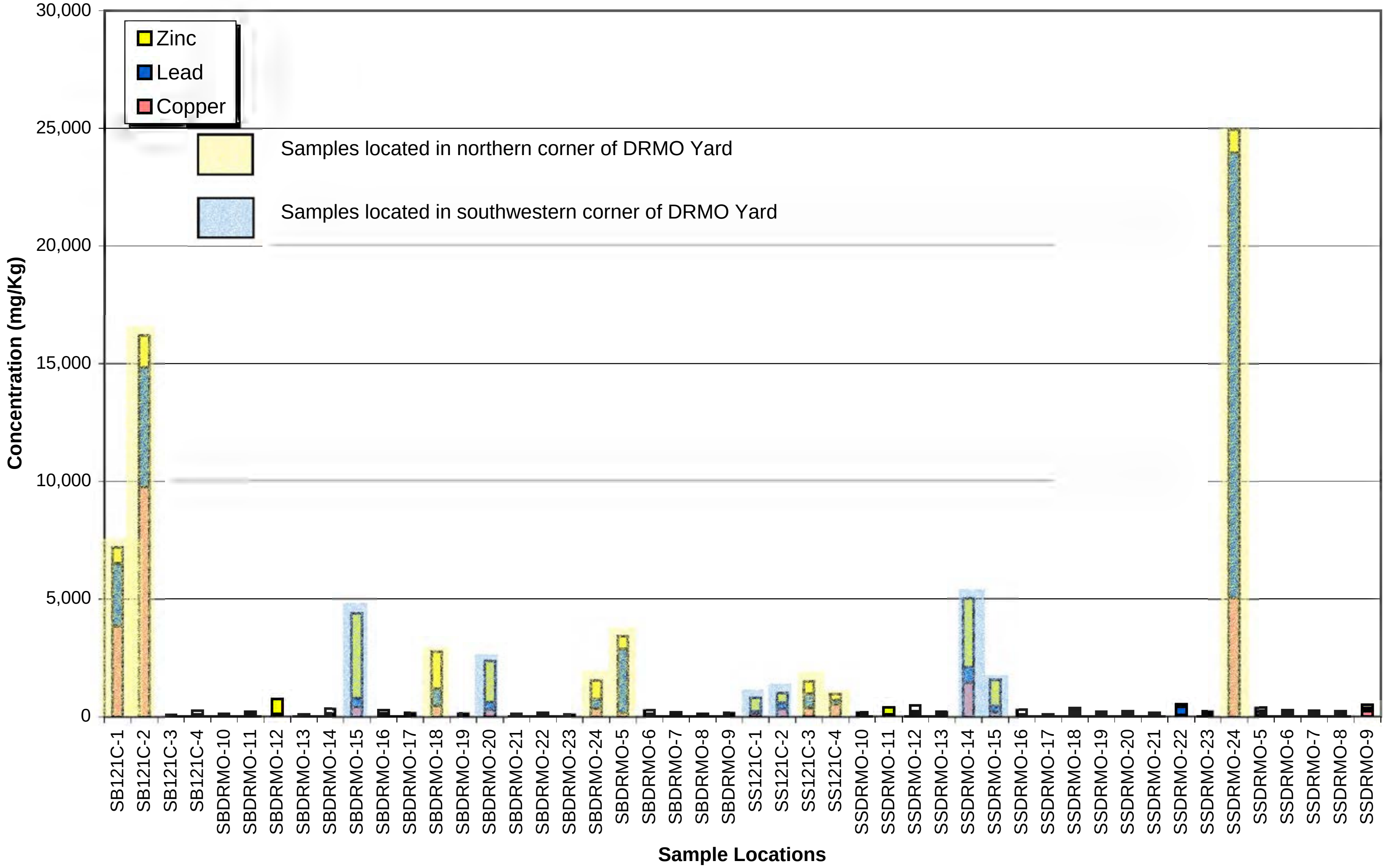
SEAD-121C & 121I RI REPORT

FIGURE 4-3
DRMO YARD - SEAD-121C
BENZO(A)PYRENE TOXICITY EQUIVALENCE
AND DETECTED METAL CONCENTRATIONS
IN DITCH SOIL SAMPLES

Job #: 741175-07000

Date: JULY 2005

FIGURE 4-4
Distribution of Tier 1 Metals in Surface Soil at the DRMO Yard
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



Note sample-duplicate pair were averaged and reported as a single value.

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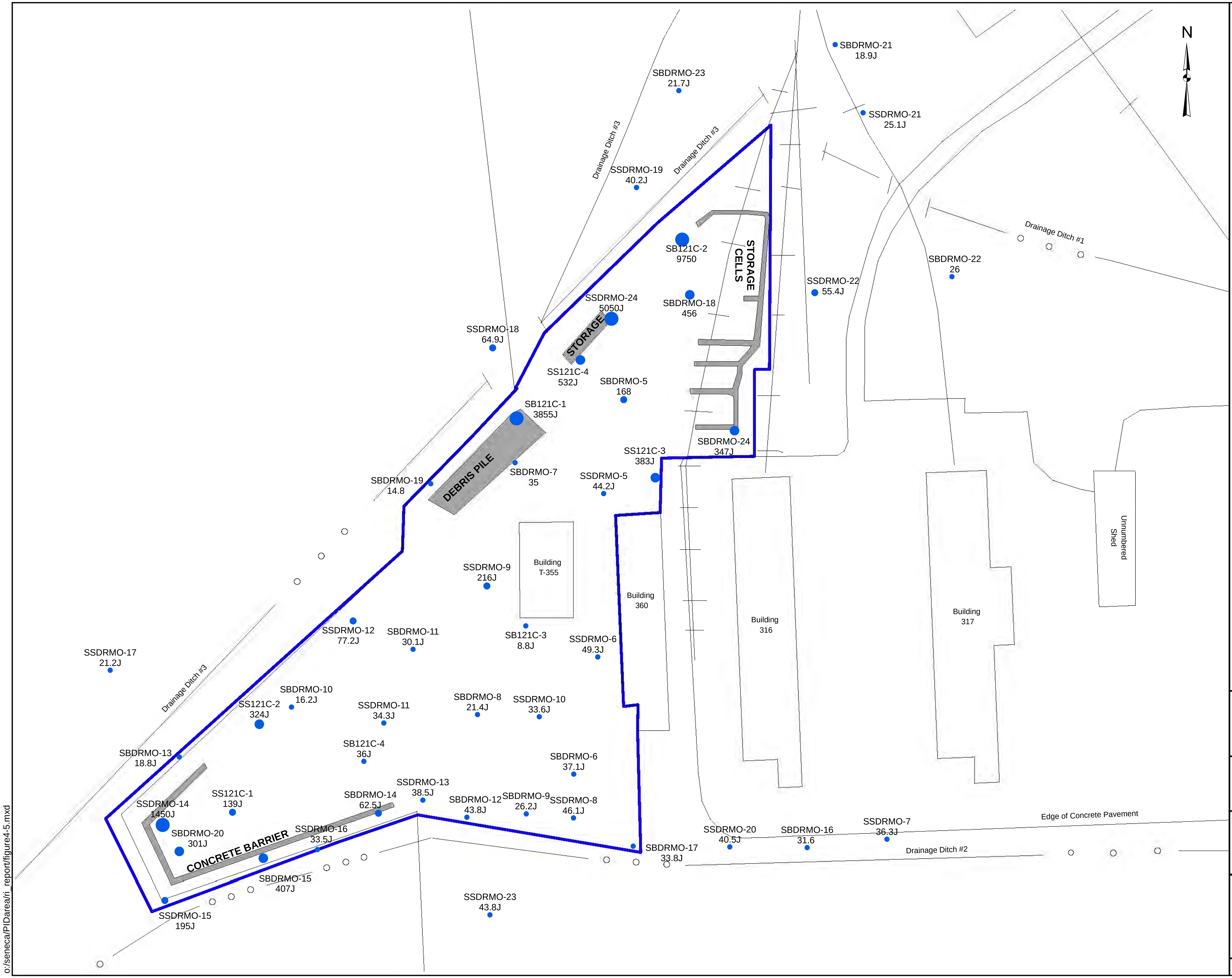

LEGEND:

SBDRMO-21 ● 8.5 — Surface Soil Sample with Copper Concentrations (mg/Kg)

Railroad Tracks

Site Boundary

ND — Not Detected

NS — Not Sampled

—○○○— Surface Water

▭ Misc. Site Feature

Concentrations (mg/Kg)

- ● < 50
- ● 50 - 300
- ● 300 - 600
- ● > 600

NOTE:
At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented. Surface soil samples were collected at depths extending from 0 to 2 inches below ground surface.

100 50 0 100 Feet

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SENECA ARMY DEPOT ACTIVITY

SEAD-121C & 121I RI REPORT

FIGURE 4-5
DRMO YARD - SEAD-121C
COPPER CONCENTRATIONS
IN SURFACE SOIL

Job #: 741175-07000
Date: JULY 2005

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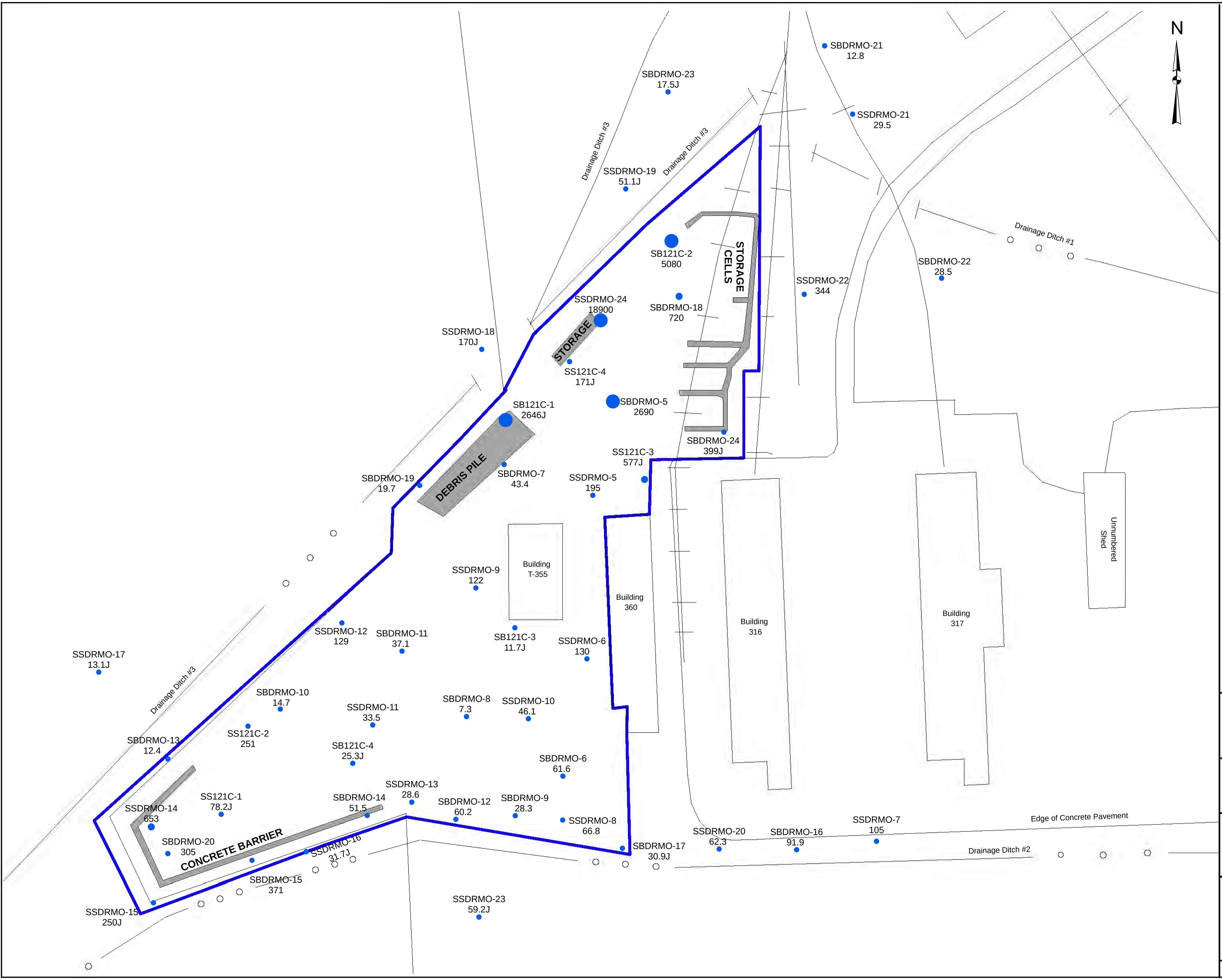


LEGEND:

SBDRMO-21 ● 8.5	Surface Soil Sample with Lead Concentrations (mg/Kg)
	Railroad Tracks
▭	Site Boundary
ND	Not Detected
NS	Not Sampled
—○○○—	Surface Water
▬	Misc. Site Feature

Concentrations (mg/Kg)

- ● < 400
- ● 400 - 1000
- ● 1000 - 1250
- ● > 1250

NOTE:
At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented. Surface soil samples were collected at depths extending from 0 to 2 inches below ground surface.

100 50 0 100 Feet

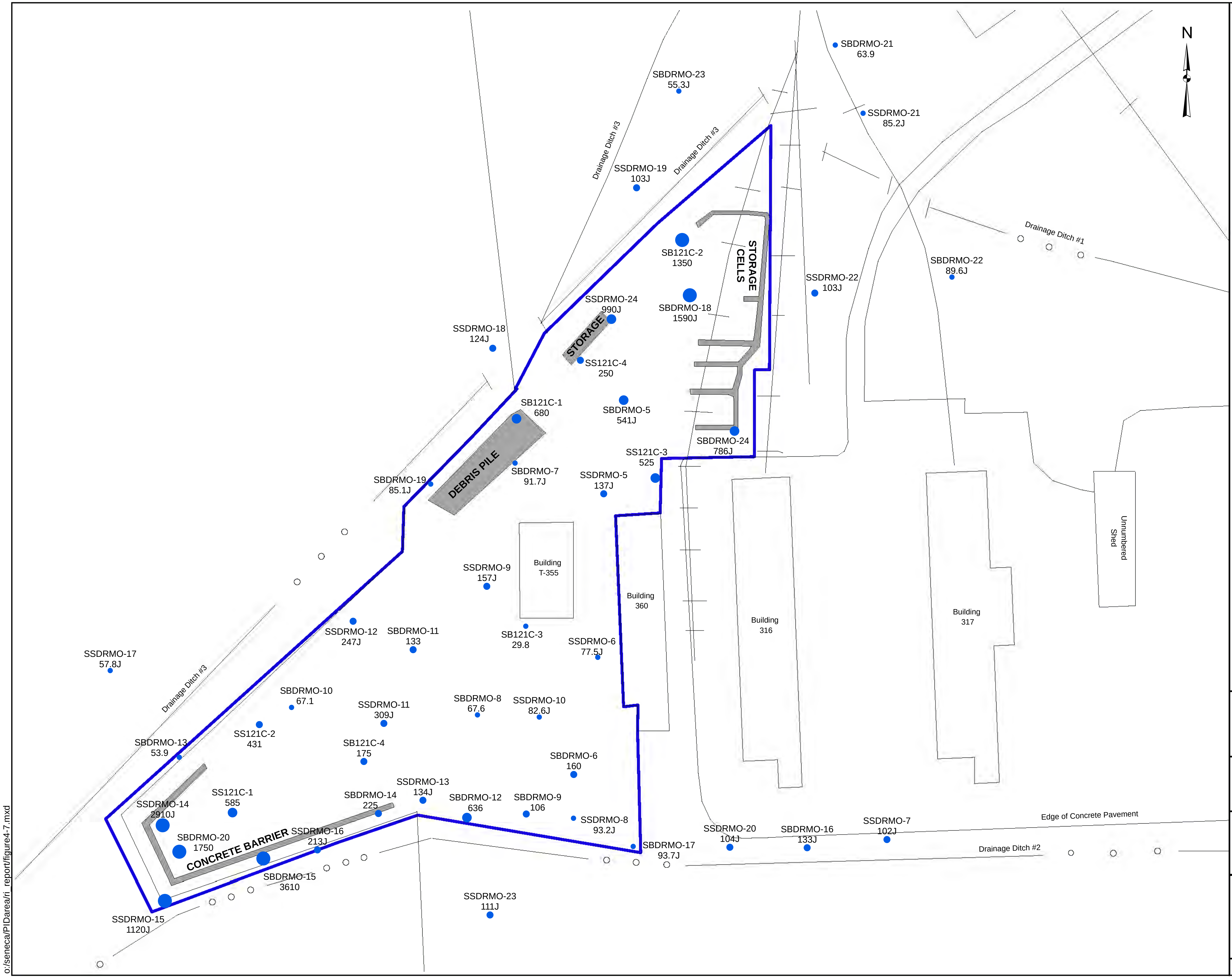
PARSONS

SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 4-6
DRMO YARD - SEAD-121C
LEAD CONCENTRATIONS
IN SURFACE SOIL

Job #: 741175-07000 Date: JULY 2005

o:/seneca/PIDarea/ri_report/figure4-6.mxd



LEGEND:

SBDRMO-21 ● 8.5	Surface Soil Sample with Zinc Concentrations (mg/Kg)
─┼─┼─	Railroad Tracks
▢	Site Boundary
ND	Not Detected
NS	Not Sampled
—○○○—	Surface Water
▨	Misc. Site Feature

Concentrations (mg/Kg)

●	< 100
●	100 - 500
●	500 - 1000
●	> 1000

NOTE:
At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented. Surface soil samples were collected at depths extending from 0 to 2 inches below ground surface.

PARSONS

SENECA ARMY DEPOT ACTIVITY

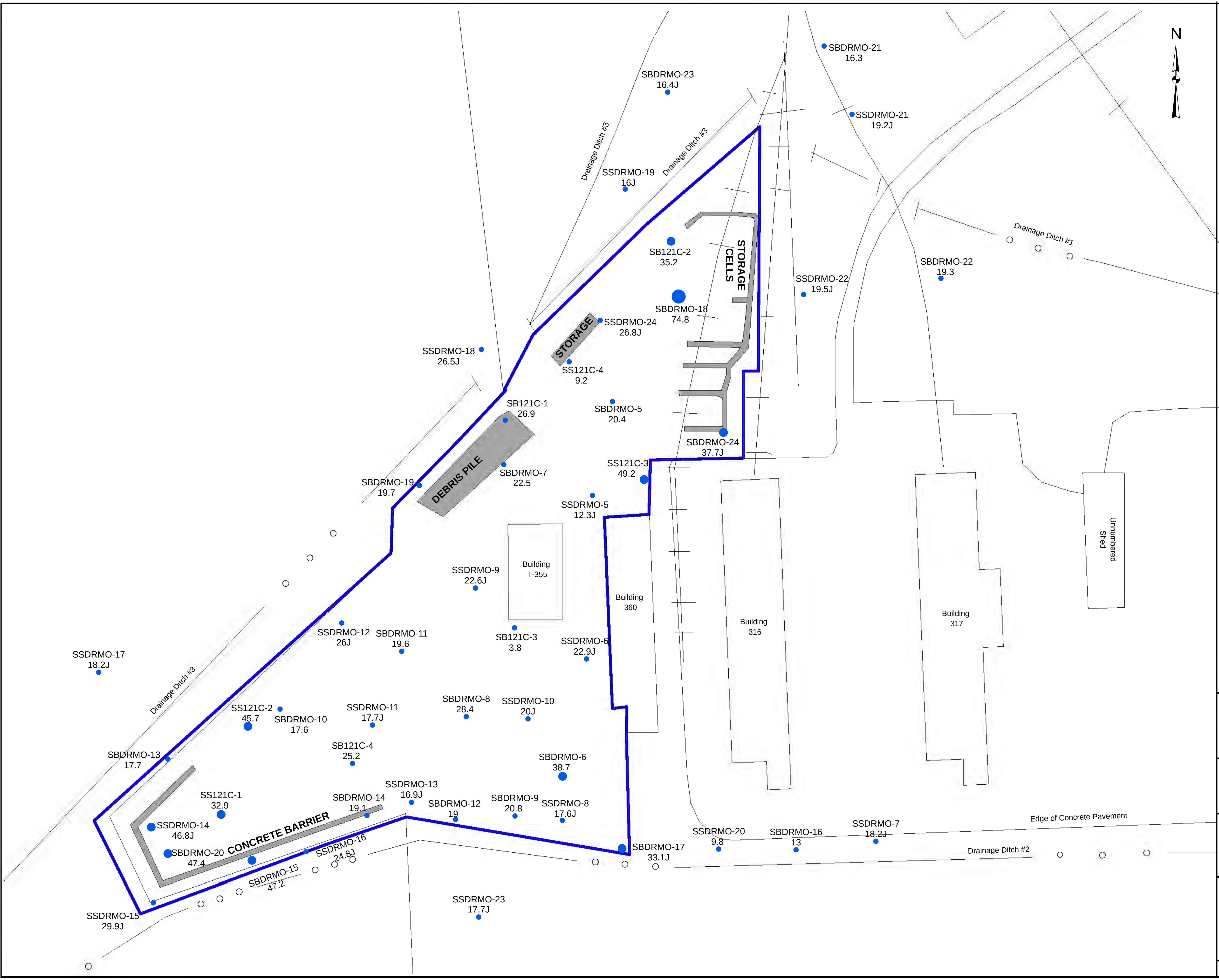
SEAD-121C & 121I RI REPORT

FIGURE 4-7
DRMO YARD - SEAD-121C
ZINC CONCENTRATIONS
IN SURFACE SOIL

Job #: 741175-07000

Date: JULY 2005

o:/seneca/PIDarea/ri_report/figure4-7.mxd



o:/seneca/PIDarea/ri_report/figure4-8.mxd

LEGEND:

SBDRMO-21 ● 8.5 Surface Soil Sample with Chromium Concentrations (mg/Kg)

Railroad Tracks

Site Boundary

ND Not Detected

NS Not Sampled

—○○○— Surface Water

▨ Misc. Site Feature

Concentrations (mg/Kg)

- ● < 30
- ● 30 - 60
- ● >60

NOTE:
At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented. Surface soil samples were collected at depths extending from 0 to 2 inches below ground surface.

100 50 0 100 Feet

PARSONS

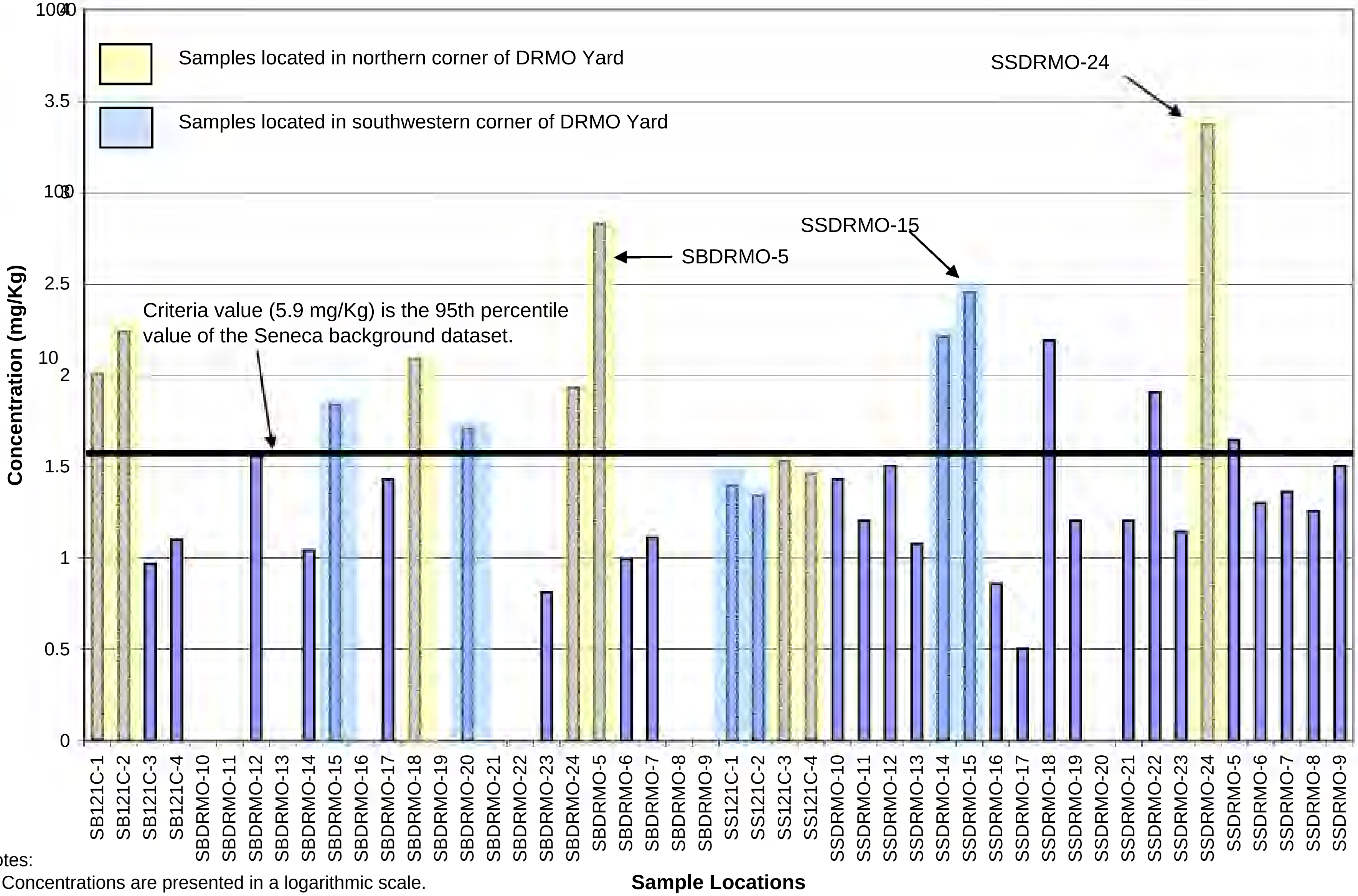
SENECA ARMY DEPOT ACTIVITY

SEAD-121C & 121I RI REPORT

FIGURE 4-8
DRMO YARD - SEAD-121C
CHROMIUM CONCENTRATIONS
IN SURFACE SOIL

Job #: 741175-07000	Date: JULY 2005

FIGURE 4-9
Distribution of Antimony in Surface Soil at the DRMO Yard
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



Notes:
1) Concentrations are presented in a logarithmic scale.
2) Sample-duplicate pairs were averaged and reported as a single value.

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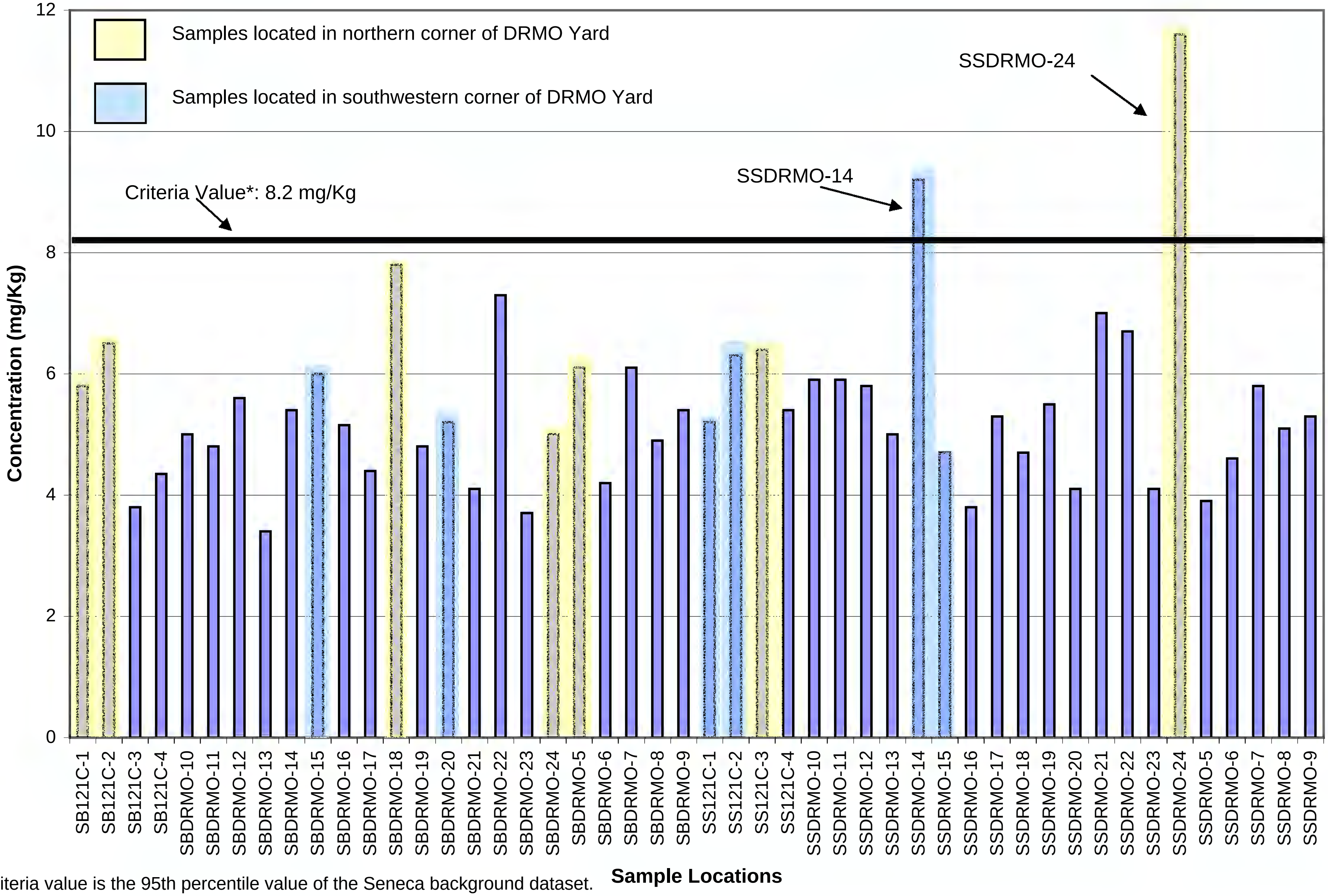
FIGURE 4-10
Distribution of Arsenic in Surface Soil at the DRMO Yard
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



*Criteria value is the 95th percentile value of the Seneca background dataset.
Note sample-duplicate pairs were averaged and reported as a single value.

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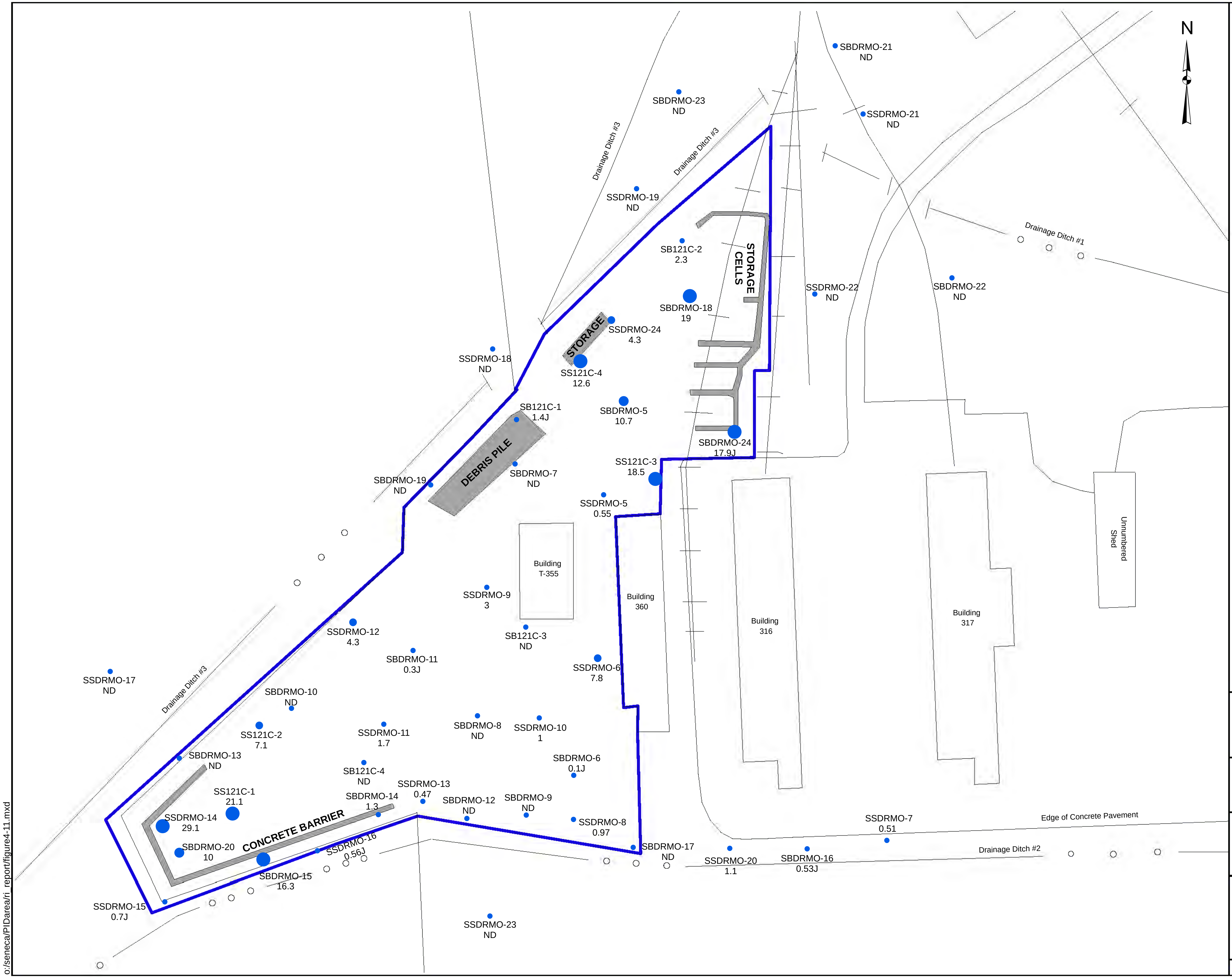

LEGEND:

SBDRMO-21 ● 8.5 Surface Soil Sample with Cadmium Concentrations (mg/Kg)

Railroad Tracks

Site Boundary

ND Not Detected

NS Not Sampled

—○○○— Surface Water

▨ Misc. Site Feature

Concentrations (mg/Kg)

- ● < 3
- ● 3 - 8
- ● 8 - 12
- ● > 12

NOTE:
At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented. Surface soil samples were collected at depths extending from 0 to 2 inches below ground surface.

100 50 0 100 Feet

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SENECA ARMY DEPOT ACTIVITY

SEAD-121C & 121I RI REPORT

FIGURE 4-11
DRMO YARD - SEAD-121C
CADMIUM CONCENTRATIONS
IN SURFACE SOIL

Job #: 741175-07000 | Date: JULY 2005

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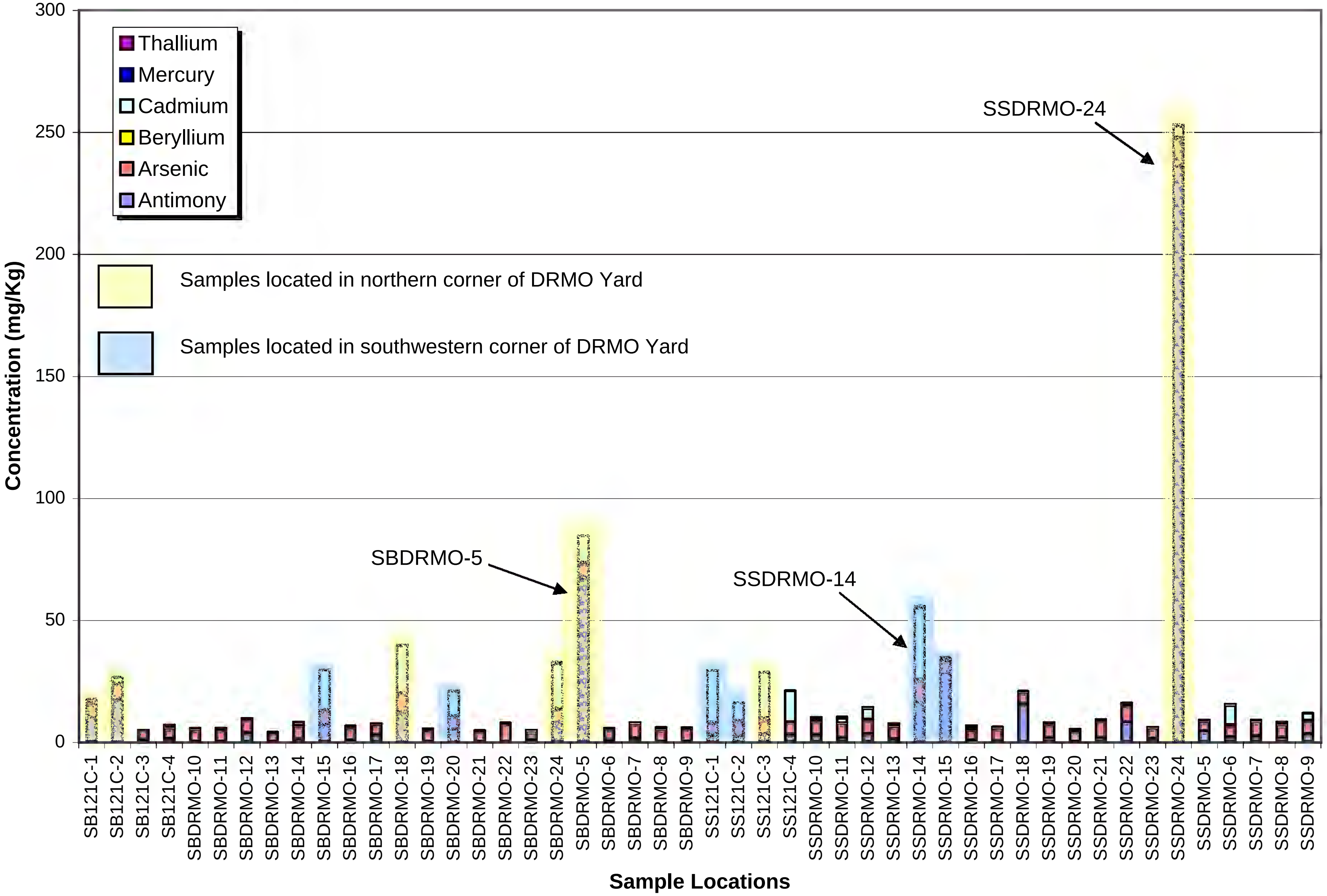
FIGURE 4-12
Distribution of Tier 2 Metals in Surface Soil at the DRMO Yard
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



Note sample-duplicate pairs were averaged and reported as a single value.

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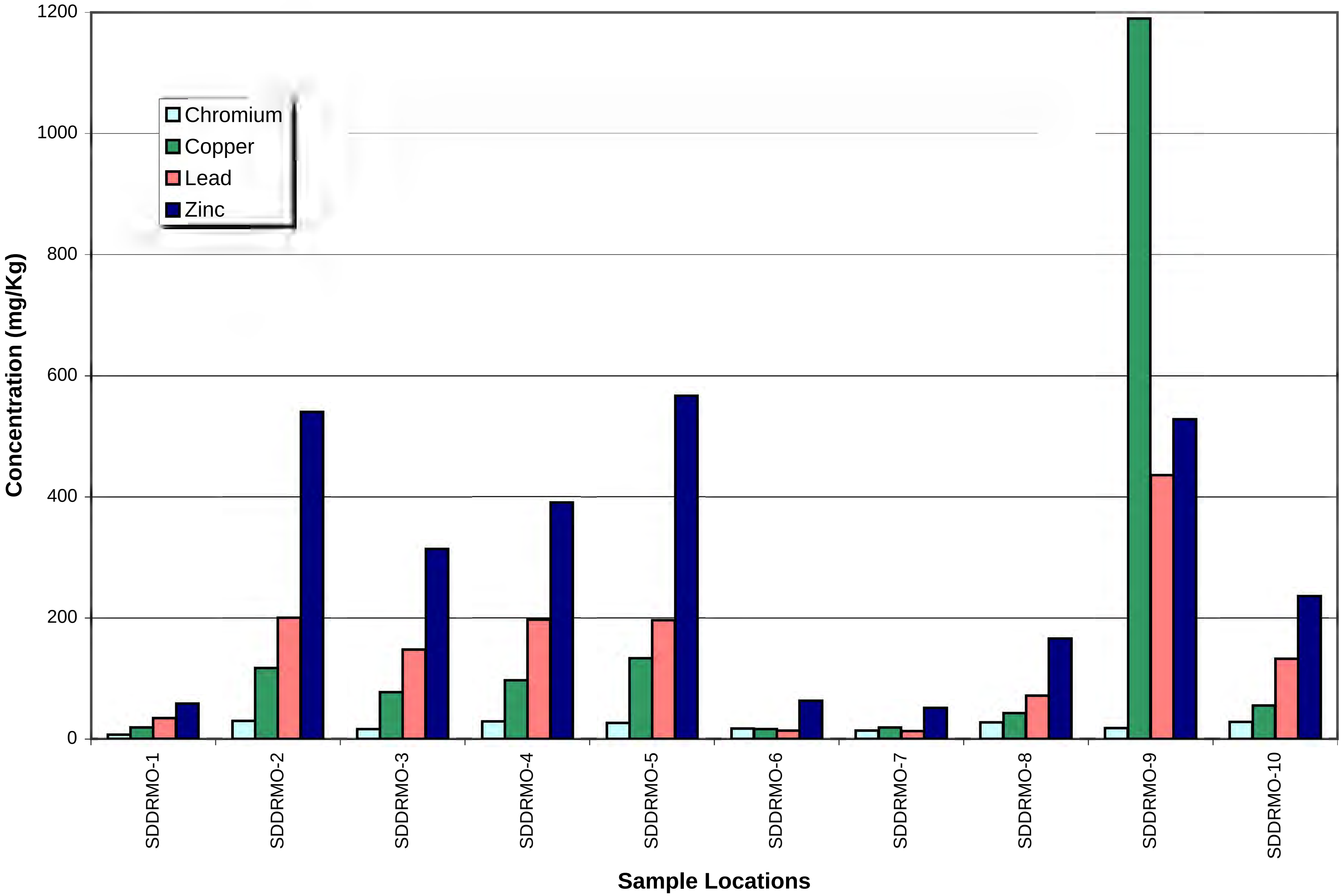
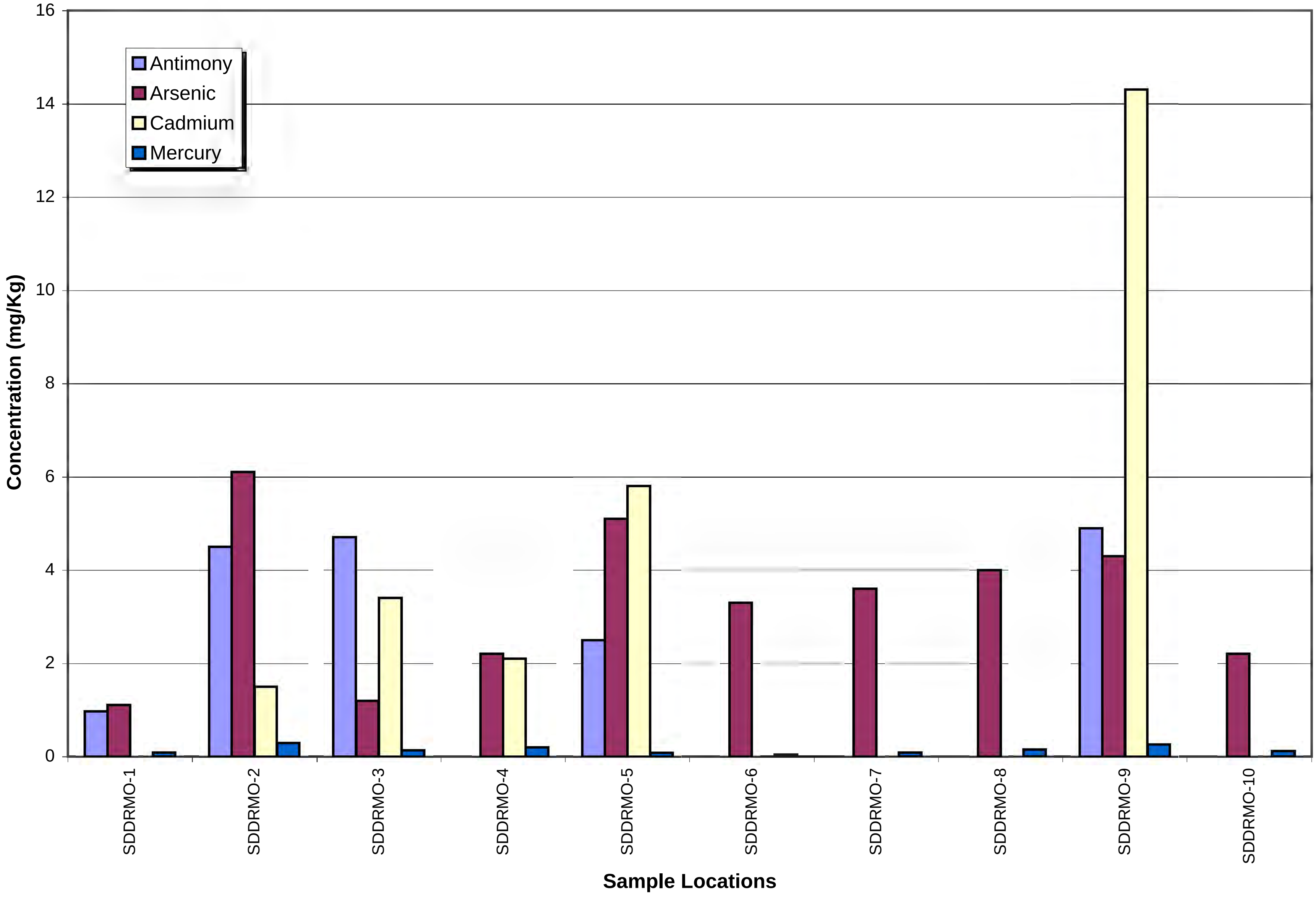
FIGURE 4-13
Distribution of Tier 1 Metals in Ditch Soil at the DRMO Yard
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



Note sample-duplicate pair was averaged and reported as a single value.

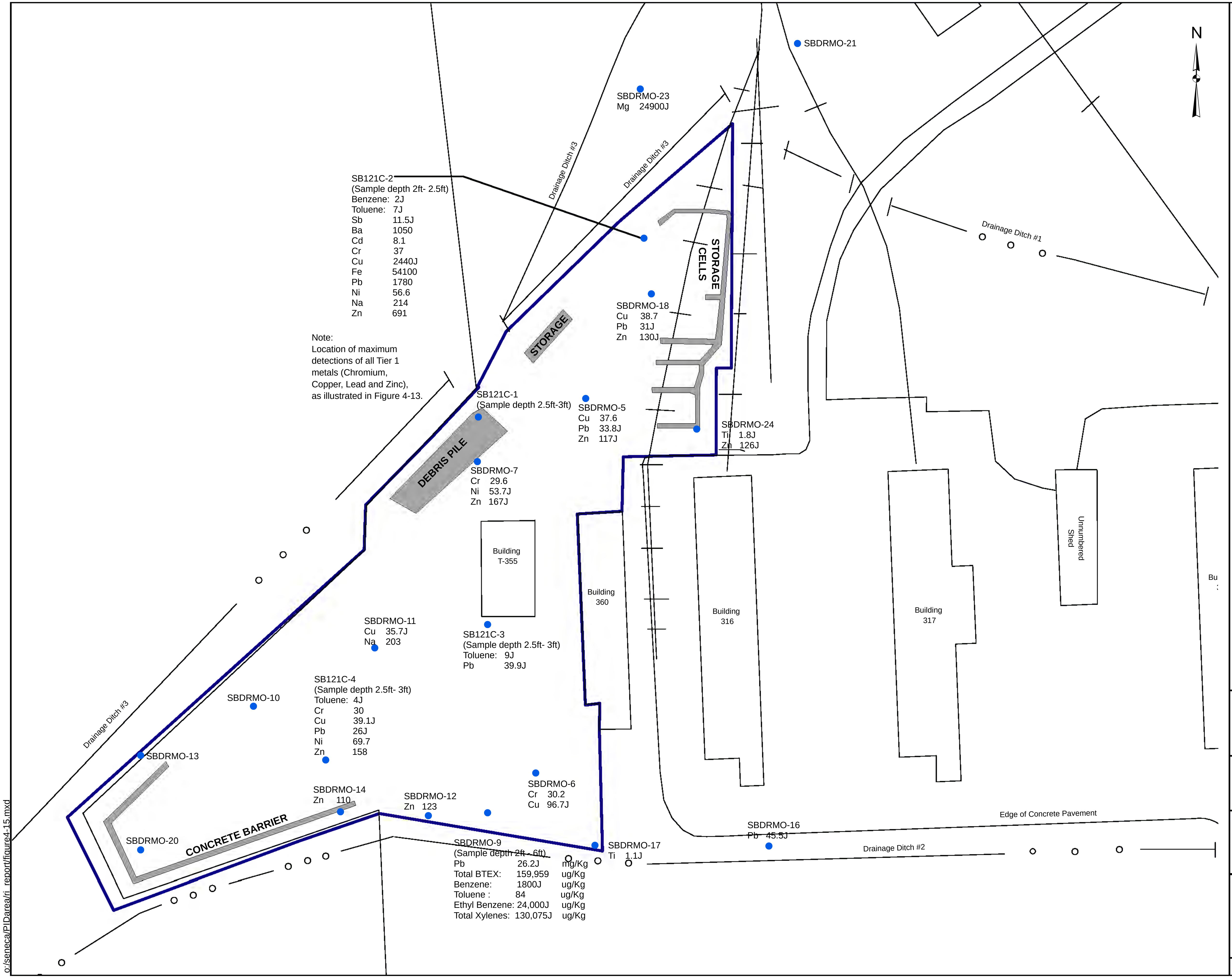
P:\PIT\Projects\SENECA\PID Area\Report\Draft Final\Figures\drmo_ditch_metals.xls.xls\tier 1

FIGURE 4-14
Distribution of Tier 2 Metals in Ditch Soil at the DRMO Yard
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



Note sample-duplicate pair was averaged and reported as a single value.

P:\PIT\Projects\SENECA\PID Area\Report\Draft Final\Figures\drmo_ditch_metals.xls.xls\tier 2



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LEGEND:

SBDRMO-21 ● Soil Boring Location
Sample depth is 2 ft-6 ft unless otherwise noted.

Railroad Tracks

Site Boundary

Surface Water

▨ Misc. Site Feature

100 50 0 100 Feet

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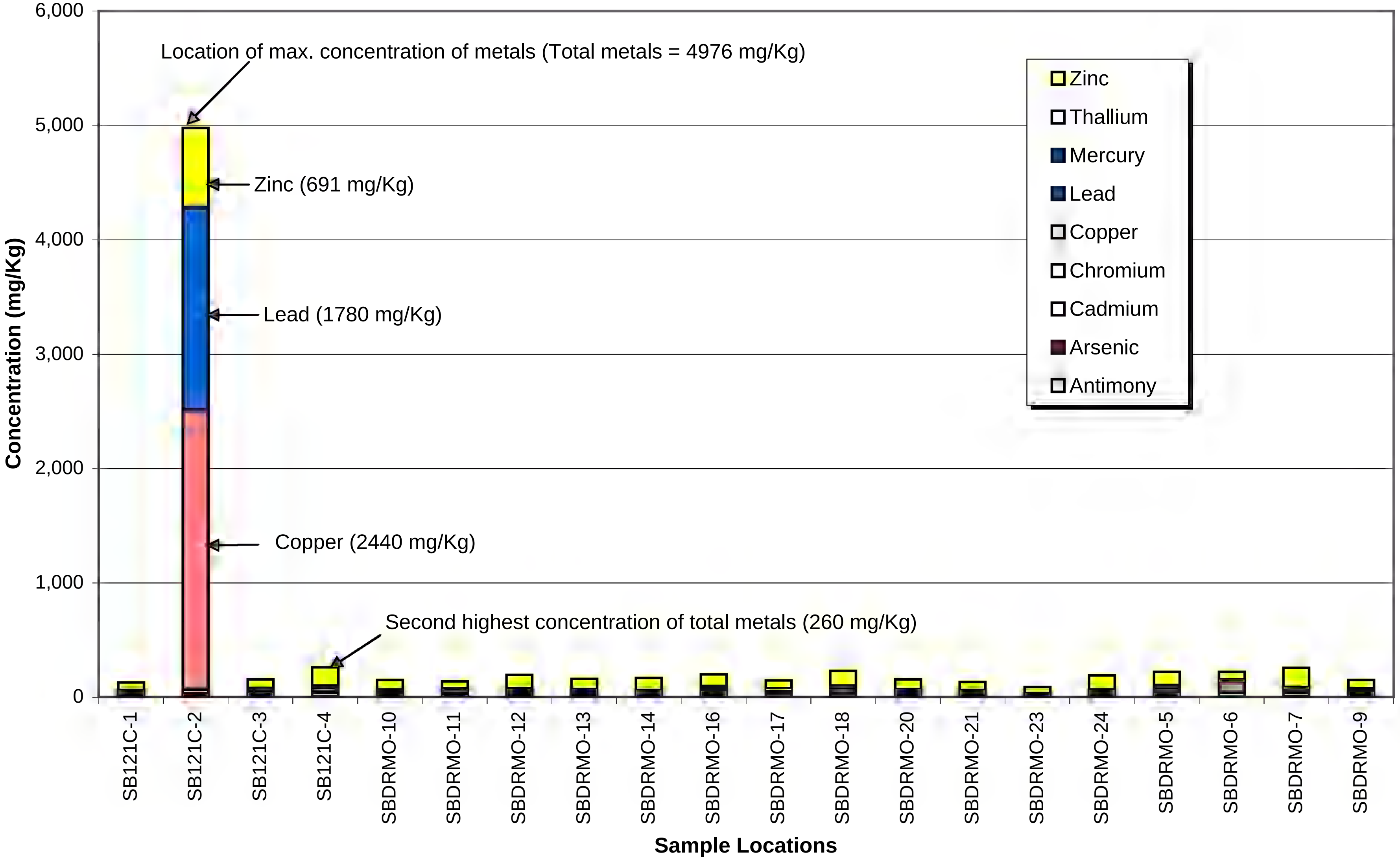
SEAD-121C & 121I RI REPORT

FIGURE 4-15
DRMO YARD - SEAD-121C
ELEVATED CONCENTRATIONS OF BTEX
AND METALS IN SUBSURFACE SOIL

Job #: 741175-07000

Date: JULY 2005

FIGURE 4-16
Distribution of Metals in Subsurface Soil at the DRMO Yard
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



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MW121C-1	
EBS	1998
4,4'-DDD	0.5J
4,4'-DDT	0.29J
Alpha-BHC	0.032J
Beta-BHC	0.33J
Dieldrin	0.16J
Heptachlor	0.05J
Heptachlor Epoxide	0.14J
Al	0.05J
Fe	436J
Mn	888
Na	1,365

MW121C-2	
EBS	1998
1,4 Dichlorobenzene	36
4,4'-DDD	0.81J
4,4'-DDE	0.3J
4,4'-DDT	0.56J
Alpha-BHC	0.059J
Beta-BHC	0.061J
Delta-BHC	0.16J
Dieldrin	0.2J
Heptachlor Epoxide	0.11J
Al	5,350J
Fe	5,620
Mn	1,100
Na	95,200

LEGEND:

MW121C-3 ●	Groundwater Location with Exceedance of NYS Class GA Groundwater Standard (ug/L)
⟋	Railroad Tracks
▢	Site Boundary
ND	Not Detected
NS	Not Sampled
—○○○—	Surface Water
▬	Misc. Site Feature

NOTE:
At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented.

100 50 0 100 Feet

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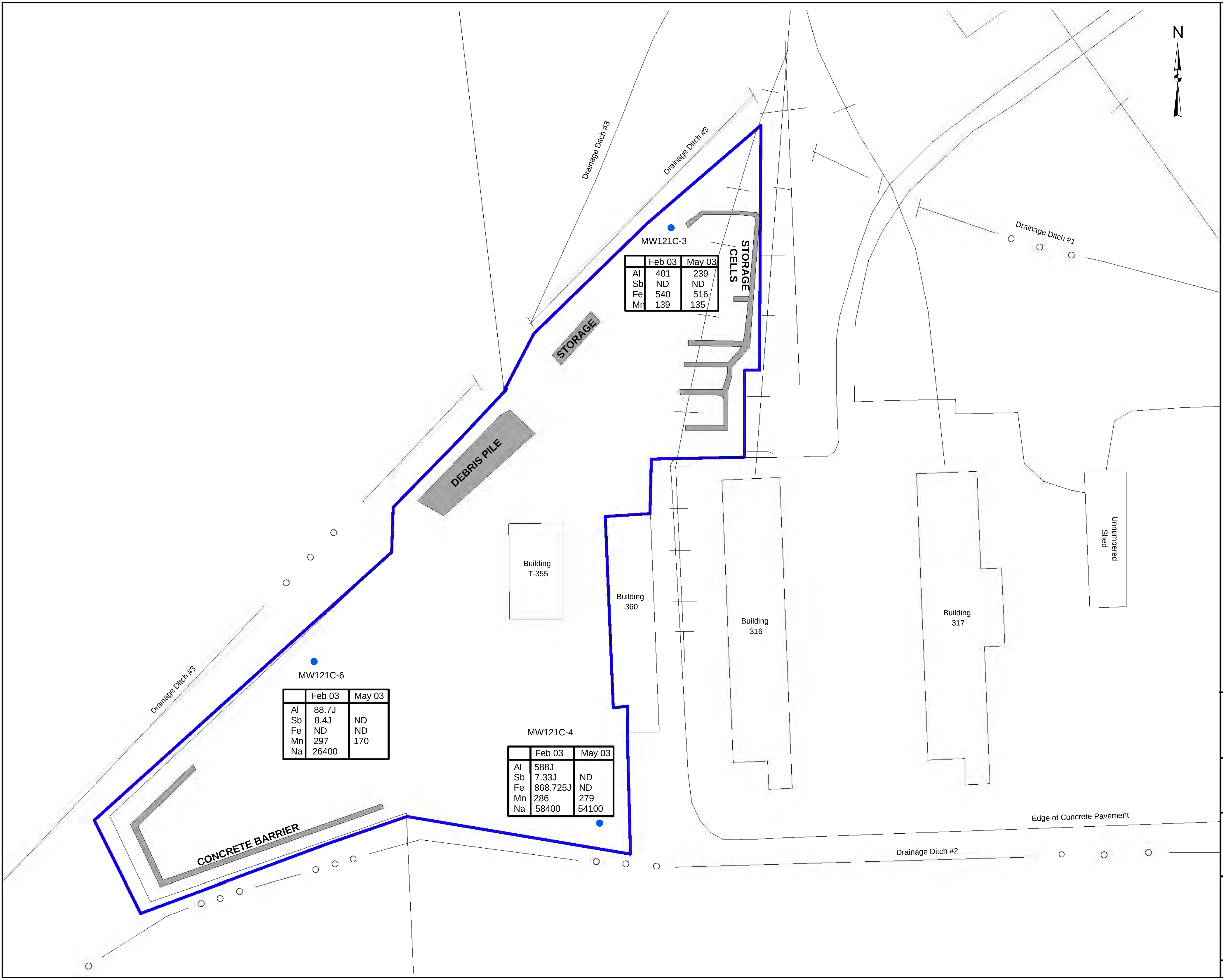
SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 4-17
DRMO YARD - SEAD-121C
GROUNDWATER EXCEEDANCES
IN TEMPORARY EBS WELLS

Job #: 741175-07000 | Date: JULY 2005

o:/seneca/PIDarea/ri report/figure4-17.mxd



MW121C-3

	Feb 03	May 03
Al	401	239
Sb	ND	ND
Fe	540	516
Mn	139	135

MW121C-6

	Feb 03	May 03
Al	88.7J	
Sb	8.4J	ND
Fe	ND	ND
Mn	297	170
Na	26400	

MW121C-4

	Feb 03	May 03
Al	588J	
Sb	7.33J	ND
Fe	868.725J	ND
Mn	286	279
Na	58400	54100

o:/seneca/PIDarea/ri_report/figure4-18.mxd

LEGEND:

MW121C-3 ● 401	Groundwater Locations with Exceedance of a Groundwater Standard (ug/L)
╳	Railroad Tracks
▭	Site Boundary
ND	Not Detected
—○○○—	Surface Water
▬	Misc. Site Feature

NOTE:

- At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented.
- All concentrations posted exceeded their respective NYS Class GA Standards, Federal Drinking Water Standards Maximun Contaminant Levels, or Secondery MCLs.
- Samples were collected using low flow sampling techiques.

100 50 0 100 Feet

PARSONS

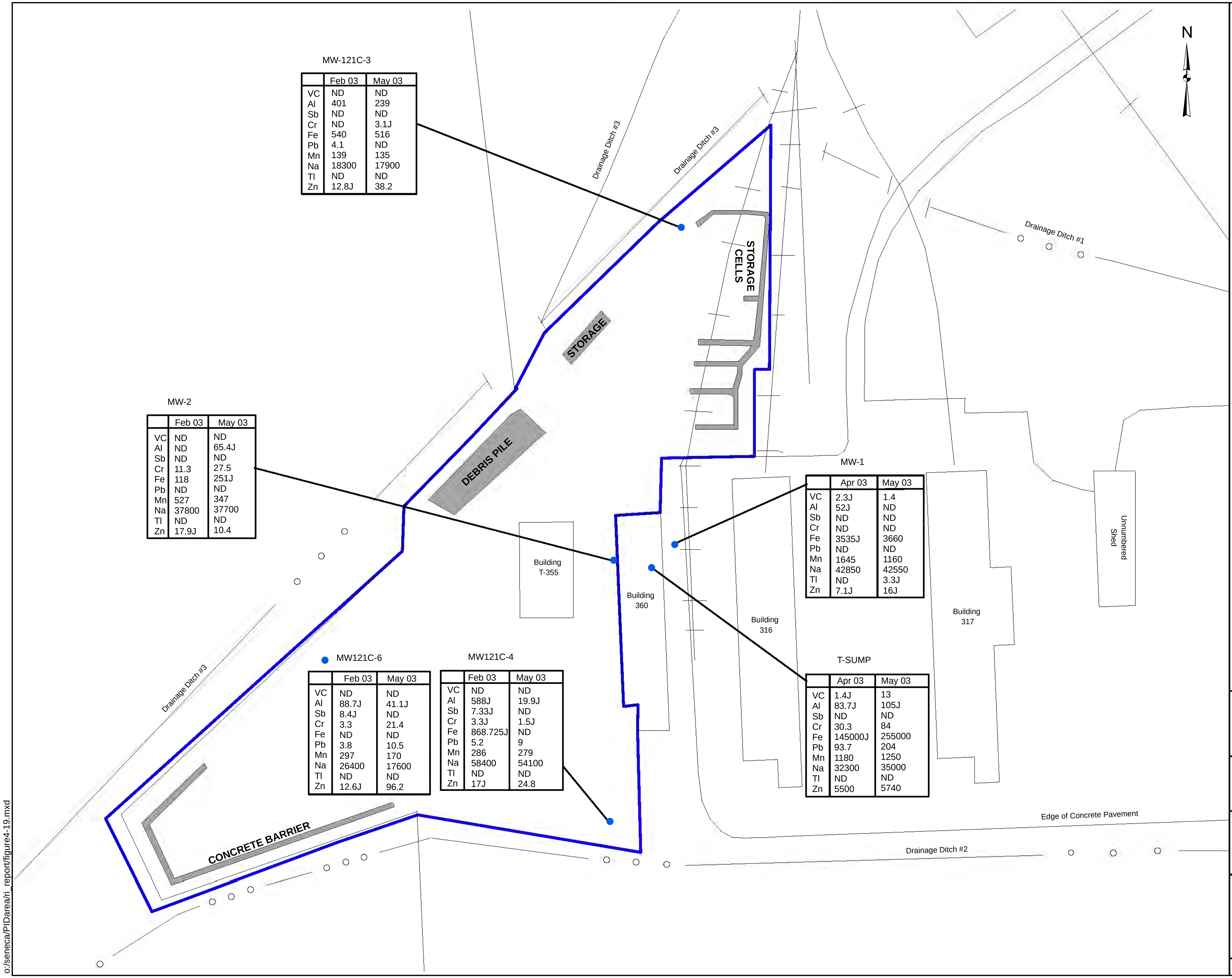
SENECA ARMY DEPOT ACTIVITY

SEAD-121C & 121I RI REPORT

FIGURE 4-18
DRMO YARD - SEAD-121C
MATALS EXCEEDANCES
AT PERMANENT RI WELLS

Job #: 741175-07000

Date: JULY 2005



MW-121C-3

	Feb 03	May 03
VC	ND	ND
Al	401	239
Sb	ND	ND
Cr	ND	3.1J
Fe	540	516
Pb	4.1	ND
Mn	139	135
Na	18300	17900
Tl	ND	ND
Zn	12.8J	38.2

MW-2

	Feb 03	May 03
VC	ND	ND
Al	ND	65.4J
Sb	ND	ND
Cr	11.3	27.5
Fe	118	251J
Pb	ND	ND
Mn	527	347
Na	37800	37700
Tl	ND	ND
Zn	17.9J	10.4

MW-1

	Apr 03	May 03
VC	2.3J	1.4
Al	52J	ND
Sb	ND	ND
Cr	ND	ND
Fe	3535J	3660
Pb	ND	ND
Mn	1645	1160
Na	42850	42550
Tl	ND	3.3J
Zn	7.1J	16J

MW121C-6

	Feb 03	May 03
VC	ND	ND
Al	88.7J	41.1J
Sb	8.4J	ND
Cr	3.3	21.4
Fe	ND	ND
Pb	3.8	10.5
Mn	297	170
Na	26400	17600
Tl	ND	ND
Zn	12.6J	96.2

MW121C-4

	Feb 03	May 03
VC	ND	ND
Al	588J	19.9J
Sb	7.33J	ND
Cr	3.3J	1.5J
Fe	868.725J	ND
Pb	5.2	9
Mn	286	279
Na	58400	54100
Tl	ND	ND
Zn	17J	24.8

T-SUMP

	Apr 03	May 03
VC	1.4J	13
Al	83.7J	105J
Sb	ND	ND
Cr	30.3	84
Fe	145000J	255000
Pb	93.7	204
Mn	1180	1250
Na	32300	35000
Tl	ND	ND
Zn	5500	5740

LEGEND:

MW121C-3 ●	Groundwater Sample Location with Detected Concentrations (ug/L)
╪	Railroad Tracks
▭	Site Boundary
ND	Not Detected
—○○○—	Surface Water
▬	Misc. Site Feature

Note:
- At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented.
- All concentrations posted were compared to NYS Class GA Standards, Federal Drinking Water Standards Maximun Contaminant Levels, or Secondery MCLs.
- Samples were collected using low flow sampling techiques.

100 50 0 100 Feet

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SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 4-19
SUMMARY OF GROUNDWATER RESULTS AT BUILDING 360 (SEAD-27) AND DOWNGRADIENT WELLS

Job #: 741175-07000
Date: JULY 2005

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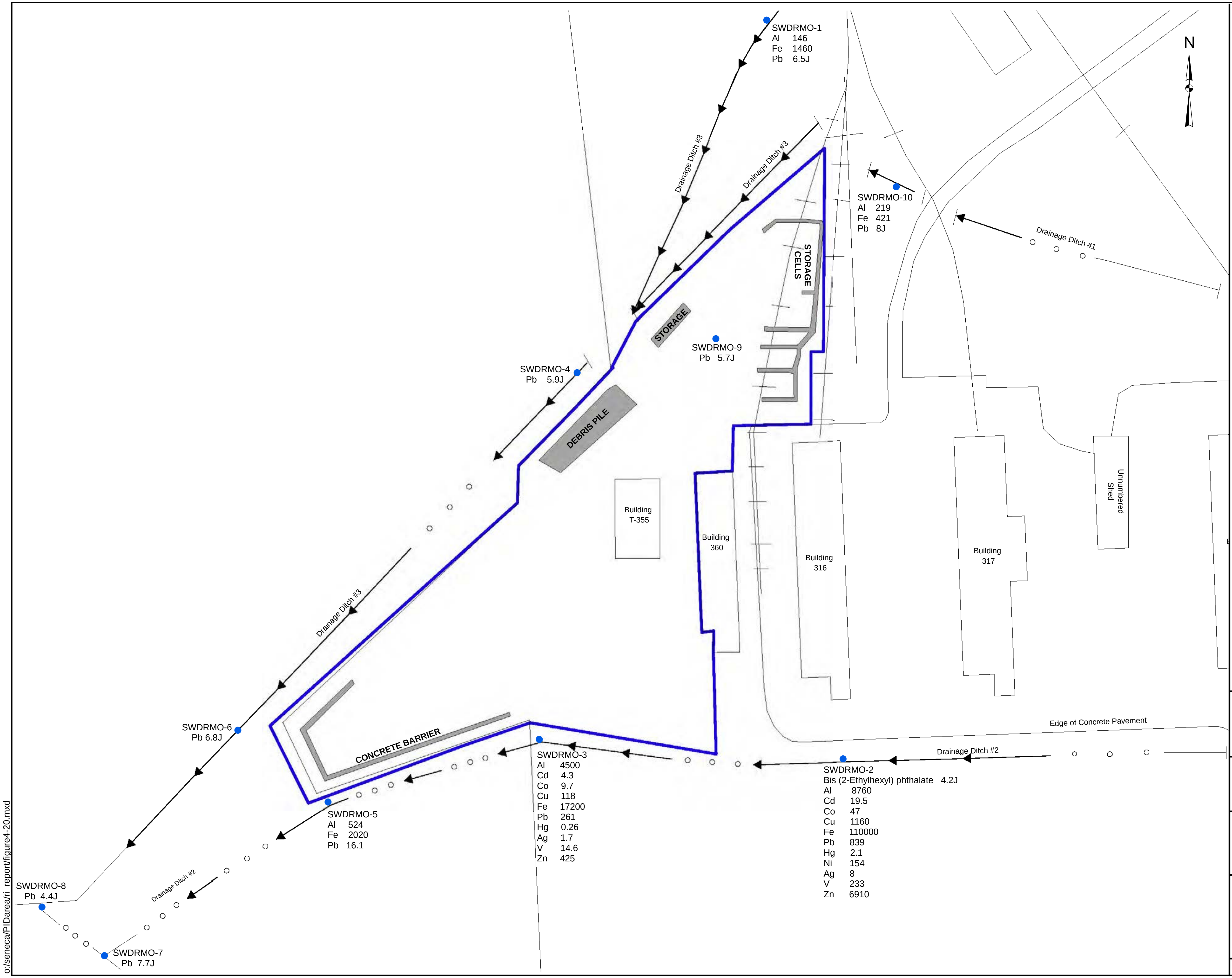

LEGEND:

SWDRMO-2 ●	Surface Water Location with Exceedances of AWQS Class C Standard (ug/L)
✕	Railroad Tracks
▭	Site Boundary
←	Surface Water Flow Direction
—○○○—	Surface Water
▭	Misc. Site Feature

NOTE:
- At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented.

120 60 0 120 Feet

PARSONS

SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 4-20
DRMO YARD - SEAD-121C
EXCEEDANCES IN SURFACE WATER

Job #: 741175-07000 | Date: JULY 2005

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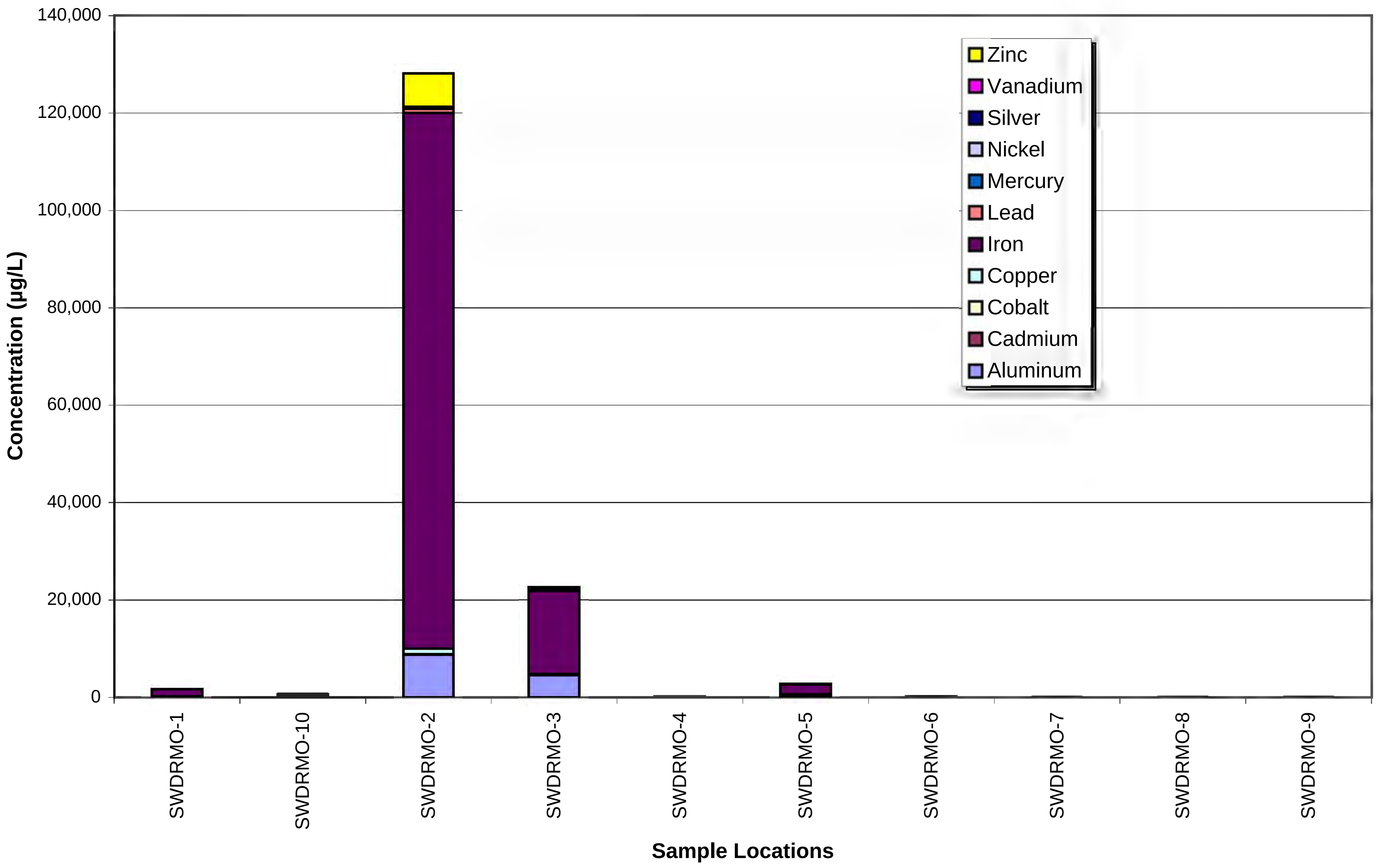
FIGURE 4-21
Distribution of Metals in Surface Water at the DRMO Yard
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



Note sample-duplicate pair was averaged and reported as a single value.

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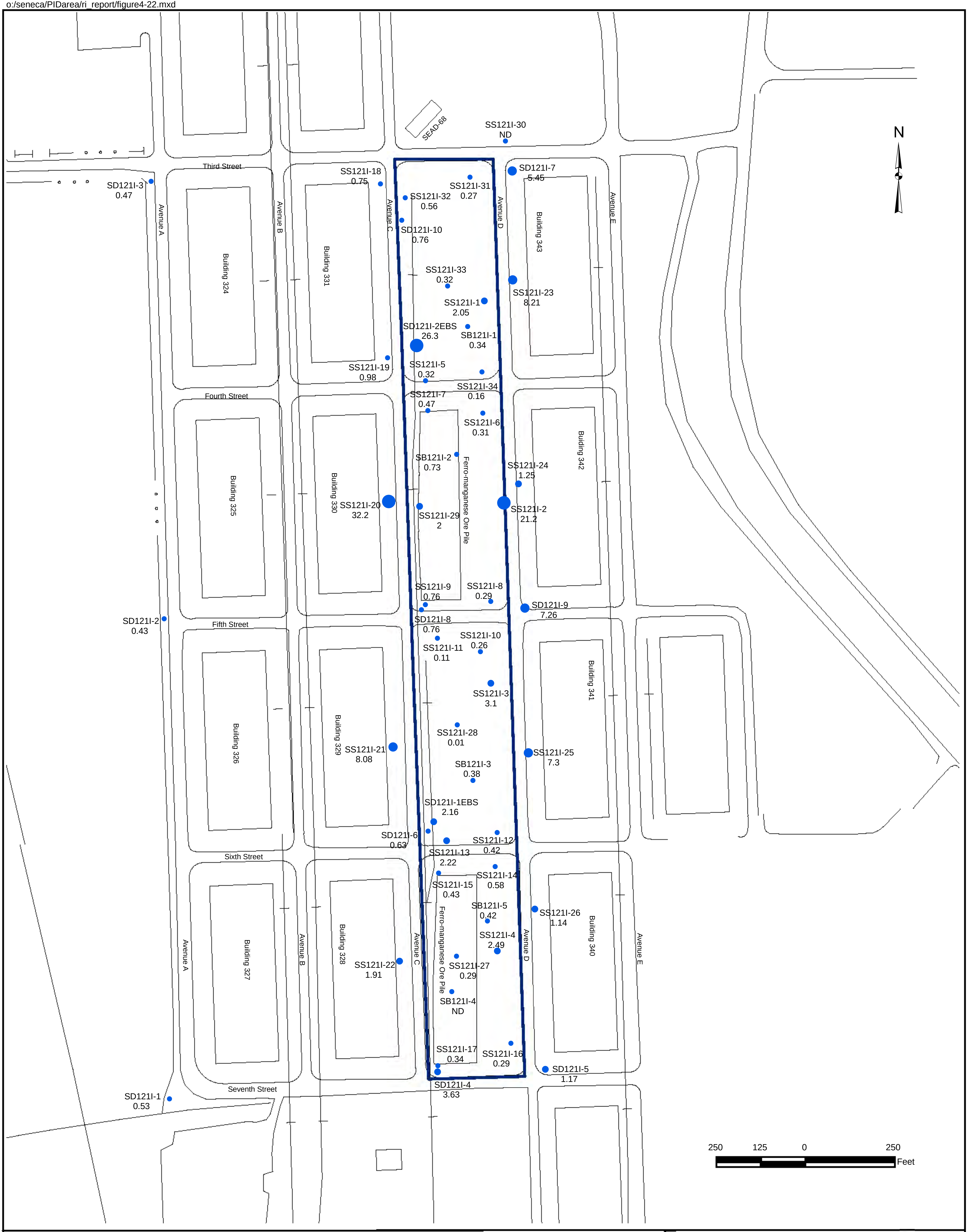
o:/seneca/PIDarea/ri_report/figure4-22.mxd



LEGEND:

SS121I-17 0.34 ●	Sample Locations with Benzo(a)pyrene Toxicity Equivalence (BTE) Concentrations (mg/Kg)
	Railroad Tracks
	Site Boundary
ND	Not Detected
—o o o—	Surface Water

BTE Concentrations (mg/Kg)

●	<1
●	1-5
●	5-10
●	>10

Benzo(a)pyrene Toxicity Equivalence Includes:

	BTE Ratio
Benzo (a) anthracene	0.1
Benzo (a) pyrene	1
Benzo (a) fluoranthene	0.1
Benzo (k) fluoranthene	0.01
Chrysene	0.01
Dibenz (a,h) anthracene	1
Indeno (1,2,3-cd) pyrene	0.1

NOTE:

- At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented.

- Surface soil samples were collected at depths extending from 0 to 2 inches below ground surface.

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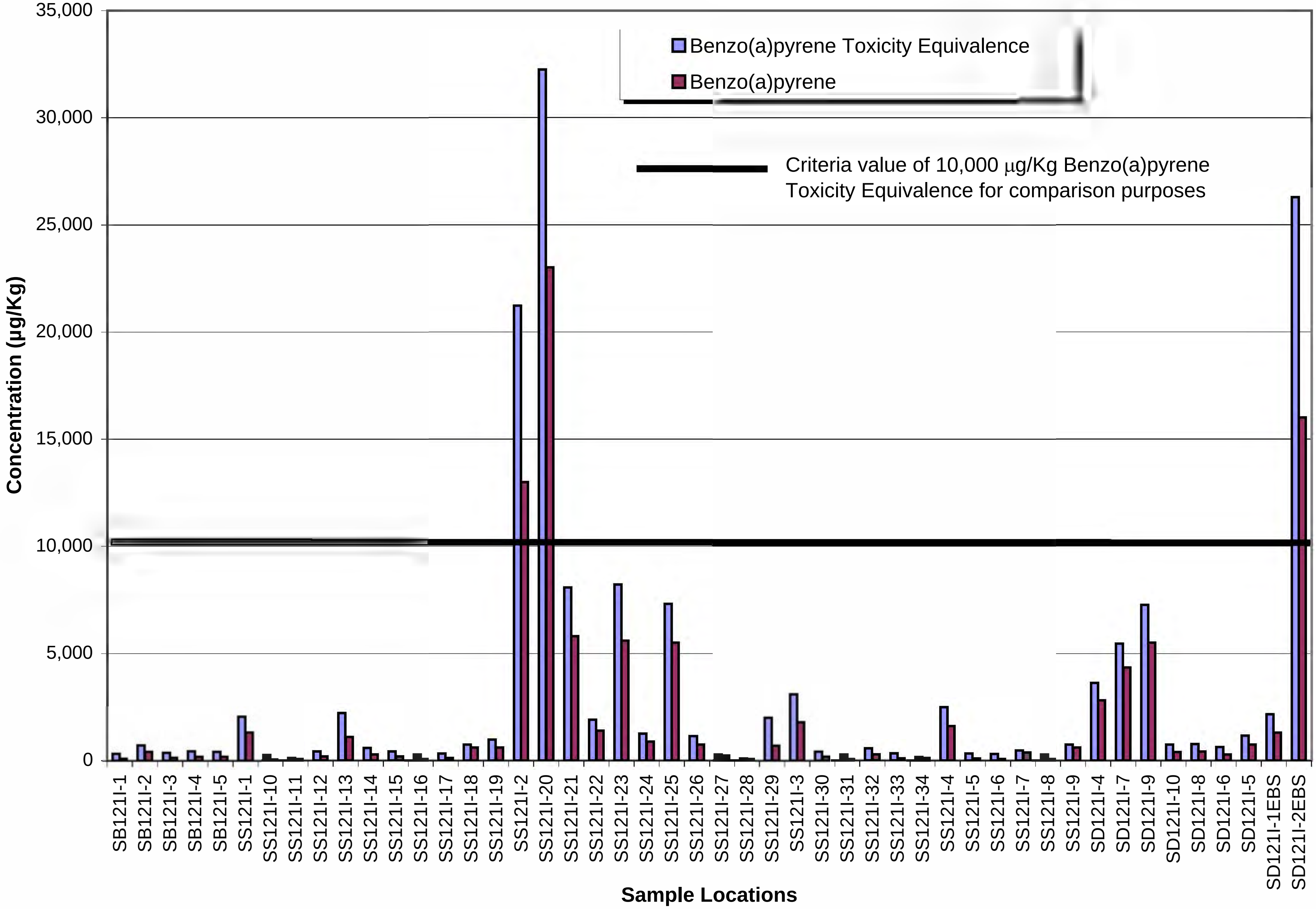
SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 4-22
RUMORED COSMOLINE
OIL DISPOSAL AREA - SEAD-121I
BENZO(A)PYRENE TOXICITY EQUIVALENCE
CONCENTRATIONS IN SOIL AND DITCH SOIL

Job #: 741175-07000
Date: JULY 2005

FIGURE 4-23
Benzo(a)pyrene Toxicity Equivalence in Soils at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



Note sample-duplicate pairs were averaged and reported as a single value.

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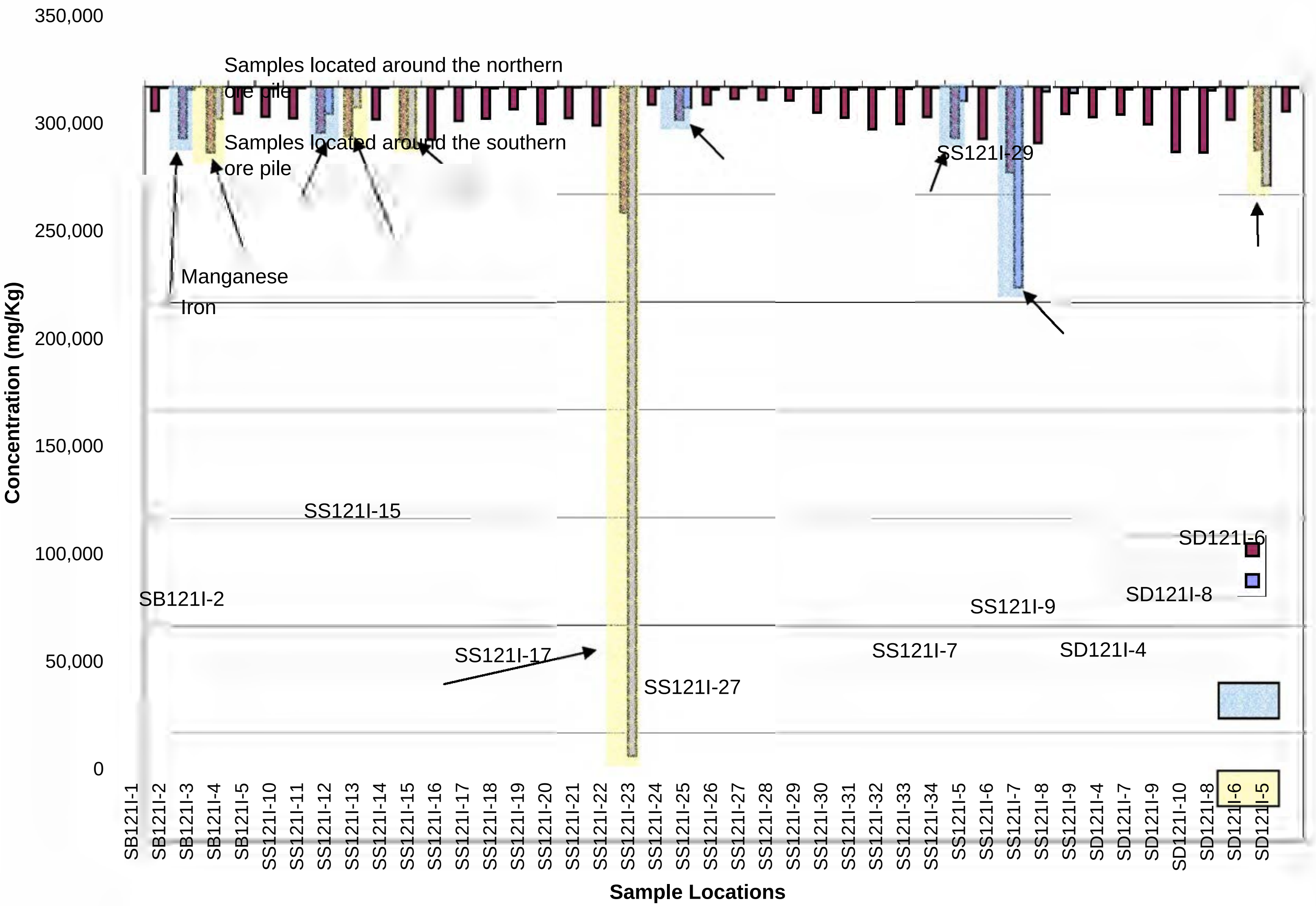
FIGURE 4-24
Iron and Manganese in Soils at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



Note sample-duplicate pairs were averaged and reported as a single value.

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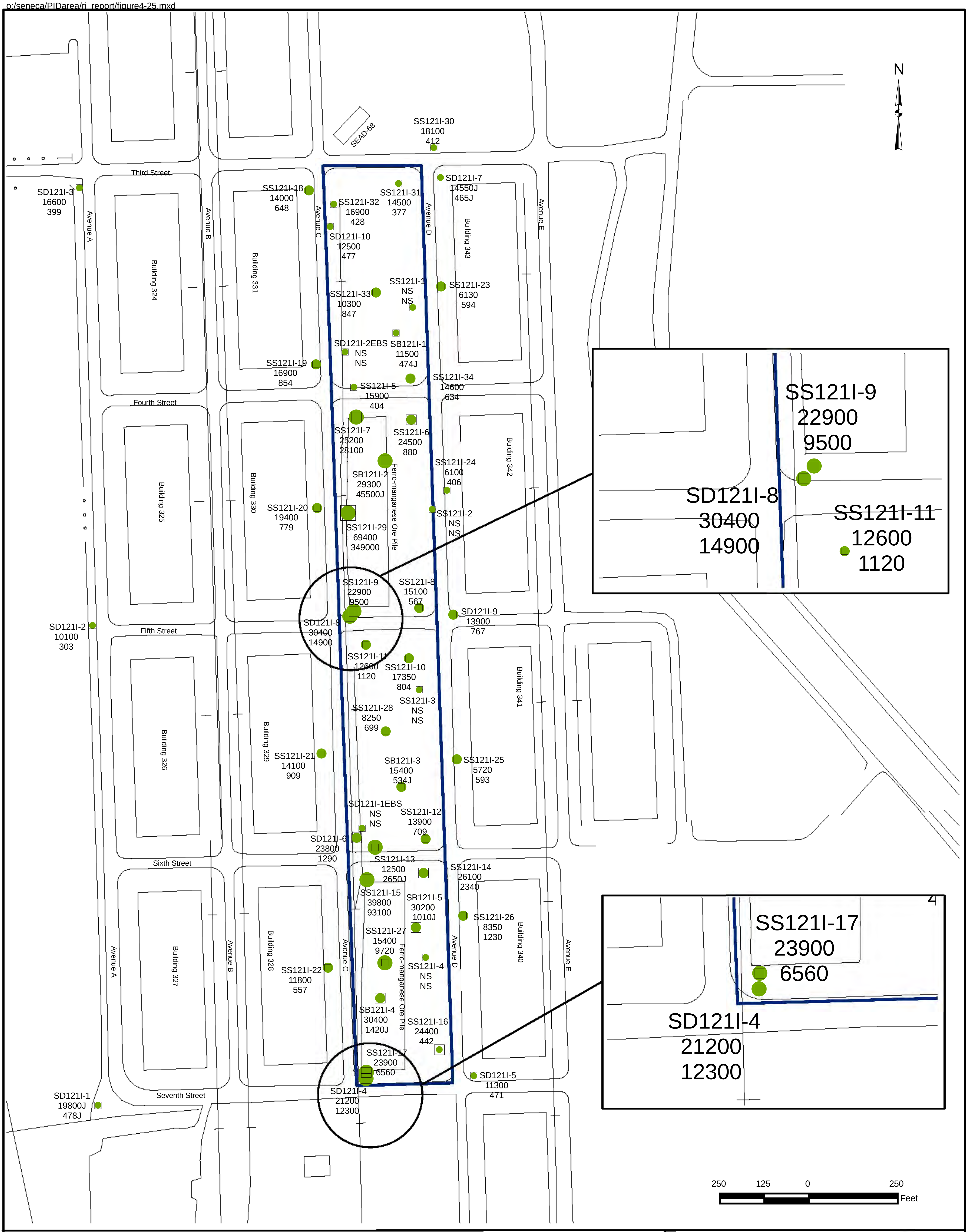
o:/seneca/PIDarea/ri_report/figure4-25.mxd



LEGEND:

SS121I-17 23900 6560	Sample Locations with Iron and Manganese Concentrations (mg/Kg)
☐ Fe	
● Mn	
	Railroad Tracks
	Site Boundary
ND	Not Detected
NS	Not Sampled
—o o o—	Surface Water

Iron Concentrations (mg/Kg)

- ☐ < 20000
- ☐ 20000 - 40000
- ☐ > 40000

Manganese Concentrations (mg/Kg)

- ● < 500
- ● 500 - 2500
- ● > 2500

NOTE:

- At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented.

- Surface soil samples were collected at depths extending from 0 to 2 inches below ground surface.

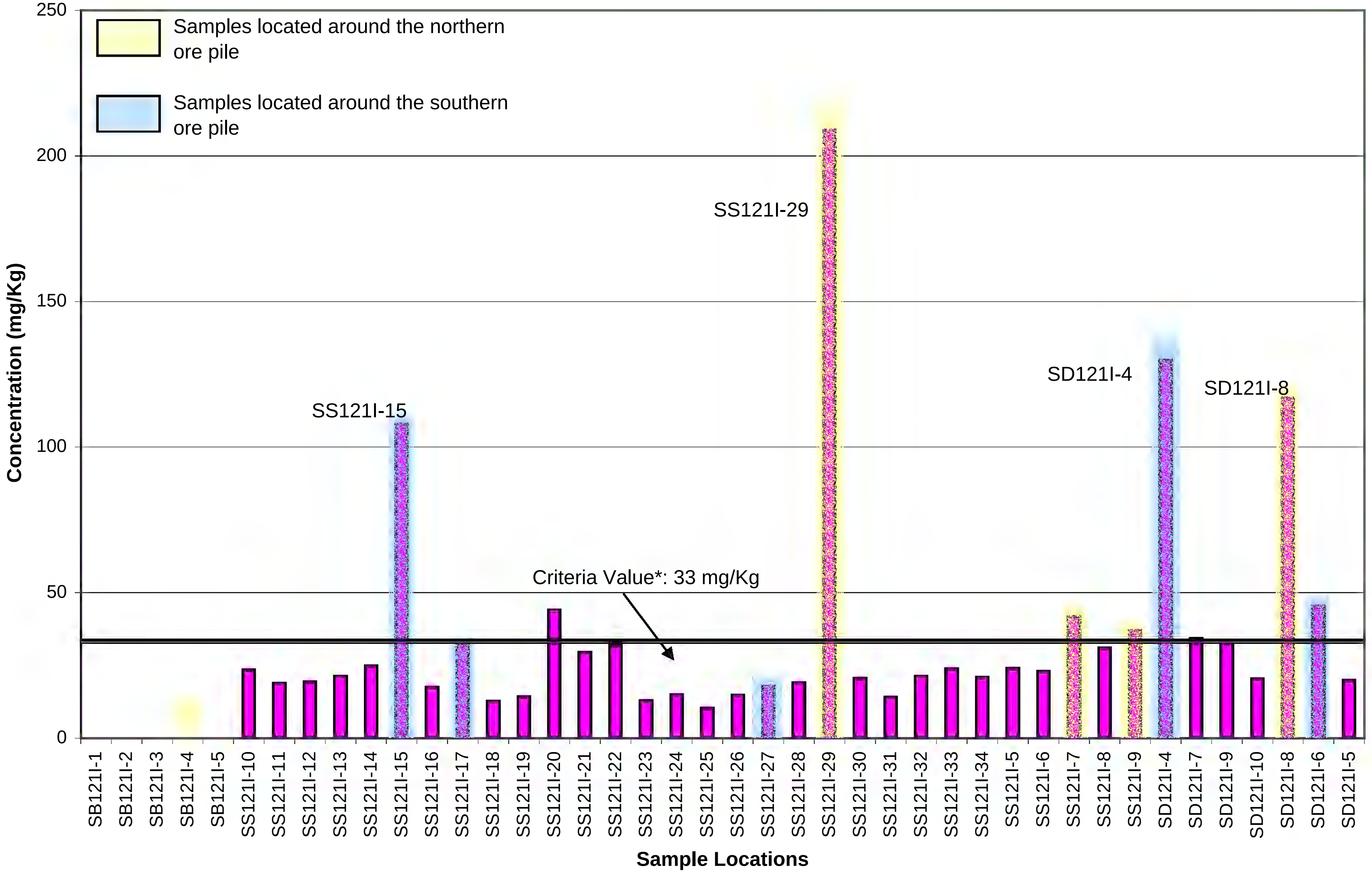
PARSONS

SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 4-25
RUMORED COSMOLINE
OIL DISPOSAL AREA - SEAD-121I
DISTRIBUTION OF IRON AND MANGANESE
CONCENTRATIONS IN SOIL AND DITCH SOIL

Job #: 741175-07000
Date: JULY 2005

FIGURE 4-26
Copper in Soils at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



* Criteria value is the 95th percentile value of the Seneca background dataset.
Note sample-duplicate pairs were averaged and reported as a single value.

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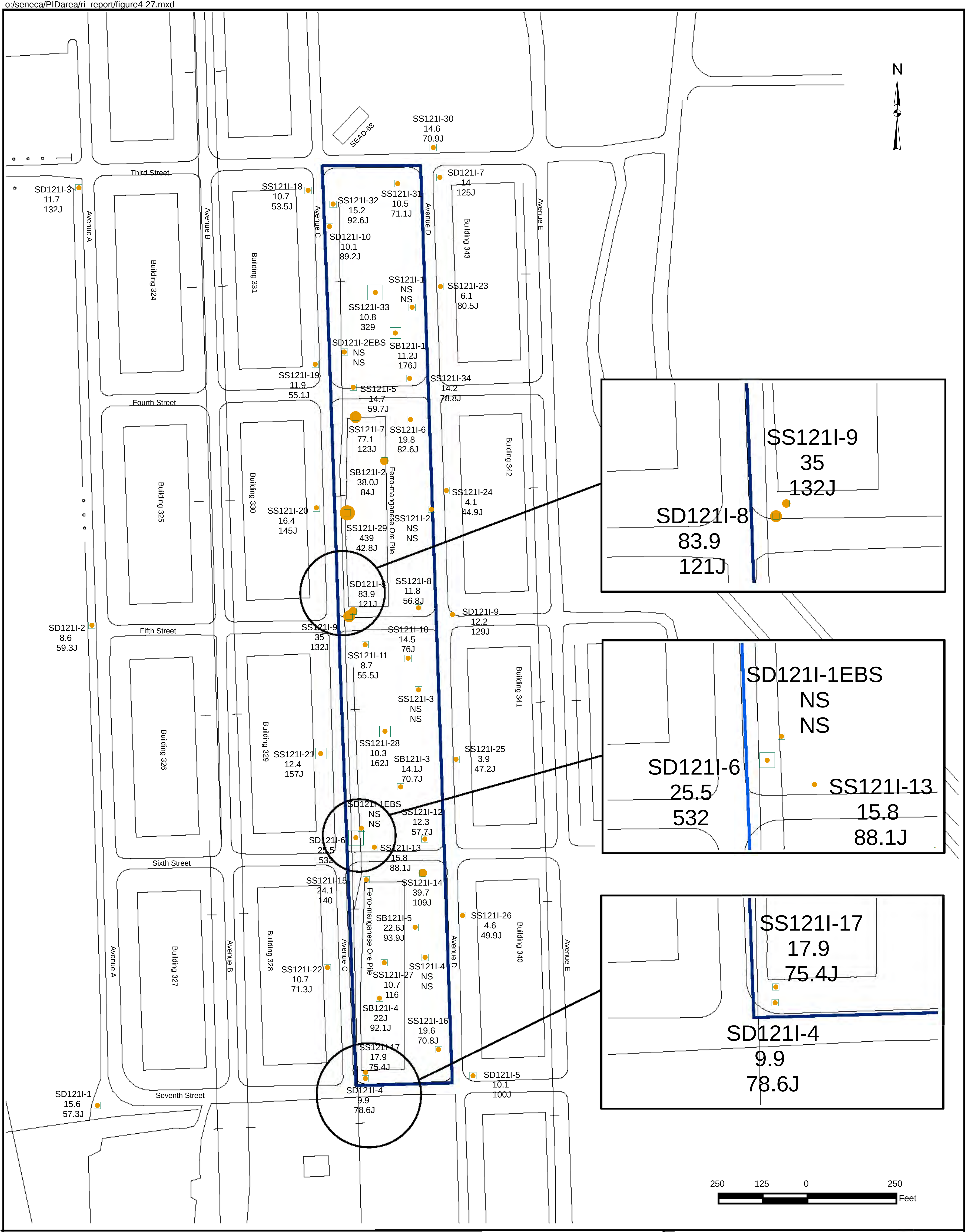


LEGEND:

SS121I-17 23900 6560 ● Cr ☐ Zn	Sample Locations with Chromium and Zinc Concentrations (mg/Kg)
	Railroad Tracks
	Site Boundary
ND	Not Detected
NS	Not Sampled
—○○○—	Surface Water

Chromium Concentrations (mg/Kg)

●	< 30
●	30 - 60
●	60 - 90
●	> 90

Zinc Concentrations (mg/Kg)

☐	< 150
☐	150 - 300
☐	> 300

NOTE:

- At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented.

- Surface soil samples were collected at depths extending from 0 to 2 inches below ground surface.

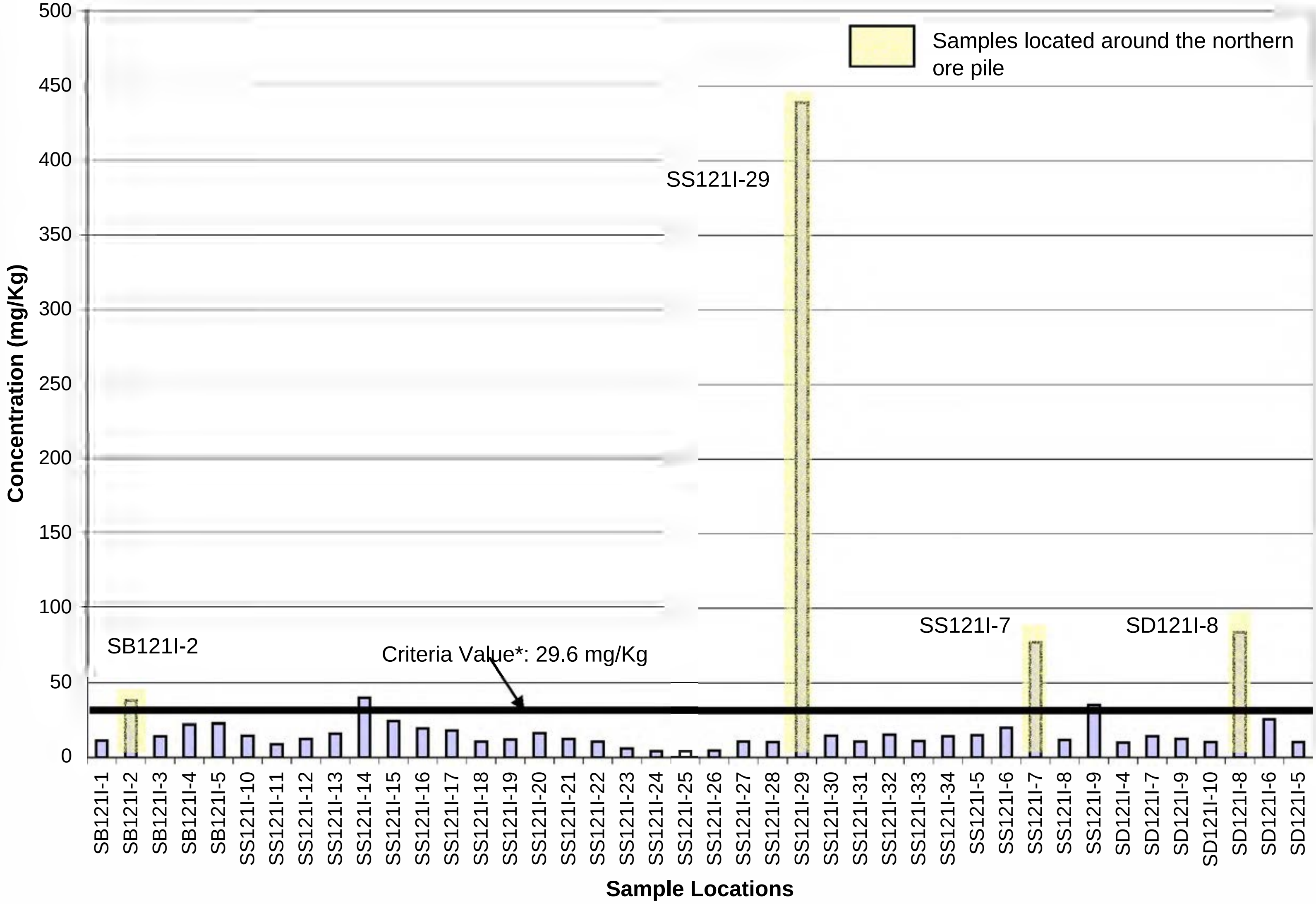
PARSONS

SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 4-27
RUMORED COSMOLINE
OIL DISPOSAL AREA - SEAD-121I
CHROMIUM AND ZINC CONCENTRATIONS
IN SOIL AND DITCH SOIL

Job #: 741175-07000 | Date: JULY 2005

FIGURE 4-28
Chromium in Soils at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



*Criteria value is the 95th percentile value of the Seneca background dataset.
Note sample-duplicate pairs were averaged and reported as a single value.

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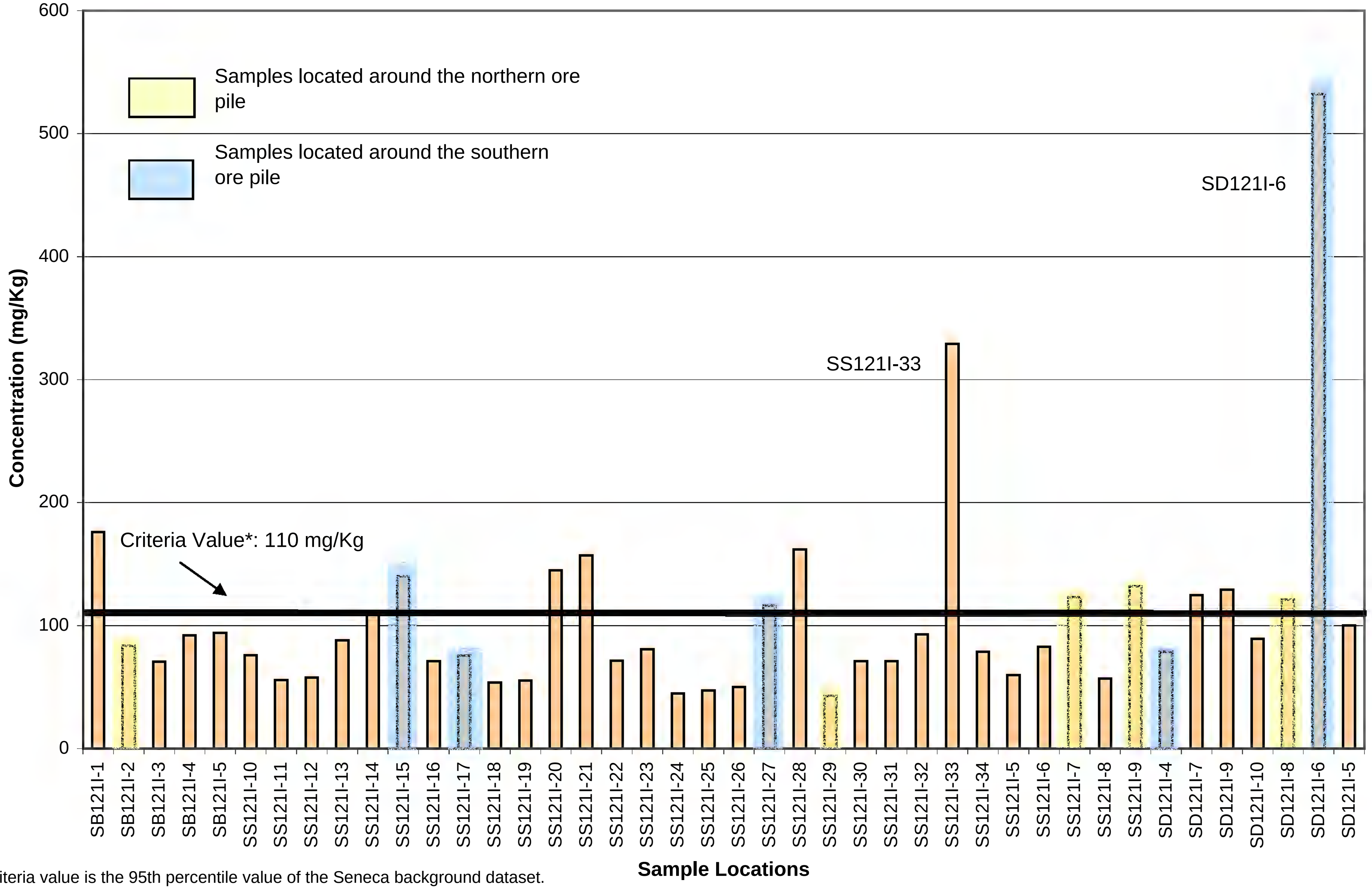
FIGURE 4-29
Zinc in Soils at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



*Criteria value is the 95th percentile value of the Seneca background dataset.
Note sample-duplicate pairs were averaged and reported as a single value.

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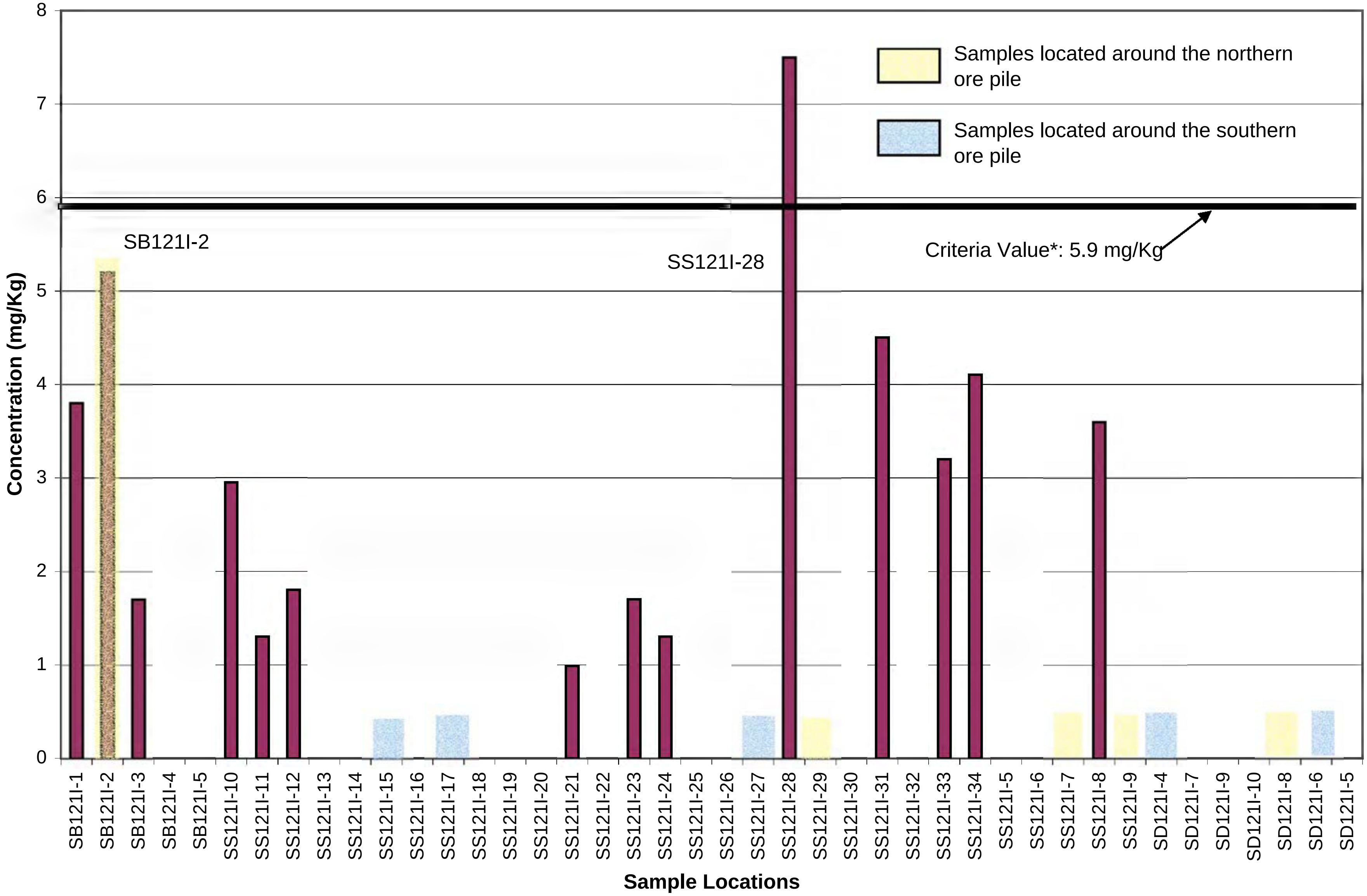
FIGURE 4-30
Antimony in Soils at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



*Criteria value is the 95th percentile value of the Seneca background dataset.
Note sample-duplicate pairs were averaged and reported as a single value.

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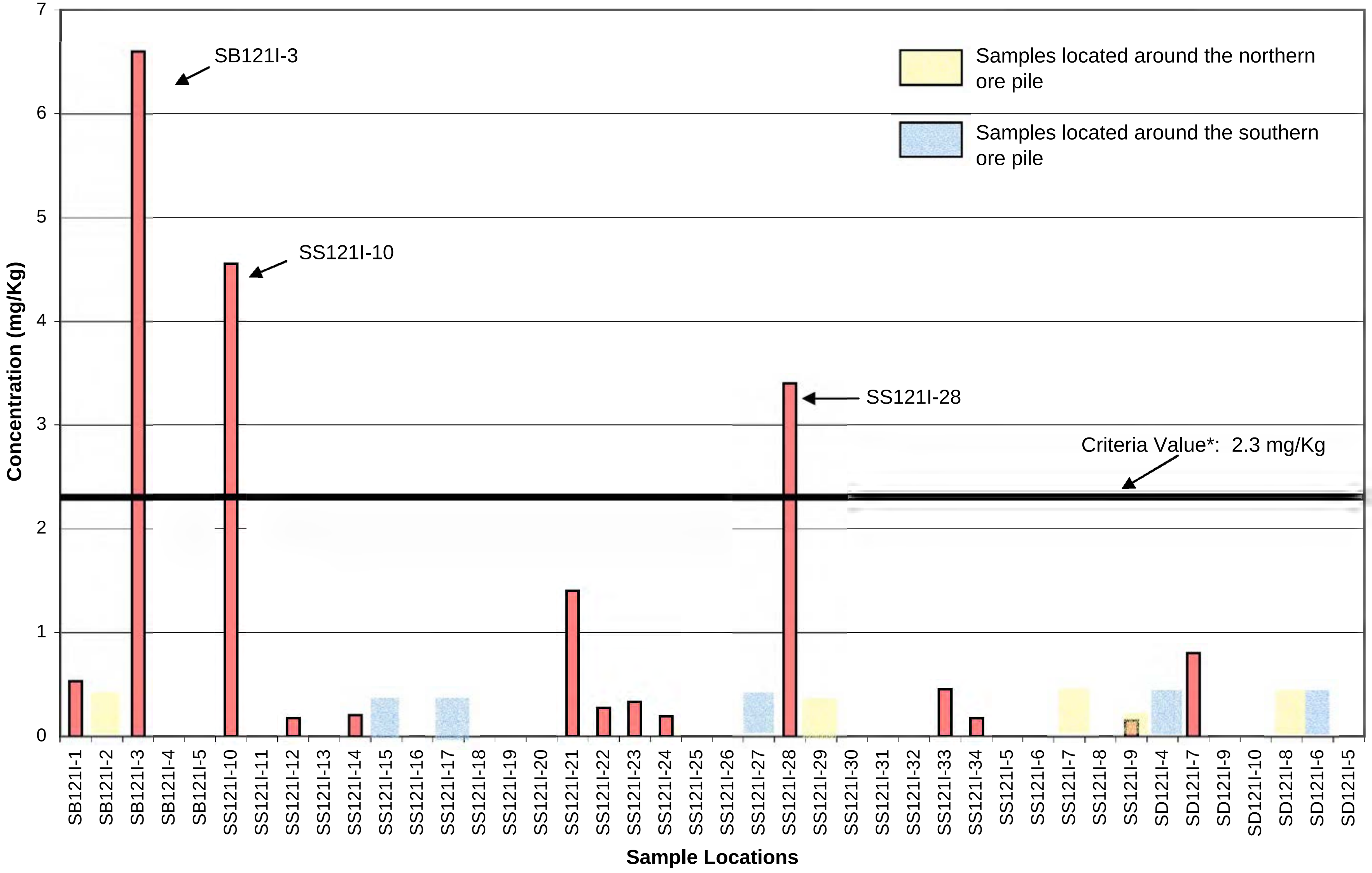
FIGURE 4-31
Cadmium in Soils at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



*Criteria value is the 95th percentile of the Seneca background dataset.
Note sample-duplicate pairs were averaged and reported as a single value.

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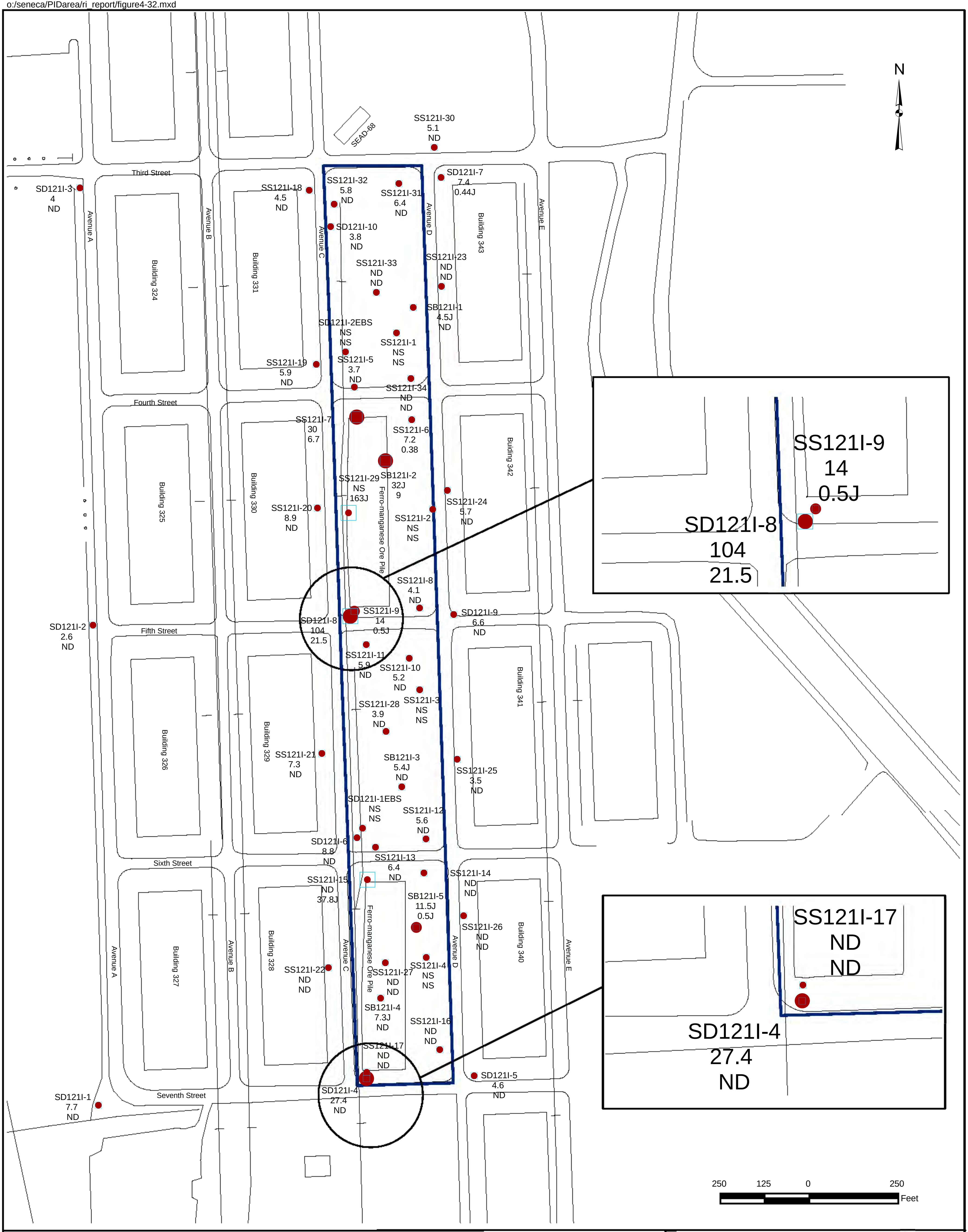

LEGEND:

SS121I-17 23900 6560	Sample Locations with Arsenic and Thallium Concentrations (mg/Kg)
□	Tl
●	As
	Railroad Tracks
□	Site Boundary
ND	Not Detected
NS	Not Sampled
—o o o—	Surface Water

Thallium Concentrations (mg/Kg)

- □ < 2
- □ 2 - 20
- □ > 20

Arsenic Concentrations (mg/Kg)

- ● < 10
- ● 10 - 20
- ● > 20

NOTE:

- At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented.

- Surface soil samples were collected at depths extending from 0 to 2 inches below ground surface.

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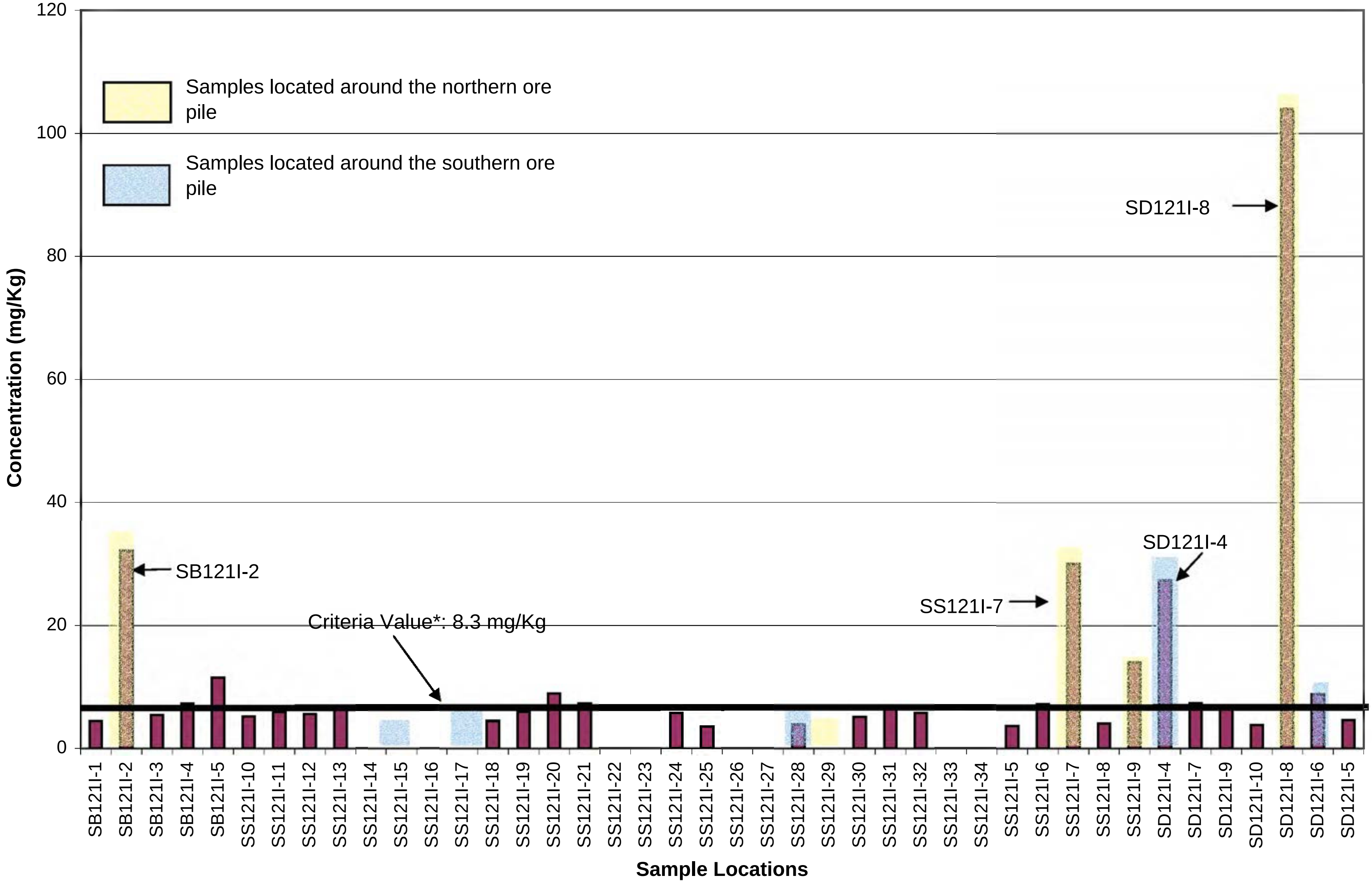
SENECA ARMY DEPOT ACTIVITY
SEAD-121C & 121I RI REPORT

FIGURE 4-32
RUMORED COSMOLINE
OIL DISPOSAL AREA - SEAD-121I
ARSENIC AND THALLIUM
CONCENTRATIONS IN SOIL AND DITCH SOIL

Job #: 741175-07000
Date: JULY 2005

FIGURE 4-33
Arsenic in Soils at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



*Criteria value is the 95th percentile of the Seneca background dataset.
Note sample-duplicate pairs were averaged and reported as a single value.

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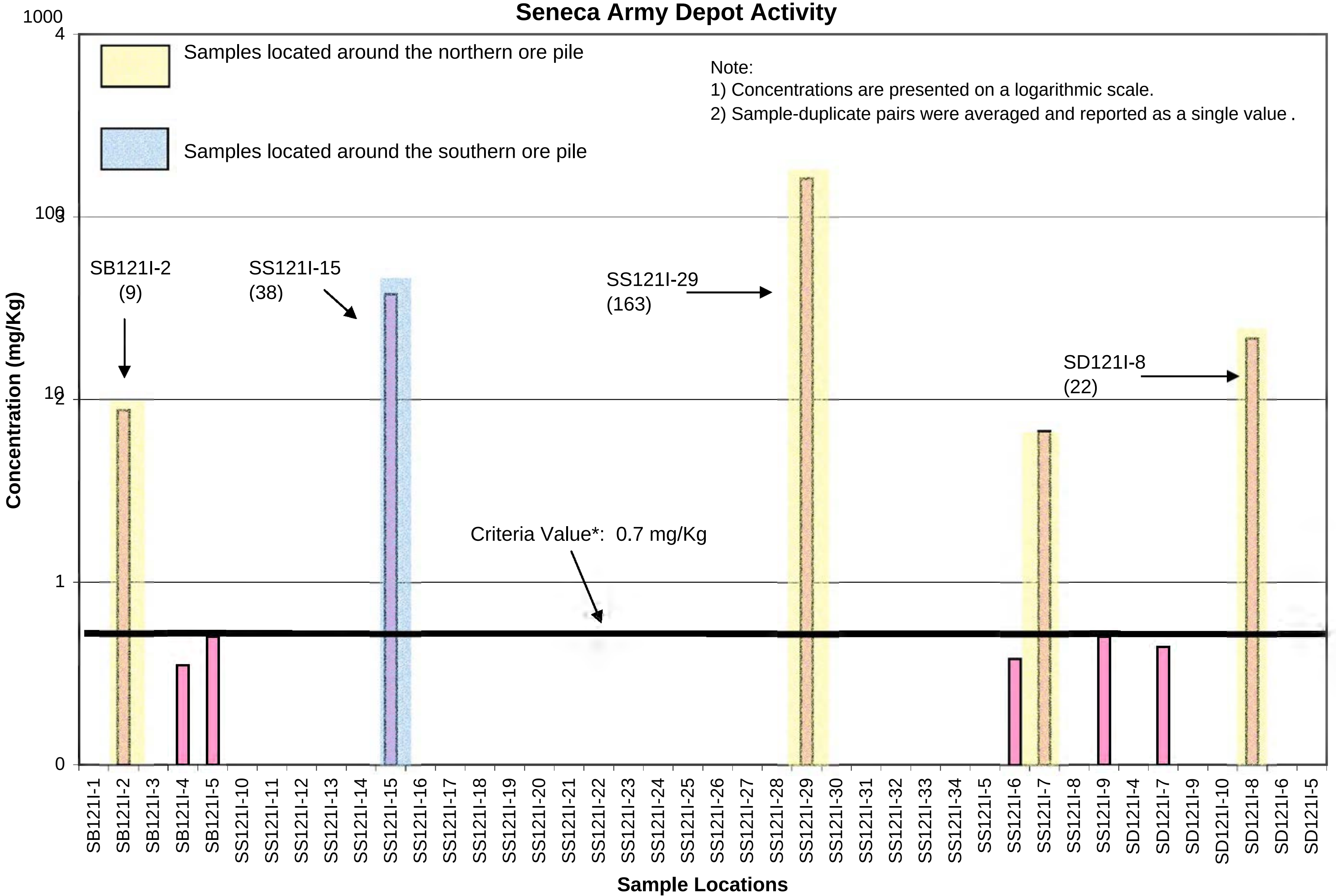
FIGURE 4-34
Thallium in Soils at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity



*Criteria value is the 95th percentile value of the Seneca background dataset.

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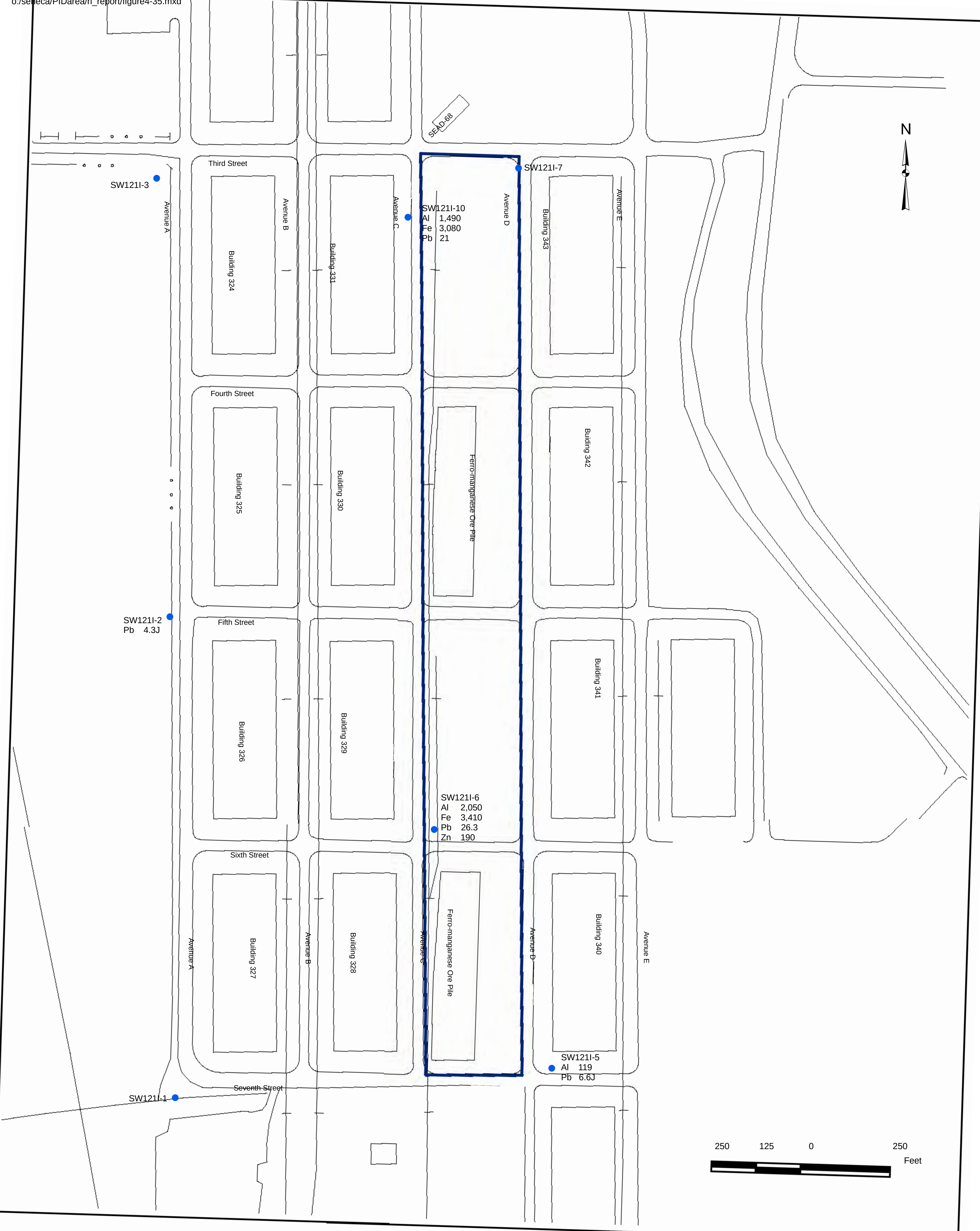

LEGEND:

SW121I-1 ● Surface Water Locations with Metals Greater than AWQS Class C Standard (ug/L)

Railroad Tracks

Site Boundary

Surface Water

NOTE:

At sample locations where duplicate samples were collected in the field, the average value of the sample and the duplicate pair is presented.

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SENECA ARMY DEPOT ACTIVITY

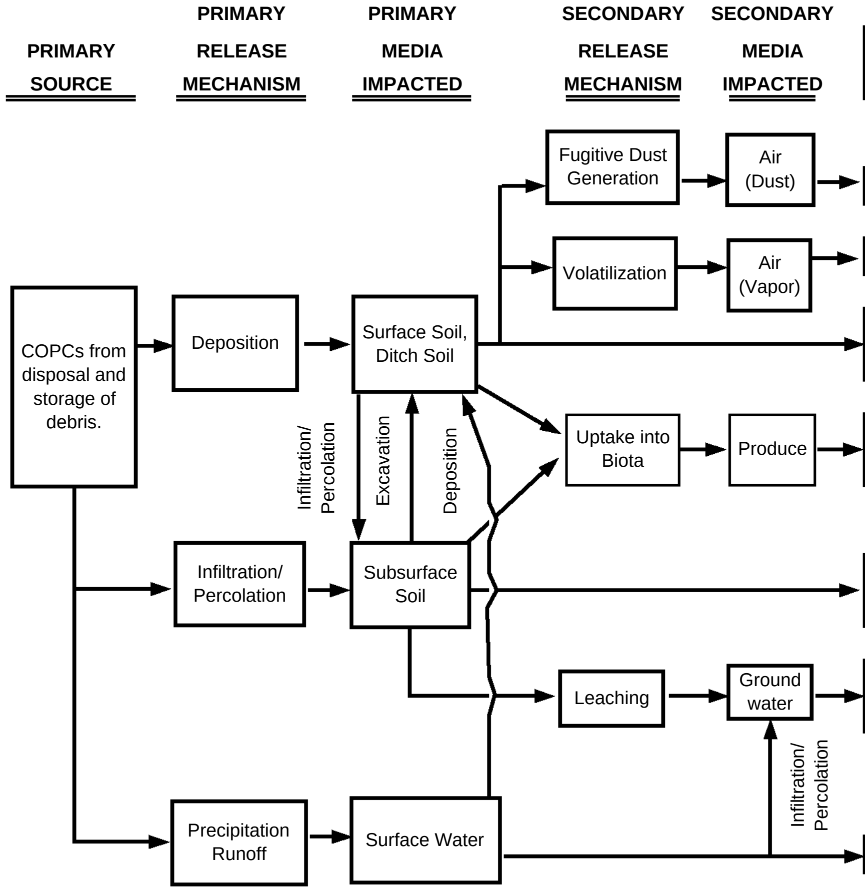
SEAD-121C & 121I RI REPORT

FIGURE 4-35
RUMORED COSMOLINE
OIL DISPOSAL AREA - SEAD-121I
METALS EXCEEDANCES IN SURFACE WATER

Job #: 741175-07000

Date: JULY 2005

Figure 6-1A
Conceptual Site Model for SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity



	POTENTIAL HUMAN RECEPTORS		
	CURRENT AND FUTURE		
EXPOSURE ROUTE	Construction Worker	Industrial Worker	Adolescent Trespasser/ Adolescent Visitor
Inhalation	●	●	●
Inhalation	—	—	—
Intake	●	●	●
Dermal Contact	●	●	●
Intake	—	—	—
Intake	●	—	—
Dermal Contact	●	—	—
Intake	●	●	●
Dermal Contact	●	—	—
Dermal Contact	●	—	●

LEGEND

→ = Potential Pathways
● = Principal Pathways for quantitative evaluation
— = Incomplete pathways

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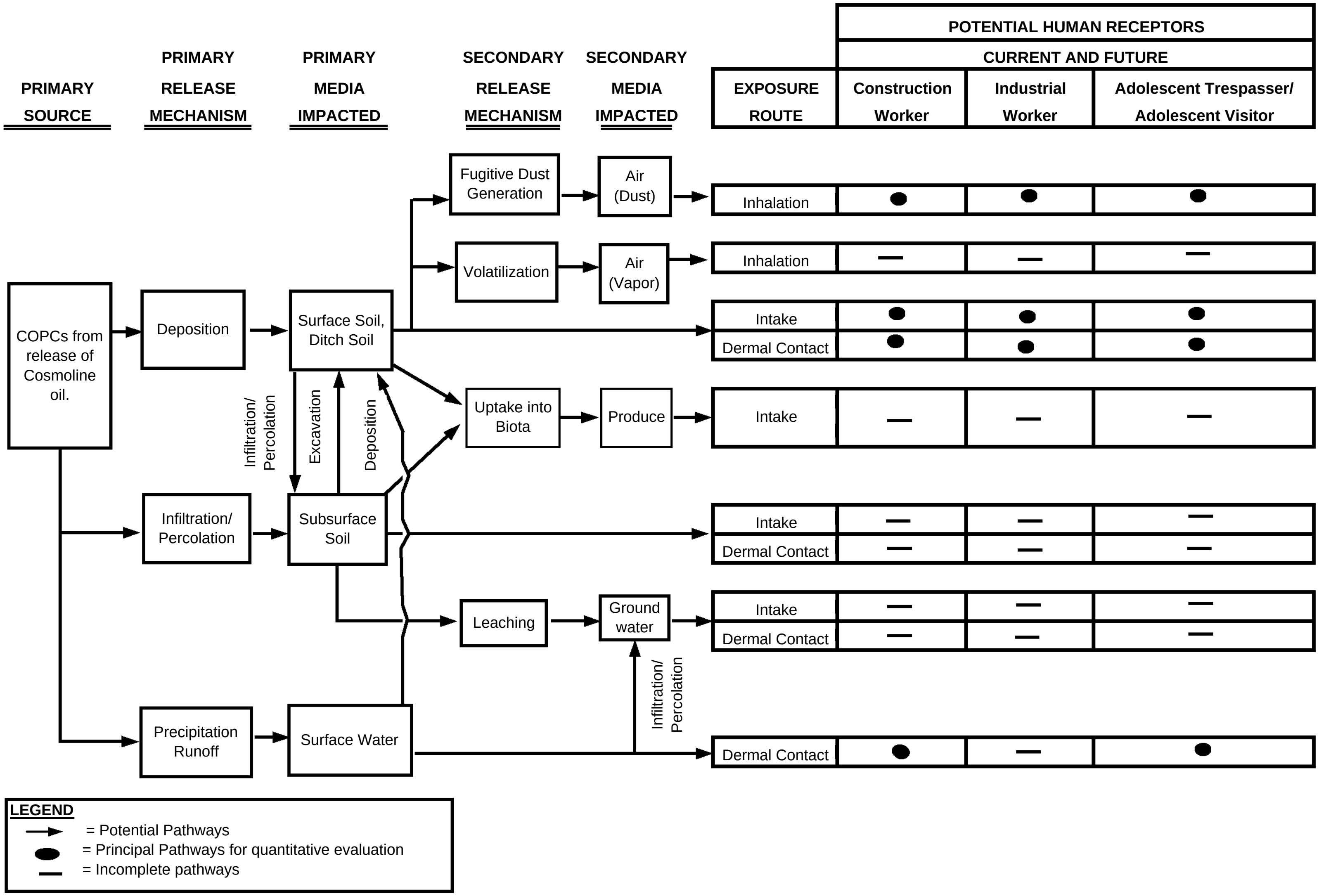
Figure 6-1B
Conceptual Site Model for SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity



EXPOSURE ROUTE	POTENTIAL HUMAN RECEPTORS CURRENT AND FUTURE		
	Construction Worker	Industrial Worker	Adolescent Trespasser/ Adolescent Visitor
Inhalation	●	●	●
Inhalation	—	—	—
Intake	●	●	●
Dermal Contact	●	●	●
Intake	—	—	—
Intake	—	—	—
Dermal Contact	—	—	—
Intake	—	—	—
Dermal Contact	—	—	—
Dermal Contact	●	—	●

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Figure 7-1 Screening Level Ecological Risk Assessment Process

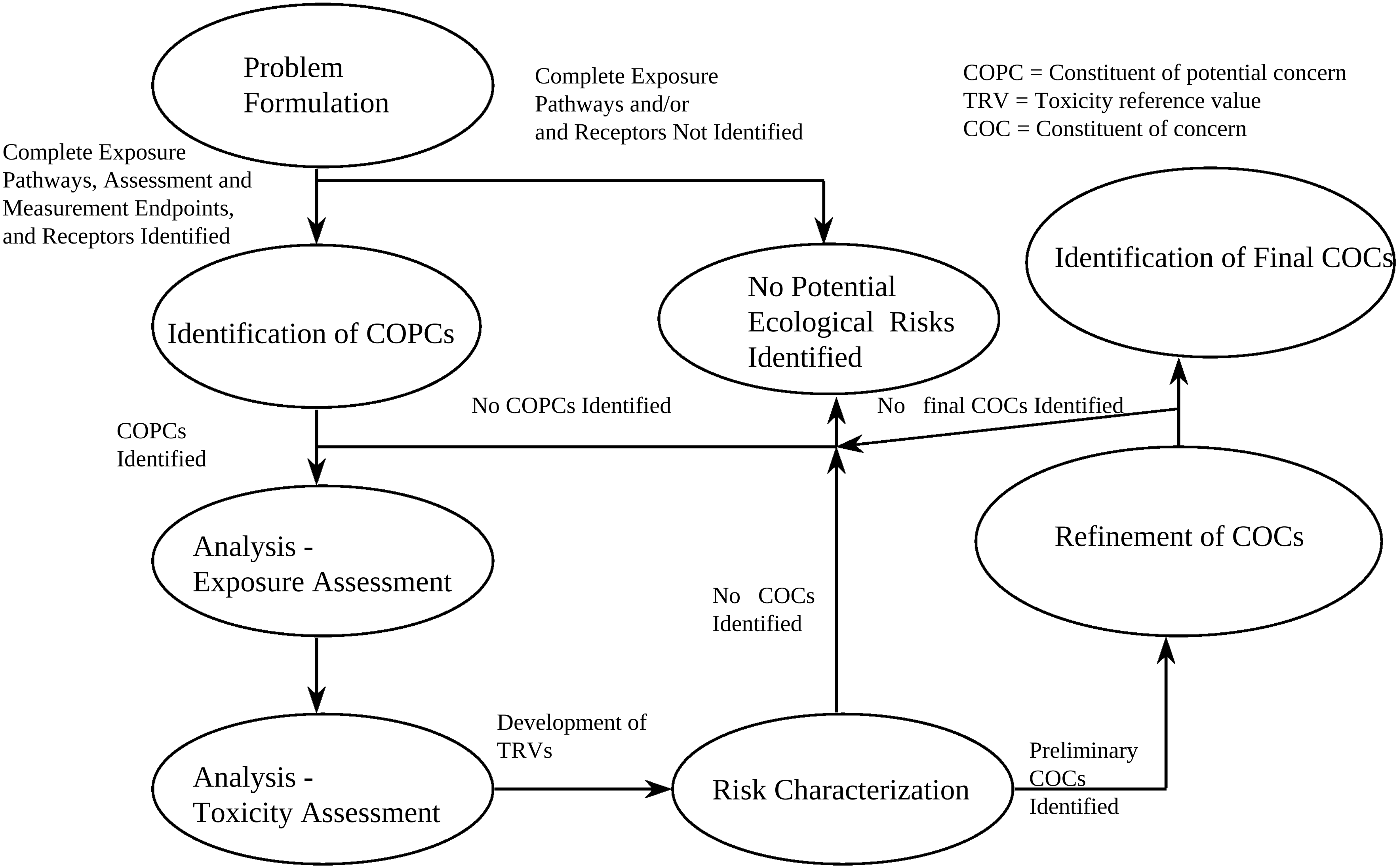

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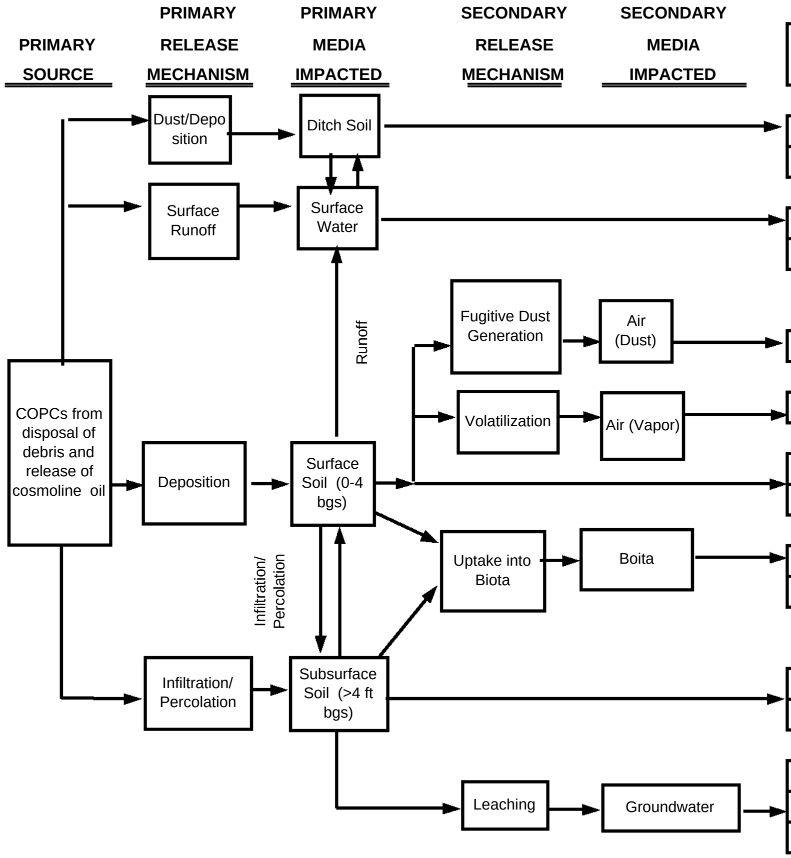
Figure 7-2
Conceptual Site Model for SEAD-121C and SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity



EXPOSURE ROUTE	POTENTIAL ECOLOGICAL RECEPTORS	
	CURRENT AND FUTURE	
	Terrestrial	Aquatic
Intake	●	●
Dermal Contact	○	○
Intake	●	●
Dermal Contact	○	○
Inhalation	○	—
Inhalation	○	—
Intake	●	—
Dermal Contact	○	—
Intake	●	—
Dermal Contact	○	—
Intake	—	—
Dermal Contact	—	—
Intake	—	—
Inhalation	—	—
Dermal Contact	—	—

LEGEND

→ = Potential Pathways
● = Principal Pathways for quantitative evaluation
○ = Pathways for qualitative evaluation
— = Incomplete pathways

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APPENDIX A

MSDS FOR COSMOLINE OIL

Material Safety Data Sheet RPC-2

Complies with OSHA's Hazard Communication
Standard 29 CFR 1910.1200.

GOODSON
Tools and Supplies for Engine Builders
Airport Industrial Park • P.O. Box 847 • Winona, MN 55987-0847
Toll-Free 1-800-533-8010 • Local 507-452-1830 • www.goodson.com

Date of Preparation: June 17, 1996

1. MATERIAL IDENTITY

Part No.: RPC-2

Description: Cosmoline

2. COMPOSITION/INFORMATION ON INGREDIENTS

The criteria for listing components in the composition section is as follows: Carcinogens are listed when present at 0.1% or greater; components which are otherwise hazardous according to OSHA are listed when present at 1.0% or greater; Non-Hazardous components are listed at 3.0% or greater. This is not intended to be a complete compositional disclosure. Refer to section 14 for applicable states' right to know and other regulatory information.

Product and/or Component(s) Carcinogenic According to:	OSHA	IARC	NTP	OTHER	NONE
					X

COMPOSITION: (SEQUENCE NUMBER AND CHEMICAL NAME)

Seq.	Chemical Name	CAS #	Range in %
01	Complex Mixture of Petroleum Hydrocarbons	8009-03-8	35.00-49.99
02	#Severely hydrotreated heavy naphthenic distillate	64741-95-3	20.00-34.99
03	*Stoddard solvent	8052-41-3	20.00-34.99
04	*Wool grease	8020-84-6	3.00-9.99
05	*Stearic acid.alkyl ester	123-95-5	1.00-2.99

Product is Hazardous According to OSHA (1910.1200)
**Component is Hazardous according to OSHA.*
#Component, by definition, is considered hazardous according to OSHA because it carries the permissible exposure limit (PEL) for mineral oil mist.

EXPOSURE LIMITS REFERENCED BY SEQUENCE NUMBER IN THE COMPOSITION SECTION

Seq.	Limit
02	5 mg/m^3 TWA-OSHA (Mineral Oil Mist)
02	5 mg/m^3 TWA-ACGIH (Mineral Oil Mist)
02	10 mg/m^3 STEL-ACGIH (Mineral Oil Mist)
03	100 ppm TWA-OSHA
03	525 mg/m^3 TWA-ACGIH

3. HEALTH IDENTIFICATION

EMERGENCY OVERVIEW **Appearance:** Dark brown liquid **Odor:** Not determined

WARNING STATEMENT **Caution:** May cause dizziness & drowsiness. Oil mist may cause respiratory irritation. Combustible Liquid & Vapor. Do Not use to coat interior of portable water tanks.

HMIS: Health 0, Reactivity 0, Flammability 2, Special -

NFPA: Health 0, Reactivity 0, Flammability 2, Special -

POTENTIAL HEALTH EFFECTS **Primary Routes of Exposure:** Eye, Skin, Inhalation

EFFECTS OF OVEREXPOSURE - ACUTE

Eyes: May cause minimal irritation, experienced as temporary discomfort.

Skin: Brief contact is not irritating. Prolonged contact, as with clothing wetted with material, may cause defatting of skin or irritation, seen as local redness with possible mild discomfort. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact: see other effects, below & section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose & throat, headache, nausea, & drowsiness.

Ingestion: If more than several mouthfuls are swallowed, abdominal discomfort, nausea, & diarrhea may occur.

3. HEALTH IDENTIFICATION CONT...

Sensitization Properties: Unknown

Chronic: No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical conditions aggravated by exposure: Because of its defatting properties, prolonged & repeated skin contact may aggravate an existing dermatitis (skin condition).

Other Remarks: Material from high pressure equipment, pinhole leaks, or high pressure line failure can penetrate the skin & if not properly treated can cause sever injury, including disfigurement, loss of function, or even require amputation of the affected area. To prevent such serious injury, immediate medical attention should be sought even if the injection injury appears to be minor.

4. FIRST AID

Eyes: Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists,

Skin: Wash skin with plenty of soap & water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion: If more than several mouthfuls of this material are swallowed, give two glasses of water (16oz.). Get medical attention.

Inhalation: If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions: High pressure injection of material can cause severe injury. Failure to debride the would of all residual material can result in disfigurement, loss of function, or may require amputation of the affected area. Remove & dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

5. FIREFIGHTING MEASURES

Ignition Temperature - AIT: not determined

Flash Point(°F): 125°F (COC)

Flammable Limits (%): **Upper:** not determined **Lower:** not determined

Recommended Fire Extinguishing Agents & Special Procedures: Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers.

Unusual or Explosive Hazards: None

Extinguishing Media which must NOT be used: not determined

Special Protective Equipment for Firefighters: No special equipment or procedures required.

6. ACCIDENTAL RELEASE MEASURES

Procedures in case of accidental release, breakage or leakage: Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers & waterways. Avoid contact with skin, eyes or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in Handling: Minimum feasible handling temperatures should be maintained.

Precautions to be Taken in Storage: Store away from heat & open flame. Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

PERSONAL PROTECTION

Eye/Face Protection: Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection: Workers should wash exposed skin several times daily with soap & water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection: Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated & the occupational exposure limit of the product, or any component of the product, is exceeded. Use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation: Adequate to meet component occupational exposure limits (see Section 2).

Exposure Limit for Total Product: None established for product: refer to Section 2 for component exposure limits.

9. PHYSICAL PROPERTIES

Appearance:	dark brown liquid	**Odor:**	not determined
Boiling Point (°F):	not determined	**Vapor Pressure:**	not determined
Melting / Freezing Point:	not applicable	**Vapor Density:**	not determined (air=1)
Specific Gravity:	not determined (water=1)	**Viscosity:**	not determined
pH of undiluted product:	not applicable	**Solubility in Water(%):**	not determined
VOC Contact:	not determined	**Other:**	None

10. STABILITY & REACTIVITY

This Material Reacts Violently with: (If OTHERS is checked below, see comments for details.)

AIR	WATER	HEAT	STRONG OXIDIZERS	OTHERS	NONE OF THESE
--	--	--	X	--	--

Comments: None

Products Evolved when Subjected to Heat or Combustion: Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes & ketones.

Hazardous Polymerizations: Do not occur.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Median Lethal Dose: **Oral:** LD50 believed to be >5.00g/kg (rat) practically non-toxic **Inhalation:** not determined

Dermal: LD50 believed to be >2.00g/kg (rabbit) practically non-toxic

Irritation Index, Estimation of Irritation (species): **Skin:** (Draize) believed to be <.50/8.0 (rabbit) no appreciable effect

Eyes: (Draize) believed to be <15.00/110 (rabbit) no appreciable effect

Sensitization: not determined

Other: none

12. DISPOSAL CONSIDERATIONS

Waste Disposal Methods: This product (as presently constituted) has the RCRA characteristics of ignitability and if discarded in it present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because the product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks: None

13. TRANSPORT INFORMATION

DOT:	**Proper Shipping Name:**	Combustible liquid, N.O.S. (petroleum distillate)
	Hazard Class:	Combustible liquid (LAND TRANSPORT ONLY - 49CFR 173.120 (b) (2))
	Identification No.:	NA 1993
	Packing Group:	III
	Label Required:	None
IMDG:	**Proper Shipping Name:**	Petroleum distillates, N.O.S.
	Hazard Class:	3.3
	Identification No.:	UN 1268 (P.G. III)
	Label Required:	Flammable liquid
ICAD:	**Proper Shipping Name:**	Petroleum distillates, N.O.S.
	Hazard Class:	3
	Identification No.:	UN 1268 (P.G. III)
	Label Required:	Flammable liquid
TDG:	**Proper Shipping Name:**	not evaluated

14. REGULATORY INFORMATION

FEDERAL REGULATIONS

SARA TITLE III, Section 302/304 Extremely Hazardous Substances:

Seq.	**Chemical Name**	**CAS #**	**Range in %**
None			

Section 311 Hazardous Categorization:

Acute	Chronic	Fire	Pressure	Reactive	N/A
--	--	X	--	--	--

Section 313 Toxic Chemical:

Chemical Name	**CAS #**	**Concentration**
None		

CERCLA 102 (a)/DOT Hazardous Substances: (+ indicates DOT Hazardous Substance)

Seq.	**Chemical Name**	**CAS #**	**Range in %**
None			

CERCLA/DOT Hazardous Substances (Sequence Numbers & RQ's):

Seq.	**RQ**
None	

TSCA Inventory Status: This product, or its components are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

Other: None

STATE REGULATIONS

California Proposition 65: The following detectable components of this product are substances or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	**CAS #**
None	

States Right-to-Know Regulations:

Chemical Name	**State Right-to-Know**
Stoddard solvent	Florida, Illinois, Massachusetts, New Jersey, Pennsylvania, Rhode Island

INTERNATIONAL REGULATIONS

WHMIS Classification: Class B, Div 3: Combustible liquid

Canada Inventory Status: This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status: not determined

Australia Inventory Status: This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substance (AICS).

Japan Inventory Status: not determined

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity: not determined

Mobility: not determined

Persistence & Biodegradability: not determined

Potential to Bioaccumulate: not evaluated

Remarks: not evaluated

16. OTHER INFORMATION

This product is not recommended for coating the interior of portable water tanks.

The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.

APPENDIX B

SOIL BORING LOGS

- SEAD -121C
- SEAD-121I

OVERBURDEN BORING REPORT

PARSONS	**CLIENT:** USACOE	**BORING NO.:** SB DRMO-5

PROJECT : P&D
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/27/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry/Rick
INSPECTOR: Ben/Jenn
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	8"	2-8	2"	SS		
		0-2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:
SAMPLES DRMO-1040(0-2) DRMO-1041(2-8)
DUPLICATES
MS/MSD
MRD DRMO-1040 MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-5

COMMENTS:

DRILLER: Harry Lyon
INSPECTOR: Rossmann/McAllister
DATE: 10/27/02

DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENETRATION RANGE (FEET)	RECOVERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN			
	8 19 23 13	2'	2'		DRMO-1040	0932		Moist Brown/Black SHALE Small (@2") layer of m-c SAND Coal ash	ML	
2	4 5 6 12	2'	1'			0935		moist Grey/Brown CLAY w/ some silt	ML	
4 5	35 50/4"	10"	10"		DRMO-1041	0942		Dry weathered shale	–	
6	32 50/3"	9"	3"			0954		Dry weathered shale	–	
8	50/1"	1"	–					No Recovery Split Spoon refusal	–	
10										
15										
20										

PAGE 1 OF

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-6

PROJECT : PED
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/25/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilly
DRILLER: Harry Lyon / Rich
INSPECTOR: J Rossmann / B McAllister
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4"	0-9ft	2"	SS		
			3"	SS		

↑
SS

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMO-1043 / DRMO-1044
DUPLICATES DRMO-1050
MS/MSD DRMO-1043MS DRMO-1043 MSD
MRD DRMO-1043 MRD

OVERBURDEN BORING REPORT

PARSONS	CLIENT: UsACoE	BORING NO.: SBDRMO-6

COMMENTS:

DRILLER: Harry Lyon / Rick
INSPECTOR: J Rossmann / B McAllister
DATE: 10/25/12

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	22				DRMO-1043	0856		DRY shale frag — fill	—	
	32	2'	2'							
	35									
	28									
2	10							wet (4 inches) weathered shale & rock w/ some silt to Dry rock fragments and silt.		
	8									
	8	2'	1¼'							
	9									
4	33				DRMO-1044	0924		Dry weathered shale		
5	50/3"	1	1'							
	[illegible]	[illegible]	[illegible]							
6	50/4"	6"	1'					Dry weathered shale		
	50/2"	3"	—					Dry weathered shale Low recovery		
9								refusal @ 0937		
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SBDRMO-7

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/27/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry / Rick
INSPECTOR: Ben / Jen
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	6"	2 - 8	2"	SS		
		0 - 2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMO-1046(0-2) DRMO-1047(2-4)
DUPLICATES
MS/MSD
MRD

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DKMO-7

COMMENTS:

DRILLER: Harry Lyon/Rick

INSPECTOR: Rossmann/McAllister

DATE: 10/27/02

DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENETRATION RANGE (FEET)	RECOVERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN			
2	9 16 16 20	2'	2'		DKMO-1046	0745		Dry Brown very stiff SILT w/some clay and shale fragments.	ML	
4	7 15 10 18	2'	1'		DKMO-1047	0748		Dry Brown SILT to weathered shale	ML	
5	11 27 50/5"	15"	1'			0800		Dry weathered shale	–	
6	50/2"	2"	2"			0806		Dry Grey weathered shale	–	
8										
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	**CLIENT:** USACOE	**BORING NO.:** SB DRMO-8

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/25/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry/Rick
INSPECTOR: Ben/Jenn
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4"	0-6	2"	SS		
		Surface	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND			CALIBRATION		WEATHER (TEMP., WIND, ETC.)
			READING	TIME	DATE	TIME	DATE	

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:
SAMPLES DRMO-1049
DUPLICATES
MS/MSD
MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-8

COMMENTS:

DRILLER: Lynn / Rich

INSPECTOR: Rossmann / McAllister

DATE: 10/25/02

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	5				DRMO-1049	1605		moist to Dry stiff silt/highly weathered Shale mixed rock at the top	ML	
	9									
	9	2'	1½'							
	20									
2	10							Dry weathered shale		
	20									
	30	2	6"							
	50/3									
4	30							Dry weathed shale Bedrock in tip		
5	50/3"	9"	5"			1619				
								Refusal - no sample collected at 2-6 or 6-10 intervals		
6										
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	**CLIENT:** USACOE	**BORING NO.:** SB DRMO-9

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/29/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry / Rick
INSPECTOR: Jenn / Ben
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER		HAMMER	
			SIZE	TYPE	TYPE	WT/FALL
HSA	4"	2-8	2"	SS		
		0-2	3"	SS		

↓ surface soil

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND			CALIBRATION		WEATHER (TEMP., WIND, ETC.)
			READING	TIME	DATE	TIME	DATE	

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:
SAMPLES DRMO-1053 (0-2), DRMO-1054 (2-6)
DUPLICATES
MS/MSD
MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USA COE	BORING NO.: XB DRMO-9

COMMENTS:
3" spoons for SS samples

DRILLER: Harry Allyn / Rich
INSPECTOR: Rossmann / McAllister
DATE: 10/25/02

DEPTH (FT)	SAMPLING BLOWS PER 6 INCHES	PENETRATION RANGE (FEET)	RECOVERY RANGE (FEET)	SAMPLE DEPTH INT (FEET)	NO.	~~VOC~~ time	~~RAD~~ VOC SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	10				DRMO-1053	1009	4ppm	moist to dry SILT w/ shale fragments Brown SILT w/ CLAY Heavy oil/gas smell.	OL	
	9									
	12	2'	1½							
	10									
2	4							moist Brown/grey SILTY CLAY w/ staining slight odor	OL	
	5		1'							
	7	2'			DRMO-1054	1018				
	23									
4	45	7"				1022		weathered shale - Dry		
5	50/2									
6	50/3"	6"	6"			1037		Dry weathered shale		
8										
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SBDRMO-10

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 74/175

START DATE: 10/25/02
FINISH DATE: 1
CONTRACTOR: Lyon Drilling
DRILLER: Harry Lyon / Rick
INSPECTOR: Ben / Jenn
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4"	0-5	2"	SS		
		Surface	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:
SAMPLES DRMO-1056(0-2) DRMO 1057 (2-6)
DUPLICATES
MS/MSD
MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-10

COMMENTS:

DRILLER: Harry Lyon / Rick
INSPECTOR: Rossmann / McAllister
DATE: 10/25/02

DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENETRATION RANGE (FEET)	RECOVERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN			
	9				DRMO-1050	1640		moist to dry Shale fagments (Black) to Dry Brown SILT mixed w/ weathered shale to Brown SILT very bottom. Brown Sand and rust at bottom of 2nd 3" spoon		
	14									
	12	2'	2'						ML	
2	12									
	5				DRMO-1057			moist Brown SILT w/ Loose weathed Shale		
	5								CL	
	5	2'	1"							
4	20									
	20	8"				1652		Dry tan loose weathered Shale		
5	50/3"									
6										
	50/3"	3"						Spoon Refusal		
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-11

PROJECT : PID

SWMU # (AREA) : DRMO

SOP NO.: 74/175

START DATE: 10/26/02

FINISH DATE: ↓

CONTRACTOR: Lyon Drlg

DRILLER: Harry Lyon/Rich

INSPECTOR: Ben/Jenn

CHECKED BY:

CHECK DATE:

BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING	HOLE	DEPTH	SAMPLER		HAMMER	
METHOD	DIA.(ft)	INTERVAL (ft)	SIZE	TYPE	TYPE	WT/FALL
HSA	4"	2-8	2"	SS		
		Surface (0-2)	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT	DETECTOR	RANGE	BACKGROUND			CALIBRATION		WEATHER
TYPE	TYPE/ENERGY		READING	TIME	DATE	TIME	DATE	(TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMO-1059 (0-1) DRMO-1060 (2-6

DUPLICATES

MS/MSD

MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SBDRMO-11

COMMENTS:

DRILLER: Harry Lyon

INSPECTOR: Rossmann / McAllister

DATE: 10/26/00

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	7 21 19 12	2'	2'		DRMO-1059	0940		Moist to Dry weathered shale and rock fragments Dry Brown dense SILT w/possible clay.	ML	
2	7 7 8 27	2'	1'			0944		~~Bro~~ mostly Dry Brown/tan SILT some weathered shale beginning at bottom.	ML	
4 5	15 50/1"	6"	6"		DRMO-1060	0953		Dry Brown/tan SILT w/some rounded m gravel and Dry weathered shale at bottom	ML	
6	41 50/2"	7"	1/4"			1001		Dry weathered shale	-	
8	50/2"	2"	[illegible]			1012		Dry weathered shale Split Spoon Refusal	-	
10										
15										
20										

H:\ENG\SENECA\FORMS\OBBORP2.XLS

FIG A-2 (cont.)

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-12

PROJECT: PID
SWMU # (AREA): DRMO
SOP NO.: 741175

START DATE: 10/25/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry/Rich
INSPECTOR: Jenn/Ben
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4"	2-8	2"	SS		
		0-2	3"	SS		

↓ surface

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMO-1062 (0-2) DRMO-1063 (2-6)
DUPLICATES
MS/MSD
MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-12

COMMENTS:

DRILLER: Harry Lyon/Rich

INSPECTOR: Rossmann/McAllister

DATE: 10/25/02

DEPTH (FT)	SAMPLING BLOWS PER 6 INCHES	SAMPLING PENETRATION RANGE (FEET)	SAMPLING RECOVERY RANGE (FEET)	SAMPLE DEPTH INT (FEET)	SAMPLE NO.	SAMPLE VOC	SAMPLE RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	5							Moist Brown/Black silty Clay. rock fragments (shale)	OL	
	10	2'	1¾'		DRMO-1662	1128				
	12									
2	6									
	3							moist Brown CLAY to weathered shale/rock frag	CL	
	13									
	30	2'	10"		DRMO-1663	1135				
4	12									
	50/4"							some CLAY mostly Dry weathered shale.	CL	
5										
	50/4"	4"								
6										
	50/1"	1"						no recovery - split spoon recovery.		
10										
15										
20										

H:\ENG\SENECA\FORMS\OBBORP2.XLS

FIG A-2 (cont.)

OVERBURDEN BORING REPORT

PARSONS	**CLIENT:** USACOE	**BORING NO.:** SB DRMO-13

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/26/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry / Rick
INSPECTOR: Ben / Jenn
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4"	2-8	2"	SS		
		Surface (0-2)	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:
SAMPLES DRMO-1065 (0-2) DRMO-1066 (2-4)
DUPLICATES
MS/MSD
MRD

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-13
COMMENTS:		DRILLER: Harry Lyon / Rick INSPECTOR: Rossmann / McAllister DATE: 10/26/02

DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENETRATION RANGE (FEET)	RECOVERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN			
	4 ~~2~~ 7 ~~10~~ 8 ~~15~~ 11 ~~50~~	2'	2'		DRMO-1065	1036		moist topsoil and Shale fragments at top. Dry Brown/tan SILT w/ minimum clay last 1½'	ML	
2	3 ~~7~~ 11 ~~5~~ 15 ~~8~~ 50 ~~6~~	2'	1'			1040		moist tan/Brown SILT w/ clay. last 3-4" Dry weathered shale	CL	
4	50/4"	4"	3"		DRMO-1066	1050		Dry weathered Bedrock	-	
5										
6	50/4"	4"				1104		No Recovery - Some Dry weathered Bedrock Split Spoon Refusal		
8										
10										
15										
20										

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-14

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/25/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry Lyon/Rick
INSPECTOR: Rossmann/McAllister
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4"	2-10	2"	SS		
		0-2	3"	SS		

↓ surface soil

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMO-1068 (0-2) DRMO-1069 (2-6)
DUPLICATES
MS/MSD
MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SBDRMO-14

COMMENTS:

DRILLER: Harry Lyon
INSPECTOR: Rossmann / McAllister
DATE: 10/25/02

DEPTH (FT)	SAMPLING: BLOWS PER 6" INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	5 9 15 12	2'	1¾'		DRMO-1068	1218		moist dk Brown/Black silty clay fragmented shale	OL	
2	3 3 4 3	2'	½'			1220		wet dk Brown/Black CLAY 6" water in hole	OL	
4 5	1 2 12 40	2'	1'		DRMO-1069	1230		Moist Brown/grey Clay & stiff SILTY CLAY Some wood at bottom above weathered shale layer (6 inches)	CL	
6	50/2"	2"	4"			1235		Dry weathered shale		
8	50/1"	1"	—					No Recovery.		
10										
15										
20										

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SBDRMO-15

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 74/175

START DATE: 10/26/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry / Rick
INSPECTOR: Ben / Jen
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING	HOLE	DEPTH	SAMPLER		HAMMER	
METHOD	DIA.(ft)	INTERVAL (ft)	SIZE	TYPE	TYPE	WT/FALL
HSA	4"	2-8	2"	SS		
		0-2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT	DETECTOR	RANGE	BACKGROUND			CALIBRATION		WEATHER
TYPE	TYPE/ENERGY		READING	TIME	DATE	TIME	DATE	(TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMO-1071
DUPLICATES
MS/MSD
MRD

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-15

COMMENTS:

DRILLER: Harry Lyon
INSPECTOR: Rossmann / McAllister
DATE: 10/26/02

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	3 9 8 12	2'	18"		DRMO-1071	1403		moist Fill Shale/Brick/silt/deer turds wet @ 2ft		
2	3 6 6 3	2'	–			1405		no recovery.		
4 5	4 3 5 7	2'	2'			1411		moist Grey/Brown CLAY w/shale intermixed or layered. mostly sluff no sample taken	ML	
6	33 50/4"	9"	1½'			1414		water wet Grey CLAY/SILT/Shale (weathered) not worth sampling due to content of spoon		
8	50/2"	2"				1441				
10										
15										
20										

PAGE 1 OF 1

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SBDRMO-16

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/27/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilly
DRILLER: Harry / Rick
INSPECTOR: Ben/Jeon
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4"	2-8.1	2"	SS		
		0-2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMO-1074 (0-2) DRMO-1075 (2-6)
DUPLICATES DRMO-1080
MS/MSD DRMO-1074MS DRMO-1074MSD
MRD DRMO-1074MRD

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FIGURE A-2

OVERBURDEN BORING REPORT

PARSONS

CLIENT: USA COE

BORING NO.: SB DRMO-16

COMMENTS:

DRILLER: Harry Lyon

INSPECTOR: Rossmann / McAllister

DATE: 10/27/02

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	4 7 14 9	2'	2'		DRMO-1074	1326		moist Brown topsoil for @ 5" then Brown SILT w/shale rock frag.	ML	
2	3 4 3 4	2'	1'			1330		moist Brown SILT w/ some trace of ~~f~~ SAND rocky (shale)	ML	
4 5	2 3 5 19	2'	1/2'		DRMO-1075	1345		moist Brown SILT. weathered Bedrock at bottom	CL	
6	20 50/2"	8"	6"			1349		wet weathered shale -grey.	–	
8	50/1"	1"				1357		No Recovery Split Spoon Refusal		
10										
15										
20										

OVERBURDEN BORING REPORT

PARSONS

CLIENT: USACOE

BORING NO.: SB DRMO-17

PROJECT : PID

SWMU # (AREA) : DRMO

SOP NO.: 741178

START DATE: 10/28/02

FINISH DATE: ↓

CONTRACTOR: Lyon Drilly

DRILLER: Harry/Eck

INSPECTOR: Ben / Jem

CHECKED BY:

CHECK DATE:

BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	8"	2-8	2"	SS		
		0-2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE	10/28/02		
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMW-1077 (0-2) DRMO-1078 (2-6)

DUPLICATES

MS/MSD

MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DEMO-17

COMMENTS:

DRILLER: Harry Lyon
INSPECTOR: Rossmann / McAllister
DATE: 10/28/02

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	50 20 18 14	2'	2'		DEMO-1077	1110		Moist. 1st foot Black rock that looks like coal but is not. mixed w/ larger rock + shale. shale w/Asphalt. 2nd foot Brown SILT	ML	
2	4 5 6 10	2'	1/2		DEMO-1078	1113		moist lt grey/orange/yellow SILT.	ML	
4	15 50/4"	10"	5"			1123		Dry weathered Bedrock	–	
5										
6	50/4"	4"	2"			1130		Dry weathered Bedrock	–	
8	50/1"	1"						No Recovery. Spoon Refusal	–	
10										
15										
20										

50
20
18
14

4
5
6
10

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB3DRMO-18

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/27/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry / Rick
INSPECTOR: Bert / Jenn
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING	HOLE	DEPTH	SAMPLER		HAMMER	
METHOD	DIA.(ft)	INTERVAL (ft)	SIZE	TYPE	TYPE	WT/FALL
HSA	6"	2-6.2	2"	SS		
		0-2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT	DETECTOR	RANGE	BACKGROUND			CALIBRATION		WEATHER
TYPE	TYPE/ENERGY		READING	TIME	DATE	TIME	DATE	(TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMO-1081 (0-2) DRMO-1082 (2-6)
DUPLICATES
MS/MSD
MRD

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USA-COE	BORING NO.: SB DRMO-18

COMMENTS:

DRILLER: Harry Lyon
INSPECTOR: Rossmann / McAllister
DATE: 10/27/02

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	15	2'	2'		DRMO-1081	1030		Moist to dry Fill material glass/bolts/nails@10"	-	
	50									
	35									
	45									
2	15	2'	1½'			1035		Dry Brown SILT & rocks. Small clay layer@ 2.5'		
	9									
	15									
	32									
4	15	10"	6"		DRMO-1082	1046		Moist Brown CLAY w/possible f sand weathered shale at bottom	ML	
5	50/4"									
6	50/2"	2"	2"					Dry weathered shale		
8										
10										
15										
20										

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SBDRMO-19

PROJECT: PID
SWMU # (AREA): DRMO
SOP NO.: 741178

START DATE: 10/27/02
FINISH DATE: ↓
CONTRACTOR: Lym Drilly
DRILLER: Harry Ikick
INSPECTOR: Ben Tseng
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4"	2-6.	2"	~~#~~SS		
		0-2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMO-1084 (0-2)
DUPLICATES
MS/MSD
MRD

OVERBURDEN BORING REPORT

PARSONS

CLIENT: WA COE

BORING NO.: SB DEMO-19

COMMENTS:

DRILLER: Harry Lym

INSPECTOR: Rossmann / McAllister

DATE: 10/27/02

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	4							(0-1') Fill - Rocks		
	6	2'	2'		DEMO-1084	0857		(1-2') Moist tan/Brown SILT w/some clay	ML	
	6									
	7									
2	3							Dry weathered shale.	–	
	14	2'	1'			0900				
	19									
4	36									
	22							Dry weathered shale	–	
5	32	2'	1'			0910				
	21									
6	38									
	45							No Recovery Split Spoon Refusal	–	
	50/1"	7"	–			0913				
8										
10										
15										
20										

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-20

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741178

START DATE: 10/26/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry / Rick
INSPECTOR: Ben / Jim
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4"	2 - 8.2	2"	SS		
		0 - 2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:
SAMPLES DRMO-1087 (0-2) DRMO-1088 (2-6)
DUPLICATES
MS/MSD
MRD

OVERBURDEN BORING REPORT

PARSONS

CLIENT: USACOE

BORING NO.: SB DRMO-20

COMMENTS:

DRILLER: Harry Lyon

INSPECTOR: Rossman/McAllister

DATE: 10/26/02

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	22							moist to Dry Fill - rocks/bolts/shale	✓	
	25	2'	1½		DRMO-1087	1249				
	21									
	27									
2	10							Dry tan SILT Granite rock fragments	ML	
	14									
	18	2'	1'		DRMO-1088	1253				
	18									
4	5							Slightly moist grey/green CLAY Fractured Shale last 2". Some well rounded gravel	CL	
5	10									
	16	2'				1307				
	40									
6	50/4"	4"	4"					Dry weathered Shale	✓	
									✓	
8	50/2"	1"	2"					Dry weathered Shale		
10										
15										
20										

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-21

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/27/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Henry/Rick
INSPECTOR: Ben Glenn
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING	HOLE	DEPTH	SAMPLER		HAMMER	
METHOD	DIA.(ft)	INTERVAL (ft)	SIZE	TYPE	TYPE	WT/FALL
HSA	4"	2-6.2	2"	SS		
		0-2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUPMENT SUMMARY

INSTRUMENT	DETECTOR	RANGE	BACKGROUND			CALIBRATION		WEATHER
TYPE	TYPE/ENERGY		READING	TIME	DATE	TIME	DATE	(TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:
SAMPLES DRMO-1020 (02) DRMO-1102
DUPLICATES
MS/MSD
MRD

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO - 21

COMMENTS:

DRILLER: Harry Ryan
INSPECTOR: Rossmann / McAllister
DATE: 10/27/02

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	1 3 5 10	2'	2'		DRMO-1090	1528		Moist Brown to Dk Brown SILT w/ CLAY topsoil at top. Brown CLAY 5' bottom	CL	
2	2 5 15 50/2"	1.8	1"		DRMO-1102	1530		Moist Brown CLAY w/ some silt. Weathered Bedrock 3"	CL	
4	50/4"	4"	8"					Moist Brown CLAY w/ some silt. (from top) Weathered Bedrock 3"	CL	
5										
6	50/2"	2"						weathered shale Dry	–	
8								Auger Refusal 6.2'	–	
10										
15										
20										

OVERBURDEN BORING REPORT

PARSONS	**CLIENT:** USACOE	**BORING NO.:** SB DRMO-22

PROJECT :	PID
SWMU # (AREA) :	DRMO
SOP NO.:	741175

START DATE:	10/27/02
FINISH DATE:	↓
CONTRACTOR:	Lyon Drilly
DRILLER:	Henry / Rick
INSPECTOR:	Jon/Ben
CHECKED BY:	
CHECK DATE:	

BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	8"	2-6.9	2"	SS		
		0-2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES	DRMO-1091 (0-2)
DUPLICATES	
MS/MSD	
MRD	

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB/DRMO-22

COMMENTS:

DRILLER: Harry Lyon

INSPECTOR: Rossmann/McAllister

DATE: 10/27/02

DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENE-TRATION RANGE (FEET)	RECOV-ERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN			
	3 3 5 11	2'	2'		DRMO-1091	1428		Moist Brown topsoil w/Shale fragments	–	
2	6 16 7 3	2'	7"			1434		Moist Brown/gray CLAY w/shale fragments and Lt br silt.	CL	
4 5	9 11 18 50/4"	1'10"	4"			1438		Dry weathered shale	–	
6	40 50/3"	9"	3"			1442		Dry weathered shale - Iron staining		
8	50/1"	1"	-					No recovery. Split spoon refusal	–	
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	**CLIENT:** USACOE	**BORING NO.:** SBDRMO-23

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/28/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry/Rick
INSPECTOR: Ben/Jem
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	6"	2-8	2"	SS		
		0-2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE	10/28/02		
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES DRMO-1095 (0-2) DRMO-1096 (2-6)
DUPLICATES
MS/MSD
MRD DRMO-1095 [illegible] MRD

FIGURE A-2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SBDKMW-23

COMMENTS:

DRILLER: HarryLyon
INSPECTOR: Rossmann / McAllister
DATE: 10/28/02

DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENETRATION RANGE (FEET)	RECOVERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN	(As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)		
	2 4 7 10	2'	2'		DRMO-1085	0950		moist, Brown SILT/CLAY		
2	2 6 5 14	2'	1'			0954		moist Brown/Gray SILT to Brown fSAND @6-8 inches		
4 5	11 14 26 27	2'	2'		DEMO-1096	1007		Moist Brown SILT w/ f SAND and angular gravel to Brown w/ silt round gravel & some fSAND.		
6	11 14 50/4"	1.4'	1'			1019		moist Brown SILT w/ weathered shale at bottom.		
8	50/2"	1"	-					Refusal. Spoon Refusal. not enough sample for last interval (6-10)		
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS

CLIENT: USACOE

BORING NO.: SB DRMO-284

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/28/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry/Rick
INSPECTOR: Jenn/Ben
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	6'	2-8	2"	SS		
		0-2	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE	10/28/02		
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:
SAMPLES DRMO-1098(0-2) DRMO-1099(2-6)
DUPLICATES
MS/MSD
MRD

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB DRMO-24

COMMENTS:

DRILLER: Harry Lyon

INSPECTOR: Rossmann / McAllister

DATE: 10/25/12

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	7 12 20 15	2'	2'		DRMO-1098	1329		Moist Fill material – Rocky (Angular/subangular) Perched H_2O 16"		
2	4 8 12 14	2'	1'		DRMO-1099	1331		wet Grey CLAY w/silt Angular rock frag throughout.		
4 5	4 4 15 50/5"	1.9'	1'			1336		Moist Grey CLAY. Brick @ 5ft 5" weathered Bedrock		
6	50/4"	4"	3"			1347		weathered Shale – Dry		
8	50/1"	1"	–					NO Recovery. Spoon Refusal		
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: MW DRMO-3

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/29/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry / Rich
INSPECTOR: Jenn / Ben
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? [✓ Y] N

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA		0 - 8	2"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE	10/29/02		
SOIL AMOUNT : (fraction of drum)	1/2 drum		
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN: none
SAMPLES
DUPLICATES
MS/MSD
MRD

OVERBURDEN BORING REPORT

PARSONS

CLIENT: USA COE

BORING NO.: MW DRmo-3

COMMENTS:

No soil Samples collected

DRILLER: Harry Lyon

INSPECTOR: Rossmann/McAllister

DATE: 10/29/02

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	8 14 17 13	2'	1'	2				Dry Rock Gry	-	
2	7 ~~40~~ 7 ~~20~~ 9 ~~27~~ 14 ~~41~~	2'	1'	4'				Slightly moist Brown silt	ML	
4 5	10 20 27 41	2'	1'	6'				moist Brown SILT w/ weathered shale at bottom (dry)	ML	
6	25 50/2"	8"	10"					weathering Shale - Dry.	-	
8										
10										
15										
20										

OVERBURDEN BORING REPORT

PARSONS

CLIENT: USACOE

BORING NO.: MW DRMO-4

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/29/02
FINISH DATE: ↓
CONTRACTOR: ~~Harry~~ Lyon Drilly
DRILLER: Harry / Rick
INSPECTOR: Tom / Ben
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? [✓ Y] N

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4¼	0-8	2"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE	10/29/02		
SOIL AMOUNT : (fraction of drum)	½ drum		
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN: None
SAMPLES
DUPLICATES
MS/MSD
MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USA CoE	BORING NO.: MW DRMO-4

COMMENTS:

DRILLER: Harry Lyon / Rick

INSPECTOR: Rossmann / McAllister

DATE: 10/29/02

DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENETRATION RANGE (FEET)	RECOVERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN			
	6							moist Brown(dk) SFLT last 3" 9" of rock (Dry)	ML	
	8									
	5	2'	1'							
2	7									
	5							moist Grey SFLT w/some, dry weathered Shale last 2" trace of clay.	ML	
	7									
	10	2'	1'							
4	32									
	24							Dry weathered shale	—	
5	50/2"	8"	6"							
6	50/1"	1"	—					no recovery Refusal Split spoon	—	
8										
10										
15										
20										

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FIG A-2 (cont.)

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OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: MWDRMO-6

PROJECT : PID
SWMU # (AREA) : DRMO
SOP NO.: 741175

START DATE: 10/29/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drlg
DRILLER: Harry / Rick
INSPECTOR: Ben / Jenn
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? [✓ Y] N

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	6"	0-8	2"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT-SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE	10/29/02		
SOIL AMOUNT : (fraction of drum)	1/2 drum		
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN: none
SAMPLES
DUPLICATES
MS/MSD
MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: MWDRMO -6

COMMENTS:

DRILLER: Harry Lyon

INSPECTOR: Rossmann / McAllister

DATE: 10/29/02

DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENETRATION RANGE (FEET)	RECOVERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN			
	4 10 11 8	2'	3/4'					Rocky Fill	–	
2	4 6 9 11	2'	1'					moist rocky Brown silt, stiff	ML	
4 5	18 50/2"	8"	8"					Dry weathered shale	–	
6	50/1"	1"	4"					Dry weathered shale	–	
8										
10										
15										
20										

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: MWDRMO-5

PROJECT : PED

SWMU # (AREA) : DRMO

SOP NO.: 741175

START DATE: 10/29/02

FINISH DATE: 10/29/02

CONTRACTOR: Lyon Drilling

DRILLER: Harry Reck

INSPECTOR: Ben Jenn

CHECKED BY:

CHECK DATE:

BORING CONVERTED TO MW? [✓ Y] N

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	6"	0-8	2'	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE	10/29/02		
SOIL AMOUNT : (fraction of drum)	1/2 drum		
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN: none

SAMPLES

DUPLICATES

MS/MSD

MRD

PAGE 2 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: MW DRMO - 5

COMMENTS:

DRILLER: Harry Lyon
INSPECTOR: Rossmann/McAllister
DATE: 10/29/02

DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENETRATION RANGE (FEET)	RECOVERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN			
	7							moist Brown SILT w/ rock fragments	ML	
	12	2'	1'							
	10									
2	5							Moist Brown SILT w/ Rock fragments (4")	ML	
	12									
	25	2'	1'					Dry weathered shale		
	28									
4	40									
	35									
5	50/2	8"	8"					Dry weathered shale	—	
6	50/4"	4"	8"					Dry weathered shale	—	
8										
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	**CLIENT:** USACOE	**BORING NO.:** SB/RI-1

PROJECT : PID
SWMU # (AREA) : R1I
SOP NO.: 174/175

START DATE: 10/24/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry Lyon
INSPECTOR: J Lossmark / B McAllister
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4 1/4	0-28	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN: 121I-1040
SAMPLES VOC/moisture/SVOC/Pest/PCB/metals/cyanide
DUPLICATES TOC/TPH
MS/MSD
MRD

FIGURE A-2

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OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB121I-1

COMMENTS:

DRILLER: Harry Lyon
INSPECTOR: JRossman / B McAllister
DATE: 10/24/12

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: ~~VOC~~ TIME	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	6 14 15 13	2'	1'		18II-1040	1119		moist, Brown/grey SILT w/ weathered Shale fragments.	CL	
2	10 50/3"					1130		No Recovery. Refusal		
4										
5										
10										
15										
20										

FIG A-2 (cont.)

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB121I-8

PROJECT : PID
SWMU # (AREA) : § 121I
SOP NO.: 74/175

START DATE: 10/24/02
FINISH DATE: "
CONTRACTOR: Lyon Drilly
DRILLER: Harry Lyon
INSPECTOR: J Rossmann/B McAllister
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	3¼"	0-3	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES 121I-1013
DUPLICATES 121I-1014
MS/MSD 121I-1013 MS/MSD
MRD 121I-1013 MRD

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OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB121I-2

COMMENTS:
Did not get ss values for 1st 2ft, just did ss like before.

DRILLER: Harry Lyon
INSPECTOR: J Rossmann / B McAllister
DATE: 10/24/12

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	no ss recovery				121I-1043	1445		Moist Brown CLAY w/ rock at bottom weathered shale	CL	
2	10 50/2"	6"	4"					rock fragments Refusal		
5										
10										
15										
20										

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OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB121I-3

PROJECT : PID
SWMU # (AREA) : 121I
SOP NO.: 74/178

START DATE: 10/24/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry / Rick
INSPECTOR: Ben / Jenn
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER		HAMMER	
			SIZE	TYPE	TYPE	WT/FALL
HSA	4 1/4	0 - 2.2'	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND			CALIBRATION		WEATHER (TEMP., WIND, ETC.)
			READING	TIME	DATE	TIME	DATE	

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:

SAMPLES 121I-1047
DUPLICATES
MS/MSD
MRD

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FIGURE A-2

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OVERBURDEN BORING REPORT

PARSONS	CLIENT: USACOE	BORING NO.: SB121I-~~3~~3.

COMMENTS:

DRILLER: Harry Lyon

INSPECTOR: J Rossman / B McAllister

DATE: 10/24/02

DEPTH (FT)	SAMPLING BLOWS PER 6 INCHES	SAMPLING PENETRATION RANGE (FEET)	SAMPLING RECOVERY RANGE (FEET)	SAMPLE DEPTH INT (FEET)	SAMPLE NO.	SAMPLE VOC	SAMPLE RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	9				1215-1047	1.57		Moist Brown SILT w/ weathered fractured shale	CL	
	30	1	1							
	50/1"									
2	50/2"							Sspoon Refusal. No Recovery.		
5										
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	**CLIENT:** USA COE	**BORING NO.:** SB121I-4

PROJECT : PID
SWMU # (AREA) : ~~Ammo~~ 121I
SOP NO.: 741175

START DATE: 10/24/02
FINISH DATE: ↓
CONTRACTOR: Lyon Drilling
DRILLER: Harry Lyon
INSPECTOR: J Rossmann B McAllister
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING METHOD	HOLE DIA.(ft)	DEPTH INTERVAL (ft)	SAMPLER SIZE	SAMPLER TYPE	HAMMER TYPE	HAMMER WT/FALL
HSA	4"	0-2.3"	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND READING	BACKGROUND TIME	BACKGROUND DATE	CALIBRATION TIME	CALIBRATION DATE	WEATHER (TEMP., WIND, ETC.)

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

Initially drilled through Asphalt near Ferro Mg piles

SAMPLES TAKEN: 121I-1050
SAMPLES VOC/SVOC/PCB/Pest/Metals/Cyanide
DUPLICATES TPH/TOC
MS/MSD
MRD

OVERBURDEN BORING REPORT

PARSONS	CLIENT: WACOE	BORING NO.: SB121I-40

COMMENTS:

DRILLER: Harry Lyon
INSPECTOR: J Rossmann B McAllister
DATE: 10/24/02

DEPTH (FT)	SAMPLING: BLOWS PER 6 INCHES	SAMPLING: PENETRATION RANGE (FEET)	SAMPLING: RECOVERY RANGE (FEET)	SAMPLE: DEPTH INT (FEET)	SAMPLE: NO.	SAMPLE: VOC	SAMPLE: RAD SCRN	SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	5							moist Brown CLAY w/ weathed Shale fragments		
	50/4"	9"	3/4'		121I-1050	1223			CL	
2	50/3"					1228		No Recovery. Refusal		
5										
10										
15										
20										

PAGE 1 OF 2

OVERBURDEN BORING REPORT

PARSONS	CLIENT: USA-COE	BORING NO.: SB121I-5

PROJECT : PID
SWMU # (AREA) : 121I
SOP NO.: 741175

START DATE: 10/24/02
FINISH DATE: "
CONTRACTOR: Lyon Drilling
DRILLER: Harry Lyon
INSPECTOR: J Rossmann B McAllister
CHECKED BY:
CHECK DATE:
BORING CONVERTED TO MW? Y [✓ N]

DRILLING SUMMARY

DRILLING	HOLE	DEPTH	SAMPLER		HAMMER	
METHOD	DIA.(ft)	INTERVAL (ft)	SIZE	TYPE	TYPE	WT/FALL
HSA	4"	0-3	3"	SS		

DRILLING ACRONYMS

HSA	HOLLOW-STEM AUGERS	HMR	HAMMER	SS	SPLIT SPOON
DW	DRIVE-AND-WASH	SHR	SAFETY HAMMER	CS	CONTINUOUS SAMPLING
MRSLC	MUD-ROTARY SOIL-CORING	HHR	HYDRAULIC HAMMER	5I	5 FT INTERVAL SAMPLING
CA	CASING ADVANCER	DHR	DOWN-HOLE HAMMER	NS	NO SAMPLING
SPC	SPIN CASING	WL	WIRE-LINE	ST	SHELBY TUBE
				3S	3 INCH SPLIT SPOON

MONITORING EQUIPMENT SUMMARY

INSTRUMENT TYPE	DETECTOR TYPE/ENERGY	RANGE	BACKGROUND			CALIBRATION		WEATHER (TEMP., WIND, ETC.)
			READING	TIME	DATE	TIME	DATE	

MONITORING ACRONYMS

PID	PHOTO - IONIZATION DETECTOR	BGD	BACKGROUND	DGRT	DRAEGER TUBES
FID	FLAME - IONIZATION DETECTOR	CPM	COUNTS PER MINUTE	PPB	PARTS PER BILLION
GMD	GEIGER MUELLER DETECTOR	PPM	PARTS PER MILLION	MDL	METHOD DETECTION LIMIT
SCT	SCINTILLATION DETECTOR	RAD	RADIATION METER		

INVESTIGATION DERIVED WASTE

DATE			
SOIL AMOUNT : (fraction of drum)			
DRUM #, LOCATION:			

COMMENTS:

SAMPLES TAKEN:
SAMPLES 121I-1053
DUPLICATES
MS/MSD
MRD

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OVERBURDEN BORING REPORT

PARSONS	CLIENT: USA COE	BORING NO.: SB121I-5

COMMENTS:

DRILLER: Harry Zyon
INSPECTOR: J Rossmann / B McAllister
DATE: 10/24/02

DEPTH (FT)	SAMPLING			SAMPLE				SAMPLE DESCRIPTION (As per Burmeister: color, grain size, MAJOR COMPONENT, Minor Components with amount modifiers and grain-size, density, stratification, wetness, etc.)	USCS CLASS	STRATUM CLASS
	BLOWS PER 6 INCHES	PENETRATION RANGE (FEET)	RECOVERY RANGE (FEET)	DEPTH INT (FEET)	NO.	VOC	RAD SCRN			
	3 11 11 12	2'	1½		121I-1053	1340		moist Brown CLAY w/ weathered shale frags.	CL	
2	7 17 50/1"	1'	8"					rock ash (fine-white) no recovery. Refusal		
5										
10										
15										
20										

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FIG A-2 (cont.)

APPENDIX C

ANALYTICAL RESULTS

C-1A	Guidelines for Sample and Sample Duplicate Merging
C-1B	SEAD-121C Surface Soil - Quality Control of Field Duplicates
C-1C	SEAD-121C Ditch Soil - Quality Control of Field Duplicates
C-1D	SEAD-121C Groundwater - Quality Control of Field Duplicates
C-1E	SEAD-121C Surface Water - Quality Control of Field Duplicates
C-1F	Building 360 Groundwater - Quality Control of Field Duplicates
C-1G	SEAD-121I Surface Soil - Quality Control of Field Duplicates
C-1H	SEAD-121I Ditch Soil - Quality Control of Field Duplicates
C-1I	SEAD-121I Surface Water - Quality Control of Field Duplicates
C-1J	SEAD-121C: Surface Soil – Sample-Duplicate Merger
C-1K	SEAD-121C: Ditch Soil - Sample-Duplicate Merger
C-1L	SEAD-121C: Groundwater - Sample-Duplicate Merger
C-1M	Building 360 (SEAD-27): Groundwater - Sample-Duplicate Merger
C-1N	SEAD-121C: Surface Water - Sample-Duplicate Merger
C-1O	SEAD-121I: Surface Soil and Ditch Soil - Sample-Duplicate Merger
C-1P	SEAD-121I: Surface Water - Sample-Duplicate Merger
C-2	SEAD-121C Surface Soil Sample Results
C-3	SEAD-121C Ditch Soil Sample Results
C-4	SEAD-121C Subsurface Soil Sample Results
C-5A	SEAD-121C EBS Groundwater Sample Results
C-5 B	SEAD-121C RI Groundwater Sample Results
C-6	Building 360 (SEAD-27) Groundwater Sample Results
C-7	SEAD-121C Surface Water Sample Results
C-8	SEAD-121I Surface and Ditch Soil Sample Results
C-9	SEAD-121I Surface Water Sample Results

Table C-1A
SAMPLE AND DUPLICATE MERGING OF QUALIFIERS
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

A Qualifier	B Qualifier		Averaged Qualifier
"NULL"	"NULL"		"NULL"
"NULL"	J		J
"NULL"	NJ		J
"NULL"	UJ		J
"NULL'	U		J
"NULL"	R		"NULL"
J	J		J
J	NJ		J
J	UJ		J
J	U		J
J	R		J
NJ	NJ		NJ
NJ	UJ		J
NJ	U		J
NJ	R		NJ
UJ	UJ		UJ
UJ	U		UJ
UJ	R		UJ
U	U		U
U	R		U
R	R		R

List of Validated Qualifers

For organics:

"NULL"	Detected concentration value
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

For inorganics:

"NULL"	Detected concentration value.
J	The associated value is an estimated quantity.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The data was unusable. (Note: Analyte may or may not be present.).

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Table C-1B
Quality Control of Field Duplicates
Surface Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121C-1					SB121C-4					SBDRMO-16					SBDRMO-6					SSDRMO-7				
Parameter	**Units**	EB231		EB014		*RPD	EB020		EB229		*RPD	DRMO-1074		DRMO-1080		RPD	DRMO-1043		DRMO-1050		*RPD	DRMO-1002		DRMO-1003		*RPD
Volatile Organic Compounds																										
1,1,1-Trichloroethane	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
1,1,2,2-Tetrachloroethane	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
1,1,2-Trichloroethane	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
1,1-Dichloroethane	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
1,1-Dichloroethene	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
1,2-Dichloroethane	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	UJ	4%	3.1	UJ	2.9	U	7%
1,2-Dichloroethene (total)	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----															
1,2-Dichloropropane	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Acetone	UG/KG	12	U	12	J	----	10	J	11	UJ	10%	2.6	UJ	2.8	UJ	7%	2.6	UJ	4.6	U	56%	3.1	UJ	2.9	R	NA
Benzene	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Bromodichloromethane	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Bromoform	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	UJ	2.8	UJ	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Carbon disulfide	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Carbon tetrachloride	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	UJ	4%	3.1	UJ	2.9	U	7%
Chlorobenzene	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Chlorodibromomethane	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Chloroethane	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Chloroform	UG/KG	12	U	12	U	----	11	UJ	4	J	93%	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Cis-1,2-Dichloroethene	UG/KG											2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Cis-1,3-Dichloropropene	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Ethyl benzene	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	0.66	J	2.7	U	121%	3.1	UJ	2.9	U	7%
Meta/Para Xylene	UG/KG											2.6	U	2.8	U	7%	4.1	J	2.7	U	41%	3.1	UJ	2.9	U	7%
Methyl bromide	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	UJ	4%	3.1	UJ	2.9	U	7%
Methyl butyl ketone	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	UJ	4%	3.1	UJ	2.9	U	7%
Methyl chloride	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	UJ	2.8	UJ	7%	2.6	UJ	2.7	UJ	4%	3.1	UJ	2.9	U	7%
Methyl ethyl ketone	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	UJ	4%	3.1	UJ	2.9	UJ	7%
Methyl isobutyl ketone	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Methylene chloride	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	1.7	U	58%
Ortho Xylene	UG/KG											2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Styrene	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	UJ	2.8	UJ	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Tetrachloroethene	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	UJ	2.8	UJ	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Toluene	UG/KG	2	J	5	J	86%	12	J	10	J	18%	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Total Xylenes	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----															
Trans-1,2-Dichloroethene	UG/KG											2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Trans-1,3-Dichloropropene	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Trichloroethene	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Vinyl chloride	UG/KG	12	U	12	U	----	11	UJ	11	UJ	----	2.6	U	2.8	U	7%	2.6	UJ	2.7	U	4%	3.1	UJ	2.9	U	7%
Semivolatile Organic Compounds																										
1,2,4-Trichlorobenzene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
1,2-Dichlorobenzene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
1,3-Dichlorobenzene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
1,4-Dichlorobenzene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
2,4,5-Trichlorophenol	UG/KG	190	U	180	U	5%	170	U	170	U	----	900	U	900	U	----	870	U	880	U	1%	960	U	950	U	1%
2,4,6-Trichlorophenol	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
2,4-Dichlorophenol	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
2,4-Dimethylphenol	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
2,4-Dinitrophenol	UG/KG	190	U	180	U	5%	170	U	170	U	----	900	U	900	UJ	----	870	R	880	UJ	NA	960	U	950	U	1%
2,4-Dinitrotoluene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
2,6-Dinitrotoluene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
2-Chloronaphthalene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----

Table C-1B
Quality Control of Field Duplicates
Surface Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121C-1					SB121C-4					SBDRMO-16					SBDRMO-6					SSDRMO-7				
Parameter	**Units**	EB231		EB014		*RPD	EB020		EB229		*RPD	DRMO-1074		DRMO-1080		RPD	DRMO-1043		DRMO-1050		*RPD	DRMO-1002		DRMO-1003		*RPD
2-Chlorophenol	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
2-Methylnaphthalene	UG/KG	78	U	4.3	J	179%	72	U	71	U	1%	200	J	210	J	5%	340	U	350	U	3%	140	J	110	J	24%
2-Methylphenol	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
2-Nitroaniline	UG/KG	190	U	180	U	5%	170	U	170	U	----	900	U	900	U	----	870	UJ	880	U	1%	960	U	950	U	1%
2-Nitrophenol	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
3 or 4-Methylphenol	UG/KG											360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
3,3'-Dichlorobenzidine	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	UJ	----	340	UJ	350	UJ	3%	380	UJ	380	UJ	----
3-Nitroaniline	UG/KG	190	U	180	U	5%	170	U	170	U	----	900	U	900	U	----	870	U	880	U	1%	960	U	950	U	1%
4,6-Dinitro-2-methylphenol	UG/KG	190	U	180	U	5%	170	U	170	U	----	900	U	900	U	----	870	UJ	880	UJ	1%	960	U	950	U	1%
4-Bromophenyl phenyl ether	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
4-Chloro-3-methylphenol	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
4-Chloroaniline	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
4-Chlorophenyl phenyl ether	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
4-Methylphenol	UG/KG	78	U	73	U	7%	72	U	71	U	1%															
4-Nitroaniline	UG/KG	190	U	180	U	5%	170	U	170	U	----	900	U	900	U	----	870	U	880	U	1%	960	U	950	U	1%
4-Nitrophenol	UG/KG	190	U	180	U	5%	170	U	170	U	----	900	U	900	U	----	870	UJ	880	U	1%	960	U	950	U	1%
Acenaphthene	UG/KG	78	U	6.8	J	168%	72	U	71	U	1%	160	J	170	J	6%	340	U	350	U	3%	310	J	190	J	48%
Acenaphthylene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	1100		750		38%	340	U	350	U	3%	1000		810		21%
Anthracene	UG/KG	78	U	15	J	135%	72	U	71	U	1%	1100		950		15%	340	U	350	U	3%	1600		850		61%
Benzo(a)anthracene	UG/KG	78	U	76		3%	3.9	J	7	J	57%	5500	J	2900	J	62%	340	U	350	UJ	3%	6700	J	3900	J	53%
Benzo(a)pyrene	UG/KG	78	U	57	J	31%	72	U	71	U	1%	4800	J	2700	J	56%	340	UJ	350	UJ	3%	7600	J	5000	J	41%
Benzo(b)fluoranthene	UG/KG	78	U	95		20%	13	J	71	U	138%	6600	J	3700	J	56%	50	J	350	UJ	150%	11000	J	6600	J	50%
Benzo(ghi)perylene	UG/KG	78	U	42	J	60%	72	U	71	U	1%	1700	J	740	J	79%	110	J	57	J	63%	3800	J	2500	J	41%
Benzo(k)fluoranthene	UG/KG	78	U	67	J	15%	72	U	71	U	1%	3000	J	1700	J	55%	340	UJ	350	UJ	3%	4900	J	3100	J	45%
Bis(2-Chloroethoxy)methane	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
Bis(2-Chloroethyl)ether	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
Bis(2-Chloroisopropyl)ether	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
Bis(2-Ethylhexyl)phthalate	UG/KG	13	J	73	U	140%	9.3	J	13	J	33%	97	J	74	J	27%	340	UJ	350	UJ	3%	200	J	97	J	69%
Butylbenzylphthalate	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	UJ	----	340	UJ	350	UJ	3%	380	UJ	380	UJ	----
Carbazole	UG/KG	78	U	17	J	128%	72	U	71	U	1%	170	J	130	J	27%	340	U	350	U	3%	910		550		49%
Chrysene	UG/KG	78	U	90		14%	8.8	J	12	J	31%	5000	J	2700	J	60%	340	UJ	350	UJ	3%	6800	J	4300	J	45%
Di-n-butylphthalate	UG/KG	78	U	73	U	7%	72	U	3.7	J	180%	360	U	360	U	----	340	U	350	U	3%	380	U	73	J	136%
Di-n-octylphthalate	UG/KG	9.9	J	73	U	152%	72	U	71	U	1%	360	U	360	UJ	----	340	UJ	350	UJ	3%	380	UJ	380	UJ	----
Dibenz(a,h)anthracene	UG/KG	78	U	21	J	115%	72	U	71	U	1%	250	J	100	J	86%	340	UJ	350	UJ	3%	570	J	370	J	43%
Dibenzofuran	UG/KG	78	U	5.1	J	175%	72	U	71	U	1%	170	J	190	J	11%	340	U	350	U	3%	330	J	160	J	69%
Diethyl phthalate	UG/KG	5.8	J	73	U	171%	8.1	J	10	J	21%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
Dimethylphthalate	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
Fluoranthene	UG/KG	78	U	180		79%	7.4	J	10	J	30%	8200	J	5100	J	47%	53	J	38	J	33%	15000		8800		52%
Fluorene	UG/KG	78	U	8	J	163%	72	U	71	U	1%	650		690		6%	340	U	350	U	3%	1000		560		56%
Hexachlorobenzene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
Hexachlorobutadiene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	UJ	380	UJ	----
Hexachlorocyclopentadiene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	UJ	350	UJ	3%	380	U	380	U	----
Hexachloroethane	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
Indeno(1,2,3-cd)pyrene	UG/KG	78	U	41	J	62%	72	U	71	U	1%	760		330	J	79%	60	J	350	UJ	141%	1100	J	840	J	27%
Isophorone	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	UJ	380	UJ	----
N-Nitrosodiphenylamine	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----
N-Nitrosodipropylamine	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	UJ	350	U	3%	380	U	380	U	----
Naphthalene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	100	J	82	J	20%	340	U	350	U	3%	97	J	74	J	27%
Nitrobenzene	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	UJ	380	UJ	----
Pentachlorophenol	UG/KG	190	UJ	180	U	5%	170	U	170	U	----	900	U	900	U	----	870	U	880	U	1%	960	U	950	U	1%
Phenanthrene	UG/KG	78	U	96		21%	8.8	J	7.6	J	15%	4400	J	4000	J	10%	340	U	350	U	3%	13000		7600		52%
Phenol	UG/KG	78	U	73	U	7%	72	U	71	U	1%	360	U	360	U	----	340	U	350	U	3%	380	U	380	U	----

Table C-1B
Quality Control of Field Duplicates
Surface Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121C-1					SB121C-4					SBDRMO-16					SBDRMO-6					SSDRMO-7				
Parameter	**Units**	EB231		EB014		*RPD	EB020		EB229		*RPD	DRMO-1074		DRMO-1080		RPD	DRMO-1043		DRMO-1050		*RPD	DRMO-1002		DRMO-1003		*RPD
Pyrene	UG/KG	78	U	170		74%	8.3	J	14	J	51%	12000	J	5300	J	77%	130	J	78	J	50%	24000	J	14000	J	53%
Pesticides/PCBs																										
4,4'-DDD	UG/KG	3.9	U	3.7	U	5%	3.6	U	3.5	U	3%	1.8	UJ	6	J	108%	1.8	R	1.8	UJ	NA	2	UJ	1.9	UJ	5%
4,4'-DDE	UG/KG	3.9	U	29		153%	3.8		4.5		17%	1.8	UJ	41	R	NA	6.1	J	6.3	J	3%	2	UJ	1.9	UJ	5%
4,4'-DDT	UG/KG	3.9	U	35		160%	1.9	J	2.3	J	19%	19	J	21	J	10%	1.8	UJ	1.8	UJ	----	2	UJ	1.9	UJ	5%
Aldrin	UG/KG	2	U	1.8	U	11%	1.8	U	1.8	U	----	9.9	J	19	NJ	63%	1.8	UJ	1.8	UJ	----	2	U	1.9	U	5%
Alpha-BHC	UG/KG	2	U	2	R	NA	1.8	U	1.8	U	----	1.8	UJ	1.8	UJ	----	1.8	UJ	1.8	UJ	----	2	UJ	1.9	UJ	5%
Alpha-Chlordane	UG/KG	2	U	1.8	U	11%	1.8	U	1.8	U	----	63	J	71	R	NA	6.1	J	4.7	J	26%	2	UJ	1.9	UJ	5%
Beta-BHC	UG/KG	2	U	1.8	UJ	11%	1.8	U	1.8	U	----	1.8	UJ	1.8	UJ	----	1.8	U	1.8	UJ	----	2	UJ	1.9	UJ	5%
Chlordane	UG/KG											18	U	18	U	----	18	U	18	U	----	20	U	19	U	5%
Delta-BHC	UG/KG	2	U	0.95	J	71%	1.8	U	1.8	U	----	1.8	UJ	1.8	UJ	----	1.8	UJ	1.8	UJ	----	2	UJ	1.9	UJ	5%
Dieldrin	UG/KG	3.9	U	3.7	UJ	5%	3.6	U	3.5	U	3%	41	J	32	R	NA	1.8	UJ	1.8	UJ	----	2	UJ	1.9	UJ	5%
Endosulfan I	UG/KG	2	U	1.8	UJ	11%	1.8	U	1.8	U	----	65		69	J	6%	6.1		5.4		12%	190	J	180	J	5%
Endosulfan II	UG/KG	3.9	U	3.7	UJ	5%	3.6	U	3.5	U	3%	1.8	U	1.8	U	----	1.8	U	1.8	U	----	2	U	1.9	U	5%
Endosulfan sulfate	UG/KG	3.9	U	3.7	UJ	5%	3.6	U	3.5	U	3%	1.8	U	1.8	U	----	1.8	U	1.8	U	----	2	U	1.9	U	5%
Endrin	UG/KG	3.9	U	3.7	UJ	5%	3.6	U	3.5	U	3%	17	J	26	J	42%	1.8	UJ	1.8	U	----	2	U	1.9	UJ	5%
Endrin aldehyde	UG/KG	3.9	U	3.7	UJ	5%	3.6	U	3.5	U	3%	1.8	U	1.8	U	----	1.8	U	1.8	U	----	2	U	1.9	UJ	5%
Endrin ketone	UG/KG	3.9	U	3.7	UJ	5%	3.6	U	3.5	U	3%	7.5	J	10	R	NA	1.8	U	1.8	U	----	2	U	1.9	U	5%
Gamma-BHC/Lindane	UG/KG	2	U	1.8	UJ	11%	1.8	U	1.8	U	----	1.8	UJ	1.8	UJ	----	1.8	UJ	1.8	UJ	----	2	U	1.9	U	5%
Gamma-Chlordane	UG/KG	2	U	1.8	UJ	11%	1.8	U	1.8	U	----	1.8	UJ	1.8	UJ	----	1.8	U	1.8	UJ	----	2	U	1.9	UJ	5%
Heptachlor	UG/KG	2	U	1.8	UJ	11%	1.8	U	1.8	U	----	1.8	UJ	1.8	UJ	----	1.8	U	1.8	UJ	----	2	U	1.9	U	5%
Heptachlor epoxide	UG/KG	2	U	1.8	UJ	11%	1.8	U	1.8	U	----	20	R	1.8	UJ	NA	1.8	U	1.8	UJ	----	2	U	1.9	UJ	5%
Methoxychlor	UG/KG	20	U	18	UJ	11%	18	U	18	U	----	1.8	U	1.8	U	----	1.8	UJ	1.8	U	----	2	U	1.9	UJ	5%
Toxaphene	UG/KG	200	U	180	UJ	11%	180	U	180	U	----	18	U	18	U	----	18	U	18	U	----	20	U	19	U	5%
Aroclor-1016	UG/KG	39	U	37	UJ	5%	36	U	35	U	3%	18	UJ	18	UJ	----	18	U	18	U	----	20	U	19	U	5%
Aroclor-1221	UG/KG	79	U	74	UJ	7%	73	U	72	U	1%	18	U	18	U	----	18	U	18	U	----	20	U	19	U	5%
Aroclor-1232	UG/KG	39	U	37	UJ	5%	36	U	35	U	3%	18	UJ	18	UJ	----	18	U	18	U	----	20	U	19	U	5%
Aroclor-1242	UG/KG	39	U	37	UJ	5%	36	U	35	U	3%	18	UJ	18	UJ	----	18	U	18	U	----	20	U	19	U	5%
Aroclor-1248	UG/KG	39	U	37	UJ	5%	36	U	35	U	3%	18	U	18	U	----	18	U	18	U	----	20	U	19	U	5%
Aroclor-1254	UG/KG	39	U	37	UJ	5%	36	U	35	U	3%	18	UJ	18	UJ	----	18	U	18	U	----	20	UJ	19	UJ	5%
Aroclor-1260	UG/KG	39	U	30	J	26%	36	U	35	U	3%	22	J	35	J	46%	18	U	18	U	----	20	UJ	19	UJ	5%
Metals & Cyanide																										
Aluminum	MG/KG	12800		14500		12%	14400		13000		10%	3100		3760		19%	8030		11100		32%	7420		8280		11%
Antimony	MG/KG	1.1	J	19.3	J	178%	1.7	J	0.81	J	71%	0.98	U	0.99		1%	1.5		0.96	U	44%	3.2	J	1.4	J	78%
Arsenic	MG/KG	5.5		6.1		10%	5		3.7		30%	4.8		5.5		14%	3.7		4.7		24%	6.2		5.4		14%
Barium	MG/KG	64.9		1600		184%	86.6		69.6		22%	42		45.6		8%	37.9	J	66.7	J	55%	80.9	J	84.5	J	4%
Beryllium	MG/KG	0.52		0.4		26%	0.57		0.49		15%	0.26	J	0.32	J	21%	0.44	J	0.6		31%	0.5		0.53		6%
Cadmium	MG/KG	0.07	U	2.7		190%	0.07	U	0.05	U	33%	0.56		0.49	J	13%	0.2	J	0.13	U	42%	0.57		0.44		26%
Calcium	MG/KG	2580		31300		170%	17200		25500		39%	199000		157000		24%	36500	J	41400	J	13%	63600	J	61200	J	4%
Chromium	MG/KG	20.9		32.9		45%	27.8		22.6		21%	13		13.8		6%	38.8		38.6		1%	17.6	J	18.8	J	7%
Cobalt	MG/KG	12.8		16.5		25%	17.6		12.5		34%	5.9		6.1		3%	9.5		14.2		40%	8.6	R	8.7	R	NA
Copper	MG/KG	19.7	J	7690		199%	39.1	J	33	J	17%	28.8		34.3		17%	34.6	J	39.6	J	13%	39.8	J	32.8	J	19%
Cyanide	MG/KG	0.63	U	0.59	U	7%	0.56	U	0.61	U	9%															
Cyanide, Amenable	MG/KG											0.54	U	0.55	U	2%	0.52	U	0.53	U	2%	0.58	U	0.57	U	2%
Cyanide, Total	MG/KG											0.542	U	0.545	U	1%	0.525	U	0.535	U	2%	0.582	U	0.575	U	1%
Iron	MG/KG	25700		41100		46%	32000		25900		21%	8710		10500		19%	18300		24200		28%	18500		18700		1%
Lead	MG/KG	11.8	J	5280		199%	27.1		23.5	J	14%	89.3		94.5		6%	66.9		56.3		17%	117		93.8		22%
Magnesium	MG/KG	4590		6820		39%	6980		5630		21%	17900		13000		32%	5080		6940		31%	12700		6180		69%
Manganese	MG/KG	598		612		2%	413		359		14%	425		390		9%	348		376		8%	480		553		14%
Mercury	MG/KG	0.06	U	0.05	U	18%	0.04	U	0.04	U	----	0.07		0.07		----	0.04		0.03		29%	0.07		0.06		15%
Nickel	MG/KG	40.5		54.2	J	29%	61.8		49.3		23%	19.4	J	22.1	J	13%	31.8	J	44.4	J	33%	22.4	J	23.5	J	5%
Potassium	MG/KG	1600		1840		14%	1980		1450		31%	934	J	882	J	6%	1220	J	1770	J	37%	862	J	712	J	19%

Table C-1B
Quality Control of Field Duplicates
Surface Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121C-1					SB121C-4					SBDRMO-16					SBDRMO-6					SSDRMO-7				
Parameter	**Units**	EB231		EB014		*RPD	EB020		EB229		*RPD	DRMO-1074		DRMO-1080		RPD	DRMO-1043		DRMO-1050		*RPD	DRMO-1002		DRMO-1003		*RPD
Selenium	MG/KG	1.1	U	0.92	UJ	18%	1	U	0.8	U	22%	0.46	U	0.45	U	2%	0.44	U	0.45	U	2%	0.49	U	0.47	U	4%
Silver	MG/KG	0.48	U	0.41	U	16%	0.46	U	0.36	U	24%	0.29	U	0.29	U	----	0.28	U	0.29	U	4%	0.31	U	0.3	U	3%
Sodium	MG/KG	139	U	606		125%	132	U	110		18%	276		232		17%	223		277		22%	191		194		2%
Thallium	MG/KG	1.4	UJ	1.2	U	15%	1.4	J	1.1	UJ	24%	0.34	U	0.33	U	3%	0.33	U	0.33	U	----	0.36	U	0.35	U	3%
Vanadium	MG/KG	20.8		19.5	J	6%	21		17		21%	11	J	10.7	J	3%	12.9		17.9		32%	15.3	J	14.4	J	6%
Zinc	MG/KG	80.3		1280		176%	153		196		25%	130	J	135	J	4%	123		196		46%	107	J	96.8	J	10%
Other																										
Total Organic Carbon	MG/KG											5200		5300		2%	3300		8500		88%	5800		6000		3%
Total Petroleum Hydrocarbons	MG/KG											2800	J	6200	J	76%	42	UJ	43	UJ	2%	190		46	U	122%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

RPD = | SR - SDR | X 100
(1/2) (SR + SDR)

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
NJ = reported value is estimated and tentatively identified based on mass spec
J = reported value is estimated
UJ = not detected to the estimated limit indicated
R = result is rejected
NA = Not Applicable, i.e. result rejected or missing result
----- = No difference between results or both results were non-detect

Table C-1C
Quality Control of Field Duplicates
Ditch Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SDDRMO-8				
Parameter	**Units**	DRMO-4005		DRMO-4008		*RPD
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	6.6	UJ	11	UJ	50%
1,1,2,2-Tetrachloroethane	UG/KG	6.6	UJ	11	UJ	50%
1,1,2-Trichloroethane	UG/KG	6.6	UJ	11	UJ	50%
1,1-Dichloroethane	UG/KG	6.6	UJ	11	UJ	50%
1,1-Dichloroethene	UG/KG	6.6	UJ	11	UJ	50%
1,2-Dichloroethane	UG/KG	6.6	UJ	11	UJ	50%
1,2-Dichloropropane	UG/KG	6.6	UJ	11	UJ	50%
Acetone	UG/KG	21	J	72	J	110%
Benzene	UG/KG	6.6	UJ	11	UJ	50%
Bromodichloromethane	UG/KG	6.6	UJ	11	UJ	50%
Bromoform	UG/KG	6.6	UJ	11	UJ	50%
Carbon disulfide	UG/KG	6.6	UJ	6.7	J	2%
Carbon tetrachloride	UG/KG	6.6	UJ	11	UJ	50%
Chlorobenzene	UG/KG	6.6	UJ	11	UJ	50%
Chlorodibromomethane	UG/KG	6.6	UJ	11	UJ	50%
Chloroethane	UG/KG	6.6	UJ	11	UJ	50%
Chloroform	UG/KG	6.6	UJ	11	UJ	50%
Cis-1,2-Dichloroethene	UG/KG	6.6	UJ	11	UJ	50%
Cis-1,3-Dichloropropene	UG/KG	6.6	UJ	11	UJ	50%
Ethyl benzene	UG/KG	6.6	UJ	11	UJ	50%
Meta/Para Xylene	UG/KG	6.6	UJ	11	UJ	50%
Methyl bromide	UG/KG	6.6	UJ	11	UJ	50%
Methyl butyl ketone	UG/KG	6.6	UJ	11	UJ	50%
Methyl chloride	UG/KG	6.6	UJ	11	UJ	50%
Methyl ethyl ketone	UG/KG	6.6	UJ	11	UJ	50%
Methyl isobutyl ketone	UG/KG	6.6	UJ	11	UJ	50%
Methylene chloride	UG/KG	6.6	UJ	11	UJ	50%
Ortho Xylene	UG/KG	6.6	UJ	11	UJ	50%
Styrene	UG/KG	6.6	UJ	11	UJ	50%
Tetrachloroethene	UG/KG	6.6	UJ	11	UJ	50%
Toluene	UG/KG	6.6	UJ	11	UJ	50%
Trans-1,2-Dichloroethene	UG/KG	6.6	UJ	11	UJ	50%
Trans-1,3-Dichloropropene	UG/KG	6.6	UJ	11	UJ	50%
Trichloroethene	UG/KG	6.6	UJ	11	UJ	50%
Vinyl chloride	UG/KG	6.6	UJ	11	UJ	50%
Semivolatile Organic Compounds						
1,2,4-Trichlorobenzene	UG/KG	650	UJ	1100	UJ	51%
1,2-Dichlorobenzene	UG/KG	650	UJ	1100	UJ	51%
1,3-Dichlorobenzene	UG/KG	650	UJ	1100	UJ	51%
1,4-Dichlorobenzene	UG/KG	650	UJ	1100	UJ	51%
2,4,5-Trichlorophenol	UG/KG	1600	UJ	2600	UJ	48%
2,4,6-Trichlorophenol	UG/KG	650	UJ	1100	UJ	51%
2,4-Dichlorophenol	UG/KG	650	UJ	1100	UJ	51%
2,4-Dimethylphenol	UG/KG	650	UJ	1100	UJ	51%
2,4-Dinitrophenol	UG/KG	1600	UJ	2600	UJ	48%

Table C-1C
Quality Control of Field Duplicates
Ditch Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SDDRMO-8				
Parameter	**Units**	DRMO-4005		DRMO-4008		*RPD
2,4-Dinitrotoluene	UG/KG	650	UJ	1100	UJ	51%
2,6-Dinitrotoluene	UG/KG	650	UJ	1100	UJ	51%
2-Chloronaphthalene	UG/KG	650	UJ	1100	UJ	51%
2-Chlorophenol	UG/KG	650	UJ	1100	UJ	51%
2-Methylnaphthalene	UG/KG	650	UJ	1100	UJ	51%
2-Methylphenol	UG/KG	650	UJ	1100	UJ	51%
2-Nitroaniline	UG/KG	1600	UJ	2600	UJ	48%
2-Nitrophenol	UG/KG	650	UJ	1100	UJ	51%
3 or 4-Methylphenol	UG/KG	650	UJ	1100	UJ	51%
3,3'-Dichlorobenzidine	UG/KG	650	UJ	1100	UJ	51%
3-Nitroaniline	UG/KG	1600	UJ	2600	UJ	48%
4,6-Dinitro-2-methylphenol	UG/KG	1600	UJ	2600	UJ	48%
4-Bromophenyl phenyl ether	UG/KG	650	UJ	1100	UJ	51%
4-Chloro-3-methylphenol	UG/KG	650	UJ	1100	UJ	51%
4-Chloroaniline	UG/KG	650	UJ	1100	UJ	51%
4-Chlorophenyl phenyl ether	UG/KG	650	UJ	1100	UJ	51%
4-Nitroaniline	UG/KG	1600	UJ	2600	UJ	48%
4-Nitrophenol	UG/KG	1600	UJ	2600	UJ	48%
Acenaphthene	UG/KG	650	UJ	1100	UJ	51%
Acenaphthylene	UG/KG	650	UJ	1100	UJ	51%
Anthracene	UG/KG	650	UJ	1100	UJ	51%
Benzo(a)anthracene	UG/KG	650	UJ	1100	UJ	51%
Benzo(a)pyrene	UG/KG	650	UJ	1100	UJ	51%
Benzo(b)fluoranthene	UG/KG	650	UJ	1100	UJ	51%
Benzo(ghi)perylene	UG/KG	650	UJ	1100	UJ	51%
Benzo(k)fluoranthene	UG/KG	650	UJ	1100	UJ	51%
Bis(2-Chloroethoxy)methane	UG/KG	650	UJ	1100	UJ	51%
Bis(2-Chloroethyl)ether	UG/KG	650	UJ	1100	UJ	51%
Bis(2-Chloroisopropyl)ether	UG/KG	650	UJ	1100	UJ	51%
Bis(2-Ethylhexyl)phthalate	UG/KG	650	UJ	1100	UJ	51%
Butylbenzylphthalate	UG/KG	650	UJ	1100	UJ	51%
Carbazole	UG/KG	650	UJ	1100	UJ	51%
Chrysene	UG/KG	650	UJ	1100	UJ	51%
Di-n-butylphthalate	UG/KG	650	UJ	1100	UJ	51%
Di-n-octylphthalate	UG/KG	650	UJ	1100	UJ	51%
Dibenz(a,h)anthracene	UG/KG	650	UJ	1100	UJ	51%
Dibenzofuran	UG/KG	650	UJ	1100	UJ	51%
Diethyl phthalate	UG/KG	650	UJ	1100	UJ	51%
Dimethylphthalate	UG/KG	650	UJ	1100	UJ	51%
Fluoranthene	UG/KG	650	UJ	1100	UJ	51%
Fluorene	UG/KG	650	UJ	1100	UJ	51%
Hexachlorobenzene	UG/KG	650	UJ	1100	UJ	51%
Hexachlorobutadiene	UG/KG	650	UJ	1100	UJ	51%
Hexachlorocyclopentadiene	UG/KG	650	UJ	1100	UJ	51%
Hexachloroethane	UG/KG	650	UJ	1100	UJ	51%
Indeno(1,2,3-cd)pyrene	UG/KG	650	UJ	1100	UJ	51%
Isophorone	UG/KG	650	UJ	1100	UJ	51%

Table C-1C
Quality Control of Field Duplicates
Ditch Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SDDRMO-8				
Parameter	**Units**	DRMO-4005		DRMO-4008		*RPD
N-Nitrosodiphenylamine	UG/KG	650	UJ	1100	UJ	51%
N-Nitrosodipropylamine	UG/KG	650	UJ	1100	UJ	51%
Naphthalene	UG/KG	650	UJ	1100	UJ	51%
Nitrobenzene	UG/KG	650	UJ	1100	UJ	51%
Pentachlorophenol	UG/KG	1600	UJ	2600	UJ	48%
Phenanthrene	UG/KG	650	UJ	1100	UJ	51%
Phenol	UG/KG	650	UJ	1100	UJ	51%
Pyrene	UG/KG	650	UJ	1100	UJ	51%
Pesticides/PCBs						
4,4'-DDD	UG/KG	0.4	UJ	0.65	UJ	48%
4,4'-DDE	UG/KG	0.4	UJ	0.65	UJ	48%
4,4'-DDT	UG/KG	0.4	UJ	0.65	UJ	48%
Aldrin	UG/KG	0.2	UJ	0.32	UJ	46%
Alpha-BHC	UG/KG	2.4	UJ	3.9	UJ	48%
Alpha-Chlordane	UG/KG	0.6	UJ	0.97	UJ	47%
Beta-BHC	UG/KG	0.2	UJ	0.32	UJ	46%
Chlordane	UG/KG	3.8	UJ	6.1	UJ	46%
Delta-BHC	UG/KG	0.4	UJ	0.65	UJ	48%
Dieldrin	UG/KG	0.2	UJ	0.32	UJ	46%
Endosulfan I	UG/KG	1	UJ	1.6	UJ	46%
Endosulfan II	UG/KG	0.6	UJ	0.97	UJ	47%
Endosulfan sulfate	UG/KG	1.2	UJ	1.9	UJ	45%
Endrin	UG/KG	1.6	UJ	2.6	UJ	48%
Endrin aldehyde	UG/KG	1.6	UJ	2.6	UJ	48%
Endrin ketone	UG/KG	0.2	UJ	0.32	UJ	46%
Gamma-BHC/Lindane	UG/KG	0.2	UJ	0.32	UJ	46%
Gamma-Chlordane	UG/KG	0.6	UJ	0.97	UJ	47%
Heptachlor	UG/KG	2	UJ	3.2	UJ	46%
Heptachlor epoxide	UG/KG	0.6	UJ	0.97	UJ	47%
Methoxychlor	UG/KG	0.2	UJ	0.32	UJ	46%
Toxaphene	UG/KG	6.4	UJ	10	UJ	44%
Aroclor-1016	UG/KG	10	UJ	17	UJ	52%
Aroclor-1221	UG/KG	2.6	UJ	4.2	UJ	47%
Aroclor-1232	UG/KG	16	UJ	26	UJ	48%
Aroclor-1242	UG/KG	4.3	UJ	7	UJ	48%
Aroclor-1248	UG/KG	11	UJ	18	UJ	48%
Aroclor-1254	UG/KG	21	UJ	34	UJ	47%
Aroclor-1260	UG/KG	3.9	UJ	6.4	UJ	49%
Metals & Cyanide						
Aluminum	MG/KG	10100		14700	J	37%
Antimony	MG/KG	1.8	UJ	2.9	UJ	47%
Arsenic	MG/KG	2.1		5.9	J	95%
Barium	MG/KG	72.2	J	122	J	51%
Beryllium	MG/KG	0.63		1	J	45%
Cadmium	MG/KG	0.24	U	0.39	UJ	48%
Calcium	MG/KG	24000		34500	J	36%
Chromium	MG/KG	22.6		32.7	J	37%

Table C-1C
Quality Control of Field Duplicates
Ditch Soil at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SDDRMO-8				
Parameter	**Units**	DRMO-4005		DRMO-4008		*RPD
Cobalt	MG/KG	11.4		20.2	J	56%
Copper	MG/KG	34		50.6	J	39%
Cyanide, Amenable	MG/KG	1.1	U	1.59	UJ	36%
Cyanide, Total	MG/KG	1.1	U	1.59	UJ	36%
Iron	MG/KG	20500		34100	J	50%
Lead	MG/KG	58.3		85.2	J	37%
Magnesium	MG/KG	5150		7310	J	35%
Manganese	MG/KG	471		885	J	61%
Mercury	MG/KG	0.11		0.18	J	48%
Nickel	MG/KG	30.9		45.3	J	38%
Potassium	MG/KG	905		1270	J	34%
Selenium	MG/KG	0.82	U	1.4	UJ	52%
Silver	MG/KG	0.65		1	J	42%
Sodium	MG/KG	388		656	J	51%
Thallium	MG/KG	0.61	U	1	UJ	48%
Vanadium	MG/KG	17.8		27.3	J	42%
Zinc	MG/KG	135	J	195	J	36%
Other						
Total Organic Carbon	MG/KG	7100	J	7100	J	----
Total Petroleum Hydrocarbons	MG/KG	80	UJ	130	UJ	48%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

RPD = $\frac{| SR - SDR | X 100}{(1/2) (SR + SDR)}$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
UJ = not detected to the estimated limit indicated
----- = No difference between results or both results were non-detect

Table C-1D
Quality Control of Field Duplicates
Groundwater at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		MW121C-4					MW121C-1				
Parameter	**Units**	121C-2002		121C-2004		*RPD	EB023		EB153		*RPD
Volatile Organic Compounds											
1,1,1-Trichloroethane	UG/L	5	U	5	U	----	1	U	1	U	----
1,1,2,2-Tetrachloroethane	UG/L	5	U	5	U	----	1	U	1	U	----
1,1,2-Trichloroethane	UG/L	5	U	5	U	----	1	U	1	U	----
1,1-Dichloroethane	UG/L	5	U	5	U	----	1	U	1	U	----
1,1-Dichloroethene	UG/L	5	U	5	U	----	1	U	1	U	----
1,2-Dibromo-3-chloropropane	UG/L						1	U	1	U	----
1,2-Dibromoethane	UG/L						1	U	1	U	----
1,2-Dichlorobenzene	UG/L						1	U	1	U	----
1,2-Dichloroethane	UG/L	5	U	5	U	----	1	U	1	U	----
1,2-Dichloropropane	UG/L	5	U	5	U	----	1	U	1	U	----
1,3-Dichlorobenzene	UG/L						1	U	1	U	----
1,4-Dichlorobenzene	UG/L						1	U	1	U	----
Acetone	UG/L	5	UJ	5	UJ	----	52		61		16%
Benzene	UG/L	5	U	5	U	----	1	U	1	U	----
Bromochloromethane	UG/L						1	U	1	U	----
Bromodichloromethane	UG/L	5	U	5	U	----	1	U	1	U	----
Bromoform	UG/L	5	U	5	U	----	1	U	1	U	----
Carbon disulfide	UG/L	5	UJ	5	UJ	----	2		2		----
Carbon tetrachloride	UG/L	5	U	5	U	----	1	U	1	U	----
Chlorobenzene	UG/L	5	U	5	U	----	1	U	1	U	----
Chlorodibromomethane	UG/L	5	U	5	U	----	1	U	1	U	----
Chloroethane	UG/L	5	U	5	U	----	1	U	1	U	----
Chloroform	UG/L	5	U	5	U	----	1	U	1	U	----
Cis-1,2-Dichloroethene	UG/L	5	U	5	U	----	1	U	1	U	----
Cis-1,3-Dichloropropene	UG/L	5	U	5	U	----	1	U	1	U	----
Ethyl benzene	UG/L	5	U	5	U	----	1	U	1	U	----
Meta/Para Xylene	UG/L	5	U	5	U	----					
Methyl bromide	UG/L	5	U	5	U	----	1	U	1	U	----
Methyl butyl ketone	UG/L	5	U	5	U	----	5	U	5	U	----
Methyl chloride	UG/L	5	UJ	5	UJ	----	1	U	1	U	----
Methyl ethyl ketone	UG/L	5	UJ	5	UJ	----	5	U	5	U	----
Methyl isobutyl ketone	UG/L	5	U	5	U	----	5	U	5	U	----
Methylene chloride	UG/L	5	U	5	U	----	2	U	2	U	----
Ortho Xylene	UG/L	5	U	5	U	----					
Styrene	UG/L	5	U	5	U	----	1	U	1	U	----
Tetrachloroethene	UG/L	5	U	5	U	----	1	U	1	U	----
Toluene	UG/L	5	U	5	U	----	1	U	1	U	----
Total Xylenes	UG/L						1	U	1	U	----
Trans-1,2-Dichloroethene	UG/L	5	U	5	U	----	1	U	1	U	----
Trans-1,3-Dichloropropene	UG/L	5	U	5	U	----	1	U	1	U	----
Trichloroethene	UG/L	5	U	5	U	----	1	U	1	U	----
Vinyl chloride	UG/L	5	U	5	U	----	1	U	1	U	----
Semivolatile Organic Compounds											
1,2,4-Trichlorobenzene	UG/L	1.2	U	1.3	UJ	8%			1.1	U	NA
1,2-Dichlorobenzene	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
1,3-Dichlorobenzene	UG/L	1.2	U	1.3	UJ	8%			1.1	U	NA
1,4-Dichlorobenzene	UG/L	1	U	1.1	UJ	10%			1.1	U	NA

Table C-1D
Quality Control of Field Duplicates
Groundwater at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		MW121C-4					MW121C-1				
Parameter	**Units**	121C-2002		121C-2004		*RPD	EB023		EB153		*RPD
2,4,5-Trichlorophenol	UG/L	1	U	1.1	U	10%			2.7	U	NA
2,4,6-Trichlorophenol	UG/L	1	U	1.1	U	10%			1.1	U	NA
2,4-Dichlorophenol	UG/L	1.4	U	1.4	U	----			1.1	U	NA
2,4-Dimethylphenol	UG/L	2.4	U	2.4	U	----			1.1	U	NA
2,4-Dinitrophenol	UG/L								2.7	U	NA
2,4-Dinitrotoluene	UG/L	1.1	U	1.2	UJ	9%			1.1	U	NA
2,6-Dinitrotoluene	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
2-Chloronaphthalene	UG/L	1.2	U	1.3	UJ	8%			1.1	U	NA
2-Chlorophenol	UG/L	1.1	U	1.2	U	9%			1.1	U	NA
2-Methylnaphthalene	UG/L	1.2	U	1.3	UJ	8%			1.1	U	NA
2-Methylphenol	UG/L	1	U	1.1	U	10%			1.1	U	NA
2-Nitroaniline	UG/L	1	U	1.1	UJ	10%			2.7	U	NA
2-Nitrophenol	UG/L	1.1	U	1.2	U	9%			1.1	U	NA
3 or 4-Methylphenol	UG/L	1.9	U	1.9	U	----					
3,3'-Dichlorobenzidine	UG/L	1	UJ	1.1	UJ	10%			1.1	U	NA
3-Nitroaniline	UG/L	1.2	U	1.3	UJ	8%			2.7	U	NA
4,6-Dinitro-2-methylphenol	UG/L	1.2	U	1.3	U	8%			2.7	U	NA
4-Bromophenyl phenyl ether	UG/L	1.4	U	1.4	UJ	----			1.1	U	NA
4-Chloro-3-methylphenol	UG/L	1.1	U	1.2	U	9%			1.1	U	NA
4-Chloroaniline	UG/L	1.2	UJ	1.3	UJ	8%			1.1	U	NA
4-Chlorophenyl phenyl ether	UG/L	1.2	U	1.3	UJ	8%			1.1	U	NA
4-Methylphenol	UG/L								1.1	U	NA
4-Nitroaniline	UG/L	2.5	U	2.5	UJ	----			2.7	U	NA
4-Nitrophenol	UG/L	1.1	U	1.2	U	9%			2.7	U	NA
Acenaphthene	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Acenaphthylene	UG/L	1.2	U	1.3	UJ	8%			1.1	U	NA
Anthracene	UG/L	1.4	U	1.4	UJ	----			1.1	U	NA
Benzo(a)anthracene	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Benzo(a)pyrene	UG/L	1.6	U	1.6	UJ	----			1.1	U	NA
Benzo(b)fluoranthene	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Benzo(ghi)perylene	UG/L	1.4	UJ	1.4	UJ	----			1.1	U	NA
Benzo(k)fluoranthene	UG/L	2.7	U	2.7	UJ	----			1.1	U	NA
Bis(2-Chloroethoxy)methane	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Bis(2-Chloroethyl)ether	UG/L	1.2	U	1.3	UJ	8%			1.1	U	NA
Bis(2-Chloroisopropyl)ether	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Bis(2-Ethylhexyl)phthalate	UG/L	1	U	1.1	UJ	10%			0.23	J	NA
Butylbenzylphthalate	UG/L	1	U	1.1	UJ	10%			0.12	J	NA
Carbazole	UG/L	0.43	U	0.44	UJ	2%			1.1	U	NA
Chrysene	UG/L	1.7	U	1.7	UJ	----			1.1	U	NA
Di-n-butylphthalate	UG/L	1.2	U	1.3	UJ	8%			1.7		NA
Di-n-octylphthalate	UG/L	1.6	U	1.6	UJ	----			1.1	U	NA
Dibenz(a,h)anthracene	UG/L	1.6	UJ	1.6	UJ	----			1.1	UJ	NA
Dibenzofuran	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Diethyl phthalate	UG/L	1	U	1.1	UJ	10%			0.057	J	NA
Dimethylphthalate	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Fluoranthene	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Fluorene	UG/L	1.1	U	1.2	UJ	9%			1.1	U	NA
Hexachlorobenzene	UG/L	1.1	U	1.2	UJ	9%			1.1	U	NA

Table C-1D
Quality Control of Field Duplicates
Groundwater at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		MW121C-4					MW121C-1				
Parameter	**Units**	121C-2002		121C-2004		*RPD	EB023		EB153		*RPD
Hexachlorobutadiene	UG/L	1.6	U	1.6	UJ	----			0.061	J	NA
Hexachlorocyclopentadiene	UG/L	4	U	4	UJ	----			1.1	UJ	NA
Hexachloroethane	UG/L	1.1	U	1.2	UJ	9%			1.1	U	NA
Indeno(1,2,3-cd)pyrene	UG/L	1.7	U	1.7	UJ	----			1.1	U	NA
Isophorone	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
N-Nitrosodiphenylamine	UG/L	2.1	U	2.1	UJ	----			1.1	U	NA
N-Nitrosodipropylamine	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Naphthalene	UG/L	1.2	U	1.3	UJ	8%			1.1	U	NA
Nitrobenzene	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Pentachlorophenol	UG/L	2	U	2	U	----			2.7	U	NA
Phenanthrene	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Phenol	UG/L	1	U	1.1	U	10%			1.1	U	NA
Pyrene	UG/L	1	U	1.1	UJ	10%			1.1	U	NA
Pesticides/PCBs											
4,4'-DDD	UG/L	0.01	R	0.01	R	NA	0.9		0.11	U	156%
4,4'-DDE	UG/L	0.005	UJ	0.005	UJ	----	0.27	J	0.093	J	98%
4,4'-DDT	UG/L	0.01	R	0.01	R	NA	0.29	J	0.28		4%
Aldrin	UG/L	0.02	U	0.02	U	----	0.057	U	0.057	U	----
Alpha-BHC	UG/L	0.01	U	0.01	U	----	0.057	U	0.036	J	45%
Alpha-Chlordane	UG/L	0.02	U	0.02	U	----	0.096		0.068		34%
Beta-BHC	UG/L	0.01	U	0.01	U	----	0.56	J	0.096	J	141%
Chlordane	UG/L	0.14	U	0.14	U	----					
Delta-BHC	UG/L	0.004	UJ	0.004	UJ	----	0.23	J	0.094		84%
Dieldrin	UG/L	0.009	U	0.009	U	----	0.11	U	0.052	J	72%
Endosulfan I	UG/L	0.02	UJ	0.02	UJ	----	0.11	J	0.08	J	32%
Endosulfan II	UG/L	0.01	UJ	0.01	UJ	----	0.28	J	0.11	U	87%
Endosulfan sulfate	UG/L	0.02	U	0.02	U	----	0.28	J	0.14	J	67%
Endrin	UG/L	0.02	UJ	0.02	UJ	----	0.11	U	0.11	U	----
Endrin aldehyde	UG/L	0.02	UJ	0.02	UJ	----	0.22	J	0.073	J	100%
Endrin ketone	UG/L	0.009	U	0.009	U	----	0.11	U	0.11	U	----
Gamma-BHC/Lindane	UG/L	0.009	U	0.009	U	----	0.057	U	0.057	U	----
Gamma-Chlordane	UG/L	0.01	U	0.01	U	----	0.47		0.086	J	138%
Heptachlor	UG/L	0.007	U	0.007	U	----	0.23	J	0.058	J	119%
Heptachlor epoxide	UG/L	0.009	UJ	0.009	UJ	----	0.057	U	0.072	J	23%
Methoxychlor	UG/L	0.008	UJ	0.008	UJ	----	0.57		0.057	U	164%
Toxaphene	UG/L	0.12	U	0.12	U	----	5.7	U	5.7	U	----
Aroclor-1016	UG/L	0.24	U	0.24	U	----	1.1	U	1.1	U	----
Aroclor-1221	UG/L	0.08	U	0.08	U	----	2.3	U	2.3	U	----
Aroclor-1232	UG/L	0.09	U	0.09	U	----	1.1	U	1.1	U	----
Aroclor-1242	UG/L	0.08	U	0.08	U	----	1.1	U	1.1	U	----
Aroclor-1248	UG/L	0.12	U	0.12	U	----	1.1	U	1.1	U	----
Aroclor-1254	UG/L	0.05	U	0.05	U	----	1.1	U	1.1	U	----
Aroclor-1260	UG/L	0.01	U	0.01	U	----	1.1	U	1.1	U	----
Metals & Cyanide											
Aluminum	UG/L	146	J	1030		150%	133		738	J	139%
Antimony	UG/L	7.5	U	10.9	J	37%	5.1	U	5.1	U	----
Arsenic	UG/L	4.5	U	4.5	U	----	3.7	U	3.8		3%
Barium	UG/L	29.6		32.4		9%	39.5		38		4%

Table C-1D
Quality Control of Field Duplicates
Groundwater at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		MW121C-4					MW121C-1				
Parameter	**Units**	121C-2002		121C-2004		*RPD	EB023		EB153		*RPD
Beryllium	UG/L	0.9	U	0.9	U	----	0.1	U	0.1	U	----
Cadmium	UG/L	0.8	U	0.8	U	----	0.39		0.3	U	26%
Calcium	UG/L	420000		513000		20%	172000	J	163000		5%
Chromium	UG/L	1.4	U	5.8		122%	1.2		2.4		67%
Cobalt	UG/L	2.3	U	4.8	J	70%	1.4	U	1.6		13%
Copper	UG/L	2	U	2	U	----	1.2	U	2		50%
Cyanide	UG/L						5	U	5	U	----
Cyanide, Amenable	MG/L	0.01	U	0.01	U	----					
Cyanide, Total	MG/L	0.01	U	0.01	U	----					
Iron	UG/L	34.9	U	1720		192%	346		1430		122%
Lead	UG/L	5.6		4.8		15%	1.8	U	1.8	U	----
Magnesium	UG/L	73600		88000		18%	23800		24100		1%
Manganese	UG/L	328		244		29%	1590		1140		33%
Mercury	UG/L	0.2	U	0.2	U	----	0.1	U	0.1	U	----
Nickel	UG/L	2	U	3.2	J	46%	2.8		4.2		40%
Potassium	UG/L	9430		6320		39%	7610		10900		36%
Selenium	UG/L	3	U	5	U	50%	3.7	J	5.6	J	41%
Silver	UG/L	3.7	U	3.7	U	----	1.3	U	1.3	U	----
Sodium	UG/L	60100		56700		6%	8920		11200		23%
Thallium	UG/L	4.2	U	4.2	U	----	6.7	U	6.7	U	----
Vanadium	UG/L	2.5	U	2.5	U	----	1.5	U	2.4		46%
Zinc	UG/L	9.2	J	24		89%	2.4		9.3		118%
Other											
Total Petroleum Hydrocarbons	MG/L	0.041	U	0.04	U	2%					

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

RPD = | SR - SDR | X 100
(1/2) (SR + SDR)

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
UJ = not detected to the estimated limit indicated
R = result is rejected
NA = Not Applicable, i.e. result rejected or missing result
----- = No difference between results or both results were non-detect

Table C-1E
Quality Control of Field Duplicates
Surface Water at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SWDRMO-8				
Parameter	**Units**	DRMO-3008		DRMO-3005		*RPD
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/L	0.75	U	0.75	U	----
1,1,2,2-Tetrachloroethane	UG/L	0.7	U	0.7	U	----
1,1,2-Trichloroethane	UG/L	0.62	U	0.62	U	----
1,1-Dichloroethane	UG/L	0.66	U	0.66	U	----
1,1-Dichloroethene	UG/L	0.69	U	0.69	U	----
1,2-Dichloroethane	UG/L	0.56	U	0.56	U	----
1,2-Dichloropropane	UG/L	0.73	U	0.73	U	----
Acetone	UG/L	3.5	UJ	3.5	UJ	----
Benzene	UG/L	0.71	U	0.71	U	----
Bromodichloromethane	UG/L	0.73	U	0.73	U	----
Bromoform	UG/L	0.49	U	0.49	U	----
Carbon disulfide	UG/L	0.72	U	0.72	U	----
Carbon tetrachloride	UG/L	0.47	U	0.47	U	----
Chlorobenzene	UG/L	0.78	U	0.78	U	----
Chlorodibromomethane	UG/L	0.66	U	0.66	U	----
Chloroethane	UG/L	2.4	U	2.4	U	----
Chloroform	UG/L	0.61	U	0.61	U	----
Cis-1,2-Dichloroethene	UG/L	0.62	U	0.62	U	----
Cis-1,3-Dichloropropene	UG/L	0.66	U	0.66	U	----
Ethyl benzene	UG/L	0.76	U	0.76	U	----
Meta/Para Xylene	UG/L	1.5	U	1.5	U	----
Methyl bromide	UG/L	0.38	UJ	0.38	UJ	----
Methyl butyl ketone	UG/L	0.6	U	0.6	U	----
Methyl chloride	UG/L	0.51	U	0.51	U	----
Methyl ethyl ketone	UG/L	2.3	U	2.3	U	----
Methyl isobutyl ketone	UG/L	0.81	UJ	0.81	UJ	----
Methylene chloride	UG/L	1.8	U	1.8	U	----
Ortho Xylene	UG/L	0.72	U	0.72	U	----
Styrene	UG/L	0.92	U	0.92	U	----
Tetrachloroethene	UG/L	0.7	UJ	0.7	UJ	----
Toluene	UG/L	0.71	U	0.71	U	----
Trans-1,2-Dichloroethene	UG/L	0.81	U	0.81	U	----
Trans-1,3-Dichloropropene	UG/L	0.66	U	0.66	U	----
Trichloroethene	UG/L	0.72	U	0.72	U	----
Vinyl chloride	UG/L	0.79	U	0.79	U	----
Semivolatile Organic Compounds						
1,2,4-Trichlorobenzene	UG/L	10	U	10	U	----
1,2-Dichlorobenzene	UG/L	10	U	10	U	----
1,3-Dichlorobenzene	UG/L	10	U	10	U	----
1,4-Dichlorobenzene	UG/L	10	U	10	U	----
2,4,5-Trichlorophenol	UG/L	10	U	10	U	----
2,4,6-Trichlorophenol	UG/L	10	U	10	U	----
2,4-Dichlorophenol	UG/L	10	U	10	U	----
2,4-Dimethylphenol	UG/L	10	U	10	U	----

Table C-1E
Quality Control of Field Duplicates
Surface Water at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SWDRMO-8				
Parameter	**Units**	DRMO-3008		DRMO-3005		*RPD
2,4-Dinitrophenol	UG/L	10	U	10	U	----
2,4-Dinitrotoluene	UG/L	10	U	10	U	----
2,6-Dinitrotoluene	UG/L	10	U	10	U	----
2-Chloronaphthalene	UG/L	10	U	10	U	----
2-Chlorophenol	UG/L	10	U	10	U	----
2-Methylnaphthalene	UG/L	10	U	10	U	----
2-Methylphenol	UG/L	10	U	10	U	----
2-Nitroaniline	UG/L	10	U	10	U	----
2-Nitrophenol	UG/L	10	U	10	U	----
3 or 4-Methylphenol	UG/L	10	U	10	U	----
3,3'-Dichlorobenzidine	UG/L	10	U	10	U	----
3-Nitroaniline	UG/L	10	U	10	U	----
4,6-Dinitro-2-methylphenol	UG/L	10	U	10	U	----
4-Bromophenyl phenyl ether	UG/L	10	U	10	U	----
4-Chloro-3-methylphenol	UG/L	10	U	10	U	----
4-Chloroaniline	UG/L	10	U	10	U	----
4-Chlorophenyl phenyl ether	UG/L	10	U	10	U	----
4-Nitroaniline	UG/L	10	U	10	U	----
4-Nitrophenol	UG/L	10	U	10	U	----
Acenaphthene	UG/L	10	U	10	U	----
Acenaphthylene	UG/L	10	U	10	U	----
Anthracene	UG/L	10	U	10	U	----
Benzo(a)anthracene	UG/L	10	U	10	U	----
Benzo(a)pyrene	UG/L	10	U	10	U	----
Benzo(b)fluoranthene	UG/L	10	U	10	U	----
Benzo(ghi)perylene	UG/L	10	U	10	U	----
Benzo(k)fluoranthene	UG/L	10	U	10	U	----
Bis(2-Chloroethoxy)methane	UG/L	10	U	10	U	----
Bis(2-Chloroethyl)ether	UG/L	10	UJ	10	UJ	----
Bis(2-Chloroisopropyl)ether	UG/L	10	U	10	U	----
Bis(2-Ethylhexyl)phthalate	UG/L	10	U	10	U	----
Butylbenzylphthalate	UG/L	10	U	10	U	----
Carbazole	UG/L	10	U	10	U	----
Chrysene	UG/L	10	U	10	U	----
Di-n-butylphthalate	UG/L	10	U	10	U	----
Di-n-octylphthalate	UG/L	10	U	10	U	----
Dibenz(a,h)anthracene	UG/L	10	U	10	U	----
Dibenzofuran	UG/L	10	U	10	U	----
Diethyl phthalate	UG/L	10	U	10	U	----
Dimethylphthalate	UG/L	10	U	10	U	----
Fluoranthene	UG/L	10	U	10	U	----
Fluorene	UG/L	10	U	10	U	----
Hexachlorobenzene	UG/L	10	U	10	U	----
Hexachlorobutadiene	UG/L	10	U	10	U	----
Hexachlorocyclopentadiene	UG/L	10	UJ	10	UJ	----

Table C-1E
Quality Control of Field Duplicates
Surface Water at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SWDRMO-8				
Parameter	**Units**	DRMO-3008		DRMO-3005		*RPD
Hexachloroethane	UG/L	10	U	10	U	----
Indeno(1,2,3-cd)pyrene	UG/L	10	U	10	U	----
Isophorone	UG/L	10	U	10	U	----
N-Nitrosodiphenylamine	UG/L	10	U	10	U	----
N-Nitrosodipropylamine	UG/L	10	U	10	U	----
Naphthalene	UG/L	10	U	10	U	----
Nitrobenzene	UG/L	10	U	10	U	----
Pentachlorophenol	UG/L	10	U	10	U	----
Phenanthrene	UG/L	10	U	10	U	----
Phenol	UG/L	10	U	10	U	----
Pyrene	UG/L	10	U	10	U	----
Pesticides/PCBs						
4,4'-DDD	UG/L	0.01	U	0.01	U	----
4,4'-DDE	UG/L	0.005	U	0.005	U	----
4,4'-DDT	UG/L	0.01	UJ	0.01	UJ	----
Aldrin	UG/L	0.02	U	0.02	U	----
Alpha-BHC	UG/L	0.01	UJ	0.01	UJ	----
Alpha-Chlordane	UG/L	0.02	U	0.02	U	----
Beta-BHC	UG/L	0.01	U	0.01	U	----
Chlordane	UG/L	0.13	U	0.13	U	----
Delta-BHC	UG/L	0.004	U	0.004	U	----
Dieldrin	UG/L	0.009	UJ	0.009	U	----
Endosulfan I	UG/L	0.01	U	0.01	U	----
Endosulfan II	UG/L	0.01	UJ	0.01	UJ	----
Endosulfan sulfate	UG/L	0.02	U	0.02	U	----
Endrin	UG/L	0.02	U	0.02	U	----
Endrin aldehyde	UG/L	0.02	U	0.02	U	----
Endrin ketone	UG/L	0.009	U	0.009	U	----
Gamma-BHC/Lindane	UG/L	0.009	U	0.009	U	----
Gamma-Chlordane	UG/L	0.01	U	0.01	U	----
Heptachlor	UG/L	0.007	U	0.007	U	----
Heptachlor epoxide	UG/L	0.008	U	0.008	U	----
Methoxychlor	UG/L	0.008	U	0.008	U	----
Toxaphene	UG/L	0.12	U	0.12	U	----
Aroclor-1016	UG/L	0.24	UJ	0.24	UJ	----
Aroclor-1221	UG/L	0.08	U	0.08	U	----
Aroclor-1232	UG/L	0.09	UJ	0.09	UJ	----
Aroclor-1242	UG/L	0.08	UJ	0.08	UJ	----
Aroclor-1248	UG/L	0.12	U	0.12	U	----
Aroclor-1254	UG/L	0.05	U	0.05	U	----
Aroclor-1260	UG/L	0.01	UJ	0.01	UJ	----
Metals & Cyanide						
Aluminum	UG/L	23.9		23.4		2%
Antimony	UG/L	4.7	U	4.7	U	----
Arsenic	UG/L	2.8	U	2.8	U	----

Table C-1E
Quality Control of Field Duplicates
Surface Water at SEAD-121C
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SWDRMO-8				
Parameter	**Units**	DRMO-3008		DRMO-3005		*RPD
Barium	UG/L	43.7		47.4		8%
Beryllium	UG/L	0.14		0.12		15%
Cadmium	UG/L	0.4	U	0.4	U	----
Calcium	UG/L	67700		72200		6%
Chromium	UG/L	0.6	U	0.6	U	----
Cobalt	UG/L	0.6		0.6		----
Copper	UG/L	1.8		2.1		15%
Cyanide, Amenable	MG/L	0.01	U	0.01	U	----
Cyanide, Total	MG/L	0.01	U	0.01	U	----
Iron	UG/L	19	J	34.2	J	57%
Lead	UG/L	3.7		5.1	J	32%
Magnesium	UG/L	11600		12300		6%
Manganese	UG/L	11.6		26.1		77%
Mercury	UG/L	0.2	U	0.2	U	----
Nickel	UG/L	1.8	U	1.8	U	----
Potassium	UG/L	3450	J	3660	J	6%
Selenium	UG/L	3	U	3	U	----
Silver	UG/L	1	U	1	U	----
Sodium	UG/L	102000	J	108000	J	6%
Thallium	UG/L	5.4	U	5.4	U	----
Vanadium	UG/L	0.7	U	0.7	U	----
Zinc	UG/L	13.9		16.8		19%
Other						
Total Petroleum Hydrocarbons	MG/L	1	U	1	U	----

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\mathbf{RPD} = \frac{| SR - SDR | \text{ X } 100}{(1/2)\ (SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
UJ = not detected to the estimated limit indicated
----- = No difference between results or both results were non-detect

Table C-1F
Quality Control of Field Duplicates
Groundwater at Building 360
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Location ID		MW-1					MW-1				
Sample Date		4/4/2003					5/9/2003				
Parameter	**Units**	DRMO-2005		DRMO-2008		*RPD	DRMO-2013		121C-2019		*RPD
Volatile Organic Compounds											
1,1,1-Trichloroethane	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
1,1,2,2-Tetrachloroethane	UG/L	5	U	5	U	----	0.3	U	0.3	U	----
1,1,2-Trichloroethane	UG/L	5	U	5	U	----	0.3	U	0.3	U	----
1,1-Dichloroethane	UG/L	5	UJ	4.4	J	13%	4.3		4.3		----
1,1-Dichloroethene	UG/L	5	U	5	U	----	0.3	U	0.3	U	----
1,2-Dibromo-3-chloropropane	UG/L										
1,2-Dibromoethane	UG/L										
1,2-Dichlorobenzene	UG/L										
1,2-Dichloroethane	UG/L	5	U	5	U	----	0.3	U	0.3	U	----
1,2-Dichloropropane	UG/L	5	U	5	U	----	0.4	U	0.5	J	22%
1,3-Dichlorobenzene	UG/L										
1,4-Dichlorobenzene	UG/L										
Acetone	UG/L	5	R	5	R	NA	5.8	R	8.4	J	NA
Benzene	UG/L	5	U	5	U	----	0.3	U	0.3	U	----
Bromochloromethane	UG/L										
Bromodichloromethane	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Bromoform	UG/L	5	U	5	U	----	0.3	U	0.3	U	----
Carbon disulfide	UG/L	5	UJ	5	UJ	----	0.3	U	0.3	U	----
Carbon tetrachloride	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Chlorobenzene	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Chlorodibromomethane	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Chloroethane	UG/L	5	UJ	5	UJ	----	0.4	U	0.4	U	----
Chloroform	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Cis-1,2-Dichloroethene	UG/L	5	U	5	U	----	0.3	U	0.4	J	29%
Cis-1,3-Dichloropropene	UG/L	5	U	5	U	----	0.3	U	0.3	U	----
Ethyl benzene	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Meta/Para Xylene	UG/L	5	U	5	U	----	0.8	U	0.8	U	----
Methyl bromide	UG/L	5	UJ	5	UJ	----	0.4	U	0.4	U	----
Methyl butyl ketone	UG/L	5	U	5	U	----	2.8	U	2.8	U	----
Methyl chloride	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Methyl ethyl ketone	UG/L	5	UJ	5	UJ	----	3.6	R	3.6	R	NA
Methyl isobutyl ketone	UG/L	5	U	5	U	----	2.5	U	2.5	U	----
Methylene chloride	UG/L	5	UJ	5	UJ	----	1	J	1	J	----
Ortho Xylene	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Styrene	UG/L	5	U	5	U	----	0.3	U	0.3	U	----
Tetrachloroethene	UG/L	5	UJ	5	UJ	----	0.5	U	0.5	U	----
Toluene	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Total Xylenes	UG/L										
Trans-1,2-Dichloroethene	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Trans-1,3-Dichloropropene	UG/L	5	U	5	U	----	0.3	U	0.3	U	----
Trichloroethene	UG/L	5	U	5	U	----	0.4	U	0.4	U	----
Vinyl chloride	UG/L	2.2	J	2.4	J	9%	1.4		1.3		7%
Semivolatile Organic Compounds											
1,2,4-Trichlorobenzene	UG/L	1.2	UJ	1.2	UJ	----	1.2	U	1.2	U	----
1,2-Dichlorobenzene	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
1,3-Dichlorobenzene	UG/L	1.2	UJ	1.2	UJ	----	1.2	U	1.2	U	----
1,4-Dichlorobenzene	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
2,4,5-Trichlorophenol	UG/L	1	R	1	R	NA	1	U	1	U	----
2,4,6-Trichlorophenol	UG/L	1	U	1	U	----	1	U	1	U	----
2,4-Dichlorophenol	UG/L	1.4	R	1.3	R	NA	1.3	U	1.3	U	----
2,4-Dimethylphenol	UG/L	2.4	R	2.3	R	NA	2.3	U	2.3	U	----

Table C-1F
Quality Control of Field Duplicates
Groundwater at Building 360
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Location ID		MW-1					MW-1				
Sample Date		4/4/2003					5/9/2003				
Parameter	**Units**	DRMO-2005		DRMO-2008		*RPD	DRMO-2013		121C-2019		*RPD
2,4-Dinitrophenol	UG/L						2	UJ	2	UJ	----
2,4-Dinitrotoluene	UG/L	1.1	UJ	1.1	UJ	----	1.1	U	1.1	U	----
2,6-Dinitrotoluene	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
2-Chloronaphthalene	UG/L	1.2	UJ	1.2	UJ	----	1.2	U	1.2	U	----
2-Chlorophenol	UG/L	1.1	R	1.1	R	NA	1.1	U	1.1	U	----
2-Methylnaphthalene	UG/L	1.2	UJ	1.2	UJ	----	1.2	U	1.2	U	----
2-Methylphenol	UG/L	1	R	1	R	NA	1	U	1	U	----
2-Nitroaniline	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
2-Nitrophenol	UG/L	1.1	R	1.1	R	NA	1.1	U	1.1	U	----
3 or 4-Methylphenol	UG/L										
3,3'-Dichlorobenzidine	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
3-Nitroaniline	UG/L	1.2	UJ	1.2	UJ	----	1.2	UJ	1.2	UJ	----
4,6-Dinitro-2-methylphenol	UG/L	1.2	R	1.2	R	NA	1.2	UJ	1.2	UJ	----
4-Bromophenyl phenyl ether	UG/L	1.4	UJ	1.3	UJ	7%	1.3	U	1.3	U	----
4-Chloro-3-methylphenol	UG/L	1.1	R	1.1	R	NA	1.1	U	1.1	U	----
4-Chloroaniline	UG/L	1.2	R	1.2	R	NA	1.2	UJ	1.2	UJ	----
4-Chlorophenyl phenyl ether	UG/L	1.2	UJ	1.2	UJ	----	1.2	U	1.2	U	----
4-Methylphenol	UG/L	1.9	R	1.8	R	NA	1.8	U	1.8	U	----
4-Nitroaniline	UG/L	2.5	UJ	2.4	UJ	4%	2.4	UJ	2.4	UJ	----
4-Nitrophenol	UG/L	1.1	R	1.1	R	NA	1.1	U	1.1	U	----
Acenaphthene	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Acenaphthylene	UG/L	1.2	UJ	1.2	UJ	----	1.2	U	1.2	U	----
Anthracene	UG/L	1.4	UJ	1.3	UJ	7%	1.3	U	1.3	U	----
Benzo(a)anthracene	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Benzo(a)pyrene	UG/L	1.6	UJ	1.5	UJ	6%	1.5	U	1.5	U	----
Benzo(b)fluoranthene	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Benzo(ghi)perylene	UG/L	1.4	UJ	1.3	UJ	7%	1.3	UJ	1.3	UJ	----
Benzo(k)fluoranthene	UG/L	2.7	UJ	2.7	UJ	----	2.6	U	2.7	U	4%
Bis(2-Chloroethoxy)methane	UG/L	1	U	1	U	----	1	U	1	U	----
Bis(2-Chloroethyl)ether	UG/L	1.2	U	1.2	U	----	1.2	U	1.2	U	----
Bis(2-Chloroisopropyl)ether	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Bis(2-Ethylhexyl)phthalate	UG/L	1	U	1	U	----	1	U	1	U	----
Butylbenzylphthalate	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Carbazole	UG/L	0.43	UJ	0.42	UJ	2%	0.42	U	0.42	U	----
Chrysene	UG/L	1.7	UJ	1.6	UJ	6%	1.6	U	1.6	U	----
Di-n-butylphthalate	UG/L	1.2	UJ	1.2	UJ	----	1.2	U	1.2	U	----
Di-n-octylphthalate	UG/L	1.6	UJ	1.5	UJ	6%	1.5	U	1.5	U	----
Dibenz(a,h)anthracene	UG/L	1.6	UJ	1.5	UJ	6%	1.5	UJ	1.5	UJ	----
Dibenzofuran	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Diethyl phthalate	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Dimethylphthalate	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Fluoranthene	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Fluorene	UG/L	1.1	UJ	1.1	UJ	----	1.1	U	1.1	U	----
Hexachlorobenzene	UG/L	1.1	UJ	1.1	UJ	----	1.1	U	1.1	U	----
Hexachlorobutadiene	UG/L	1.6	UJ	1.5	UJ	6%	1.5	U	1.5	U	----
Hexachlorocyclopentadiene	UG/L	4	UJ	3.9	UJ	3%	3.8	R	3.9	R	NA
Hexachloroethane	UG/L	1.1	UJ	1.1	UJ	----	1.1	U	1.1	U	----
Indeno(1,2,3-cd)pyrene	UG/L	1.7	UJ	1.6	UJ	6%	1.6	UJ	1.6	UJ	----
Isophorone	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
N-Nitrosodiphenylamine	UG/L	2.1	UJ	2	UJ	5%	2	U	2	U	----
N-Nitrosodipropylamine	UG/L	1	UJ	1	UJ	----	1	UJ	1	UJ	----
Naphthalene	UG/L	1.2	UJ	1.2	UJ	----	1.2	U	1.2	U	----

Table C-1F
Quality Control of Field Duplicates
Groundwater at Building 360
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Location ID		MW-1					MW-1				
Sample Date		4/4/2003					5/9/2003				
Parameter	**Units**	DRMO-2005		DRMO-2008		*RPD	DRMO-2013		121C-2019		*RPD
Nitrobenzene	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Pentachlorophenol	UG/L	2	R	1.9	R	NA	1.9	U	1.9	U	----
Phenanthrene	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Phenol	UG/L	1	R	1	R	NA	1	U	1	U	----
Pyrene	UG/L	1	UJ	1	UJ	----	1	U	1	U	----
Pesticides/PCBs											
4,4'-DDD	UG/L	0.01	U	0.01	U	----	0.01	UJ	0.01	UJ	----
4,4'-DDE	UG/L	0.005	U	0.005	U	----	0.005	U	0.005	U	----
4,4'-DDT	UG/L	0.01	UJ	0.01	UJ	----	0.01	UJ	0.01	UJ	----
Aldrin	UG/L	0.02	U	0.02	U	----	0.02	UJ	0.02	UJ	----
Alpha-BHC	UG/L	0.01	UJ	0.01	UJ	----	0.01	UJ	0.01	UJ	----
Alpha-Chlordane	UG/L	0.02	U	0.02	U	----	0.02	UJ	0.02	UJ	----
Beta-BHC	UG/L	0.01	U	0.01	U	----	0.01	U	0.01	U	----
Chlordane	UG/L	0.14	U	0.14	U	----					
Delta-BHC	UG/L	0.004	UJ	0.004	UJ	----	0.004	UJ	0.004	UJ	----
Dieldrin	UG/L	0.009	U	0.009	U	----	0.009	U	0.009	U	----
Endosulfan I	UG/L	0.02	U	0.02	U	----	0.02	UJ	0.01	UJ	67%
Endosulfan II	UG/L	0.01	U	0.01	U	----	0.01	UJ	0.01	UJ	----
Endosulfan sulfate	UG/L	0.02	U	0.02	U	----	0.02	U	0.02	U	----
Endrin	UG/L	0.02	U	0.02	U	----	0.02	U	0.02	U	----
Endrin aldehyde	UG/L	0.02	U	0.02	U	----	0.02	U	0.02	U	----
Endrin ketone	UG/L	0.009	U	0.009	U	----	0.009	UJ	0.009	UJ	----
Gamma-BHC/Lindane	UG/L	0.009	U	0.009	U	----	0.009	UJ	0.009	UJ	----
Gamma-Chlordane	UG/L	0.01	UJ	0.01	UJ	----	0.01	U	0.01	U	----
Heptachlor	UG/L	0.007	U	0.007	U	----	0.007	U	0.007	U	----
Heptachlor epoxide	UG/L	0.009	U	0.009	U	----	0.009	U	0.008	U	12%
Methoxychlor	UG/L	0.008	UJ	0.008	UJ	----	0.008	U	0.008	U	----
Toxaphene	UG/L	0.12	U	0.12	U	----	0.12	U	0.12	U	----
Aroclor-1016	UG/L	0.24	UJ	0.25	UJ	4%	0.25	UJ	0.24	UJ	4%
Aroclor-1221	UG/L	0.082	U	0.082	U	----	0.083	U	0.081	U	2%
Aroclor-1232	UG/L	0.092	UJ	0.093	UJ	1%	0.094	UJ	0.091	UJ	3%
Aroclor-1242	UG/L	0.082	UJ	0.082	UJ	----	0.083	UJ	0.081	UJ	2%
Aroclor-1248	UG/L	0.12	U	0.12	U	----	0.12	U	0.12	U	----
Aroclor-1254	UG/L	0.051	U	0.052	U	2%	0.052	U	0.051	U	2%
Aroclor-1260	UG/L	0.01	U	0.01	U	----	0.01	UJ	0.01	UJ	----
Metals & Cyanide											
Aluminum	UG/L	150	U	28.3	J	137%	32	U	32	U	----
Antimony	UG/L	3.8	U	3.8	U	----	7.5	U	7.5	U	----
Arsenic	UG/L	4.5	U	4.5	U	----	7.1		4.5	U	45%
Barium	UG/L	135		147		9%	113		113		----
Beryllium	UG/L	0.1	U	0.1	U	----	0.9	U	0.9	U	----
Cadmium	UG/L	0.8	U	0.8	U	----	0.8	U	0.8	U	----
Calcium	UG/L	88700		96900		9%	84200		87100		3%
Chromium	UG/L	1.4	U	1.4	U	----	1.4	U	1.4	U	----
Cobalt	UG/L	0.7	U	0.7	U	----	2.3	U	2.3	U	----
Copper	UG/L	3.6	U	3.6	U	----	2	U	2	U	----
Cyanide	UG/L										
Cyanide, Amenable	MG/L	0.01	U	0.01	U	----	0.01	U	0.01	U	----
Cyanide, Total	MG/L										
Iron	UG/L	3780	J	3290	J	14%	3810		3510		8%
Lead	UG/L	3	U	3	U	----	3	U	3	U	----
Magnesium	UG/L	11400		12500		9%	11000		11400		4%

Table C-1F
Quality Control of Field Duplicates
Groundwater at Building 360
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Location ID		MW-1					MW-1				
Sample Date		4/4/2003					5/9/2003				
Parameter	**Units**	DRMO-2005		DRMO-2008		*RPD	DRMO-2013		121C-2019		*RPD
Manganese	UG/L	1580		1710		8%	1140		1180		3%
Mercury	UG/L	0.2	U	0.2	U	----	0.2	U	0.2	U	----
Nickel	UG/L	3	J	3.8	J	24%	2	U	2	U	----
Potassium	UG/L	9450	J	10600	J	11%	8820		9430		7%
Selenium	UG/L	4.2	J	3.3	J	24%	1.3	U	3.2	J	84%
Silver	UG/L	3.7	U	3.7	U	----	3.7	U	3.7	U	----
Sodium	UG/L	40400		45300		11%	41100		44000		7%
Thallium	UG/L	5.3	U	5.3	U	----	4.4	J	4.2	U	5%
Vanadium	UG/L	1.4	U	1.4	U	----	2.5	U	2.5	U	----
Zinc	UG/L	7.1	J	7.1	J	----	14.4	J	17	J	17%
Other											
Total Petroleum Hydrocarbons	MG/L	1	U	1	U	----	1	U	1	U	----

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\textbf{RPD} = \frac{| SR - SDR | \times 100}{(1/2)(SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
UJ = not detected to the estimated limit indicated
R = result is rejected
NA = Not Applicable, i.e. result rejected or missing result
----- = No difference between results or both results were non-detect

Table C-1G
Quality Control of Field Duplicates
Surface Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121I-2					SS121I-10					SS121I-29				
Parameter	**Units**	121I-1043		121I-1044		*RPD	121I-1006		121I-1031		*RPD	121I-1025		121I-1030		*RPD
Volatile Organic Compounds																
1,1,1-Trichloroethane	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
1,1,2,2-Tetrachloroethane	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
1,1,2-Trichloroethane	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
1,1-Dichloroethane	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
1,1-Dichloroethene	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
1,2-Dichloroethane	UG/KG	3.1	U	2.8	UJ	10%	2.5	UJ	2.2	U	13%	3.1	UJ	3.6	UJ	15%
1,2-Dichloropropane	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Acetone	UG/KG	110	U	33	UJ	108%	4.5	J	2.2	U	69%	3.1	U	3.6	UJ	15%
Benzene	UG/KG	6.6	J	10	J	41%	2.5	U	2.2	U	13%	24		57	J	81%
Bromodichloromethane	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Bromoform	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Carbon disulfide	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Carbon tetrachloride	UG/KG	3.1	U	2.8	UJ	10%	2.5	UJ	2.2	U	13%	3.1	UJ	3.6	UJ	15%
Chlorobenzene	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Chlorodibromomethane	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Chloroethane	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	UJ	3.6	UJ	15%
Chloroform	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Cis-1,2-Dichloroethene	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Cis-1,3-Dichloropropene	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Ethyl benzene	UG/KG	2	J	3.5	J	55%	2.5	U	2.2	U	13%	4.4		9.5	J	73%
Meta/Para Xylene	UG/KG	2.2	J	3.4	J	43%	2.5	U	2.2	U	13%	3.9		8.7	J	76%
Methyl bromide	UG/KG	3.1	U	2.8	UJ	10%	2.5	UJ	2.2	U	13%	3.1	UJ	3.6	UJ	15%
Methyl butyl ketone	UG/KG	3.1	U	2.8	UJ	10%	2.5	UJ	2.2	U	13%	3.1	UJ	3.6	UJ	15%
Methyl chloride	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Methyl ethyl ketone	UG/KG	55		27	J	68%	2.5	U	2.2	U	13%	3.1	U	67	J	182%
Methyl isobutyl ketone	UG/KG	3.1	U	2.8	U	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Methylene chloride	UG/KG	3.1	U	2.7	J	14%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Ortho Xylene	UG/KG	1.1	J	2	J	58%	2.5	U	2.2	U	13%	2.1	J	5.1	J	83%
Styrene	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Tetrachloroethene	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	UJ	3.6	UJ	15%
Toluene	UG/KG	6.9		11	J	46%	2.5	U	2.2	U	13%	18		43	J	82%
Trans-1,2-Dichloroethene	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Trans-1,3-Dichloropropene	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Trichloroethene	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%
Vinyl chloride	UG/KG	3.1	U	2.8	UJ	10%	2.5	U	2.2	U	13%	3.1	U	3.6	UJ	15%

Table C-1G
Quality Control of Field Duplicates
Surface Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121I-2					SS121I-10					SS121I-29				
Parameter	**Units**	121I-1043		121I-1044		*RPD	121I-1006		121I-1031		*RPD	121I-1025		121I-1030		*RPD
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
1,2-Dichlorobenzene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
1,3-Dichlorobenzene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
1,4-Dichlorobenzene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
2,4,5-Trichlorophenol	UG/KG	970	U	980	U	1%	910	U	910	U	----	5200	U	5700	U	9%
2,4,6-Trichlorophenol	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
2,4-Dichlorophenol	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
2,4-Dimethylphenol	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
2,4-Dinitrophenol	UG/KG	970	U	980	U	1%	910	UJ	910	UJ	----	5200	R	5700	UJ	NA
2,4-Dinitrotoluene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
2,6-Dinitrotoluene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
2-Chloronaphthalene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
2-Chlorophenol	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
2-Methylnaphthalene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
2-Methylphenol	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
2-Nitroaniline	UG/KG	970	U	980	U	1%	910	U	910	UJ	----	5200	UJ	5700	UJ	9%
2-Nitrophenol	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
3 or 4-Methylphenol	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
3,3'-Dichlorobenzidine	UG/KG	390	UJ	390	U	----	360	U	360	U	----	2100	UJ	2300	R	NA
3-Nitroaniline	UG/KG	970	U	980	U	1%	910	U	910	U	----	5200	U	5700	UJ	9%
4,6-Dinitro-2-methylphenol	UG/KG	970	U	980	UJ	1%	910	UJ	910	UJ	----	5200	R	5700	UJ	NA
4-Bromophenyl phenyl ether	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
4-Chloro-3-methylphenol	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
4-Chloroaniline	UG/KG	390	U	390	U	----	360	UJ	360	U	----	2100	U	2300	U	9%
4-Chlorophenyl phenyl ether	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
4-Methylphenol	UG/KG															
4-Nitroaniline	UG/KG	970	U	980	U	1%	910	U	910	U	----	5200	U	5700	UJ	9%
4-Nitrophenol	UG/KG	970	U	980	U	1%	910	U	910	U	----	5200	U	5700	U	9%
Acenaphthene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Acenaphthylene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Anthracene	UG/KG	89	J	74	J	18%	360	U	360	U	----	330	J	2300	U	150%
Benzo(a)anthracene	UG/KG	350	J	350	J	----	48	J	47	J	2%	700	J	260	J	92%
Benzo(a)pyrene	UG/KG	390	J	450	J	14%	66	J	60	J	10%	700	J	2300	R	NA
Benzo(b)fluoranthene	UG/KG	600	J	620	J	3%	53	J	51	J	4%	720	J	2300	R	NA
Benzo(ghi)perylene	UG/KG	220	J	140	J	44%	67	J	63	J	6%	430	J	2300	R	NA

Table C-1G
Quality Control of Field Duplicates
Surface Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121I-2					SS121I-10					SS121I-29				
Parameter	**Units**	121I-1043		121I-1044		*RPD	121I-1006		121I-1031		*RPD	121I-1025		121I-1030		*RPD
Benzo(k)fluoranthene	UG/KG	300	J	360	J	18%	360	U	360	U	----	720	J	2300	R	NA
Bis(2-Chloroethoxy)methane	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Bis(2-Chloroethyl)ether	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Bis(2-Chloroisopropyl)ether	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Bis(2-Ethylhexyl)phthalate	UG/KG	78	J	390	U	133%	360	UJ	360	U	----	2100	U	260	J	156%
Butylbenzylphthalate	UG/KG	390	UJ	390	U	----	360	U	360	U	----	2100	U	2300	R	NA
Carbazole	UG/KG	56	J	67	J	18%	360	U	360	U	----	340	J	2300	UJ	148%
Chrysene	UG/KG	380	J	400		5%	62	J	63	J	2%	790	J	2300	R	NA
Di-n-butylphthalate	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Di-n-octylphthalate	UG/KG	390	UJ	390	U	----	360	U	360	U	----	2100	U	2300	R	NA
Dibenz(a,h)anthracene	UG/KG	390	UJ	390	U	----	360	U	360	UJ	----	2100	UJ	2300	R	NA
Dibenzofuran	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Diethyl phthalate	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	230	J	161%
Dimethylphthalate	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Fluoranthene	UG/KG	720		920		24%	100	J	78	J	25%	2500		490	J	134%
Fluorene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Hexachlorobenzene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Hexachlorobutadiene	UG/KG	390	UJ	390	UJ	----	360	U	360	U	----	2100	U	2300	U	9%
Hexachlorocyclopentadiene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	UJ	2300	U	9%
Hexachloroethane	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Indeno(1,2,3-cd)pyrene	UG/KG	63	J	79	J	23%	83	J	74	J	11%	2100	UJ	2300	R	NA
Isophorone	UG/KG	390	UJ	390	UJ	----	360	U	360	U	----	2100	U	2300	U	9%
N-Nitrosodiphenylamine	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
N-Nitrosodipropylamine	UG/KG	390	U	390	U	----	360	U	360	UJ	----	2100	U	2300	UJ	9%
Naphthalene	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Nitrobenzene	UG/KG	390	UJ	390	UJ	----	360	U	360	U	----	2100	U	2300	U	9%
Pentachlorophenol	UG/KG	970	U	980	U	1%	910	U	910	U	----	5200	UJ	5700	U	9%
Phenanthrene	UG/KG	450		440		2%	60	J	56	J	7%	2200		530	J	122%
Phenol	UG/KG	390	U	390	U	----	360	U	360	U	----	2100	U	2300	U	9%
Pyrene	UG/KG	1200	J	660		58%	79	J	98	J	21%	2300		1600	J	36%
Pesticides/PCBs																
4,4'-DDD	UG/KG	2	UJ	2	UJ	----	1.9	UJ	1.8	UJ	5%	2.2	UJ	2.3	UJ	4%
4,4'-DDE	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	2.2	U	2.3	U	4%
4,4'-DDT	UG/KG	2	U	2	U	----	1.9	UJ	1.8	UJ	5%	2.2	UJ	2.3	UJ	4%
Aldrin	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	2.2	U	2.3	U	4%
Alpha-BHC	UG/KG	2	UJ	2	U	----	1.9	UJ	1.8	UJ	5%	2.2	UJ	2.3	UJ	4%

Table C-1G
Quality Control of Field Duplicates
Surface Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121I-2					SS121I-10					SS121I-29				
Parameter	**Units**	121I-1043		121I-1044		*RPD	121I-1006		121I-1031		*RPD	121I-1025		121I-1030		*RPD
Alpha-Chlordane	UG/KG	2	U	2	U	----	1.9	UJ	1.8	UJ	5%	2.2	UJ	2.3	UJ	4%
Beta-BHC	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	2.2	U	2.3	U	4%
Chlordane	UG/KG	20	U	20	U	----	19	U	18	U	5%	22	U	23	U	4%
Delta-BHC	UG/KG	2	UJ	2	UJ	----	1.9	UJ	1.8	UJ	5%	2.2	UJ	2.3	UJ	4%
Dieldrin	UG/KG	2	UJ	2	UJ	----	1.9	UJ	1.8	UJ	5%	2.2	UJ	2.3	UJ	4%
Endosulfan I	UG/KG	11	J	6.9	J	46%	3.7	J	4.2	J	13%	23		2.3	U	164%
Endosulfan II	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	2.2	U	2.3	U	4%
Endosulfan sulfate	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	2.2	U	2.3	U	4%
Endrin	UG/KG	2	U	2	U	----	1.9	UJ	1.8	UJ	5%	2.2	U	2.3	U	4%
Endrin aldehyde	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	2.2	U	2.3	U	4%
Endrin ketone	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	2.2	U	2.3	U	4%
Gamma-BHC/Lindane	UG/KG	2	U	2	U	----	1.9	UJ	1.8	UJ	5%	2.2	U	2.3	U	4%
Gamma-Chlordane	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	2.2	U	2.3	U	4%
Heptachlor	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	2.2	U	2.3	U	4%
Heptachlor epoxide	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	17	R	2.3	U	NA
Methoxychlor	UG/KG	2	U	2	U	----	1.9	U	1.8	U	5%	2.2	UJ	2.3	UJ	4%
Toxaphene	UG/KG	20	U	20	U	----	19	U	18	U	5%	22	U	23	U	4%
Aroclor-1016	UG/KG	20	U	20	U	----	19	UJ	19	UJ	----	21	UJ	23	UJ	9%
Aroclor-1221	UG/KG	20	U	20	U	----	19	U	19	U	----	21	UJ	23	UJ	9%
Aroclor-1232	UG/KG	20	U	20	U	----	19	UJ	19	UJ	----	21	UJ	23	UJ	9%
Aroclor-1242	UG/KG	20	U	20	U	----	19	UJ	19	UJ	----	21	UJ	23	UJ	9%
Aroclor-1248	UG/KG	20	U	20	U	----	19	U	19	U	----	21	UJ	23	UJ	9%
Aroclor-1254	UG/KG	20	UJ	20	UJ	----	19	U	19	U	----	21	UJ	23	UJ	9%
Aroclor-1260	UG/KG	20	UJ	20	UJ	----	19	U	19	U	----	21	UJ	23	UJ	9%
Metals & Cyanide																
Aluminum	MG/KG	9700		9020		7%	6480		7510		15%	3730		2200		52%
Antimony	MG/KG	1.8		8.6		131%	3.4		2.5		31%	1.1	U	1.2	U	9%
Arsenic	MG/KG	21.2	J	43	J	68%	5.2		5.2		----	349	R	239	R	NA
Barium	MG/KG	74.3	J	83.6	J	12%	116		119		3%	87.4	J	84.9	J	3%
Beryllium	MG/KG	0.49		0.46		6%	0.38	J	0.43	J	12%	0.16	U	0.18	U	12%
Cadmium	MG/KG	0.14	U	0.14	U	----	5		4.1		20%	0.15	U	0.16	U	6%
Calcium	MG/KG	30900		27800		11%	166000		143000		15%	29900	J	46500	J	43%
Chromium	MG/KG	25.9	J	50	J	64%	14.3		14.7		3%	516		362		35%
Cobalt	MG/KG	23.9	J	40.6	J	52%	8.4		8.9		6%	237	J	174	J	31%
Copper	MG/KG	37.5	R	66.1	R	NA	24.5	J	22.6	J	8%	243		175		33%
Cyanide, Amenable	MG/KG	0.59	U	0.6	U	2%	0.56	UJ	0.55	UJ	2%	0.63	U	0.68	U	8%

Table C-1G
Quality Control of Field Duplicates
Surface Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SB121I-2					SS121I-10					SS121I-29				
Parameter	**Units**	121I-1043		121I-1044		*RPD	121I-1006		121I-1031		*RPD	121I-1025		121I-1030		*RPD
Cyanide, Total	MG/KG	0.592	U	0.595	U	1%	0.556	UJ	0.551	UJ	1%	1.26		2.73		74%
Iron	MG/KG	27100		31500		15%	17100		17600		3%	69400		47400		38%
Lead	MG/KG	31.3		42.1		29%	19		16.3		15%	47.8	J	45.9	J	4%
Magnesium	MG/KG	6110		4240		36%	13500		9040		40%	2770	J	6090	J	75%
Manganese	MG/KG	33200	J	57800	J	54%	786		822		4%	349000		272000		25%
Mercury	MG/KG	0.04		0.05		22%	0.03		0.03		----	0.02		0.02		----
Nickel	MG/KG	38.9	J	46.3	J	17%	26.7		26.9		1%	394	J	289	J	31%
Potassium	MG/KG	859	J	929	J	8%	786		1150		38%	656		612		7%
Selenium	MG/KG	5.1	J	17.9	J	111%	0.87		0.8		8%	160	J	131	J	20%
Silver	MG/KG	1.9	J	4.2	J	75%	1.1	U	1.1	U	----	24.1	R	18.6	R	NA
Sodium	MG/KG	118	U	115	U	3%	210		188		11%	126	U	135	U	7%
Thallium	MG/KG	3		14.4		131%	1.1	U	1.1	U	----	173	J	152	J	13%
Vanadium	MG/KG	22.6	J	31.6	J	33%	11.6		13.2		13%	217	J	147	J	38%
Zinc	MG/KG	85.1	J	82	J	4%	84	J	67.9	J	21%	47.7	J	37.8	J	23%
Other																
Total Organic Carbon	MG/KG	5600		6800		19%	5600		4500		22%	7300		4900		39%
Total Petroleum Hydrocarbons	MG/KG	47	U	48	U	2%	44	UJ	44	UJ	----	240		1600		148%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\textbf{RPD} = \frac{| SR - SDR | \ X\ 100}{(1/2)\ (SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
UJ = not detected to the estimated limit indicated
R = result is rejected
NA = Not Applicable, i.e. result rejected or missing result
----- = No difference between results or both results were non-detect

Table C-1H
Quality Control of Field Duplicates
Ditch Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	SD121I-7				
		121I-4005		121I-4007		*RPD
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	3.1	UJ	3.2	UJ	3%
1,1,2,2-Tetrachloroethane	UG/KG	3.1	UJ	3.2	UJ	3%
1,1,2-Trichloroethane	UG/KG	3.1	UJ	3.2	UJ	3%
1,1-Dichloroethane	UG/KG	3.1	UJ	3.2	UJ	3%
1,1-Dichloroethene	UG/KG	3.1	UJ	3.2	UJ	3%
1,2-Dichloroethane	UG/KG	3.1	UJ	3.2	UJ	3%
1,2-Dichloropropane	UG/KG	3.1	UJ	3.2	UJ	3%
Acetone	UG/KG	25	J	10	J	86%
Benzene	UG/KG	3.1	UJ	3.2	UJ	3%
Bromodichloromethane	UG/KG	3.1	UJ	3.2	UJ	3%
Bromoform	UG/KG	3.1	UJ	3.2	UJ	3%
Carbon disulfide	UG/KG	3.1	UJ	3.2	UJ	3%
Carbon tetrachloride	UG/KG	3.1	UJ	3.2	UJ	3%
Chlorobenzene	UG/KG	3.1	UJ	3.2	UJ	3%
Chlorodibromomethane	UG/KG	3.1	UJ	3.2	UJ	3%
Chloroethane	UG/KG	3.1	UJ	3.2	UJ	3%
Chloroform	UG/KG	3.1	UJ	3.2	UJ	3%
Cis-1,2-Dichloroethene	UG/KG	3.1	UJ	3.2	UJ	3%
Cis-1,3-Dichloropropene	UG/KG	3.1	UJ	3.2	UJ	3%
Ethyl benzene	UG/KG	3.1	UJ	3.2	UJ	3%
Meta/Para Xylene	UG/KG	3.1	UJ	3.2	UJ	3%
Methyl bromide	UG/KG	3.1	UJ	3.2	UJ	3%
Methyl butyl ketone	UG/KG	3.1	UJ	3.2	UJ	3%
Methyl chloride	UG/KG	3.1	UJ	3.2	UJ	3%
Methyl ethyl ketone	UG/KG	3.1	UJ	3.2	UJ	3%
Methyl isobutyl ketone	UG/KG	3.1	UJ	3.2	UJ	3%
Methylene chloride	UG/KG	2.5	U	1.9	U	27%
Ortho Xylene	UG/KG	3.1	UJ	3.2	UJ	3%
Styrene	UG/KG	3.1	UJ	3.2	UJ	3%
Tetrachloroethene	UG/KG	3.1	UJ	3.2	UJ	3%
Toluene	UG/KG	3.1	UJ	3.2	UJ	3%
Trans-1,2-Dichloroethene	UG/KG	3.1	UJ	3.2	UJ	3%
Trans-1,3-Dichloropropene	UG/KG	3.1	UJ	3.2	UJ	3%
Trichloroethene	UG/KG	3.1	UJ	3.2	UJ	3%
Vinyl chloride	UG/KG	3.1	UJ	3.2	UJ	3%
Semivolatile Organic Compounds						
1,2,4-Trichlorobenzene	UG/KG	420	U	420	U	----
1,2-Dichlorobenzene	UG/KG	420	U	420	U	----
1,3-Dichlorobenzene	UG/KG	420	U	420	U	----
1,4-Dichlorobenzene	UG/KG	420	U	420	U	----
2,4,5-Trichlorophenol	UG/KG	1100	U	1100	U	----
2,4,6-Trichlorophenol	UG/KG	420	U	420	U	----
2,4-Dichlorophenol	UG/KG	420	U	420	U	----
2,4-Dimethylphenol	UG/KG	420	U	420	U	----
2,4-Dinitrophenol	UG/KG	1100	U	1100	U	----

Table C-1H
Quality Control of Field Duplicates
Ditch Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SD121I-7				
Parameter	**Units**	121I-4005		121I-4007		*RPD
2,4-Dinitrotoluene	UG/KG	420	U	420	U	----
2,6-Dinitrotoluene	UG/KG	420	U	420	U	----
2-Chloronaphthalene	UG/KG	420	U	420	U	----
2-Chlorophenol	UG/KG	420	U	420	U	----
2-Methylnaphthalene	UG/KG	420	U	130	J	105%
2-Methylphenol	UG/KG	420	U	420	U	----
2-Nitroaniline	UG/KG	1100	U	1100	U	----
2-Nitrophenol	UG/KG	420	U	420	U	----
3 or 4-Methylphenol	UG/KG	420	U	420	U	----
3,3'-Dichlorobenzidine	UG/KG	420	UJ	420	UJ	----
3-Nitroaniline	UG/KG	1100	U	1100	U	----
4,6-Dinitro-2-methylphenol	UG/KG	1100	U	1100	U	----
4-Bromophenyl phenyl ether	UG/KG	420	U	420	U	----
4-Chloro-3-methylphenol	UG/KG	420	U	420	U	----
4-Chloroaniline	UG/KG	420	U	420	U	----
4-Chlorophenyl phenyl ether	UG/KG	420	U	420	U	----
4-Methylphenol	UG/KG					
4-Nitroaniline	UG/KG	1100	U	1100	U	----
4-Nitrophenol	UG/KG	1100	U	1100	U	----
Acenaphthene	UG/KG	280	J	1200		124%
Acenaphthylene	UG/KG	70	J	420	U	143%
Anthracene	UG/KG	420	J	1900		128%
Benzo(a)anthracene	UG/KG	2200	J	5000	J	78%
Benzo(a)pyrene	UG/KG	2800	J	5900	J	71%
Benzo(b)fluoranthene	UG/KG	3600	J	8100	J	77%
Benzo(ghi)perylene	UG/KG	1400	J	3200	J	78%
Benzo(k)fluoranthene	UG/KG	2500	J	4900	J	65%
Bis(2-Chloroethoxy)methane	UG/KG	420	U	420	U	----
Bis(2-Chloroethyl)ether	UG/KG	420	UJ	420	U	----
Bis(2-Chloroisopropyl)ether	UG/KG	420	U	420	U	----
Bis(2-Ethylhexyl)phthalate	UG/KG	75	J	110	J	38%
Butylbenzylphthalate	UG/KG	420	J	420	J	----
Carbazole	UG/KG	440		1700		118%
Chrysene	UG/KG	2400	J	5400	J	77%
Di-n-butylphthalate	UG/KG	420	U	420	U	----
Di-n-octylphthalate	UG/KG	420	J	420	J	----
Dibenz(a,h)anthracene	UG/KG	130	J	350	J	92%
Dibenzofuran	UG/KG	71	J	640		160%
Diethyl phthalate	UG/KG	420	U	420	U	----
Dimethylphthalate	UG/KG	420	U	420	U	----
Fluoranthene	UG/KG	4400		13000		99%
Fluorene	UG/KG	190	J	1100		141%
Hexachlorobenzene	UG/KG	420	U	420	U	----
Hexachlorobutadiene	UG/KG	420	U	420	U	----
Hexachlorocyclopentadiene	UG/KG	420	U	420	U	----
Hexachloroethane	UG/KG	420	U	420	U	----
Indeno(1,2,3-cd)pyrene	UG/KG	400	J	1300	J	106%

Table C-1H
Quality Control of Field Duplicates
Ditch Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SD121I-7				
Parameter	**Units**	121I-4005		121I-4007		*RPD
Isophorone	UG/KG	420	J	420	U	----
N-Nitrosodiphenylamine	UG/KG	420	U	420	U	----
N-Nitrosodipropylamine	UG/KG	420	U	420	U	----
Naphthalene	UG/KG	420	U	490		15%
Nitrobenzene	UG/KG	420	J	420	U	----
Pentachlorophenol	UG/KG	1100	U	1100	U	----
Phenanthrene	UG/KG	2500		10000		120%
Phenol	UG/KG	420	J	420	U	----
Pyrene	UG/KG	6500	J	17000	J	89%
Pesticides/PCBs						
4,4'-DDD	UG/KG	2.2	U	2.2	U	----
4,4'-DDE	UG/KG	14	J	2.2	UJ	146%
4,4'-DDT	UG/KG	2.2	UJ	2.2	UJ	----
Aldrin	UG/KG	2.2	U	2.2	U	----
Alpha-BHC	UG/KG	2.2	U	2.2	U	----
Alpha-Chlordane	UG/KG	2.2	U	2.2	U	----
Beta-BHC	UG/KG	2.2	U	2.2	U	----
Chlordane	UG/KG	22	U	22	U	----
Delta-BHC	UG/KG	2.2	UJ	2.2	UJ	----
Dieldrin	UG/KG	2.2	UJ	2.2	UJ	----
Endosulfan I	UG/KG	2.2	U	56	R	NA
Endosulfan II	UG/KG	2.2	U	2.2	U	----
Endosulfan sulfate	UG/KG	2.2	U	2.2	U	----
Endrin	UG/KG	2.2	UJ	2.2	UJ	----
Endrin aldehyde	UG/KG	2.2	UJ	2.2	UJ	----
Endrin ketone	UG/KG	2.2	U	2.2	U	----
Gamma-BHC/Lindane	UG/KG	2.2	U	2.2	U	----
Gamma-Chlordane	UG/KG	2.2	U	2.2	U	----
Heptachlor	UG/KG	2.2	U	2.2	U	----
Heptachlor epoxide	UG/KG	2.2	U	2.2	U	----
Methoxychlor	UG/KG	2.2	UJ	2.2	UJ	----
Toxaphene	UG/KG	22	U	22	U	----
Aroclor-1016	UG/KG	22	U	22	U	----
Aroclor-1221	UG/KG	22	U	22	U	----
Aroclor-1232	UG/KG	22	U	22	U	----
Aroclor-1242	UG/KG	22	U	22	U	----
Aroclor-1248	UG/KG	22	U	22	U	----
Aroclor-1254	UG/KG	22	U	22	U	----
Aroclor-1260	UG/KG	22	U	17	NJ	26%
Metals & Cyanide						
Aluminum	MG/KG	6950		6170		12%
Antimony	MG/KG	1.1	U	0.99	U	11%
Arsenic	MG/KG	7.8		6.9		12%
Barium	MG/KG	72.2		58.9		20%
Beryllium	MG/KG	0.48	J	0.43	J	11%
Cadmium	MG/KG	0.83		0.77		7%
Calcium	MG/KG	145000		110000		27%

Table C-1H
Quality Control of Field Duplicates
Ditch Soil at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SD121I-7				
Parameter	**Units**	121I-4005		121I-4007		*RPD
Chromium	MG/KG	14.5		13.5		7%
Cobalt	MG/KG	11		10.5		5%
Copper	MG/KG	33.8	J	34.7	J	3%
Cyanide, Amenable	MG/KG	0.64	U	0.65	U	2%
Cyanide, Total	MG/KG	0.644	U	0.648	U	1%
Iron	MG/KG	15200	J	13900	J	9%
Lead	MG/KG	71.2	J	77.4	J	8%
Magnesium	MG/KG	11700	J	9890	J	17%
Manganese	MG/KG	588	J	541	J	8%
Mercury	MG/KG	0.12	UJ	0.11	UJ	9%
Nickel	MG/KG	27.9	J	26.9	J	4%
Potassium	MG/KG	1340	J	1230	J	9%
Selenium	MG/KG	0.53	U	0.46	U	14%
Silver	MG/KG	0.34	U	0.3	U	13%
Sodium	MG/KG	288		211		31%
Thallium	MG/KG	0.71	J	0.34	U	70%
Vanadium	MG/KG	20.2	J	18.4	J	9%
Zinc	MG/KG	124	J	125	J	1%
Other						
Total Organic Carbon	MG/KG	5300		4500		16%
Total Petroleum Hydrocarbons	MG/KG	1000	J	630	J	45%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\textbf{RPD} = \frac{|\ SR - SDR\ |\ X\ 100}{(1/2)\ (SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
NJ = reported value is estimated and tentatively identified based on Mass Spec
J = reported value is estimated
UJ = not detected to the estimated limit indicated
R = result is rejected
NA = Not Applicable, i.e. result rejected or missing result
----- = No difference between results or both results were non-detect

Table C-1I
Quality Control of Field Duplicates
Surface Water at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SW121I-7				
Parameter	**Units**	121I-3007		121I-3005		*RPD
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/L	5	U	5	U	----
1,1,2,2-Tetrachloroethane	UG/L	5	U	5	U	----
1,1,2-Trichloroethane	UG/L	5	U	5	U	----
1,1-Dichloroethane	UG/L	5	U	5	U	----
1,1-Dichloroethene	UG/L	5	U	5	U	----
1,2-Dichloroethane	UG/L	5	U	5	U	----
1,2-Dichloropropane	UG/L	5	U	5	U	----
Acetone	UG/L	5	UJ	5	UJ	----
Benzene	UG/L	5	U	5	U	----
Bromodichloromethane	UG/L	5	U	5	U	----
Bromoform	UG/L	5	U	5	U	----
Carbon disulfide	UG/L	5	U	5	U	----
Carbon tetrachloride	UG/L	5	U	5	U	----
Chlorobenzene	UG/L	5	U	5	U	----
Chlorodibromomethane	UG/L	5	UJ	5	UJ	----
Chloroethane	UG/L	5	UJ	5	UJ	----
Chloroform	UG/L	5	U	5	U	----
Cis-1,2-Dichloroethene	UG/L	5	U	5	U	----
Cis-1,3-Dichloropropene	UG/L	5	U	5	U	----
Ethyl benzene	UG/L	5	U	5	U	----
Meta/Para Xylene	UG/L	5	U	5	U	----
Methyl bromide	UG/L	5	U	5	U	----
Methyl butyl ketone	UG/L	5	U	5	U	----
Methyl chloride	UG/L	5	U	5	U	----
Methyl ethyl ketone	UG/L	5	UJ	5	UJ	----
Methyl isobutyl ketone	UG/L	5	U	5	U	----
Methylene chloride	UG/L	5	U	5	U	----
Ortho Xylene	UG/L	5	U	5	U	----
Styrene	UG/L	5	U	5	U	----
Tetrachloroethene	UG/L	5	U	5	U	----
Toluene	UG/L	5	U	5	U	----
Trans-1,2-Dichloroethene	UG/L	5	U	5	U	----
Trans-1,3-Dichloropropene	UG/L	5	UJ	5	UJ	----
Trichloroethene	UG/L	5	U	5	U	----
Vinyl chloride	UG/L	5	UJ	5	UJ	----
Semivolatile Organic Compounds						
1,2,4-Trichlorobenzene	UG/L	10	U	10	UJ	----
1,2-Dichlorobenzene	UG/L	10	U	10	U	----
1,3-Dichlorobenzene	UG/L	10	U	10	U	----
1,4-Dichlorobenzene	UG/L	10	U	10	U	----
2,4,5-Trichlorophenol	UG/L	10	U	10	R	NA
2,4,6-Trichlorophenol	UG/L	10	U	10	R	NA
2,4-Dichlorophenol	UG/L	10	U	10	R	NA
2,4-Dimethylphenol	UG/L	10	U	10	R	NA

Table C-1I
Quality Control of Field Duplicates
Surface Water at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SW121I-7				
Parameter	**Units**	121I-3007		121I-3005		*RPD
2,4-Dinitrophenol	UG/L	10	UJ	10	R	NA
2,4-Dinitrotoluene	UG/L	10	U	10	U	----
2,6-Dinitrotoluene	UG/L	10	U	10	U	----
2-Chloronaphthalene	UG/L	10	U	10	U	----
2-Chlorophenol	UG/L	10	U	10	R	NA
2-Methylnaphthalene	UG/L	10	U	10	U	----
2-Methylphenol	UG/L	10	U	10	U	----
2-Nitroaniline	UG/L	10	UJ	10	U	----
2-Nitrophenol	UG/L	10	U	10	R	NA
3 or 4-Methylphenol	UG/L	10	U	10	UJ	----
3,3'-Dichlorobenzidine	UG/L	10	U	10	R	NA
3-Nitroaniline	UG/L	10	U	10	U	----
4,6-Dinitro-2-methylphenol	UG/L	10	U	10	R	NA
4-Bromophenyl phenyl ether	UG/L	10	U	10	U	----
4-Chloro-3-methylphenol	UG/L	10	U	10	R	NA
4-Chloroaniline	UG/L	10	U	10	U	----
4-Chlorophenyl phenyl ether	UG/L	10	U	10	U	----
4-Nitroaniline	UG/L	10	U	10	U	----
4-Nitrophenol	UG/L	10	U	10	R	NA
Acenaphthene	UG/L	10	U	10	U	----
Acenaphthylene	UG/L	10	U	10	U	----
Anthracene	UG/L	10	U	10	U	----
Benzo(a)anthracene	UG/L	10	U	10	U	----
Benzo(a)pyrene	UG/L	10	U	10	U	----
Benzo(b)fluoranthene	UG/L	10	U	10	U	----
Benzo(ghi)perylene	UG/L	10	U	10	U	----
Benzo(k)fluoranthene	UG/L	10	U	10	U	----
Bis(2-Chloroethoxy)methane	UG/L	10	U	10	U	----
Bis(2-Chloroethyl)ether	UG/L	10	UJ	10	UJ	----
Bis(2-Chloroisopropyl)ether	UG/L	10	U	10	U	----
Bis(2-Ethylhexyl)phthalate	UG/L	10	U	10	U	----
Butylbenzylphthalate	UG/L	10	U	10	U	----
Carbazole	UG/L	10	U	10	U	----
Chrysene	UG/L	10	U	10	U	----
Di-n-butylphthalate	UG/L	10	U	10	U	----
Di-n-octylphthalate	UG/L	10	U	10	U	----
Dibenz(a,h)anthracene	UG/L	10	U	10	U	----
Dibenzofuran	UG/L	10	U	10	U	----
Diethyl phthalate	UG/L	10	U	10	U	----
Dimethylphthalate	UG/L	10	U	10	U	----
Fluoranthene	UG/L	10	U	10	U	----
Fluorene	UG/L	10	U	10	U	----
Hexachlorobenzene	UG/L	10	U	10	U	----
Hexachlorobutadiene	UG/L	10	UJ	10	UJ	----
Hexachlorocyclopentadiene	UG/L	10	UJ	10	UJ	----

Table C-1I
Quality Control of Field Duplicates
Surface Water at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

		SW121I-7				
Parameter	**Units**	121I-3007		121I-3005		*RPD
Hexachloroethane	UG/L	10	U	10	U	----
Indeno(1,2,3-cd)pyrene	UG/L	10	U	10	UJ	----
Isophorone	UG/L	10	UJ	10	U	----
N-Nitrosodiphenylamine	UG/L	10	UJ	10	UJ	----
N-Nitrosodipropylamine	UG/L	10	U	10	U	----
Naphthalene	UG/L	10	U	10	U	----
Nitrobenzene	UG/L	10	U	10	U	----
Pentachlorophenol	UG/L	10	U	10	R	NA
Phenanthrene	UG/L	10	U	10	U	----
Phenol	UG/L	10	U	10	R	NA
Pyrene	UG/L	10	U	10	U	----
Pesticides/PCBs						
4,4'-DDD	UG/L	0.01	UJ	0.01	UJ	----
4,4'-DDE	UG/L	0.005	UJ	0.005	UJ	----
4,4'-DDT	UG/L	0.01	UJ	0.01	UJ	----
Aldrin	UG/L	0.02	UJ	0.02	UJ	----
Alpha-BHC	UG/L	0.01	UJ	0.01	UJ	----
Alpha-Chlordane	UG/L	0.02	UJ	0.02	UJ	----
Beta-BHC	UG/L	0.01	UJ	0.01	UJ	----
Chlordane	UG/L	0.13	U	0.13	U	----
Delta-BHC	UG/L	0.004	UJ	0.004	UJ	----
Dieldrin	UG/L	0.009	UJ	0.009	UJ	----
Endosulfan I	UG/L	0.01	UJ	0.01	UJ	----
Endosulfan II	UG/L	0.01	U	0.01	U	----
Endosulfan sulfate	UG/L	0.02	U	0.02	U	----
Endrin	UG/L	0.02	UJ	0.02	UJ	----
Endrin aldehyde	UG/L	0.02	U	0.02	U	----
Endrin ketone	UG/L	0.009	U	0.009	U	----
Gamma-BHC/Lindane	UG/L	0.009	UJ	0.009	UJ	----
Gamma-Chlordane	UG/L	0.01	UJ	0.01	UJ	----
Heptachlor	UG/L	0.007	UJ	0.007	UJ	----
Heptachlor epoxide	UG/L	0.008	UJ	0.008	UJ	----
Methoxychlor	UG/L	0.008	U	0.008	U	----
Toxaphene	UG/L	0.12	U	0.12	U	----
Aroclor-1016	UG/L	0.5	UJ	0.5	UJ	----
Aroclor-1221	UG/L	0.5	U	0.5	U	----
Aroclor-1232	UG/L	0.5	UJ	0.5	UJ	----
Aroclor-1242	UG/L	0.5	U	0.5	U	----
Aroclor-1248	UG/L	0.5	U	0.5	U	----
Aroclor-1254	UG/L	0.5	U	0.5	U	----
Aroclor-1260	UG/L	0.5	UJ	0.5	UJ	----
Metals & Cyanide						
Aluminum	UG/L	45.8		46.3		1%
Antimony	UG/L	3.8	U	3.8	U	----
Arsenic	UG/L	4.5	U	4.5	U	----

Table C-1I
Quality Control of Field Duplicates
Surface Water at SEAD-121I
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

Parameter	Units	SW121I-7				
		121I-3007		121I-3005		*RPD
Barium	UG/L	9.9	U	9.9	U	----
Beryllium	UG/L	0.1	U	0.1	U	----
Cadmium	UG/L	0.8	U	0.8	U	----
Calcium	UG/L	18300		17700		3%
Chromium	UG/L	1.4	U	1.4	U	----
Cobalt	UG/L	0.7	U	0.7	U	----
Copper	UG/L	3.6	U	3.6	U	----
Cyanide, Amenable	MG/L	0.01	U	0.01	U	----
Cyanide, Total	MG/L	0.01	U	0.01	U	----
Iron	UG/L	41.8	J	41.8	J	----
Lead	UG/L	3	U	3	U	----
Magnesium	UG/L	3660		3610		1%
Manganese	UG/L	5.3		3		55%
Mercury	UG/L	0.2	U	0.2	U	----
Nickel	UG/L	2	U	2	U	----
Potassium	UG/L	630		660		5%
Selenium	UG/L	3.1	J	1.8	J	53%
Silver	UG/L	3.7	U	3.7	U	----
Sodium	UG/L	2180		2300		5%
Thallium	UG/L	5.3	U	5.3	U	----
Vanadium	UG/L	1.4	UJ	1.4	UJ	----
Zinc	UG/L	14.7	J	13.8	J	6%
Other						
Total Petroleum Hydrocarbons	MG/L	0.412	UJ	0.408	UJ	1%

NOTES:
*Formula for Relative Percent Difference (RPD)
Source: p. 921 of http://www.epa.gov/region02/desa/hsw/clp.pdf

$$\textbf{RPD} = \frac{|\,SR - SDR\,| \times 100}{(1/2)\,(SR + SDR)}$$

SR = Sample Result of a particular analyte.
SDR = Sample Duplicate Result of a particular analyte.
Shading indicates RPD > 50%

U = not detected to the limit indicated
J = reported value is estimated
UJ = not detected to the estimated limit indicated
R = result is rejected
NA = Not Applicable, i.e. result rejected or missing result
----- = No difference between results or both results were non-detect

Table C-1J
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		SB121C-1	SB121C-1	SB121C-1	SB121C-4	SB121C-4	SB121C-4	SBDRMO-16	SBDRMO-16	SBDRMO-16
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		EB231	EB014	EB231/EB014	EB020	EB229	EB229/EB020	DRMO-1074	DRMO-1080	DRMO-1074/DRMO-1080
Sample Depth to Top of Sample		0	0	0	0	0	0	0	0	0
Sample Depth to Bottom of Sample		0.2	0.2	0.2	0.2	0.2	0.2	2	2	2
Sample Date		3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	10/27/2002	10/27/2002	10/27/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU	SA	SA	SA/DU
Investigation		EBS	EBS	EBS	EBS	EBS	EBS	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds										
1,1,1-Trichloroethane	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
1,1,2,2-Tetrachloroethane	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
1,1,2-Trichloroethane	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
1,1-Dichloroethane	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
1,1-Dichloroethene	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
1,2-Dichloroethane	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
1,2-Dichloroethene (total)	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ			
1,2-Dichloropropane	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Acetone	UG/KG	6 U	12 J	9 J	10 J	5.5 UJ	7.8 J	2.6 UJ	2.8 UJ	2.7 UJ
Benzene	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Bromodichloromethane	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Bromoform	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 UJ	2.8 UJ	2.7 UJ
Carbon disulfide	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Carbon tetrachloride	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Chlorobenzene	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Chlorodibromomethane	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Chloroethane	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Chloroform	UG/KG	12 U	12 U	12 U	5.5 UJ	4 J	4.8 J	2.6 U	2.8 U	2.7 U
Cis-1,2-Dichloroethene	UG/KG							2.6 U	2.8 U	2.7 U
Cis-1,3-Dichloropropene	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Ethyl benzene	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Meta/Para Xylene	UG/KG							2.6 U	2.8 U	2.7 U
Methyl bromide	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Methyl butyl ketone	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Methyl chloride	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 UJ	2.8 UJ	2.7 UJ
Methyl ethyl ketone	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Methyl isobutyl ketone	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Methylene chloride	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Ortho Xylene	UG/KG							2.6 U	2.8 U	2.7 U
Styrene	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 UJ	2.8 UJ	2.7 UJ
Tetrachloroethene	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 UJ	2.8 UJ	2.7 UJ
Toluene	UG/KG	2 J	5 J	4 J	12 J	10 J	11 J	2.6 U	2.8 U	2.7 U
Total Xylenes	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ			
Trans-1,2-Dichloroethene	UG/KG							2.6 U	2.8 U	2.7 U
Trans-1,3-Dichloropropene	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Trichloroethene	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Vinyl chloride	UG/KG	12 U	12 U	12 U	11 UJ	11 UJ	11 UJ	2.6 U	2.8 U	2.7 U
Semivolatile Organic Compounds										
1,2,4-Trichlorobenzene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
1,2-Dichlorobenzene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
1,3-Dichlorobenzene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
1,4-Dichlorobenzene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U

Table C-1J
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		SB121C-1	SB121C-1	SB121C-1	SB121C-4	SB121C-4	SB121C-4	SBDRMO-16	SBDRMO-16	SBDRMO-16
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		EB231	EB014	EB231/EB014	EB020	EB229	EB229/EB020	DRMO-1074	DRMO-1080	DRMO-1074/DRMO-1080
Sample Depth to Top of Sample		0	0	0	0	0	0	0	0	0
Sample Depth to Bottom of Sample		0.2	0.2	0.2	0.2	0.2	0.2	2	2	2
Sample Date		3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	10/27/2002	10/27/2002	10/27/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU	SA	SA	SA/DU
Investigation		EBS	EBS	EBS	EBS	EBS	EBS	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4,5-Trichlorophenol	UG/KG	190 U	180 U	185 U	170 U	170 U	170 U	900 U	900 U	900 U
2,4,6-Trichlorophenol	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
2,4-Dichlorophenol	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
2,4-Dimethylphenol	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
2,4-Dinitrophenol	UG/KG	190 U	180 U	185 U	170 U	170 U	170 U	900 U	900 UJ	900 UJ
2,4-Dinitrotoluene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
2,6-Dinitrotoluene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
2-Chloronaphthalene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
2-Chlorophenol	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
2-Methylnaphthalene	UG/KG	39 U	4.3 J	21.7 J	72 U	71 U	72 U	200 J	210 J	205 J
2-Methylphenol	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
2-Nitroaniline	UG/KG	190 U	180 U	185 U	170 U	170 U	170 U	900 U	900 U	900 U
2-Nitrophenol	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
3 or 4-Methylphenol	UG/KG							360 U	360 U	360 U
3,3'-Dichlorobenzidine	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 UJ	360 UJ
3-Nitroaniline	UG/KG	190 U	180 U	185 U	170 U	170 U	170 U	900 U	900 U	900 U
4,6-Dinitro-2-methylphenol	UG/KG	190 U	180 U	185 U	170 U	170 U	170 U	900 U	900 U	900 U
4-Bromophenyl phenyl ether	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
4-Chloro-3-methylphenol	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
4-Chloroaniline	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
4-Chlorophenyl phenyl ether	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
4-Methylphenol	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U			
4-Nitroaniline	UG/KG	190 U	180 U	185 U	170 U	170 U	170 U	900 U	900 U	900 U
4-Nitrophenol	UG/KG	190 U	180 U	185 U	170 U	170 U	170 U	900 U	900 U	900 U
Acenaphthene	UG/KG	39 U	6.8 J	22.9 J	72 U	71 U	72 U	160 J	170 J	165 J
Acenaphthylene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	1100	750	925
Anthracene	UG/KG	39 U	15 J	27 J	72 U	71 U	72 U	1100	950	1025
Benzo(a)anthracene	UG/KG	39 U	76	58 J	3.9 J	7 J	5.5 J	5500 J	2900 J	4200 J
Benzo(a)pyrene	UG/KG	39 U	57 J	48 J	72 U	71 U	72 U	4800 J	2700 J	3750 J
Benzo(b)fluoranthene	UG/KG	39 U	95	67 J	13 J	35.5 U	24 J	6600 J	3700 J	5150 J
Benzo(ghi)perylene	UG/KG	39 U	42 J	41 J	72 U	71 U	72 U	1700 J	740 J	1220 J
Benzo(k)fluoranthene	UG/KG	39 U	67 J	53 J	72 U	71 U	72 U	3000 J	1700 J	2350 J
Bis(2-Chloroethoxy)methane	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Bis(2-Chloroethyl)ether	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Bis(2-Chloroisopropyl)ether	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Bis(2-Ethylhexyl)phthalate	UG/KG	13 J	36.5 U	25 J	9.3 J	13 J	11 J	97 J	74 J	86 J
Butylbenzylphthalate	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 UJ	360 UJ
Carbazole	UG/KG	39 U	17 J	28 J	72 U	71 U	72 U	170 J	130 J	150 J
Chrysene	UG/KG	39 U	90	65 J	8.8 J	12 J	10 J	5000 J	2700 J	3850 J
Di-n-butylphthalate	UG/KG	78 U	73 U	76 U	36 U	3.7 J	20 J	360 U	360 U	360 U
Di-n-octylphthalate	UG/KG	9.9 J	36.5 U	23 J	72 U	71 U	72 U	360 U	360 UJ	360 UJ
Dibenz(a,h)anthracene	UG/KG	39 U	21 J	30 J	72 U	71 U	72 U	250 J	100 J	175 J
Dibenzofuran	UG/KG	39 U	5.1 J	22 J	72 U	71 U	72 U	170 J	190 J	180 J

Table C-1J
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		SB121C-1	SB121C-1	SB121C-1	SB121C-4	SB121C-4	SB121C-4	SBDRMO-16	SBDRMO-16	SBDRMO-16
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		EB231	EB014	EB231/EB014	EB020	EB229	EB229/EB020	DRMO-1074	DRMO-1080	DRMO-1074/DRMO-1080
Sample Depth to Top of Sample		0	0	0	0	0	0	0	0	0
Sample Depth to Bottom of Sample		0.2	0.2	0.2	0.2	0.2	0.2	2	2	2
Sample Date		3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	10/27/2002	10/27/2002	10/27/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU	SA	SA	SA/DU
Investigation		EBS	EBS	EBS	EBS	EBS	EBS	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Diethyl phthalate	UG/KG	5.8 J	36.5 U	21 J	8.1 J	10 J	9.1 J	360 U	360 U	360 U
Dimethylphthalate	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Fluoranthene	UG/KG	39 U	180	110 J	7.4 J	10 J	8.7 J	8200 J	5100 J	6650 J
Fluorene	UG/KG	39 U	8 J	24 J	72 U	71 U	72 U	650	690	670
Hexachlorobenzene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Hexachlorobutadiene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Hexachlorocyclopentadiene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Hexachloroethane	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Indeno(1,2,3-cd)pyrene	UG/KG	39 U	41 J	40 J	72 U	71 U	72 U	760	330 J	545 J
Isophorone	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
N-Nitrosodiphenylamine	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
N-Nitrosodipropylamine	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Naphthalene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	100 J	82 J	91 J
Nitrobenzene	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Pentachlorophenol	UG/KG	190 UJ	180 U	185 UJ	170 U	170 U	170 U	900 U	900 U	900 U
Phenanthrene	UG/KG	39 U	96	68 J	8.8 J	7.6 J	8.2 J	4400 J	4000 J	4200 J
Phenol	UG/KG	78 U	73 U	76 U	72 U	71 U	72 U	360 U	360 U	360 U
Pyrene	UG/KG	39 U	170	105 J	8.3 J	14 J	11 J	12000 J	5300 J	8650 J
Pesticides/PCBs										
4,4'-DDD	UG/KG	3.9 U	3.7 U	3.8 U	3.6 U	3.5 U	3.6 U	0.9 UJ	6 J	3 J
4,4'-DDE	UG/KG	1.95 U	29	15 J	3.8	4.5	4.2	1.8 UJ	41 R	1.8 UJ
4,4'-DDT	UG/KG	1.95 U	35	18 J	1.9 J	2.3 J	2.1 J	19 J	21 J	20 J
Aldrin	UG/KG	2 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	9.9 J	19 NJ	14 J
Alpha-BHC	UG/KG	2 U	2 R	2 U	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 UJ	1.8 UJ
Alpha-Chlordane	UG/KG	2 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	63 J	71 R	63 J
Beta-BHC	UG/KG	2 U	1.8 UJ	1.9 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 UJ	1.8 UJ
Chlordane	UG/KG							18 U	18 U	18 U
Delta-BHC	UG/KG	1 U	0.95 J	0.98 J	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 UJ	1.8 UJ
Dieldrin	UG/KG	3.9 U	3.7 UJ	3.8 UJ	3.6 U	3.5 U	3.6 U	41 J	32 R	41 J
Endosulfan I	UG/KG	2 U	1.8 UJ	1.9 UJ	1.8 U	1.8 U	1.8 U	65	69 J	67 J
Endosulfan II	UG/KG	3.9 U	3.7 UJ	3.8 UJ	3.6 U	3.5 U	3.6 U	1.8 U	1.8 U	1.8 U
Endosulfan sulfate	UG/KG	3.9 U	3.7 UJ	3.8 UJ	3.6 U	3.5 U	3.6 U	1.8 U	1.8 U	1.8 U
Endrin	UG/KG	3.9 U	3.7 UJ	3.8 UJ	3.6 U	3.5 U	3.6 U	17 J	26 J	22 J
Endrin aldehyde	UG/KG	3.9 U	3.7 UJ	3.8 UJ	3.6 U	3.5 U	3.6 U	1.8 U	1.8 U	1.8 U
Endrin ketone	UG/KG	3.9 U	3.7 UJ	3.8 UJ	3.6 U	3.5 U	3.6 U	7.5 J	10 R	7.5 J
Gamma-BHC/Lindane	UG/KG	2 U	1.8 UJ	1.9 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 UJ	1.8 UJ
Gamma-Chlordane	UG/KG	2 U	1.8 UJ	1.9 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 UJ	1.8 UJ
Heptachlor	UG/KG	2 U	1.8 UJ	1.9 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 UJ	1.8 UJ
Heptachlor epoxide	UG/KG	2 U	1.8 UJ	1.9 UJ	1.8 U	1.8 U	1.8 U	20 R	1.8 UJ	1.8 UJ
Methoxychlor	UG/KG	20 U	18 UJ	19 UJ	18 U	18 U	18 U	1.8 U	1.8 U	1.8 U
Toxaphene	UG/KG	200 U	180 UJ	190 UJ	180 U	180 U	180 U	18 U	18 U	18 U
Aroclor-1016	UG/KG	39 U	37 UJ	38 UJ	36 U	35 U	36 U	18 UJ	18 UJ	18 UJ

Table C-1J
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		SB121C-1	SB121C-1	SB121C-1	SB121C-4	SB121C-4	SB121C-4	SBDRMO-16	SBDRMO-16	SBDRMO-16
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		EB231	EB014	EB231/EB014	EB020	EB229	EB229/EB020	DRMO-1074	DRMO-1080	DRMO-1074/DRMO-1080
Sample Depth to Top of Sample		0	0	0	0	0	0	0	0	0
Sample Depth to Bottom of Sample		0.2	0.2	0.2	0.2	0.2	0.2	2	2	2
Sample Date		3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	10/27/2002	10/27/2002	10/27/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU	SA	SA	SA/DU
Investigation		EBS	EBS	EBS	EBS	EBS	EBS	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aroclor-1221	UG/KG	79 U	74 UJ	77 UJ	73 U	72 U	73 U	18 U	18 U	18 U
Aroclor-1232	UG/KG	39 U	37 UJ	38 UJ	36 U	35 U	36 U	18 UJ	18 UJ	18 UJ
Aroclor-1242	UG/KG	39 U	37 UJ	38 UJ	36 U	35 U	36 U	18 UJ	18 UJ	18 UJ
Aroclor-1248	UG/KG	39 U	37 UJ	38 UJ	36 U	35 U	36 U	18 U	18 U	18 U
Aroclor-1254	UG/KG	39 U	37 UJ	38 UJ	36 U	35 U	36 U	18 UJ	18 UJ	18 UJ
Aroclor-1260	UG/KG	19.5 U	30 J	25 J	36 U	35 U	36 U	22 J	35 J	29 J
Metals and Cyanide										
Aluminum	MG/KG	12800	14500	13650	14400	13000	13700	3100	3760	3430
Antimony	MG/KG	1.1 J	19.3 J	10.2 J	1.7 J	0.81 J	1.3 J	0.49 U	0.99	0.74 J
Arsenic	MG/KG	5.5	6.1	5.8	5	3.7	4.4	4.8	5.5	5.2
Barium	MG/KG	64.9	1600	832	86.6	69.6	78.1	42	45.6	44
Beryllium	MG/KG	0.52	0.4	0.5	0.57	0.49	0.53	0.26 J	0.32 J	0.29 J
Cadmium	MG/KG	0.035 U	2.7	1.4 J	0.07 U	0.05 U	0.06 U	0.56	0.49 J	0.53 J
Calcium	MG/KG	2580	31300	16940	17200	25500	21350	199000	157000	178000
Chromium	MG/KG	20.9	32.9	26.9	27.8	22.6	25.2	13	13.8	13
Cobalt	MG/KG	12.8	16.5	14.7	17.6	12.5	15.1	5.9	6.1	6.0
Copper	MG/KG	19.7 J	7690	3855 J	39.1 J	33 J	36 J	28.8	34.3	31.6
Cyanide	MG/KG	0.63 U	0.59 U	0.61 U	0.56 U	0.61 U	0.59 U			
Cyanide, Amenable	MG/KG							0.54 U	0.55 U	0.55 U
Cyanide, Total	MG/KG							0.542 U	0.545 U	0.544 U
Iron	MG/KG	25700	41100	33400	32000	25900	28950	8710	10500	9605
Lead	MG/KG	11.8 J	5280	2646 J	27.1	23.5 J	25.3 J	89.3	94.5	91.9
Magnesium	MG/KG	4590	6820	5705	6980	5630	6305	17900	13000	15450
Manganese	MG/KG	598	612	605	413	359	386	425	390	408
Mercury	MG/KG	0.06 U	0.05 U	0.06 U	0.04 U	0.04 U	0.04 U	0.07	0.07	0.07
Nickel	MG/KG	40.5	54.2 J	47.4 J	61.8	49.3	55.6	19.4 J	22.1 J	20.8 J
Potassium	MG/KG	1600	1840	1720	1980	1450	1715	934 J	882 J	908 J
Selenium	MG/KG	1.1 U	0.92 UJ	1.0 UJ	1 U	0.8 U	0.9 U	0.46 U	0.45 U	0.46 U
Silver	MG/KG	0.48 U	0.41 U	0.45 U	0.46 U	0.36 U	0.41 U	0.29 U	0.29 U	0.29 U
Sodium	MG/KG	69.5 U	606	338 J	66 U	110	88 J	276	232	254
Thallium	MG/KG	1.4 UJ	1.2 U	1.3 UJ	1.4 J	0.55 UJ	0.98 J	0.34 U	0.33 U	0.34 U
Vanadium	MG/KG	20.8	19.5 J	20.2 J	21	17	19	11 J	10.7 J	11 J
Zinc	MG/KG	80.3	1280	680	153	196	175	130 J	135 J	133 J
Other										
Total Organic Carbon	MG/KG							5200	5300	5250
Total Petroleum Hydrocarbons	MG/KG							2800 J	6200 J	4500 J

NOTES:
Shaded cells indicate a detect/non-detect pair. Concentrations reported as not detected in the shaded pair, as indicated by "U" or "UJ" data qualifiers, are presented at 1/2 the value reported by the laboratory. The modified value (i.e., 1/2 the laboratory's reported detection limit) was used to compute the average result.

When a chemical was not detected in either the sample or the duplicate, as indicated by "U" or "UJ" data qualifiers, the average of the two reported detection limits at full value is reported as the final value.

Table C-1J
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		SBDRMO-6	SBDRMO-6	SBDRMO-6	SSDRMO-7	SSDRMO-7	SSDRMO-7
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		DRMO-1043	DRMO-1050	DRMO-1043/DRMO-1050	DRMO-1002	DRMO-1003	DRMO-1002/DRMO-1003
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		2	2	2	0.2	0.2	0.2
Sample Date		10/25/2002	10/25/2002	10/25/2002	10/24/2002	10/24/2002	10/24/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
1,1,2,2-Tetrachloroethane	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
1,1,2-Trichloroethane	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
1,1-Dichloroethane	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
1,1-Dichloroethene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
1,2-Dichloroethane	UG/KG	2.6 UJ	2.7 UJ	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
1,2-Dichloroethene (total)	UG/KG						
1,2-Dichloropropane	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Acetone	UG/KG	2.6 UJ	4.6 U	3.6 UJ	3.1 UJ	2.9 R	3.1 UJ
Benzene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Bromodichloromethane	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Bromoform	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Carbon disulfide	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Carbon tetrachloride	UG/KG	2.6 UJ	2.7 UJ	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Chlorobenzene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Chlorodibromomethane	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Chloroethane	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Chloroform	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Cis-1,2-Dichloroethene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Cis-1,3-Dichloropropene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Ethyl benzene	UG/KG	0.66 J	1.35 U	1.0 J	3.1 UJ	2.9 U	3.0 UJ
Meta/Para Xylene	UG/KG	4.1 J	1.35 U	2.7 J	3.1 UJ	2.9 U	3.0 UJ
Methyl bromide	UG/KG	2.6 UJ	2.7 UJ	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Methyl butyl ketone	UG/KG	2.6 UJ	2.7 UJ	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Methyl chloride	UG/KG	2.6 UJ	2.7 UJ	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Methyl ethyl ketone	UG/KG	2.6 UJ	2.7 UJ	2.7 UJ	3.1 UJ	2.9 UJ	3.0 UJ
Methyl isobutyl ketone	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Methylene chloride	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	1.7 U	2.4 UJ
Ortho Xylene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Styrene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Tetrachloroethene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Toluene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Total Xylenes	UG/KG						
Trans-1,2-Dichloroethene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Trans-1,3-Dichloropropene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Trichloroethene	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Vinyl chloride	UG/KG	2.6 UJ	2.7 U	2.7 UJ	3.1 UJ	2.9 U	3.0 UJ
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
1,2-Dichlorobenzene	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
1,3-Dichlorobenzene	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
1,4-Dichlorobenzene	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U

Table C-1J
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		SBDRMO-6	SBDRMO-6	SBDRMO-6	SSDRMO-7	SSDRMO-7	SSDRMO-7
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		DRMO-1043	DRMO-1050	DRMO-1043/DRMO-1050	DRMO-1002	DRMO-1003	DRMO-1002/DRMO-1003
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		2	2	2	0.2	0.2	0.2
Sample Date		10/25/2002	10/25/2002	10/25/2002	10/24/2002	10/24/2002	10/24/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4,5-Trichlorophenol	UG/KG	870 U	880 U	875 U	960 U	950 U	955 U
2,4,6-Trichlorophenol	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
2,4-Dichlorophenol	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
2,4-Dimethylphenol	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
2,4-Dinitrophenol	UG/KG	870 R	880 UJ	880 UJ	960 U	950 U	955 U
2,4-Dinitrotoluene	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
2,6-Dinitrotoluene	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
2-Chloronaphthalene	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
2-Chlorophenol	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
2-Methylnaphthalene	UG/KG	340 U	350 U	345 U	140 J	110 J	125 J
2-Methylphenol	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
2-Nitroaniline	UG/KG	870 UJ	880 U	875 UJ	960 U	950 U	955 U
2-Nitrophenol	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
3 or 4-Methylphenol	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
3,3'-Dichlorobenzidine	UG/KG	340 UJ	350 UJ	345 UJ	380 UJ	380 UJ	380 UJ
3-Nitroaniline	UG/KG	870 U	880 U	875 U	960 U	950 U	955 U
4,6-Dinitro-2-methylphenol	UG/KG	870 UJ	880 UJ	875 UJ	960 U	950 U	955 U
4-Bromophenyl phenyl ether	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
4-Chloro-3-methylphenol	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
4-Chloroaniline	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
4-Chlorophenyl phenyl ether	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
4-Methylphenol	UG/KG						
4-Nitroaniline	UG/KG	870 U	880 U	875 U	960 U	950 U	955 U
4-Nitrophenol	UG/KG	870 UJ	880 U	875 UJ	960 U	950 U	955 U
Acenaphthene	UG/KG	340 U	350 U	345 U	310 J	190 J	250 J
Acenaphthylene	UG/KG	340 U	350 U	345 U	1000	810	905
Anthracene	UG/KG	340 U	350 U	345 U	1600	850	1225
Benzo(a)anthracene	UG/KG	340 U	350 UJ	345 UJ	6700 J	3900 J	5300 J
Benzo(a)pyrene	UG/KG	340 UJ	350 UJ	345 UJ	7600 J	5000 J	6300 J
Benzo(b)fluoranthene	UG/KG	50 J	175 UJ	113 J	11000 J	6600 J	8800 J
Benzo(ghi)perylene	UG/KG	110 J	57 J	84 J	3800 J	2500 J	3150 J
Benzo(k)fluoranthene	UG/KG	340 UJ	350 UJ	345 UJ	4900 J	3100 J	4000 J
Bis(2-Chloroethoxy)methane	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
Bis(2-Chloroethyl)ether	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
Bis(2-Chloroisopropyl)ether	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
Bis(2-Ethylhexyl)phthalate	UG/KG	340 UJ	350 UJ	345 UJ	200 J	97 J	149 J
Butylbenzylphthalate	UG/KG	340 UJ	350 UJ	345 UJ	380 UJ	380 UJ	380 UJ
Carbazole	UG/KG	340 U	350 U	345 U	910	550	730
Chrysene	UG/KG	340 UJ	350 UJ	345 UJ	6800 J	4300 J	5550 J
Di-n-butylphthalate	UG/KG	340 U	350 U	345 U	190 U	73 J	132 J
Di-n-octylphthalate	UG/KG	340 UJ	350 UJ	345 UJ	380 UJ	380 UJ	380 UJ
Dibenz(a,h)anthracene	UG/KG	340 UJ	350 UJ	345 UJ	570 J	370 J	470 J
Dibenzofuran	UG/KG	340 U	350 U	345 U	330 J	160 J	245 J

Table C-1J
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

	Facility	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
	Location ID	SBDRMO-6	SBDRMO-6	SBDRMO-6	SSDRMO-7	SSDRMO-7	SSDRMO-7
	Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample ID	DRMO-1043	DRMO-1050	DRMO-1043/DRMO-1050	DRMO-1002	DRMO-1003	DRMO-1002/DRMO-1003
	Sample Depth to Top of Sample	0	0	0	0	0	0
	Sample Depth to Bottom of Sample	2	2	2	0.2	0.2	0.2
	Sample Date	10/25/2002	10/25/2002	10/25/2002	10/24/2002	10/24/2002	10/24/2002
	QC Code	SA	SA	SA/DU	SA	SA	SA/DU
	Investigation	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Diethyl phthalate	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
Dimethylphthalate	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
Fluoranthene	UG/KG	53 J	38 J	46 J	15000	8800	11900
Fluorene	UG/KG	340 U	350 U	345 U	1000	560	780
Hexachlorobenzene	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
Hexachlorobutadiene	UG/KG	340 U	350 U	345 U	380 UJ	380 UJ	380 UJ
Hexachlorocyclopentadiene	UG/KG	340 UJ	350 UJ	345 UJ	380 U	380 U	380 U
Hexachloroethane	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
Indeno(1,2,3-cd)pyrene	UG/KG	60 J	175 UJ	118 J	1100 J	840 J	970 J
Isophorone	UG/KG	340 U	350 U	345 U	380 UJ	380 UJ	380 UJ
N-Nitrosodiphenylamine	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
N-Nitrosodipropylamine	UG/KG	340 UJ	350 U	345 UJ	380 U	380 U	380 U
Naphthalene	UG/KG	340 U	350 U	345 U	97 J	74 J	86 J
Nitrobenzene	UG/KG	340 U	350 U	345 U	380 UJ	380 UJ	380 UJ
Pentachlorophenol	UG/KG	870 U	880 U	875 U	960 U	950 U	955 U
Phenanthrene	UG/KG	340 U	350 U	345 U	13000	7600	10300
Phenol	UG/KG	340 U	350 U	345 U	380 U	380 U	380 U
Pyrene	UG/KG	130 J	78 J	104 J	24000 J	14000 J	19000 J
Pesticides/PCBs							
4,4'-DDD	UG/KG	1.8 R	1.8 UJ	1.8 UJ	2 UJ	1.9 UJ	2.0 UJ
4,4'-DDE	UG/KG	6.1 J	6.3 J	6.2 J	2 UJ	1.9 UJ	2.0 UJ
4,4'-DDT	UG/KG	1.8 UJ	1.8 UJ	1.8 UJ	2 UJ	1.9 UJ	2.0 UJ
Aldrin	UG/KG	1.8 UJ	1.8 UJ	1.8 UJ	2 U	1.9 U	2.0 U
Alpha-BHC	UG/KG	1.8 UJ	1.8 UJ	1.8 UJ	2 UJ	1.9 UJ	2.0 UJ
Alpha-Chlordane	UG/KG	6.1 J	4.7 J	5.4 J	2 UJ	1.9 UJ	2.0 UJ
Beta-BHC	UG/KG	1.8 U	1.8 UJ	1.8 UJ	2 UJ	1.9 UJ	2.0 UJ
Chlordane	UG/KG	18 U	18 U	18 U	20 U	19 U	20 U
Delta-BHC	UG/KG	1.8 UJ	1.8 UJ	1.8 UJ	2 UJ	1.9 UJ	2.0 UJ
Dieldrin	UG/KG	1.8 UJ	1.8 UJ	1.8 UJ	2 UJ	1.9 UJ	2.0 UJ
Endosulfan I	UG/KG	6.1	5.4	5.8	190 J	180 J	185 J
Endosulfan II	UG/KG	1.8 U	1.8 U	1.8 U	2 U	1.9 U	2.0 U
Endosulfan sulfate	UG/KG	1.8 U	1.8 U	1.8 U	2 U	1.9 U	2.0 U
Endrin	UG/KG	1.8 UJ	1.8 U	1.8 UJ	2 U	1.9 UJ	2.0 UJ
Endrin aldehyde	UG/KG	1.8 U	1.8 U	1.8 U	2 U	1.9 UJ	2.0 UJ
Endrin ketone	UG/KG	1.8 U	1.8 U	1.8 U	2 U	1.9 U	2.0 U
Gamma-BHC/Lindane	UG/KG	1.8 UJ	1.8 UJ	1.8 UJ	2 U	1.9 U	2.0 U
Gamma-Chlordane	UG/KG	1.8 U	1.8 UJ	1.8 UJ	2 U	1.9 UJ	2.0 UJ
Heptachlor	UG/KG	1.8 U	1.8 UJ	1.8 UJ	2 U	1.9 U	2.0 U
Heptachlor epoxide	UG/KG	1.8 U	1.8 UJ	1.8 UJ	2 U	1.9 UJ	2.0 UJ
Methoxychlor	UG/KG	1.8 UJ	1.8 U	1.8 UJ	2 U	1.9 UJ	2.0 UJ
Toxaphene	UG/KG	18 U	18 U	18 U	20 U	19 U	20 U
Aroclor-1016	UG/KG	18 U	18 U	18 U	20 U	19 U	20 U

Table C-1J
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		SBDRMO-6	SBDRMO-6	SBDRMO-6	SSDRMO-7	SSDRMO-7	SSDRMO-7
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		DRMO-1043	DRMO-1050	DRMO-1043/DRMO-1050	DRMO-1002	DRMO-1003	DRMO-1002/DRMO-1003
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		2	2	2	0.2	0.2	0.2
Sample Date		10/25/2002	10/25/2002	10/25/2002	10/24/2002	10/24/2002	10/24/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aroclor-1221	UG/KG	18 U	18 U	18 U	20 U	19 U	20 U
Aroclor-1232	UG/KG	18 U	18 U	18 U	20 U	19 U	20 U
Aroclor-1242	UG/KG	18 U	18 U	18 U	20 U	19 U	20 U
Aroclor-1248	UG/KG	18 U	18 U	18 U	20 U	19 U	20 U
Aroclor-1254	UG/KG	18 U	18 U	18 U	20 UJ	19 UJ	20 UJ
Aroclor-1260	UG/KG	18 U	18 U	18 U	20 UJ	19 UJ	20 UJ
Metals and Cyanide							
Aluminum	MG/KG	8030	11100	9565	7420	8280	7850
Antimony	MG/KG	1.5	0.48 U	0.99 J	3.2 J	1.4 J	2.3 J
Arsenic	MG/KG	3.7	4.7	4.2	6.2	5.4	5.8
Barium	MG/KG	37.9 J	66.7 J	52.3 J	80.9 J	84.5 J	82.7 J
Beryllium	MG/KG	0.44 J	0.6	0.52 J	0.5	0.53	0.5
Cadmium	MG/KG	0.2 J	0.065 U	0.1 J	0.57	0.44	0.51
Calcium	MG/KG	36500 J	41400 J	38950 J	63600 J	61200 J	62400 J
Chromium	MG/KG	38.8	38.6	38.7	17.6 J	18.8 J	18.2 J
Cobalt	MG/KG	9.5	14.2	12	8.6 R	8.7 R	
Copper	MG/KG	34.6 J	39.6 J	37.1 J	39.8 J	32.8 J	36.3 J
Cyanide	MG/KG						
Cyanide, Amenable	MG/KG	0.52 U	0.53 U	0.53 U	0.58 U	0.57 U	0.58 U
Cyanide, Total	MG/KG	0.525 U	0.535 U	0.53 U	0.582 U	0.575 U	0.579 U
Iron	MG/KG	18300	24200	21250	18500	18700	18600
Lead	MG/KG	66.9	56.3	61.6	117	93.8	105
Magnesium	MG/KG	5080	6940	6010	12700	6180	9440
Manganese	MG/KG	348	376	362	480	553	517
Mercury	MG/KG	0.04	0.03	0.04	0.07	0.06	0.07
Nickel	MG/KG	31.8 J	44.4 J	38.1 J	22.4 J	23.5 J	23.0 J
Potassium	MG/KG	1220 J	1770 J	1495 J	862 J	712 J	787 J
Selenium	MG/KG	0.44 U	0.45 U	0.445 U	0.49 U	0.47 U	0.48 U
Silver	MG/KG	0.28 U	0.29 U	0.29 U	0.31 U	0.3 U	0.3 U
Sodium	MG/KG	223	277	250	191	194	193
Thallium	MG/KG	0.33 U	0.33 U	0.33 U	0.36 U	0.35 U	0.36 U
Vanadium	MG/KG	12.9	17.9	15.4	15.3 J	14.4 J	14.9 J
Zinc	MG/KG	123	196	160	107 J	96.8 J	102 J
Other							
Total Organic Carbon	MG/KG	3300	8500	5900	5800	6000	5900
Total Petroleum Hydrocarbons	MG/KG	42 UJ	43 UJ	43 UJ	190	46 U	118 J

NOTES:
Shaded cells indicate a detect/non-detect pair. Concentrations reported as not detected in the shaded pair, as indicated by "U" or "UJ" data qualifiers, are presented at 1/2 the value reported by the laboratory. The modified value (i.e., 1/2 the laboratory's reported detection limit) was used to compute the average result.

When a chemical was not detected in either the sample or the duplicate, as indicated by “U” or “UJ” data qualifiers, the average of the two reported detection limits at full value is reported as the final value.

Table C-1K
SAMPLE-DUPLICATE MERGING RESULTS - DITCH SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID		SDDRMO-8		SDDRMO-8		SDDRMO-8	
Matrix		DITCHSOIL		DITCHSOIL		DITCHSOIL	
Sample ID		DRMO-4005		DRMO-4008		DRMO-4008/DRMO-4005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		2		2		2	
Sample Date		11/5/2002		11/5/2002		11/5/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1		1		1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/KG	6.6	UJ	11	UJ	8.8	UJ
1,1,2,2-Tetrachloroethane	UG/KG	6.6	UJ	11	UJ	8.8	UJ
1,1,2-Trichloroethane	UG/KG	6.6	UJ	11	UJ	8.8	UJ
1,1-Dichloroethane	UG/KG	6.6	UJ	11	UJ	8.8	UJ
1,1-Dichloroethene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
1,2-Dichloroethane	UG/KG	6.6	UJ	11	UJ	8.8	UJ
1,2-Dichloropropane	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Acetone	UG/KG	21	J	72	J	47	J
Benzene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Bromodichloromethane	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Bromoform	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Carbon disulfide	UG/KG	3.3	UJ	6.7	J	5.0	J
Carbon tetrachloride	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Chlorobenzene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Chlorodibromomethane	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Chloroethane	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Chloroform	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Cis-1,2-Dichloroethene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Cis-1,3-Dichloropropene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Ethyl benzene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Meta/Para Xylene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Methyl bromide	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Methyl butyl ketone	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Methyl chloride	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Methyl ethyl ketone	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Methyl isobutyl ketone	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Methylene chloride	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Ortho Xylene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Styrene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Tetrachloroethene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Toluene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Trans-1,2-Dichloroethene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Trans-1,3-Dichloropropene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Trichloroethene	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Vinyl chloride	UG/KG	6.6	UJ	11	UJ	8.8	UJ
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	UG/KG	650	UJ	1100	UJ	875	UJ
1,2-Dichlorobenzene	UG/KG	650	UJ	1100	UJ	875	UJ
1,3-Dichlorobenzene	UG/KG	650	UJ	1100	UJ	875	UJ
1,4-Dichlorobenzene	UG/KG	650	UJ	1100	UJ	875	UJ
2,4,5-Trichlorophenol	UG/KG	1600	UJ	2600	UJ	2100	UJ
2,4,6-Trichlorophenol	UG/KG	650	UJ	1100	UJ	875	UJ
2,4-Dichlorophenol	UG/KG	650	UJ	1100	UJ	875	UJ
2,4-Dimethylphenol	UG/KG	650	UJ	1100	UJ	875	UJ
2,4-Dinitrophenol	UG/KG	1600	UJ	2600	UJ	2100	UJ

Table C-1K
SAMPLE-DUPLICATE MERGING RESULTS - DITCH SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID		SDDRMO-8		SDDRMO-8		SDDRMO-8	
Matrix		DITCHSOIL		DITCHSOIL		DITCHSOIL	
Sample ID		DRMO-4005		DRMO-4008		DRMO-4008/DRMO-4005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		2		2		2	
Sample Date		11/5/2002		11/5/2002		11/5/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1		1		1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
2,4-Dinitrotoluene	UG/KG	650	UJ	1100	UJ	875	UJ
2,6-Dinitrotoluene	UG/KG	650	UJ	1100	UJ	875	UJ
2-Chloronaphthalene	UG/KG	650	UJ	1100	UJ	875	UJ
2-Chlorophenol	UG/KG	650	UJ	1100	UJ	875	UJ
2-Methylnaphthalene	UG/KG	650	UJ	1100	UJ	875	UJ
2-Methylphenol	UG/KG	650	UJ	1100	UJ	875	UJ
2-Nitroaniline	UG/KG	1600	UJ	2600	UJ	2100	UJ
2-Nitrophenol	UG/KG	650	UJ	1100	UJ	875	UJ
3 or 4-Methylphenol	UG/KG	650	UJ	1100	UJ	875	UJ
3,3'-Dichlorobenzidine	UG/KG	650	UJ	1100	UJ	875	UJ
3-Nitroaniline	UG/KG	1600	UJ	2600	UJ	2100	UJ
4,6-Dinitro-2-methylphenol	UG/KG	1600	UJ	2600	UJ	2100	UJ
4-Bromophenyl phenyl ether	UG/KG	650	UJ	1100	UJ	875	UJ
4-Chloro-3-methylphenol	UG/KG	650	UJ	1100	UJ	875	UJ
4-Chloroaniline	UG/KG	650	UJ	1100	UJ	875	UJ
4-Chlorophenyl phenyl ether	UG/KG	650	UJ	1100	UJ	875	UJ
4-Nitroaniline	UG/KG	1600	UJ	2600	UJ	2100	UJ
4-Nitrophenol	UG/KG	1600	UJ	2600	UJ	2100	UJ
Acenaphthene	UG/KG	650	UJ	1100	UJ	875	UJ
Acenaphthylene	UG/KG	650	UJ	1100	UJ	875	UJ
Anthracene	UG/KG	650	UJ	1100	UJ	875	UJ
Benzo(a)anthracene	UG/KG	650	UJ	1100	UJ	875	UJ
Benzo(a)pyrene	UG/KG	650	UJ	1100	UJ	875	UJ
Benzo(b)fluoranthene	UG/KG	650	UJ	1100	UJ	875	UJ
Benzo(ghi)perylene	UG/KG	650	UJ	1100	UJ	875	UJ
Benzo(k)fluoranthene	UG/KG	650	UJ	1100	UJ	875	UJ
Bis(2-Chloroethoxy)methane	UG/KG	650	UJ	1100	UJ	875	UJ
Bis(2-Chloroethyl)ether	UG/KG	650	UJ	1100	UJ	875	UJ
Bis(2-Chloroisopropyl)ether	UG/KG	650	UJ	1100	UJ	875	UJ
Bis(2-Ethylhexyl)phthalate	UG/KG	650	UJ	1100	UJ	875	UJ
Butylbenzylphthalate	UG/KG	650	UJ	1100	UJ	875	UJ
Carbazole	UG/KG	650	UJ	1100	UJ	875	UJ
Chrysene	UG/KG	650	UJ	1100	UJ	875	UJ
Di-n-butylphthalate	UG/KG	650	UJ	1100	UJ	875	UJ
Di-n-octylphthalate	UG/KG	650	UJ	1100	UJ	875	UJ
Dibenz(a,h)anthracene	UG/KG	650	UJ	1100	UJ	875	UJ
Dibenzofuran	UG/KG	650	UJ	1100	UJ	875	UJ
Diethyl phthalate	UG/KG	650	UJ	1100	UJ	875	UJ
Dimethylphthalate	UG/KG	650	UJ	1100	UJ	875	UJ
Fluoranthene	UG/KG	650	UJ	1100	UJ	875	UJ
Fluorene	UG/KG	650	UJ	1100	UJ	875	UJ
Hexachlorobenzene	UG/KG	650	UJ	1100	UJ	875	UJ
Hexachlorobutadiene	UG/KG	650	UJ	1100	UJ	875	UJ
Hexachlorocyclopentadiene	UG/KG	650	UJ	1100	UJ	875	UJ
Hexachloroethane	UG/KG	650	UJ	1100	UJ	875	UJ
Indeno(1,2,3-cd)pyrene	UG/KG	650	UJ	1100	UJ	875	UJ

Table C-1K
SAMPLE-DUPLICATE MERGING RESULTS - DITCH SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID		SDDRMO-8		SDDRMO-8		SDDRMO-8	
Matrix		DITCHSOIL		DITCHSOIL		DITCHSOIL	
Sample ID		DRMO-4005		DRMO-4008		DRMO-4008/DRMO-4005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		2		2		2	
Sample Date		11/5/2002		11/5/2002		11/5/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1		1		1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
Isophorone	UG/KG	650	UJ	1100	UJ	875	UJ
N-Nitrosodiphenylamine	UG/KG	650	UJ	1100	UJ	875	UJ
N-Nitrosodipropylamine	UG/KG	650	UJ	1100	UJ	875	UJ
Naphthalene	UG/KG	650	UJ	1100	UJ	875	UJ
Nitrobenzene	UG/KG	650	UJ	1100	UJ	875	UJ
Pentachlorophenol	UG/KG	1600	UJ	2600	UJ	2100	UJ
Phenanthrene	UG/KG	650	UJ	1100	UJ	875	UJ
Phenol	UG/KG	650	UJ	1100	UJ	875	UJ
Pyrene	UG/KG	650	UJ	1100	UJ	875	UJ
Pesticides/PCBs							
4,4'-DDD	UG/KG	0.4	UJ	0.65	UJ	0.5	UJ
4,4'-DDE	UG/KG	0.4	UJ	0.65	UJ	0.5	UJ
4,4'-DDT	UG/KG	0.4	UJ	0.65	UJ	0.5	UJ
Aldrin	UG/KG	0.2	UJ	0.32	UJ	0.3	UJ
Alpha-BHC	UG/KG	2.4	UJ	3.9	UJ	3.2	UJ
Alpha-Chlordane	UG/KG	0.6	UJ	0.97	UJ	0.8	UJ
Beta-BHC	UG/KG	0.2	UJ	0.32	UJ	0.3	UJ
Chlordane	UG/KG	3.8	UJ	6.1	UJ	5.0	UJ
Delta-BHC	UG/KG	0.4	UJ	0.65	UJ	0.5	UJ
Dieldrin	UG/KG	0.2	UJ	0.32	UJ	0.3	UJ
Endosulfan I	UG/KG	1	UJ	1.6	UJ	1	UJ
Endosulfan II	UG/KG	0.6	UJ	0.97	UJ	0.8	UJ
Endosulfan sulfate	UG/KG	1.2	UJ	1.9	UJ	1.6	UJ
Endrin	UG/KG	1.6	UJ	2.6	UJ	2.1	UJ
Endrin aldehyde	UG/KG	1.6	UJ	2.6	UJ	2.1	UJ
Endrin ketone	UG/KG	0.2	UJ	0.32	UJ	0.3	UJ
Gamma-BHC/Lindane	UG/KG	0.2	UJ	0.32	UJ	0.3	UJ
Gamma-Chlordane	UG/KG	0.6	UJ	0.97	UJ	0.8	UJ
Heptachlor	UG/KG	2	UJ	3.2	UJ	3	UJ
Heptachlor epoxide	UG/KG	0.6	UJ	0.97	UJ	0.8	UJ
Methoxychlor	UG/KG	0.2	UJ	0.32	UJ	0.3	UJ
Toxaphene	UG/KG	6.4	UJ	10	UJ	8.2	UJ
Aroclor-1016	UG/KG	10	UJ	17	UJ	13.5	UJ
Aroclor-1221	UG/KG	2.6	UJ	4.2	UJ	3.4	UJ
Aroclor-1232	UG/KG	16	UJ	26	UJ	21	UJ
Aroclor-1242	UG/KG	4.3	UJ	7	UJ	6	UJ
Aroclor-1248	UG/KG	11	UJ	18	UJ	15	UJ
Aroclor-1254	UG/KG	21	UJ	34	UJ	28	UJ
Aroclor-1260	UG/KG	3.9	UJ	6.4	UJ	5.2	UJ
Metals and Cyanide							
Aluminum	MG/KG	10100		14700	J	12400	J
Antimony	MG/KG	1.8	UJ	2.9	UJ	2.4	UJ
Arsenic	MG/KG	2.1		5.9	J	4.0	J
Barium	MG/KG	72.2	J	122	J	97.1	J
Beryllium	MG/KG	0.63		1	J	0.8	J
Cadmium	MG/KG	0.24	U	0.39	UJ	0.32	UJ
Calcium	MG/KG	24000		34500	J	29250	J

Table C-1K
SAMPLE-DUPLICATE MERGING RESULTS - DITCH SOIL
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID		SDDRMO-8		SDDRMO-8		SDDRMO-8	
Matrix		DITCHSOIL		DITCHSOIL		DITCHSOIL	
Sample ID		DRMO-4005		DRMO-4008		DRMO-4008/DRMO-4005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		2		2		2	
Sample Date		11/5/2002		11/5/2002		11/5/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1		1		1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
Chromium	MG/KG	22.6		32.7	J	27.7	J
Cobalt	MG/KG	11.4		20.2	J	15.8	J
Copper	MG/KG	34		50.6	J	42	J
Cyanide, Amenable	MG/KG	1.1	U	1.59	UJ	1.3	UJ
Cyanide, Total	MG/KG	1.1	U	1.59	UJ	1.3	UJ
Iron	MG/KG	20500		34100	J	27300	J
Lead	MG/KG	58.3		85.2	J	71.8	J
Magnesium	MG/KG	5150		7310	J	6230	J
Manganese	MG/KG	471		885	J	678	J
Mercury	MG/KG	0.11		0.18	J	0.15	J
Nickel	MG/KG	30.9		45.3	J	38.1	J
Potassium	MG/KG	905		1270	J	1088	J
Selenium	MG/KG	0.82	U	1.4	UJ	1.1	UJ
Silver	MG/KG	0.65		1	J	0.8	J
Sodium	MG/KG	388		656	J	522	J
Thallium	MG/KG	0.61	U	1	UJ	1	UJ
Vanadium	MG/KG	17.8		27.3	J	22.6	J
Zinc	MG/KG	135	J	195	J	165	J
Other							
Total Organic Carbon	MG/KG	7100	J	7100	J	7100	J
Total Petroleum Hydrocarbons	MG/KG	80	UJ	130	UJ	105	UJ

NOTES:
Shaded cells indicate a detect/non-detect pair. Concentrations reported as not detected in the shaded pair, as indicated by "U" or "UJ" data qualifiers, are presented at 1/2 the value reported by the laboratory. The modified value (i.e., 1/2 the laboratory's reported detection limit) was used to compute the average result.

When a chemical was not detected in either the sample or the duplicate, as indicated by “U” or “UJ” data qualifiers, the average of the two reported detection limits at full value is reported as the final value.

Table C-1L
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		MW121C-4	MW121C-4	MW121C-4	MW121C-1	MW121C-1	MW121C-1
Matrix		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Sample ID		121C-2002	121C-2004	121C-2004/121C-2002	EB023	EB153	EB153/EB023
Sample Depth to Top of Sample		4.5	4.5	4.5	2.1	2.1	2.1
Sample Depth to Bottom of Sample		10	10	10	9.7	9.7	9.7
Sample Date		2/3/2003	2/4/2003	2/4/2003	3/17/1998	3/17/1998	3/17/1998
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	EBS	EBS	EBS
		2	2	2			
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
1,1,2-Trichloroethane	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
1,1-Dichloroethane	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
1,1-Dichloroethene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	UG/L				1 U	1 U	1 U
1,2-Dibromoethane	UG/L				1 U	1 U	1 U
1,2-Dichlorobenzene	UG/L				1 U	1 U	1 U
1,2-Dichloroethane	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
1,2-Dichloropropane	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
1,3-Dichlorobenzene	UG/L				1 U	1 U	1 U
1,4-Dichlorobenzene	UG/L				1 U	1 U	1 U
Acetone	UG/L	5 UJ	5 UJ	5 UJ	52	61	57
Benzene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Bromochloromethane	UG/L				1 U	1 U	1 U
Bromodichloromethane	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Bromoform	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Carbon disulfide	UG/L	5 UJ	5 UJ	5 UJ	2	2	2
Carbon tetrachloride	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Chlorobenzene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Chlorodibromomethane	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Chloroethane	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Chloroform	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Cis-1,3-Dichloropropene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Ethyl benzene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Meta/Para Xylene	UG/L	5 U	5 U	5 U			
Methyl bromide	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Methyl butyl ketone	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Methyl chloride	UG/L	5 UJ	5 UJ	5 UJ	1 U	1 U	1 U
Methyl ethyl ketone	UG/L	5 UJ	5 UJ	5 UJ	5 U	5 U	5 U

Table C-1L
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		MW121C-4	MW121C-4	MW121C-4	MW121C-1	MW121C-1	MW121C-1
Matrix		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Sample ID		121C-2002	121C-2004	121C-2004/121C-2002	EB023	EB153	EB153/EB023
Sample Depth to Top of Sample		4.5	4.5	4.5	2.1	2.1	2.1
Sample Depth to Bottom of Sample		10	10	10	9.7	9.7	9.7
Sample Date		2/3/2003	2/4/2003	2/4/2003	3/17/1998	3/17/1998	3/17/1998
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI 2	PID-RI 2	PID-RI 2	EBS	EBS	EBS
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Methyl isobutyl ketone	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Methylene chloride	UG/L	5 U	5 U	5 U	2 U	2 U	2 U
Ortho Xylene	UG/L	5 U	5 U	5 U			
Styrene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Tetrachloroethene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Toluene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Total Xylenes	UG/L				1 U	1 U	1 U
Trans-1,2-Dichloroethene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Trichloroethene	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Vinyl chloride	UG/L	5 U	5 U	5 U	1 U	1 U	1 U
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	UG/L	1.2 U	1.3 UJ	1.3 UJ		1.1 U	1.1 U
1,2-Dichlorobenzene	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
1,3-Dichlorobenzene	UG/L	1.2 U	1.3 UJ	1.3 UJ		1.1 U	1.1 U
1,4-Dichlorobenzene	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
2,4,5-Trichlorophenol	UG/L	1 U	1.1 U	1 U		2.7 U	2.7 U
2,4,6-Trichlorophenol	UG/L	1 U	1.1 U	1 U		1.1 U	1.1 U
2,4-Dichlorophenol	UG/L	1.4 U	1.4 U	1.4 U		1.1 U	1.1 U
2,4-Dimethylphenol	UG/L	2.4 U	2.4 U	2.4 U		1.1 U	1.1 U
2,4-Dinitrophenol	UG/L					2.7 U	2.7 U
2,4-Dinitrotoluene	UG/L	1.1 U	1.2 UJ	1.2 UJ		1.1 U	1.1 U
2,6-Dinitrotoluene	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
2-Chloronaphthalene	UG/L	1.2 U	1.3 UJ	1.3 UJ		1.1 U	1.1 U
2-Chlorophenol	UG/L	1.1 U	1.2 U	1.2 U		1.1 U	1.1 U
2-Methylnaphthalene	UG/L	1.2 U	1.3 UJ	1.3 UJ		1.1 U	1.1 U
2-Methylphenol	UG/L	1 U	1.1 U	1 U		1.1 U	1.1 U
2-Nitroaniline	UG/L	1 U	1.1 UJ	1 UJ		2.7 U	2.7 U
2-Nitrophenol	UG/L	1.1 U	1.2 U	1.2 U		1.1 U	1.1 U
3 or 4-Methylphenol	UG/L	1.9 U	1.9 U	1.9 U			
3,3'-Dichlorobenzidine	UG/L	1 UJ	1.1 UJ	1.1 UJ		1.1 U	1.1 U
3-Nitroaniline	UG/L	1.2 U	1.3 UJ	1.3 UJ		2.7 U	2.7 U

Table C-1L
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		MW121C-4	MW121C-4	MW121C-4	MW121C-1	MW121C-1	MW121C-1
Matrix		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Sample ID		121C-2002	121C-2004	121C-2004/121C-2002	EB023	EB153	EB153/EB023
Sample Depth to Top of Sample		4.5	4.5	4.5	2.1	2.1	2.1
Sample Depth to Bottom of Sample		10	10	10	9.7	9.7	9.7
Sample Date		2/3/2003	2/4/2003	2/4/2003	3/17/1998	3/17/1998	3/17/1998
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI 2	PID-RI 2	PID-RI 2	EBS	EBS	EBS
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
4,6-Dinitro-2-methylphenol	UG/L	1.2 U	1.3 U	1.3 U		2.7 U	2.7 U
4-Bromophenyl phenyl ether	UG/L	1.4 U	1.4 UJ	1.4 UJ		1.1 U	1.1 U
4-Chloro-3-methylphenol	UG/L	1.1 U	1.2 U	1.2 U		1.1 U	1.1 U
4-Chloroaniline	UG/L	1.2 UJ	1.3 UJ	1.3 UJ		1.1 U	1.1 U
4-Chlorophenyl phenyl ether	UG/L	1.2 U	1.3 UJ	1.3 UJ		1.1 U	1.1 U
4-Methylphenol	UG/L					1.1 U	1.1 U
4-Nitroaniline	UG/L	2.5 U	2.5 UJ	2.5 UJ		2.7 U	2.7 U
4-Nitrophenol	UG/L	1.1 U	1.2 U	1.2 U		2.7 U	2.7 U
Acenaphthene	UG/L	1 U	1.1 UJ	1.1 UJ		1.1 U	1.1 U
Acenaphthylene	UG/L	1.2 U	1.3 UJ	1.3 UJ		1.1 U	1.1 U
Anthracene	UG/L	1.4 U	1.4 UJ	1.4 UJ		1.1 U	1.1 U
Benzo(a)anthracene	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
Benzo(a)pyrene	UG/L	1.6 U	1.6 UJ	1.6 UJ		1.1 U	1.1 U
Benzo(b)fluoranthene	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
Benzo(ghi)perylene	UG/L	1.4 UJ	1.4 UJ	1.4 UJ		1.1 U	1.1 U
Benzo(k)fluoranthene	UG/L	2.7 U	2.7 UJ	2.7 UJ		1.1 U	1.1 U
Bis(2-Chloroethoxy)methane	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
Bis(2-Chloroethyl)ether	UG/L	1.2 U	1.3 UJ	1.3 UJ		1.1 U	1.1 U
Bis(2-Chloroisopropyl)ether	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
Bis(2-Ethylhexyl)phthalate	UG/L	1 U	1.1 UJ	1 UJ		0.23 J	0.23 J
Butylbenzylphthalate	UG/L	1 U	1.1 UJ	1 UJ		0.12 J	0.12 J
Carbazole	UG/L	0.43 U	0.44 UJ	0.44 UJ		1.1 U	1.1 U
Chrysene	UG/L	1.7 U	1.7 UJ	1.7 UJ		1.1 U	1.1 U
Di-n-butylphthalate	UG/L	1.2 U	1.3 UJ	1.3 UJ		1.7	1.7
Di-n-octylphthalate	UG/L	1.6 U	1.6 UJ	1.6 UJ		1.1 U	1.1 U
Dibenz(a,h)anthracene	UG/L	1.6 UJ	1.6 UJ	1.6 UJ		1.1 UJ	1.1 UJ
Dibenzofuran	UG/L	1 U	1.1 UJ	1.1 UJ		1.1 U	1.1 U
Diethyl phthalate	UG/L	1 U	1.1 UJ	1.1 UJ		0.057 J	0.057 J
Dimethylphthalate	UG/L	1 U	1.1 UJ	1.1 UJ		1.1 U	1.1 U
Fluoranthene	UG/L	1 U	1.1 UJ	1.1 UJ		1.1 U	1.1 U
Fluorene	UG/L	1.1 U	1.2 UJ	1.2 UJ		1.1 U	1.1 U
Hexachlorobenzene	UG/L	1.1 U	1.2 UJ	1.2 UJ		1.1 U	1.1 U

Table C-1L
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		MW121C-4	MW121C-4	MW121C-4	MW121C-1	MW121C-1	MW121C-1
Matrix		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Sample ID		121C-2002	121C-2004	121C-2004/121C-2002	EB023	EB153	EB153/EB023
Sample Depth to Top of Sample		4.5	4.5	4.5	2.1	2.1	2.1
Sample Depth to Bottom of Sample		10	10	10	9.7	9.7	9.7
Sample Date		2/3/2003	2/4/2003	2/4/2003	3/17/1998	3/17/1998	3/17/1998
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	EBS	EBS	EBS
		2	2	2			
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Hexachlorobutadiene	UG/L	1.6 U	1.6 UJ	1.6 UJ		0.061 J	0.061 J
Hexachlorocyclopentadiene	UG/L	4 U	4 UJ	4 UJ		1.1 UJ	1.1 UJ
Hexachloroethane	UG/L	1.1 U	1.2 UJ	1.2 UJ		1.1 U	1.1 U
Indeno(1,2,3-cd)pyrene	UG/L	1.7 U	1.7 UJ	1.7 UJ		1.1 U	1.1 U
Isophorone	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
N-Nitrosodiphenylamine	UG/L	2.1 U	2.1 UJ	2.1 UJ		1.1 U	1.1 U
N-Nitrosodipropylamine	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
Naphthalene	UG/L	1.2 U	1.3 UJ	1.25 UJ		1.1 U	1.1 U
Nitrobenzene	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
Pentachlorophenol	UG/L	2 U	2 U	2 U		2.7 U	2.7 U
Phenanthrene	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
Phenol	UG/L	1 U	1.1 U	1 U		1.1 U	1.1 U
Pyrene	UG/L	1 U	1.1 UJ	1 UJ		1.1 U	1.1 U
Pesticides/PCBs							
4,4'-DDD	UG/L	0.01 R	0.01 R		0.9	0.055 U	0.5 J
4,4'-DDE	UG/L	0.005 UJ	0.005 UJ	0.005 UJ	0.27 J	0.093 J	0.18 J
4,4'-DDT	UG/L	0.01 R	0.01 R		0.29 J	0.28	0.29 J
Aldrin	UG/L	0.02 U	0.02 U	0.02 U	0.057 U	0.057 U	0.057 U
Alpha-BHC	UG/L	0.01 U	0.01 U	0.01 U	0.0285 U	0.036 J	0.032 J
Alpha-Chlordane	UG/L	0.02 U	0.02 U	0.02 U	0.096	0.068	0.082
Beta-BHC	UG/L	0.01 U	0.01 U	0.01 U	0.56 J	0.096 J	0.33 J
Chlordane	UG/L	0.14 U	0.14 U	0.14 U			
Delta-BHC	UG/L	0.004 UJ	0.004 UJ	0.004 UJ	0.23 J	0.094	0.16 J
Dieldrin	UG/L	0.009 U	0.009 U	0.009 U	0.055 U	0.052 J	0.05 J
Endosulfan I	UG/L	0.02 UJ	0.02 UJ	0.02 UJ	0.11 J	0.08 J	0.10 J
Endosulfan II	UG/L	0.01 UJ	0.01 UJ	0.01 UJ	0.28 J	0.055 U	0.17 J
Endosulfan sulfate	UG/L	0.02 U	0.02 U	0.02 U	0.28 J	0.14 J	0.21 J
Endrin	UG/L	0.02 UJ	0.02 UJ	0.02 UJ	0.11 U	0.11 U	0.11 U
Endrin aldehyde	UG/L	0.02 UJ	0.02 UJ	0.02 UJ	0.22 J	0.073 J	0.15 J
Endrin ketone	UG/L	0.009 U	0.009 U	0.009 U	0.11 U	0.11 U	0.11 U
Gamma-BHC/Lindane	UG/L	0.009 U	0.009 U	0.009 U	0.057 U	0.057 U	0.057 U
Gamma-Chlordane	UG/L	0.01 U	0.01 U	0.01 U	0.47	0.086 J	0.28 J

Table C-1L
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID		MW121C-4	MW121C-4	MW121C-4	MW121C-1	MW121C-1	MW121C-1
Matrix		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Sample ID		121C-2002	121C-2004	121C-2004/121C-2002	EB023	EB153	EB153/EB023
Sample Depth to Top of Sample		4.5	4.5	4.5	2.1	2.1	2.1
Sample Depth to Bottom of Sample		10	10	10	9.7	9.7	9.7
Sample Date		2/3/2003	2/4/2003	2/4/2003	3/17/1998	3/17/1998	3/17/1998
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	EBS	EBS	EBS
		2	2	2			
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Heptachlor	UG/L	0.007 U	0.007 U	0.007 U	0.23 J	0.058 J	0.14 J
Heptachlor epoxide	UG/L	0.009 UJ	0.009 UJ	0.009 UJ	0.0285 U	0.072 J	0.050 J
Methoxychlor	UG/L	0.008 UJ	0.008 UJ	0.008 UJ	0.57	0.285 U	0.43 J
Toxaphene	UG/L	0.12 U	0.12 U	0.12 U	5.7 U	5.7 U	5.7 U
Aroclor-1016	UG/L	0.24 U	0.24 U	0.24 U	1.1 U	1.1 U	1.1 U
Aroclor-1221	UG/L	0.08 U	0.08 U	0.08 U	2.3 U	2.3 U	2.3 U
Aroclor-1232	UG/L	0.09 U	0.09 U	0.09 U	1.1 U	1.1 U	1.1 U
Aroclor-1242	UG/L	0.08 U	0.08 U	0.08 U	1.1 U	1.1 U	1.1 U
Aroclor-1248	UG/L	0.12 U	0.12 U	0.12 U	1.1 U	1.1 U	1.1 U
Aroclor-1254	UG/L	0.05 U	0.05 U	0.05 U	1.1 U	1.1 U	1.1 U
Aroclor-1260	UG/L	0.01 U	0.01 U	0.01 U	1.1 U	1.1 U	1.1 U
Metals and Cyanide							
Aluminum	UG/L	146 J	1030	588 J	133	738 J	436 J
Antimony	UG/L	3.75 U	10.9 J	7.33 J	5.1 U	5.1 U	5.1 U
Arsenic	UG/L	4.5 U	4.5 U	4.5 U	1.85 U	3.8	2.8 J
Barium	UG/L	29.6	32.4	31.0	39.5	38	39
Beryllium	UG/L	0.9 U	0.9 U	0.9 U	0.1 U	0.1 U	0.1 U
Cadmium	UG/L	0.8 U	0.8 U	0.8 U	0.39	0.15 U	0.27 J
Calcium	UG/L	420000	513000	466500	172000 J	163000	167500 J
Chromium	UG/L	0.7 U	5.8	3.3 J	1.2	2.4	1.8
Cobalt	UG/L	1.15 U	4.8 J	3.0 J	0.7 U	1.6	1 J
Copper	UG/L	2 U	2 U	2 U	0.6 U	2	1 J
Cyanide	UG/L				5 U	5 U	5 U
Cyanide, Amenable	MG/L	0.01 U	0.01 U	0.01 U			
Cyanide, Total	MG/L	0.01 U	0.01 U	0.01 U			
Iron	UG/L	17.45 U	1720	868.725 J	346	1430	888
Lead	UG/L	5.6	4.8	5.2	1.8 U	1.8 U	1.8 U
Magnesium	UG/L	73600	88000	80800	23800	24100	23950
Manganese	UG/L	328	244	286	1590	1140	1365
Mercury	UG/L	0.2 U	0.2 U	0.2 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	1 U	3.2 J	2.1 J	2.8	4.2	3.5
Potassium	UG/L	9430	6320	7875	7610	10900	9255

Table C-1L
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

	Facility	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
	Location ID	MW121C-4	MW121C-4	MW121C-4	MW121C-1	MW121C-1	MW121C-1
	Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
	Sample ID	121C-2002	121C-2004	121C-2004/121C-2002	EB023	EB153	EB153/EB023
	Sample Depth to Top of Sample	4.5	4.5	4.5	2.1	2.1	2.1
	Sample Depth to Bottom of Sample	10	10	10	9.7	9.7	9.7
	Sample Date	2/3/2003	2/4/2003	2/4/2003	3/17/1998	3/17/1998	3/17/1998
	QC Code	SA	SA	SA/DU	SA	SA	SA/DU
	Investigation	PID-RI 2	PID-RI 2	PID-RI 2	EBS	EBS	EBS
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Selenium	UG/L	3 U	5 U	4 U	3.7 J	5.6 J	4.7 J
Silver	UG/L	3.7 U	3.7 U	3.7 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	60100	56700	58400	8920	11200	10060
Thallium	UG/L	4.2 U	4.2 U	4.2 U	6.7 U	6.7 U	6.7 U
Vanadium	UG/L	2.5 U	2.5 U	2.5 U	0.75 U	2.4	1.6 J
Zinc	UG/L	9.2 J	24	17 J	2.4	9.3	5.9
Other							
Total Petroleum Hydrocarbons	MG/L	0.041 U	0.04 U	0.04 U			

NOTES:

Shaded cells indicate a detect/non-detect pair. Concentrations reported as not detected in the shaded pair, as indicated by "U" or "UJ" data qualifiers, are presented at 1/2 the value reported by the laboratory. The modified value (i.e., 1/2 the laboratory's reported detection limit) was used to compute the average result.

When a chemical was not detected in either the sample or the duplicate, as indicated by “U” or “UJ” data qualifiers, the average of the two reported detection limits at full value is reported as the final value.

Table C-1M
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		Building 360	Building 360	Building 360	Building 360	Building 360	Building 360
Location ID		MW-1	MW-1	MW-1	MW-1	MW-1	MW-1
Matrix		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Sample ID		DRMO-2005	DRMO-2008	DRMO-2005/DRMO-2008	DRMO-2013	121C-2019	DRMO-2013/DRMO-2019
Sample Depth to Top of Sample		16.5	16.5	16.5	16.6	16.6	16.6
Sample Depth to Bottom of Sample		16.5	16.5	16.5	16.6	16.6	16.6
Sample Date		4/4/2003	4/4/2003	4/4/2003	5/9/2003	5/9/2003	5/9/2003
QC Code		SA	SA	SADU	SA	SA	SADU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		2	2	2	3	3	3
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
1,1,2,2-Tetrachloroethane	UG/L	5 U	5 U	5 U	0.3 U	0.3 U	0.3 U
1,1,2-Trichloroethane	UG/L	5 U	5 U	5 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethane	UG/L	2.5 UJ	4.4 J	3 J	4.3	4.3	4.3
1,1-Dichloroethene	UG/L	5 U	5 U	5 U	0.3 U	0.3 U	0.3 U
1,2-Dibromo-3-chloropropane	UG/L						
1,2-Dibromoethane	UG/L						
1,2-Dichlorobenzene	UG/L						
1,2-Dichloroethane	UG/L	5 U	5 U	5 U	0.3 U	0.3 U	0.3 U
1,2-Dichloropropane	UG/L	5 U	5 U	5 U	0.2 U	0.5 J	0.4 J
1,3-Dichlorobenzene	UG/L						
1,4-Dichlorobenzene	UG/L						
Acetone	UG/L	5 R	5 R	5 R	5.8 R	8.4 J	8.4 J
Benzene	UG/L	5 U	5 U	5 U	0.3 U	0.3 U	0.3 U
Bromochloromethane	UG/L						
Bromodichloromethane	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Bromoform	UG/L	5 U	5 U	5 U	0.3 U	0.3 U	0.3 U
Carbon disulfide	UG/L	5 UJ	5 UJ	5 UJ	0.3 U	0.3 U	0.3 U
Carbon tetrachloride	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Chlorobenzene	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Chlorodibromomethane	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Chloroethane	UG/L	5 UJ	5 UJ	5 UJ	0.4 U	0.4 U	0.4 U
Chloroform	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Cis-1,2-Dichloroethene	UG/L	5 U	5 U	5 U	0.15 U	0.4 J	0.3 J
Cis-1,3-Dichloropropene	UG/L	5 U	5 U	5 U	0.3 U	0.3 U	0.3 U
Ethyl benzene	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Meta/Para Xylene	UG/L	5 U	5 U	5 U	0.8 U	0.8 U	0.8 U
Methyl bromide	UG/L	5 UJ	5 UJ	5 UJ	0.4 U	0.4 U	0.4 U
Methyl butyl ketone	UG/L	5 U	5 U	5 U	2.8 U	2.8 U	2.8 U
Methyl chloride	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Methyl ethyl ketone	UG/L	5 UJ	5 UJ	5 UJ	3.6 R	3.6 R	
Methyl isobutyl ketone	UG/L	5 U	5 U	5 U	2.5 U	2.5 U	2.5 U
Methylene chloride	UG/L	5 UJ	5 UJ	5 UJ	1 J	1 J	1 J
Ortho Xylene	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Styrene	UG/L	5 U	5 U	5 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	UG/L	5 UJ	5 UJ	5 UJ	0.5 U	0.5 U	0.5 U
Toluene	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Total Xylenes	UG/L						

Table C-1M
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		Building 360	Building 360	Building 360	Building 360	Building 360	Building 360
Location ID		MW-1	MW-1	MW-1	MW-1	MW-1	MW-1
Matrix		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Sample ID		DRMO-2005	DRMO-2008	DRMO-2005/DRMO-2008	DRMO-2013	121C-2019	DRMO-2013/DRMO-2019
Sample Depth to Top of Sample		16.5	16.5	16.5	16.6	16.6	16.6
Sample Depth to Bottom of Sample		16.5	16.5	16.5	16.6	16.6	16.6
Sample Date		4/4/2003	4/4/2003	4/4/2003	5/9/2003	5/9/2003	5/9/2003
QC Code		SA	SA	SADU	SA	SA	SADU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		2	2	2	3	3	3
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Trans-1,2-Dichloroethene	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Trans-1,3-Dichloropropene	UG/L	5 U	5 U	5 U	0.3 U	0.3 U	0.3 U
Trichloroethene	UG/L	5 U	5 U	5 U	0.4 U	0.4 U	0.4 U
Vinyl chloride	UG/L	2.2 J	2.4 J	2.3 J	1.4	1.3	1.4
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	UG/L	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U
1,2-Dichlorobenzene	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
1,3-Dichlorobenzene	UG/L	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
2,4,5-Trichlorophenol	UG/L	1 R	1 R		1 U	1 U	1 U
2,4,6-Trichlorophenol	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
2,4-Dichlorophenol	UG/L	1.4 R	1.3 R		1.3 U	1.3 U	1.3 U
2,4-Dimethylphenol	UG/L	2.4 R	2.3 R		2.3 U	2.3 U	2.3 U
2,4-Dinitrophenol	UG/L				2 UJ	2 UJ	2 UJ
2,4-Dinitrotoluene	UG/L	1.1 UJ	1.1 UJ	1.1 UJ	1.1 U	1.1 U	1.1 U
2,6-Dinitrotoluene	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
2-Chloronaphthalene	UG/L	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U
2-Chlorophenol	UG/L	1.1 R	1.1 R		1.1 U	1.1 U	1.1 U
2-Methylnaphthalene	UG/L	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U
2-Methylphenol	UG/L	1 R	1 R		1 U	1 U	1 U
2-Nitroaniline	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
2-Nitrophenol	UG/L	1.1 R	1.1 R		1.1 U	1.1 U	1.1 U
3 or 4-Methylphenol	UG/L						
3,3'-Dichlorobenzidine	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
3-Nitroaniline	UG/L	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ
4,6-Dinitro-2-methylphenol	UG/L	1.2 R	1.2 R		1.2 UJ	1.2 UJ	1.2 UJ
4-Bromophenyl phenyl ether	UG/L	1.4 UJ	1.3 UJ	1.4 UJ	1.3 U	1.3 U	1.3 U
4-Chloro-3-methylphenol	UG/L	1.1 R	1.1 R		1.1 U	1.1 U	1.1 U
4-Chloroaniline	UG/L	1.2 R	1.2 R		1.2 UJ	1.2 UJ	1.2 UJ
4-Chlorophenyl phenyl ether	UG/L	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U
4-Methylphenol	UG/L	1.9 R	1.8 R		1.8 U	1.8 U	1.8 U
4-Nitroaniline	UG/L	2.5 UJ	2.4 UJ	2.5 UJ	2.4 UJ	2.4 UJ	2.4 UJ
4-Nitrophenol	UG/L	1.1 R	1.1 R		1.1 U	1.1 U	1.1 U
Acenaphthene	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Acenaphthylene	UG/L	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U
Anthracene	UG/L	1.4 UJ	1.3 UJ	1.4 UJ	1.3 U	1.3 U	1.3 U
Benzo(a)anthracene	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Benzo(a)pyrene	UG/L	1.6 UJ	1.5 UJ	1.6 UJ	1.5 U	1.5 U	1.5 U
Benzo(b)fluoranthene	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U

Table C-1M
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		Building 360	Building 360	Building 360	Building 360	Building 360	Building 360
Location ID		MW-1	MW-1	MW-1	MW-1	MW-1	MW-1
Matrix		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Sample ID		DRMO-2005	DRMO-2008	DRMO-2005/DRMO-2008	DRMO-2013	121C-2019	DRMO-2013/DRMO-2019
Sample Depth to Top of Sample		16.5	16.5	16.5	16.6	16.6	16.6
Sample Depth to Bottom of Sample		16.5	16.5	16.5	16.6	16.6	16.6
Sample Date		4/4/2003	4/4/2003	4/4/2003	5/9/2003	5/9/2003	5/9/2003
QC Code		SA	SA	SADU	SA	SA	SADU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		2	2	2	3	3	3
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Benzo(ghi)perylene	UG/L	1.4 UJ	1.3 UJ	1.4 UJ	1.3 UJ	1.3 UJ	1.3 UJ
Benzo(k)fluoranthene	UG/L	2.7 UJ	2.7 UJ	2.7 UJ	2.6 U	2.7 U	2.7 U
Bis(2-Chloroethoxy)methane	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Bis(2-Chloroethyl)ether	UG/L	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Bis(2-Chloroisopropyl)ether	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Bis(2-Ethylhexyl)phthalate	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Butylbenzylphthalate	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Carbazole	UG/L	0.43 UJ	0.42 UJ	0.43 UJ	0.42 U	0.42 U	0.42 U
Chrysene	UG/L	1.7 UJ	1.6 UJ	1.7 UJ	1.6 U	1.6 U	1.6 U
Di-n-butylphthalate	UG/L	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U
Di-n-octylphthalate	UG/L	1.6 UJ	1.5 UJ	1.6 UJ	1.5 U	1.5 U	1.5 U
Dibenz(a,h)anthracene	UG/L	1.6 UJ	1.5 UJ	1.6 UJ	1.5 UJ	1.5 UJ	1.5 UJ
Dibenzofuran	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Diethyl phthalate	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Dimethylphthalate	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Fluoranthene	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Fluorene	UG/L	1.1 UJ	1.1 UJ	1.1 UJ	1.1 U	1.1 U	1.1 U
Hexachlorobenzene	UG/L	1.1 UJ	1.1 UJ	1.1 UJ	1.1 U	1.1 U	1.1 U
Hexachlorobutadiene	UG/L	1.6 UJ	1.5 UJ	1.6 UJ	1.5 U	1.5 U	1.5 U
Hexachlorocyclopentadiene	UG/L	4 UJ	3.9 UJ	4 UJ	3.8 R	3.9 R	
Hexachloroethane	UG/L	1.1 UJ	1.1 UJ	1.1 UJ	1.1 U	1.1 U	1.1 U
Indeno(1,2,3-cd)pyrene	UG/L	1.7 UJ	1.6 UJ	1.7 UJ	1.6 UJ	1.6 UJ	1.6 UJ
Isophorone	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
N-Nitrosodiphenylamine	UG/L	2.1 UJ	2 UJ	2 UJ	2 U	2 U	2 U
N-Nitrosodipropylamine	UG/L	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Naphthalene	UG/L	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U
Nitrobenzene	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Pentachlorophenol	UG/L	2 R	1.9 R		1.9 U	1.9 U	1.9 U
Phenanthrene	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Phenol	UG/L	1 R	1 R		1 U	1 U	1 U
Pyrene	UG/L	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U
Pesticides/PCBs							
4,4'-DDD	UG/L	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ
4,4'-DDE	UG/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
4,4'-DDT	UG/L	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Aldrin	UG/L	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 UJ	0.02 UJ
Alpha-BHC	UG/L	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Alpha-Chlordane	UG/L	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 UJ	0.02 UJ
Beta-BHC	UG/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Table C-1M
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		Building 360	Building 360	Building 360	Building 360	Building 360	Building 360
Location ID		MW-1	MW-1	MW-1	MW-1	MW-1	MW-1
Matrix		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Sample ID		DRMO-2005	DRMO-2008	DRMO-2005/DRMO-2008	DRMO-2013	121C-2019	DRMO-2013/DRMO-2019
Sample Depth to Top of Sample		16.5	16.5	16.5	16.6	16.6	16.6
Sample Depth to Bottom of Sample		16.5	16.5	16.5	16.6	16.6	16.6
Sample Date		4/4/2003	4/4/2003	4/4/2003	5/9/2003	5/9/2003	5/9/2003
QC Code		SA	SA	SADU	SA	SA	SADU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		2	2	2	3	3	3
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Chlordane	UG/L	0.14 U	0.14 U	0.14 U			
Delta-BHC	UG/L	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Dieldrin	UG/L	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U
Endosulfan I	UG/L	0.02 U	0.02 U	0.02 U	0.02 UJ	0.01 UJ	0.02 UJ
Endosulfan II	UG/L	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ
Endosulfan sulfate	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin aldehyde	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin ketone	UG/L	0.009 U	0.009 U	0.009 U	0.009 UJ	0.009 UJ	0.009 UJ
Gamma-BHC/Lindane	UG/L	0.009 U	0.009 U	0.009 U	0.009 UJ	0.009 UJ	0.009 UJ
Gamma-Chlordane	UG/L	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U	0.01 U	0.01 U
Heptachlor	UG/L	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U
Heptachlor epoxide	UG/L	0.009 U	0.009 U	0.009 U	0.009 U	0.008 U	0.0085 U
Methoxychlor	UG/L	0.008 UJ	0.008 UJ	0.008 UJ	0.008 U	0.008 U	0.008 U
Toxaphene	UG/L	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor-1016	UG/L	0.24 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.24 UJ	0.25 UJ
Aroclor-1221	UG/L	0.082 U	0.082 U	0.082 U	0.083 U	0.081 U	0.082 U
Aroclor-1232	UG/L	0.092 UJ	0.093 UJ	0.093 UJ	0.094 UJ	0.091 UJ	0.093 UJ
Aroclor-1242	UG/L	0.082 UJ	0.082 UJ	0.082 UJ	0.083 UJ	0.081 UJ	0.082 UJ
Aroclor-1248	UG/L	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor-1254	UG/L	0.051 U	0.052 U	0.052 U	0.052 U	0.051 U	0.052 U
Aroclor-1260	UG/L	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ
Metals and Cyanide							
Aluminum	UG/L	75 U	28.3 J	52 J	32 U	32 U	32 U
Antimony	UG/L	3.8 U	3.8 U	3.8 U	7.5 U	7.5 U	7.5 U
Arsenic	UG/L	4.5 U	4.5 U	4.5 U	7.1	2.25 U	4.7 J
Barium	UG/L	135	147	141	113	113	113
Beryllium	UG/L	0.1 U	0.1 U	0.1 U	0.9 U	0.9 U	0.9 U
Cadmium	UG/L	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Calcium	UG/L	88700	96900	92800	84200	87100	85650
Chromium	UG/L	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Cobalt	UG/L	0.7 U	0.7 U	0.7 U	2.3 U	2.3 U	2.3 U
Copper	UG/L	3.6 U	3.6 U	3.6 U	2 U	2 U	2 U
Cyanide	UG/L						
Cyanide, Amenable	MG/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Cyanide, Total	MG/L						
Iron	UG/L	3780 J	3290 J	3535 J	3810	3510	3660
Lead	UG/L	3 U	3 U	3 U	3 U	3 U	3 U
Magnesium	UG/L	11400	12500	11950	11000	11400	11200

Table C-1M
SAMPLE-DUPLICATE MERGING RESULTS - GROUNDWATER
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		Building 360	Building 360	Building 360	Building 360	Building 360	Building 360
Location ID		MW-1	MW-1	MW-1	MW-1	MW-1	MW-1
Matrix		GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Sample ID		DRMO-2005	DRMO-2008	DRMO-2005/DRMO-2008	DRMO-2013	121C-2019	DRMO-2013/DRMO-2019
Sample Depth to Top of Sample		16.5	16.5	16.5	16.6	16.6	16.6
Sample Depth to Bottom of Sample		16.5	16.5	16.5	16.6	16.6	16.6
Sample Date		4/4/2003	4/4/2003	4/4/2003	5/9/2003	5/9/2003	5/9/2003
QC Code		SA	SA	SADU	SA	SA	SADU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		2	2	2	3	3	3
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Manganese	UG/L	1580	1710	1645	1140	1180	1160
Mercury	UG/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	UG/L	3 J	3.8 J	3.4 J	2 U	2 U	2 U
Potassium	UG/L	9450 J	10600 J	10025 J	8820	9430	9125
Selenium	UG/L	4.2 J	3.3 J	3.8 J	0.65 U	3.2 J	1.9 J
Silver	UG/L	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Sodium	UG/L	40400	45300	42850	41100	44000	42550
Thallium	UG/L	5.3 U	5.3 U	5.3 U	4.4 J	2.1 U	3.3 J
Vanadium	UG/L	1.4 U	1.4 U	1.4 U	2.5 U	2.5 U	2.5 U
Zinc	UG/L	7.1 J	7.1 J	7.1 J	14.4 J	17 J	16 J
Other							
Total Petroleum Hydrocarbons	MG/L	1 U	1 U	1 U	1 U	1 U	1 U

NOTES:
Shaded cells indicate a detect/non-detect pair. Concentrations reported as not detected in the shaded pair, as indicated by "U" or "UJ" data qualifiers, are presented at 1/2 the value reported by the laboratory. The modified value (i.e., 1/2 the laboratory's reported detection limit) was used to compute the average result.

When a chemical was not detected in either the sample or the duplicate, as indicated by “U” or “UJ” data qualifiers, the average of the two reported detection limits at full value is reported as the final value.

Table C-1N
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE WATER
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID		SWDRMO-8		SWDRMO-8		SWDRMO-8	
Matrix		SURFACE WATER		SURFACE WATER		SURFACE WATER	
Sample ID		DRMO-3008		DRMO-3005		DRMO-3008/DRMO-3005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		N/A		N/A		N/A	
Sample Date		11/5/2002		11/5/2002		11/5/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1				1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	0.75	U	0.75	U	0.75	U
1,1,2,2-Tetrachloroethane	UG/L	0.7	U	0.7	U	0.7	U
1,1,2-Trichloroethane	UG/L	0.62	U	0.62	U	0.62	U
1,1-Dichloroethane	UG/L	0.66	U	0.66	U	0.66	U
1,1-Dichloroethene	UG/L	0.69	U	0.69	U	0.69	U
1,2-Dichloroethane	UG/L	0.56	U	0.56	U	0.56	U
1,2-Dichloropropane	UG/L	0.73	U	0.73	U	0.73	U
Acetone	UG/L	3.5	UJ	3.5	UJ	3.5	UJ
Benzene	UG/L	0.71	U	0.71	U	0.71	U
Bromodichloromethane	UG/L	0.73	U	0.73	U	0.73	U
Bromoform	UG/L	0.49	U	0.49	U	0.49	U
Carbon disulfide	UG/L	0.72	U	0.72	U	0.72	U
Carbon tetrachloride	UG/L	0.47	U	0.47	U	0.47	U
Chlorobenzene	UG/L	0.78	U	0.78	U	0.78	U
Chlorodibromomethane	UG/L	0.66	U	0.66	U	0.66	U
Chloroethane	UG/L	2.4	U	2.4	U	2.4	U
Chloroform	UG/L	0.61	U	0.61	U	0.61	U
Cis-1,2-Dichloroethene	UG/L	0.62	U	0.62	U	0.62	U
Cis-1,3-Dichloropropene	UG/L	0.66	U	0.66	U	0.66	U
Ethyl benzene	UG/L	0.76	U	0.76	U	0.76	U
Meta/Para Xylene	UG/L	1.5	U	1.5	U	1.5	U
Methyl bromide	UG/L	0.38	UJ	0.38	UJ	0.38	UJ
Methyl butyl ketone	UG/L	0.6	U	0.6	U	0.6	U
Methyl chloride	UG/L	0.51	U	0.51	U	0.51	U
Methyl ethyl ketone	UG/L	2.3	U	2.3	U	2.3	U
Methyl isobutyl ketone	UG/L	0.81	UJ	0.81	UJ	0.81	UJ
Methylene chloride	UG/L	1.8	U	1.8	U	1.8	U
Ortho Xylene	UG/L	0.72	U	0.72	U	0.72	U
Styrene	UG/L	0.92	U	0.92	U	0.92	U
Tetrachloroethene	UG/L	0.7	UJ	0.7	UJ	0.7	UJ
Toluene	UG/L	0.71	U	0.71	U	0.71	U
Trans-1,2-Dichloroethene	UG/L	0.81	U	0.81	U	0.81	U
Trans-1,3-Dichloropropene	UG/L	0.66	U	0.66	U	0.66	U
Trichloroethene	UG/L	0.72	U	0.72	U	0.72	U
Vinyl chloride	UG/L	0.79	U	0.79	U	0.79	U
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	UG/L	10	U	10	U	10	U
1,2-Dichlorobenzene	UG/L	10	U	10	U	10	U
1,3-Dichlorobenzene	UG/L	10	U	10	U	10	U
1,4-Dichlorobenzene	UG/L	10	U	10	U	10	U

Table C-1N
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE WATER
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID		SWDRMO-8		SWDRMO-8		SWDRMO-8	
Matrix		SURFACE WATER		SURFACE WATER		SURFACE WATER	
Sample ID		DRMO-3008		DRMO-3005		DRMO-3008/DRMO-3005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		N/A		N/A		N/A	
Sample Date		11/5/2002		11/5/2002		11/5/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1				1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
2,4,5-Trichlorophenol	UG/L	10	U	10	U	10	U
2,4,6-Trichlorophenol	UG/L	10	U	10	U	10	U
2,4-Dichlorophenol	UG/L	10	U	10	U	10	U
2,4-Dimethylphenol	UG/L	10	U	10	U	10	U
2,4-Dinitrophenol	UG/L	10	U	10	U	10	U
2,4-Dinitrotoluene	UG/L	10	U	10	U	10	U
2,6-Dinitrotoluene	UG/L	10	U	10	U	10	U
2-Chloronaphthalene	UG/L	10	U	10	U	10	U
2-Chlorophenol	UG/L	10	U	10	U	10	U
2-Methylnaphthalene	UG/L	10	U	10	U	10	U
2-Methylphenol	UG/L	10	U	10	U	10	U
2-Nitroaniline	UG/L	10	U	10	U	10	U
2-Nitrophenol	UG/L	10	U	10	U	10	U
3 or 4-Methylphenol	UG/L	10	U	10	U	10	U
3,3'-Dichlorobenzidine	UG/L	10	U	10	U	10	U
3-Nitroaniline	UG/L	10	U	10	U	10	U
4,6-Dinitro-2-methylphenol	UG/L	10	U	10	U	10	U
4-Bromophenyl phenyl ether	UG/L	10	U	10	U	10	U
4-Chloro-3-methylphenol	UG/L	10	U	10	U	10	U
4-Chloroaniline	UG/L	10	U	10	U	10	U
4-Chlorophenyl phenyl ether	UG/L	10	U	10	U	10	U
4-Nitroaniline	UG/L	10	U	10	U	10	U
4-Nitrophenol	UG/L	10	U	10	U	10	U
Acenaphthene	UG/L	10	U	10	U	10	U
Acenaphthylene	UG/L	10	U	10	U	10	U
Anthracene	UG/L	10	U	10	U	10	U
Benzo(a)anthracene	UG/L	10	U	10	U	10	U
Benzo(a)pyrene	UG/L	10	U	10	U	10	U
Benzo(b)fluoranthene	UG/L	10	U	10	U	10	U
Benzo(ghi)perylene	UG/L	10	U	10	U	10	U
Benzo(k)fluoranthene	UG/L	10	U	10	U	10	U
Bis(2-Chloroethoxy)methane	UG/L	10	U	10	U	10	U
Bis(2-Chloroethyl)ether	UG/L	10	UJ	10	UJ	10	UJ
Bis(2-Chloroisopropyl)ether	UG/L	10	U	10	U	10	U
Bis(2-Ethylhexyl)phthalate	UG/L	10	U	10	U	10	U
Butylbenzylphthalate	UG/L	10	U	10	U	10	U
Carbazole	UG/L	10	U	10	U	10	U
Chrysene	UG/L	10	U	10	U	10	U
Di-n-butylphthalate	UG/L	10	U	10	U	10	U
Di-n-octylphthalate	UG/L	10	U	10	U	10	U
Dibenz(a,h)anthracene	UG/L	10	U	10	U	10	U

Table C-1N
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE WATER
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID		SWDRMO-8		SWDRMO-8		SWDRMO-8	
Matrix		SURFACE WATER		SURFACE WATER		SURFACE WATER	
Sample ID		DRMO-3008		DRMO-3005		DRMO-3008/DRMO-3005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		N/A		N/A		N/A	
Sample Date		11/5/2002		11/5/2002		11/5/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1				1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
Dibenzofuran	UG/L	10	U	10	U	10	U
Diethyl phthalate	UG/L	10	U	10	U	10	U
Dimethylphthalate	UG/L	10	U	10	U	10	U
Fluoranthene	UG/L	10	U	10	U	10	U
Fluorene	UG/L	10	U	10	U	10	U
Hexachlorobenzene	UG/L	10	U	10	U	10	U
Hexachlorobutadiene	UG/L	10	U	10	U	10	U
Hexachlorocyclopentadiene	UG/L	10	UJ	10	UJ	10	UJ
Hexachloroethane	UG/L	10	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	UG/L	10	U	10	U	10	U
Isophorone	UG/L	10	U	10	U	10	U
N-Nitrosodiphenylamine	UG/L	10	U	10	U	10	U
N-Nitrosodipropylamine	UG/L	10	U	10	U	10	U
Naphthalene	UG/L	10	U	10	U	10	U
Nitrobenzene	UG/L	10	U	10	U	10	U
Pentachlorophenol	UG/L	10	U	10	U	10	U
Phenanthrene	UG/L	10	U	10	U	10	U
Phenol	UG/L	10	U	10	U	10	U
Pyrene	UG/L	10	U	10	U	10	U
Pesticides/PCBs							
4,4'-DDD	UG/L	0.01	U	0.01	U	0.01	U
4,4'-DDE	UG/L	0.005	U	0.005	U	0.005	U
4,4'-DDT	UG/L	0.01	UJ	0.01	UJ	0.01	UJ
Aldrin	UG/L	0.02	U	0.02	U	0.02	U
Alpha-BHC	UG/L	0.01	UJ	0.01	UJ	0.01	UJ
Alpha-Chlordane	UG/L	0.02	U	0.02	U	0.02	U
Beta-BHC	UG/L	0.01	U	0.01	U	0.01	U
Chlordane	UG/L	0.13	U	0.13	U	0.13	U
Delta-BHC	UG/L	0.004	U	0.004	U	0.004	U
Dieldrin	UG/L	0.009	UJ	0.009	U	0.009	UJ
Endosulfan I	UG/L	0.01	U	0.01	U	0.01	U
Endosulfan II	UG/L	0.01	UJ	0.01	UJ	0.01	UJ
Endosulfan sulfate	UG/L	0.02	U	0.02	U	0.02	U
Endrin	UG/L	0.02	U	0.02	U	0.02	U
Endrin aldehyde	UG/L	0.02	U	0.02	U	0.02	U
Endrin ketone	UG/L	0.009	U	0.009	U	0.009	U
Gamma-BHC/Lindane	UG/L	0.009	U	0.009	U	0.009	U
Gamma-Chlordane	UG/L	0.01	U	0.01	U	0.01	U
Heptachlor	UG/L	0.007	U	0.007	U	0.007	U
Heptachlor epoxide	UG/L	0.008	U	0.008	U	0.008	U
Methoxychlor	UG/L	0.008	U	0.008	U	0.008	U

Table C-1N
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE WATER
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID		SWDRMO-8		SWDRMO-8		SWDRMO-8	
Matrix		SURFACE WATER		SURFACE WATER		SURFACE WATER	
Sample ID		DRMO-3008		DRMO-3005		DRMO-3008/DRMO-3005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		N/A		N/A		N/A	
Sample Date		11/5/2002		11/5/2002		11/5/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1				1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
Toxaphene	UG/L	0.12	U	0.12	U	0.12	U
Aroclor-1016	UG/L	0.24	UJ	0.24	UJ	0.24	UJ
Aroclor-1221	UG/L	0.08	U	0.08	U	0.08	U
Aroclor-1232	UG/L	0.09	UJ	0.09	UJ	0.09	UJ
Aroclor-1242	UG/L	0.08	UJ	0.08	UJ	0.08	UJ
Aroclor-1248	UG/L	0.12	U	0.12	U	0.12	U
Aroclor-1254	UG/L	0.05	U	0.05	U	0.05	U
Aroclor-1260	UG/L	0.01	UJ	0.01	UJ	0.01	UJ
Metals and Cyanide							
Aluminum	UG/L	23.9		23.4		23.7	
Antimony	UG/L	4.7	U	4.7	U	4.7	U
Arsenic	UG/L	2.8	U	2.8	U	2.8	U
Barium	UG/L	43.7		47.4		45.6	
Beryllium	UG/L	0.14		0.12		0.13	
Cadmium	UG/L	0.4	U	0.4	U	0.4	U
Calcium	UG/L	67700		72200		69950	
Chromium	UG/L	0.6	U	0.6	U	0.6	U
Cobalt	UG/L	0.6		0.6		0.6	
Copper	UG/L	1.8		2.1		2.0	
Cyanide, Amenable	MG/L	0.01	U	0.01	U	0.01	U
Cyanide, Total	MG/L	0.01	U	0.01	U	0.01	U
Iron	UG/L	19	J	34.2	J	27	J
Lead	UG/L	3.7		5.1	J	4.4	J
Magnesium	UG/L	11600		12300		11950	
Manganese	UG/L	11.6		26.1		18.9	
Mercury	UG/L	0.2	U	0.2	U	0.2	U
Nickel	UG/L	1.8	U	1.8	U	1.8	U
Potassium	UG/L	3450	J	3660	J	3555	J
Selenium	UG/L	3	U	3	U	3	U
Silver	UG/L	1	U	1	U	1	U
Sodium	UG/L	102000	J	108000	J	105000	J
Thallium	UG/L	5.4	U	5.4	U	5.4	U
Vanadium	UG/L	0.7	U	0.7	U	0.7	U
Zinc	UG/L	13.9		16.8		15.4	
Other							
Total Petroleum Hydrocarbons	MG/L	1	U	1	U	1	U

Table C-1O
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID		SB121I-2	SB121I-2	SB121I-2	SS121I-10	SS121I-10	SS121I-10
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		121I-1043	121I-1044	121I-1043/121I-1044	121I-1006	121I-1031	121I-1006/121I-1031
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		2	2	2	0.2	0.2	0.2
Sample Date		10/24/2002	10/24/2002	10/24/2002	10/22/2002	10/22/2002	10/22/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
1,1,2,2-Tetrachloroethane	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
1,1,2-Trichloroethane	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
1,1-Dichloroethane	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
1,1-Dichloroethene	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
1,2-Dichloroethane	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 UJ	2.2 U	2.4 UJ
1,2-Dichloropropane	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Acetone	UG/KG	110 U	33 UJ	72 UJ	4.5 J	1.1 U	2.8 J
Benzene	UG/KG	6.6 J	10 J	8 J	2.5 U	2.2 U	2.4 U
Bromodichloromethane	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Bromoform	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Carbon disulfide	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Carbon tetrachloride	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 UJ	2.2 U	2.4 UJ
Chlorobenzene	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Chlorodibromomethane	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Chloroethane	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Chloroform	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Cis-1,2-Dichloroethene	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Cis-1,3-Dichloropropene	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Ethyl benzene	UG/KG	2 J	3.5 J	2.8 J	2.5 U	2.2 U	2.4 U
Meta/Para Xylene	UG/KG	2.2 J	3.4 J	2.8 J	2.5 U	2.2 U	2.4 U
Methyl bromide	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 UJ	2.2 U	2.4 UJ
Methyl butyl ketone	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 UJ	2.2 U	2.4 UJ
Methyl chloride	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Methyl ethyl ketone	UG/KG	55	27 J	41 J	2.5 U	2.2 U	2.4 U
Methyl isobutyl ketone	UG/KG	3.1 U	2.8 U	3.0 U	2.5 U	2.2 U	2.4 U
Methylene chloride	UG/KG	1.55 U	2.7 J	2.1 J	2.5 U	2.2 U	2.4 U
Ortho Xylene	UG/KG	1.1 J	2 J	2 J	2.5 U	2.2 U	2.4 U
Styrene	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Tetrachloroethene	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Toluene	UG/KG	6.9	11 J	9.0 J	2.5 U	2.2 U	2.4 U
Trans-1,2-Dichloroethene	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Trans-1,3-Dichloropropene	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Trichloroethene	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U
Vinyl chloride	UG/KG	3.1 U	2.8 UJ	3.0 UJ	2.5 U	2.2 U	2.4 U

Table C-1O
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID		SB121I-2	SB121I-2	SB121I-2	SS121I-10	SS121I-10	SS121I-10
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		121I-1043	121I-1044	121I-1043/121I-1044	121I-1006	121I-1031	121I-1006/121I-1031
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		2	2	2	0.2	0.2	0.2
Sample Date		10/24/2002	10/24/2002	10/24/2002	10/22/2002	10/22/2002	10/22/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
1,2-Dichlorobenzene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
1,3-Dichlorobenzene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
1,4-Dichlorobenzene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
2,4,5-Trichlorophenol	UG/KG	970 U	980 U	975 U	910 U	910 U	910 U
2,4,6-Trichlorophenol	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
2,4-Dichlorophenol	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
2,4-Dimethylphenol	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
2,4-Dinitrophenol	UG/KG	970 U	980 U	975 U	910 UJ	910 UJ	910 UJ
2,4-Dinitrotoluene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
2,6-Dinitrotoluene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
2-Chloronaphthalene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
2-Chlorophenol	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
2-Methylnaphthalene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
2-Methylphenol	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
2-Nitroaniline	UG/KG	970 U	980 U	975 U	910 U	910 UJ	910 UJ
2-Nitrophenol	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
3 or 4-Methylphenol	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
3,3'-Dichlorobenzidine	UG/KG	390 UJ	390 U	390 UJ	360 U	360 U	360 U
3-Nitroaniline	UG/KG	970 U	980 U	975 U	910 U	910 U	910 U
4,6-Dinitro-2-methylphenol	UG/KG	970 U	980 UJ	975 UJ	910 UJ	910 UJ	910 UJ
4-Bromophenyl phenyl ether	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
4-Chloro-3-methylphenol	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
4-Chloroaniline	UG/KG	390 U	390 U	390 U	360 UJ	360 U	360 UJ
4-Chlorophenyl phenyl ether	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
4-Methylphenol	UG/KG						
4-Nitroaniline	UG/KG	970 U	980 U	975 U	910 U	910 U	910 U
4-Nitrophenol	UG/KG	970 U	980 U	975 U	910 U	910 U	910 U
Acenaphthene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Acenaphthylene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Anthracene	UG/KG	89 J	74 J	82 J	360 U	360 U	360 U
Benzo(a)anthracene	UG/KG	350 J	350 J	350 J	48 J	47 J	48 J
Benzo(a)pyrene	UG/KG	390 J	450 J	420 J	66 J	60 J	63 J
Benzo(b)fluoranthene	UG/KG	600 J	620 J	610 J	53 J	51 J	52 J
Benzo(ghi)perylene	UG/KG	220 J	140 J	180 J	67 J	63 J	65 J
Benzo(k)fluoranthene	UG/KG	300 J	360 J	330 J	360 U	360 U	360 U

Table C-1O
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID		SB121I-2	SB121I-2	SB121I-2	SS121I-10	SS121I-10	SS121I-10
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		121I-1043	121I-1044	121I-1043/121I-1044	121I-1006	121I-1031	121I-1006/121I-1031
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		2	2	2	0.2	0.2	0.2
Sample Date		10/24/2002	10/24/2002	10/24/2002	10/22/2002	10/22/2002	10/22/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Bis(2-Chloroethoxy)methane	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Bis(2-Chloroethyl)ether	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Bis(2-Chloroisopropyl)ether	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Bis(2-Ethylhexyl)phthalate	UG/KG	78 J	195 U	137 J	360 UJ	360 U	360 UJ
Butylbenzylphthalate	UG/KG	390 UJ	390 U	390 UJ	360 U	360 U	360 U
Carbazole	UG/KG	56 J	67 J	62 J	360 U	360 U	360 U
Chrysene	UG/KG	380 J	400	390 J	62 J	63 J	63 J
Di-n-butylphthalate	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Di-n-octylphthalate	UG/KG	390 UJ	390 U	390 UJ	360 U	360 U	360 U
Dibenz(a,h)anthracene	UG/KG	390 UJ	390 U	390 UJ	360 U	360 UJ	360 UJ
Dibenzofuran	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Diethyl phthalate	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Dimethylphthalate	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Fluoranthene	UG/KG	720	920	820	100 J	78 J	89 J
Fluorene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Hexachlorobenzene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Hexachlorobutadiene	UG/KG	390 UJ	390 UJ	390 UJ	360 U	360 U	360 U
Hexachlorocyclopentadiene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Hexachloroethane	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Indeno(1,2,3-cd)pyrene	UG/KG	63 J	79 J	71 J	83 J	74 J	79 J
Isophorone	UG/KG	390 UJ	390 UJ	390 UJ	360 U	360 U	360 U
N-Nitrosodiphenylamine	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
N-Nitrosodipropylamine	UG/KG	390 U	390 U	390 U	360 U	360 UJ	360 UJ
Naphthalene	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Nitrobenzene	UG/KG	390 UJ	390 UJ	390 UJ	360 U	360 U	360 U
Pentachlorophenol	UG/KG	970 U	980 U	975 U	910 U	910 U	910 U
Phenanthrene	UG/KG	450	440	445	60 J	56 J	58 J
Phenol	UG/KG	390 U	390 U	390 U	360 U	360 U	360 U
Pyrene	UG/KG	1200 J	660	930 J	79 J	98 J	89 J
Pesticides/PCBs							
4,4'-DDD	UG/KG	2 UJ	2 UJ	2 UJ	1.9 UJ	1.8 UJ	1.9 UJ
4,4'-DDE	UG/KG	2 U	2 U	2 U	1.9 U	1.8 U	1.9 U
4,4'-DDT	UG/KG	2 U	2 U	2 U	1.9 UJ	1.8 UJ	1.9 UJ
Aldrin	UG/KG	2 U	2 U	2 U	1.9 U	1.8 U	1.9 U
Alpha-BHC	UG/KG	2 UJ	2 U	2 UJ	1.9 UJ	1.8 UJ	1.9 UJ
Alpha-Chlordane	UG/KG	2 U	2 U	2 U	1.9 UJ	1.8 UJ	1.9 UJ
Beta-BHC	UG/KG	2 U	2 U	2 U	1.9 U	1.8 U	1.9 U

Table C-1O
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I		SEAD-121I		SEAD-121I		SEAD-121I		SEAD-121I		SEAD-121I	
Location ID		SB121I-2		SB121I-2		SB121I-2		SS121I-10		SS121I-10		SS121I-10	
Matrix		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
Sample ID		121I-1043		121I-1044		121I-1043/121I-1044		121I-1006		121I-1031		121I-1006/121I-1031	
Sample Depth to Top of Sample		0		0		0		0		0		0	
Sample Depth to Bottom of Sample		2		2		2		0.2		0.2		0.2	
Sample Date		10/24/2002		10/24/2002		10/24/2002		10/22/2002		10/22/2002		10/22/2002	
QC Code		SA		SA		SA/DU		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI		PID-RI		PID-RI		PID-RI	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Chlordane	UG/KG	20	U	20	U	20	U	19	U	18	U	19	U
Delta-BHC	UG/KG	2	UJ	2	UJ	2	UJ	1.9	UJ	1.8	UJ	1.9	UJ
Dieldrin	UG/KG	2	UJ	2	UJ	2	UJ	1.9	UJ	1.8	UJ	1.9	UJ
Endosulfan I	UG/KG	11	J	6.9	J	9.0	J	3.7	J	4.2	J	4.0	J
Endosulfan II	UG/KG	2	U	2	U	2	U	1.9	U	1.8	U	1.9	U
Endosulfan sulfate	UG/KG	2	U	2	U	2	U	1.9	U	1.8	U	1.9	U
Endrin	UG/KG	2	U	2	U	2	U	1.9	UJ	1.8	UJ	1.9	UJ
Endrin aldehyde	UG/KG	2	U	2	U	2	U	1.9	U	1.8	U	1.9	U
Endrin ketone	UG/KG	2	U	2	U	2	U	1.9	U	1.8	U	1.9	U
Gamma-BHC/Lindane	UG/KG	2	U	2	U	2	U	1.9	UJ	1.8	UJ	1.9	UJ
Gamma-Chlordane	UG/KG	2	U	2	U	2	U	1.9	U	1.8	U	1.9	U
Heptachlor	UG/KG	2	U	2	U	2	U	1.9	U	1.8	U	1.9	U
Heptachlor epoxide	UG/KG	2	U	2	U	2	U	1.9	U	1.8	U	1.9	U
Methoxychlor	UG/KG	2	U	2	U	2	U	1.9	U	1.8	U	1.9	U
Toxaphene	UG/KG	20	U	20	U	20	U	19	U	18	U	19	U
Aroclor-1016	UG/KG	20	U	20	U	20	U	19	UJ	19	UJ	19	UJ
Aroclor-1221	UG/KG	20	U	20	U	20	U	19	U	19	U	19	U
Aroclor-1232	UG/KG	20	U	20	U	20	U	19	UJ	19	UJ	19	UJ
Aroclor-1242	UG/KG	20	U	20	U	20	U	19	UJ	19	UJ	19	UJ
Aroclor-1248	UG/KG	20	U	20	U	20	U	19	U	19	U	19	U
Aroclor-1254	UG/KG	20	UJ	20	UJ	20	UJ	19	U	19	U	19	U
Aroclor-1260	UG/KG	20	UJ	20	UJ	20	UJ	19	U	19	U	19	U
Metals and Cyanide													
Aluminum	MG/KG	9700		9020		9360		6480		7510		6995	
Antimony	MG/KG	1.8		8.6		5.2		3.4		2.5		3.0	
Arsenic	MG/KG	21.2	J	43	J	32	J	5.2		5.2		5.2	
Barium	MG/KG	74.3	J	83.6	J	79.0	J	116		119		118	
Beryllium	MG/KG	0.49		0.46		0.48		0.38	J	0.43	J	0.41	J
Cadmium	MG/KG	0.14	U	0.14	U	0.14	U	5		4.1		5	
Calcium	MG/KG	30900		27800		29350		166000		143000		154500	
Chromium	MG/KG	25.9	J	50	J	38	J	14.3		14.7		14.5	
Cobalt	MG/KG	23.9	J	40.6	J	32.3	J	8.4		8.9		8.7	
Copper	MG/KG	37.5	R	66.1	R			24.5	J	22.6	J	23.6	J
Cyanide, Amenable	MG/KG	0.59	U	0.6	U	0.6	U	0.56	UJ	0.55	UJ	0.56	UJ
Cyanide, Total	MG/KG	0.592	U	0.595	U	0.594	U	0.556	UJ	0.551	UJ	0.554	UJ
Iron	MG/KG	27100		31500		29300		17100		17600		17350	
Lead	MG/KG	31.3		42.1		36.7		19		16.3		18	

Table C-1O
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID		SB121I-2	SB121I-2	SB121I-2	SS121I-10	SS121I-10	SS121I-10
Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID		121I-1043	121I-1044	121I-1043/121I-1044	121I-1006	121I-1031	121I-1006/121I-1031
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		2	2	2	0.2	0.2	0.2
Sample Date		10/24/2002	10/24/2002	10/24/2002	10/22/2002	10/22/2002	10/22/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Magnesium	MG/KG	6110	4240	5175	13500	9040	11270
Manganese	MG/KG	33200 J	57800 J	45500 J	786	822	804
Mercury	MG/KG	0.04	0.05	0.05	0.03	0.03	0.03
Nickel	MG/KG	38.9 J	46.3 J	42.6 J	26.7	26.9	26.8
Potassium	MG/KG	859 J	929 J	894 J	786	1150	968
Selenium	MG/KG	5.1 J	17.9 J	12 J	0.87	0.8	0.8
Silver	MG/KG	1.9 J	4.2 J	3.1 J	1.1 U	1.1 U	1.1 U
Sodium	MG/KG	118 U	115 U	117 U	210	188	199
Thallium	MG/KG	3	14.4	9	1.1 U	1.1 U	1.1 U
Vanadium	MG/KG	22.6 J	31.6 J	27.1 J	11.6	13.2	12.4
Zinc	MG/KG	85.1 J	82 J	84 J	84 J	67.9 J	76 J
Other							
Total Organic Carbon	MG/KG	5600	6800	6200	5600	4500	5050
Total Petroleum Hydrocarbons	MG/KG	47 U	48 U	48 U	44 UJ	44 UJ	44 UJ

NOTES:
Shaded cells indicate a detect/non-detect pair. Concentrations reported as not detected in the shaded pair, as indicated by "U" or "UJ" data qualifiers, are presented at 1/2 the value reported by the laboratory. The modified value (i.e., 1/2 the laboratory's reported detection limit) was used to compute the average result.

When a chemical was not detected in either the sample or the duplicate, as indicated by “U” or “UJ” data qualifiers, the average of the two reported detection limits at full value is reported as the final value.

Table C-1O
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID		SS121I-29	SS121I-29	SS121I-29	SD121I-7	SD121I-7	SD121I-7
Matrix		SOIL	SOIL	SOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID		121I-1025	121I-1030	121I-1025/121I-1030	121I-4005	121I-4007	121I-4007/121I-4005
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		0.2	0.2	0.2	2	2	2
Sample Date		10/23/2002	10/23/2002	10/23/2002	10/26/2002	10/26/2002	10/26/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
					1	1	1
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
1,1,2,2-Tetrachloroethane	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
1,1,2-Trichloroethane	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
1,1-Dichloroethane	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
1,1-Dichloroethene	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
1,2-Dichloroethane	UG/KG	3.1 UJ	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
1,2-Dichloropropane	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Acetone	UG/KG	3.1 U	3.6 UJ	3.4 UJ	25 J	10 J	18 J
Benzene	UG/KG	24	57 J	41 J	3.1 UJ	3.2 UJ	3.2 UJ
Bromodichloromethane	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Bromoform	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Carbon disulfide	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Carbon tetrachloride	UG/KG	3.1 UJ	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Chlorobenzene	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Chlorodibromomethane	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Chloroethane	UG/KG	3.1 UJ	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Chloroform	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Cis-1,2-Dichloroethene	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Cis-1,3-Dichloropropene	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Ethyl benzene	UG/KG	4.4	9.5 J	7.0 J	3.1 UJ	3.2 UJ	3.2 UJ
Meta/Para Xylene	UG/KG	3.9	8.7 J	6.3 J	3.1 UJ	3.2 UJ	3.2 UJ
Methyl bromide	UG/KG	3.1 UJ	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Methyl butyl ketone	UG/KG	3.1 UJ	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Methyl chloride	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Methyl ethyl ketone	UG/KG	1.55 U	67 J	34 J	3.1 UJ	3.2 UJ	3.2 UJ
Methyl isobutyl ketone	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Methylene chloride	UG/KG	3.1 U	3.6 UJ	3.4 UJ	2.5 U	1.9 U	2.2 U
Ortho Xylene	UG/KG	2.1 J	5.1 J	3.6 J	3.1 UJ	3.2 UJ	3.2 UJ
Styrene	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Tetrachloroethene	UG/KG	3.1 UJ	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Toluene	UG/KG	18	43 J	31 J	3.1 UJ	3.2 UJ	3.2 UJ
Trans-1,2-Dichloroethene	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Trans-1,3-Dichloropropene	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Trichloroethene	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ
Vinyl chloride	UG/KG	3.1 U	3.6 UJ	3.4 UJ	3.1 UJ	3.2 UJ	3.2 UJ

Table C-1O
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID		SS121I-29	SS121I-29	SS121I-29	SD121I-7	SD121I-7	SD121I-7
Matrix		SOIL	SOIL	SOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID		121I-1025	121I-1030	121I-1025/121I-1030	121I-4005	121I-4007	121I-4007/121I-4005
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		0.2	0.2	0.2	2	2	2
Sample Date		10/23/2002	10/23/2002	10/23/2002	10/26/2002	10/26/2002	10/26/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
					1	1	1
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
1,2-Dichlorobenzene	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
1,3-Dichlorobenzene	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
1,4-Dichlorobenzene	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
2,4,5-Trichlorophenol	UG/KG	5200 U	5700 U	5450 U	1100 U	1100 U	1100 U
2,4,6-Trichlorophenol	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
2,4-Dichlorophenol	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
2,4-Dimethylphenol	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
2,4-Dinitrophenol	UG/KG	5200 R	5700 UJ	5700 UJ	1100 U	1100 U	1100 U
2,4-Dinitrotoluene	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
2,6-Dinitrotoluene	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
2-Chloronaphthalene	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
2-Chlorophenol	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
2-Methylnaphthalene	UG/KG	2100 U	2300 U	2200 U	210 U	130 J	170 J
2-Methylphenol	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
2-Nitroaniline	UG/KG	5200 UJ	5700 UJ	5450 UJ	1100 U	1100 U	1100 U
2-Nitrophenol	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
3 or 4-Methylphenol	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
3,3'-Dichlorobenzidine	UG/KG	2100 UJ	2300 R	2100 UJ	210 UJ	420 J	315 J
3-Nitroaniline	UG/KG	5200 U	5700 UJ	5450 UJ	1100 U	1100 U	1100 U
4,6-Dinitro-2-methylphenol	UG/KG	5200 R	5700 UJ	5700 UJ	1100 U	1100 U	1100 U
4-Bromophenyl phenyl ether	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
4-Chloro-3-methylphenol	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
4-Chloroaniline	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
4-Chlorophenyl phenyl ether	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
4-Methylphenol	UG/KG						
4-Nitroaniline	UG/KG	5200 U	5700 UJ	5450 UJ	1100 U	1100 U	1100 U
4-Nitrophenol	UG/KG	5200 U	5700 U	5450 U	1100 U	1100 U	1100 U
Acenaphthene	UG/KG	2100 U	2300 U	2200 U	280 J	1200	740 J
Acenaphthylene	UG/KG	2100 U	2300 U	2200 U	70 J	210 U	140 J
Anthracene	UG/KG	330 J	1150 U	740 J	420 J	1900	1160 J
Benzo(a)anthracene	UG/KG	700 J	260 J	480 J	2200 J	5000 J	3600 J
Benzo(a)pyrene	UG/KG	700 J	2300 R	700 J	2800 J	5900 J	4350 J
Benzo(b)fluoranthene	UG/KG	720 J	2300 R	720 J	3600 J	8100 J	5850 J
Benzo(ghi)perylene	UG/KG	430 J	2300 R	430 J	1400 J	3200 J	2300 J
Benzo(k)fluoranthene	UG/KG	720 J	2300 R	720 J	2500 J	4900 J	3700 J

Table C-1O
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID		SS121I-29	SS121I-29	SS121I-29	SD121I-7	SD121I-7	SD121I-7
Matrix		SOIL	SOIL	SOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID		121I-1025	121I-1030	121I-1025/121I-1030	121I-4005	121I-4007	121I-4007/121I-4005
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		0.2	0.2	0.2	2	2	2
Sample Date		10/23/2002	10/23/2002	10/23/2002	10/26/2002	10/26/2002	10/26/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
					1	1	1
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Bis(2-Chloroethoxy)methane	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
Bis(2-Chloroethyl)ether	UG/KG	2100 U	2300 U	2200 U	420 UJ	420 U	420 UJ
Bis(2-Chloroisopropyl)ether	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
Bis(2-Ethylhexyl)phthalate	UG/KG	1050 U	260 J	655 J	75 J	110 J	93 J
Butylbenzylphthalate	UG/KG	2100 U	2300 R	2100 U	420 J	420 J	420 J
Carbazole	UG/KG	340 J	1150 UJ	745 J	440	1700	1070
Chrysene	UG/KG	790 J	2300 R	790 J	2400 J	5400 J	3900 J
Di-n-butylphthalate	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
Di-n-octylphthalate	UG/KG	2100 U	2300 R	2100 U	420 J	420 J	420 J
Dibenz(a,h)anthracene	UG/KG	2100 UJ	2300 R	2100 UJ	130 J	350 J	240 J
Dibenzofuran	UG/KG	2100 U	2300 U	2200 U	71 J	640	356 J
Diethyl phthalate	UG/KG	1050 U	230 J	640 J	420 U	420 U	420 U
Dimethylphthalate	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
Fluoranthene	UG/KG	2500	490 J	1495 J	4400	13000	8700
Fluorene	UG/KG	2100 U	2300 U	2200 U	190 J	1100	645 J
Hexachlorobenzene	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
Hexachlorobutadiene	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
Hexachlorocyclopentadiene	UG/KG	2100 UJ	2300 U	2200 UJ	420 U	420 U	420 U
Hexachloroethane	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
Indeno(1,2,3-cd)pyrene	UG/KG	2100 UJ	2300 R	2100 UJ	400 J	1300 J	850 J
Isophorone	UG/KG	2100 U	2300 U	2200 U	420 J	210 U	315 J
N-Nitrosodiphenylamine	UG/KG	2100 U	2300 U	2200 U	420 U	420 U	420 U
N-Nitrosodipropylamine	UG/KG	2100 U	2300 UJ	2200 UJ	420 U	420 U	420 U
Naphthalene	UG/KG	2100 U	2300 U	2200 U	210 U	490	350 J
Nitrobenzene	UG/KG	2100 U	2300 U	2200 U	420 J	210 U	315 J
Pentachlorophenol	UG/KG	5200 UJ	5700 U	5450 UJ	1100 U	1100 U	1100 U
Phenanthrene	UG/KG	2200	530 J	1365 J	2500	10000	6250
Phenol	UG/KG	2100 U	2300 U	2200 U	420 J	210 U	315 J
Pyrene	UG/KG	2300	1600 J	1950 J	6500 J	17000 J	11750 J
Pesticides/PCBs							
4,4'-DDD	UG/KG	2.2 UJ	2.3 UJ	2.3 UJ	2.2 U	2.2 U	2.2 U
4,4'-DDE	UG/KG	2.2 U	2.3 U	2.3 U	14 J	1.1 UJ	7.6 J
4,4'-DDT	UG/KG	2.2 UJ	2.3 UJ	2.3 UJ	2.2 UJ	2.2 UJ	2.2 UJ
Aldrin	UG/KG	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U
Alpha-BHC	UG/KG	2.2 UJ	2.3 UJ	2.3 UJ	2.2 U	2.2 U	2.2 U
Alpha-Chlordane	UG/KG	2.2 UJ	2.3 UJ	2.3 UJ	2.2 U	2.2 U	2.2 U
Beta-BHC	UG/KG	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U

Table C-1O
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL AND DITCH SOIL
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID		SS121I-29	SS121I-29	SS121I-29	SD121I-7	SD121I-7	SD121I-7
Matrix		SOIL	SOIL	SOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID		121I-1025	121I-1030	121I-1025/121I-1030	121I-4005	121I-4007	121I-4007/121I-4005
Sample Depth to Top of Sample		0	0	0	0	0	0
Sample Depth to Bottom of Sample		0.2	0.2	0.2	2	2	2
Sample Date		10/23/2002	10/23/2002	10/23/2002	10/26/2002	10/26/2002	10/26/2002
QC Code		SA	SA	SA/DU	SA	SA	SA/DU
Investigation		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
					1	1	1
Parameter	**Units**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Chlordane	UG/KG	22 U	23 U	23 U	22 U	22 U	22 U
Delta-BHC	UG/KG	2.2 UJ	2.3 UJ	2.3 UJ	2.2 UJ	2.2 UJ	2.2 UJ
Dieldrin	UG/KG	2.2 UJ	2.3 UJ	2.3 UJ	2.2 UJ	2.2 UJ	2.2 UJ
Endosulfan I	UG/KG	23	1.15 U	12 J	2.2 U	56 R	2.2 U
Endosulfan II	UG/KG	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U
Endosulfan sulfate	UG/KG	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U
Endrin	UG/KG	2.2 U	2.3 U	2.3 U	2.2 UJ	2.2 UJ	2.2 UJ
Endrin aldehyde	UG/KG	2.2 U	2.3 U	2.3 U	2.2 UJ	2.2 UJ	2.2 UJ
Endrin ketone	UG/KG	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U
Gamma-BHC/Lindane	UG/KG	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U
Gamma-Chlordane	UG/KG	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U
Heptachlor	UG/KG	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U
Heptachlor epoxide	UG/KG	17 R	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U
Methoxychlor	UG/KG	2.2 UJ	2.3 UJ	2.3 UJ	2.2 UJ	2.2 UJ	2.2 UJ
Toxaphene	UG/KG	22 U	23 U	23 U	22 U	22 U	22 U
Aroclor-1016	UG/KG	21 UJ	23 UJ	22 UJ	22 U	22 U	22 U
Aroclor-1221	UG/KG	21 UJ	23 UJ	22 UJ	22 U	22 U	22 U
Aroclor-1232	UG/KG	21 UJ	23 UJ	22 UJ	22 U	22 U	22 U
Aroclor-1242	UG/KG	21 UJ	23 UJ	22 UJ	22 U	22 U	22 U
Aroclor-1248	UG/KG	21 UJ	23 UJ	22 UJ	22 U	22 U	22 U
Aroclor-1254	UG/KG	21 UJ	23 UJ	22 UJ	22 U	22 U	22 U
Aroclor-1260	UG/KG	21 UJ	23 UJ	22 UJ	11 U	17 NJ	14 J
Metals and Cyanide							
Aluminum	MG/KG	3730	2200	2965	6950	6170	6560
Antimony	MG/KG	1.1 U	1.2 U	1.2 U	1.1 U	0.99 U	1.0 U
Arsenic	MG/KG	349 R	239 R		7.8	6.9	7.4
Barium	MG/KG	87.4 J	84.9 J	86.2 J	72.2	58.9	65.6
Beryllium	MG/KG	0.16 U	0.18 U	0.17 U	0.48 J	0.43 J	0.46 J
Cadmium	MG/KG	0.15 U	0.16 U	0.16 U	0.83	0.77	0.80
Calcium	MG/KG	29900 J	46500 J	38200 J	145000	110000	127500
Chromium	MG/KG	516	362	439	14.5	13.5	14
Cobalt	MG/KG	237 J	174 J	206 J	11	10.5	11
Copper	MG/KG	243	175	209	33.8 J	34.7 J	34.3 J
Cyanide, Amenable	MG/KG	0.63 U	0.68 U	0.66 U	0.64 U	0.65 U	0.65 U
Cyanide, Total	MG/KG	1.26	2.73	2.00	0.644 U	0.648 U	0.646 U
Iron	MG/KG	69400	47400	58400	15200 J	13900 J	14550 J
Lead	MG/KG	47.8 J	45.9 J	46.9 J	71.2 J	77.4 J	74.3 J

Table C-1O

SAMPLE-DUPLICATE MERGING RESULTS - SURFACE SOIL AND DITCH SOIL

SEAD-121I

SEAD-121C and SEAD-121I RI REPORT

Seneca Army Depot Activity

Facility		SEAD-121I		SEAD-121I		SEAD-121I		SEAD-121I		SEAD-121I		SEAD-121I	
Location ID		SS121I-29		SS121I-29		SS121I-29		SD121I-7		SD121I-7		SD121I-7	
Matrix		SOIL		SOIL		SOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL	
Sample ID		121I-1025		121I-1030		121I-1025/121I-1030		121I-4005		121I-4007		121I-4007/121I-4005	
Sample Depth to Top of Sample		0		0		0		0		0		0	
Sample Depth to Bottom of Sample		0.2		0.2		0.2		2		2		2	
Sample Date		10/23/2002		10/23/2002		10/23/2002		10/26/2002		10/26/2002		10/26/2002	
QC Code		SA		SA		SA/DU		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI		PID-RI		PID-RI		PID-RI	
								1		1		1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Magnesium	MG/KG	2770	J	6090	J	4430	J	11700	J	9890	J	10795	J
Manganese	MG/KG	349000		272000		310500		588	J	541	J	565	J
Mercury	MG/KG	0.02		0.02		0.02		0.12	UJ	0.11	UJ	0.12	UJ
Nickel	MG/KG	394	J	289	J	342	J	27.9	J	26.9	J	27.4	J
Potassium	MG/KG	656		612		634		1340	J	1230	J	1285	J
Selenium	MG/KG	160	J	131	J	146	J	0.53	U	0.46	U	0.50	U
Silver	MG/KG	24.1	R	18.6	R			0.34	U	0.3	U	0.3	U
Sodium	MG/KG	126	U	135	U	131	U	288		211		250	
Thallium	MG/KG	173	J	152	J	163	J	0.71	J	0.17	U	0.44	J
Vanadium	MG/KG	217	J	147	J	182	J	20.2	J	18.4	J	19.3	J
Zinc	MG/KG	47.7	J	37.8	J	42.8	J	124	J	125	J	125	J
Other													
Total Organic Carbon	MG/KG	7300		4900		6100		5300		4500		4900	
Total Petroleum Hydrocarbons	MG/KG	240		1600		920		1000	J	630	J	815	J

NOTES:

Shaded cells indicate a detect/non-detect pair. Concentrations reported as not detected in the shaded pair, as indicated by "U" or "UJ" data qualifiers, are presented at 1/2 the value reported by the laboratory. The modified value (i.e., 1/2 the laboratory's reported detection limit) was used to compute the average result.

When a chemical was not detected in either the sample or the duplicate, as indicated by “U” or “UJ” data qualifiers, the average of the two reported detection limits at full value is reported as the final value.

Table C-1P
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE WATER
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I		SEAD-121I		SEAD-121I	
Location ID		SW121I-7		SW121I-7		SW121I-7	
Matrix		SURFACE WATER		SURFACE WATER		SURFACE WATER	
Sample ID		121I-3007		121I-3005		121I-3007/121I-3005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		N/A		N/A		N/A	
Sample Date		10/26/2002		10/26/2002		10/26/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1		1		1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane	UG/L	5	U	5	U	5	U
1,1,2-Trichloroethane	UG/L	5	U	5	U	5	U
1,1-Dichloroethane	UG/L	5	U	5	U	5	U
1,1-Dichloroethene	UG/L	5	U	5	U	5	U
1,2-Dichloroethane	UG/L	5	U	5	U	5	U
1,2-Dichloropropane	UG/L	5	U	5	U	5	U
Acetone	UG/L	5	UJ	5	UJ	5	UJ
Benzene	UG/L	5	U	5	U	5	U
Bromodichloromethane	UG/L	5	U	5	U	5	U
Bromoform	UG/L	5	U	5	U	5	U
Carbon disulfide	UG/L	5	U	5	U	5	U
Carbon tetrachloride	UG/L	5	U	5	U	5	U
Chlorobenzene	UG/L	5	U	5	U	5	U
Chlorodibromomethane	UG/L	5	UJ	5	UJ	5	UJ
Chloroethane	UG/L	5	UJ	5	UJ	5	UJ
Chloroform	UG/L	5	U	5	U	5	U
Cis-1,2-Dichloroethene	UG/L	5	U	5	U	5	U
Cis-1,3-Dichloropropene	UG/L	5	U	5	U	5	U
Ethyl benzene	UG/L	5	U	5	U	5	U
Meta/Para Xylene	UG/L	5	U	5	U	5	U
Methyl bromide	UG/L	5	U	5	U	5	U
Methyl butyl ketone	UG/L	5	U	5	U	5	U
Methyl chloride	UG/L	5	U	5	U	5	U
Methyl ethyl ketone	UG/L	5	UJ	5	UJ	5	UJ
Methyl isobutyl ketone	UG/L	5	U	5	U	5	U
Methylene chloride	UG/L	5	U	5	U	5	U
Ortho Xylene	UG/L	5	U	5	U	5	U
Styrene	UG/L	5	U	5	U	5	U
Tetrachloroethene	UG/L	5	U	5	U	5	U
Toluene	UG/L	5	U	5	U	5	U
Trans-1,2-Dichloroethene	UG/L	5	U	5	U	5	U
Trans-1,3-Dichloropropene	UG/L	5	UJ	5	UJ	5	UJ
Trichloroethene	UG/L	5	U	5	U	5	U
Vinyl chloride	UG/L	5	UJ	5	UJ	5	UJ
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	UG/L	10	U	10	UJ	10	UJ
1,2-Dichlorobenzene	UG/L	10	U	10	U	10	U
1,3-Dichlorobenzene	UG/L	10	U	10	U	10	U
1,4-Dichlorobenzene	UG/L	10	U	10	U	10	U

Table C-1P
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE WATER
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I		SEAD-121I		SEAD-121I	
Location ID		SW121I-7		SW121I-7		SW121I-7	
Matrix		SURFACE WATER		SURFACE WATER		SURFACE WATER	
Sample ID		121I-3007		121I-3005		121I-3007/121I-3005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		N/A		N/A		N/A	
Sample Date		10/26/2002		10/26/2002		10/26/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1		1		1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
2,4,5-Trichlorophenol	UG/L	10	U	10	R	10	U
2,4,6-Trichlorophenol	UG/L	10	U	10	R	10	U
2,4-Dichlorophenol	UG/L	10	U	10	R	10	U
2,4-Dimethylphenol	UG/L	10	U	10	R	10	U
2,4-Dinitrophenol	UG/L	10	UJ	10	R	10	UJ
2,4-Dinitrotoluene	UG/L	10	U	10	U	10	U
2,6-Dinitrotoluene	UG/L	10	U	10	U	10	U
2-Chloronaphthalene	UG/L	10	U	10	U	10	U
2-Chlorophenol	UG/L	10	U	10	R	10	U
2-Methylnaphthalene	UG/L	10	U	10	U	10	U
2-Methylphenol	UG/L	10	U	10	U	10	U
2-Nitroaniline	UG/L	10	UJ	10	U	10	U
2-Nitrophenol	UG/L	10	U	10	R	10	U
3 or 4-Methylphenol	UG/L	10	U	10	UJ	10	UJ
3,3'-Dichlorobenzidine	UG/L	10	U	10	R	10	U
3-Nitroaniline	UG/L	10	U	10	U	10	U
4,6-Dinitro-2-methylphenol	UG/L	10	U	10	R	10	U
4-Bromophenyl phenyl ether	UG/L	10	U	10	U	10	U
4-Chloro-3-methylphenol	UG/L	10	U	10	R	10	U
4-Chloroaniline	UG/L	10	U	10	U	10	U
4-Chlorophenyl phenyl ether	UG/L	10	U	10	U	10	U
4-Nitroaniline	UG/L	10	U	10	U	10	U
4-Nitrophenol	UG/L	10	U	10	R	10	U
Acenaphthene	UG/L	10	U	10	U	10	U
Acenaphthylene	UG/L	10	U	10	U	10	U
Anthracene	UG/L	10	U	10	U	10	U
Benzo(a)anthracene	UG/L	10	U	10	U	10	U
Benzo(a)pyrene	UG/L	10	U	10	U	10	U
Benzo(b)fluoranthene	UG/L	10	U	10	U	10	U
Benzo(ghi)perylene	UG/L	10	U	10	U	10	U
Benzo(k)fluoranthene	UG/L	10	U	10	U	10	U
Bis(2-Chloroethoxy)methane	UG/L	10	U	10	U	10	U
Bis(2-Chloroethyl)ether	UG/L	10	UJ	10	UJ	10	UJ
Bis(2-Chloroisopropyl)ether	UG/L	10	U	10	U	10	U
Bis(2-Ethylhexyl)phthalate	UG/L	10	U	10	U	10	U
Butylbenzylphthalate	UG/L	10	U	10	U	10	U
Carbazole	UG/L	10	U	10	U	10	U
Chrysene	UG/L	10	U	10	U	10	U
Di-n-butylphthalate	UG/L	10	U	10	U	10	U
Di-n-octylphthalate	UG/L	10	U	10	U	10	U
Dibenz(a,h)anthracene	UG/L	10	U	10	U	10	U

Table C-1P
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE WATER
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility		SEAD-121I		SEAD-121I		SEAD-121I	
Location ID		SW121I-7		SW121I-7		SW121I-7	
Matrix		SURFACE WATER		SURFACE WATER		SURFACE WATER	
Sample ID		121I-3007		121I-3005		121I-3007/121I-3005	
Sample Depth to Top of Sample		0		0		0	
Sample Depth to Bottom of Sample		N/A		N/A		N/A	
Sample Date		10/26/2002		10/26/2002		10/26/2002	
QC Code		SA		SA		SA/DU	
Investigation		PID-RI		PID-RI		PID-RI	
		1		1		1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
Dibenzofuran	UG/L	10	U	10	U	10	U
Diethyl phthalate	UG/L	10	U	10	U	10	U
Dimethylphthalate	UG/L	10	U	10	U	10	U
Fluoranthene	UG/L	10	U	10	U	10	U
Fluorene	UG/L	10	U	10	U	10	U
Hexachlorobenzene	UG/L	10	U	10	U	10	U
Hexachlorobutadiene	UG/L	10	UJ	10	UJ	10	UJ
Hexachlorocyclopentadiene	UG/L	10	UJ	10	UJ	10	UJ
Hexachloroethane	UG/L	10	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	UG/L	10	U	10	UJ	10	UJ
Isophorone	UG/L	10	UJ	10	U	10	UJ
N-Nitrosodiphenylamine	UG/L	10	UJ	10	UJ	10	UJ
N-Nitrosodipropylamine	UG/L	10	U	10	U	10	U
Naphthalene	UG/L	10	U	10	U	10	U
Nitrobenzene	UG/L	10	U	10	U	10	U
Pentachlorophenol	UG/L	10	U	10	R	10	U
Phenanthrene	UG/L	10	U	10	U	10	U
Phenol	UG/L	10	U	10	R	10	U
Pyrene	UG/L	10	U	10	U	10	U
Pesticides/PCBs							
4,4'-DDD	UG/L	0.01	UJ	0.01	UJ	0.01	UJ
4,4'-DDE	UG/L	0.005	UJ	0.005	UJ	0.005	UJ
4,4'-DDT	UG/L	0.01	UJ	0.01	UJ	0.01	UJ
Aldrin	UG/L	0.02	UJ	0.02	UJ	0.02	UJ
Alpha-BHC	UG/L	0.01	UJ	0.01	UJ	0.01	UJ
Alpha-Chlordane	UG/L	0.02	UJ	0.02	UJ	0.02	UJ
Beta-BHC	UG/L	0.01	UJ	0.01	UJ	0.01	UJ
Chlordane	UG/L	0.13	U	0.13	U	0.13	U
Delta-BHC	UG/L	0.004	UJ	0.004	UJ	0.004	UJ
Dieldrin	UG/L	0.009	UJ	0.009	UJ	0.009	UJ
Endosulfan I	UG/L	0.01	UJ	0.01	UJ	0.01	UJ
Endosulfan II	UG/L	0.01	U	0.01	U	0.01	U
Endosulfan sulfate	UG/L	0.02	U	0.02	U	0.02	U
Endrin	UG/L	0.02	UJ	0.02	UJ	0.02	UJ
Endrin aldehyde	UG/L	0.02	U	0.02	U	0.02	U
Endrin ketone	UG/L	0.009	U	0.009	U	0.009	U
Gamma-BHC/Lindane	UG/L	0.009	UJ	0.009	UJ	0.009	UJ
Gamma-Chlordane	UG/L	0.01	UJ	0.01	UJ	0.01	UJ
Heptachlor	UG/L	0.007	UJ	0.007	UJ	0.007	UJ
Heptachlor epoxide	UG/L	0.008	UJ	0.008	UJ	0.008	UJ
Methoxychlor	UG/L	0.008	U	0.008	U	0.008	U

Table C-1P
SAMPLE-DUPLICATE MERGING RESULTS - SURFACE WATER
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

	Facility	SEAD-121I		SEAD-121I		SEAD-121I	
	Location ID	SW121I-7		SW121I-7		SW121I-7	
	Matrix	SURFACE WATER		SURFACE WATER		SURFACE WATER	
	Sample ID	121I-3007		121I-3005		121I-3007/121I-3005	
	Sample Depth to Top of Sample	0		0		0	
	Sample Depth to Bottom of Sample	N/A		N/A		N/A	
	Sample Date	10/26/2002		10/26/2002		10/26/2002	
	QC Code	SA		SA		SA/DU	
	Investigation	PID-RI		PID-RI		PID-RI	
		1		1		1	
Parameter	**Units**	Value	(Q)	Value	(Q)	Value	(Q)
Toxaphene	UG/L	0.12	U	0.12	U	0.12	U
Aroclor-1016	UG/L	0.5	UJ	0.5	UJ	0.5	UJ
Aroclor-1221	UG/L	0.5	U	0.5	U	0.5	U
Aroclor-1232	UG/L	0.5	UJ	0.5	UJ	0.5	UJ
Aroclor-1242	UG/L	0.5	U	0.5	U	0.5	U
Aroclor-1248	UG/L	0.5	U	0.5	U	0.5	U
Aroclor-1254	UG/L	0.5	U	0.5	U	0.5	U
Aroclor-1260	UG/L	0.5	UJ	0.5	UJ	0.5	UJ
Metals and Cyanide							
Aluminum	UG/L	45.8		46.3		46.1	
Antimony	UG/L	3.8	U	3.8	U	3.8	U
Arsenic	UG/L	4.5	U	4.5	U	4.5	U
Barium	UG/L	9.9	U	9.9	U	9.9	U
Beryllium	UG/L	0.1	U	0.1	U	0.1	U
Cadmium	UG/L	0.8	U	0.8	U	0.8	U
Calcium	UG/L	18300		17700		18000	
Chromium	UG/L	1.4	U	1.4	U	1.4	U
Cobalt	UG/L	0.7	U	0.7	U	0.7	U
Copper	UG/L	3.6	U	3.6	U	3.6	U
Cyanide, Amenable	MG/L	0.01	U	0.01	U	0.01	U
Cyanide, Total	MG/L	0.01	U	0.01	U	0.01	U
Iron	UG/L	41.8	J	41.8	J	41.8	J
Lead	UG/L	3	U	3	U	3	U
Magnesium	UG/L	3660		3610		3635	
Manganese	UG/L	5.3		3		4	
Mercury	UG/L	0.2	U	0.2	U	0.2	U
Nickel	UG/L	2	U	2	U	2	U
Potassium	UG/L	630		660		645	
Selenium	UG/L	3.1	J	1.8	J	2.5	J
Silver	UG/L	3.7	U	3.7	U	3.7	U
Sodium	UG/L	2180		2300		2240	
Thallium	UG/L	5.3	U	5.3	U	5.3	U
Vanadium	UG/L	1.4	UJ	1.4	UJ	1.4	UJ
Zinc	UG/L	14.7	J	13.8	J	14.3	J
Other							
Total Petroleum Hydrocarbons	MG/L	0.412	UJ	0.408	UJ	0.410	UJ

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SB121C-2	SB121C-1	SB121C-1	SB121C-3	SB121C-4	SB121C-4
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB226	EB231	EB014	EB233	EB020	EB229
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998
QC Code										SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	EBS	EBS	EBS	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	48	1.20E+06		800		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	48	4.08E+02		600		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	48	7.29E+02				12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	48	5.06E+05		200		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	48	1.24E+05		400		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	48	2.78E+02		100		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	8					12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
1,2-Dichloropropane	UG/KG	0	0%	0	48	3.42E+02				12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Acetone	UG/KG	13	28%	13	47	1.41E+07		200		12 UJ	12 U	12 J	11 U	10 J	11 UJ
Benzene	UG/KG	41	2%	1	48	6.43E+02		60		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Bromodichloromethane	UG/KG	0	0%	0	48	8.24E+02				12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Bromoform	UG/KG	0	0%	0	48	6.16E+04				12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Carbon disulfide	UG/KG	4.7	4%	2	48	3.55E+05		2700		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Carbon tetrachloride	UG/KG	0	0%	0	48	2.51E+02		600		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Chlorobenzene	UG/KG	0	0%	0	48	1.51E+05		1700		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Chlorodibromomethane	UG/KG	0	0%	0	48	1.11E+03				12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Chloroethane	UG/KG	0	0%	0	48	3.03E+03		1900		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Chloroform	UG/KG	4.8 [4]	4%	2	48	2.21E+02		300		12 UJ	12 U	12 U	11 U	11 UJ	4 J
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	40	4.29E+04									
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	48					12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Ethyl benzene	UG/KG	3300	4%	2	48	3.95E+05		5500		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Meta/Para Xylene	UG/KG	4400	8%	3	40										
Methyl bromide	UG/KG	0	0%	0	48	3.90E+03				12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Methyl butyl ketone	UG/KG	0	0%	0	48					12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Methyl chloride	UG/KG	0	0%	0	48	4.69E+04				12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Methyl ethyl ketone	UG/KG	0	0%	0	48	2.23E+07		300		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	48	5.28E+06		1000		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Methylene chloride	UG/KG	2.6	2%	1	48	9.11E+03		100		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Ortho Xylene	UG/KG	16	3%	1	40										
Styrene	UG/KG	0	0%	0	48	1.70E+06				12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Tetrachloroethene	UG/KG	0	0%	0	48	4.84E+02		1400		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Toluene	UG/KG	28	19%	9	48	5.20E+05		1500		3 J	2 J	5 J	2 J	12 J	10 J
Total Xylenes	UG/KG	0	0%	0	8	2.71E+05		1200		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	40	6.95E+04		300							
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	48					12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Trichloroethene	UG/KG	0	0%	0	48	5.30E+01		700		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Vinyl chloride	UG/KG	0	0%	0	48	7.91E+01		200		12 UJ	12 U	12 U	11 U	11 UJ	11 UJ
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	48	6.22E+04		3400		73 U	78 U	73 U	72 U	72 U	71 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	48	6.00E+05		7900		73 U	78 U	73 U	72 U	72 U	71 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	48	5.31E+05		1600		73 U	78 U	73 U	72 U	72 U	71 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	48	3.45E+03		8500		73 U	78 U	73 U	72 U	72 U	71 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+06		100		180 U	190 U	180 U	180 U	170 U	170 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+03				73 U	78 U	73 U	72 U	72 U	71 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SB121C-2	SB121C-1	SB121C-1	SB121C-3	SB121C-4	SB121C-4
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB226	EB231	EB014	EB233	EB020	EB229
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998
QC Code										SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	EBS	EBS	EBS	EBS
2,4-Dichlorophenol	UG/KG	0	0%	0	48	1.83E+05		400		73 U	78 U	73 U	72 U	72 U	71 U
2,4-Dimethylphenol	UG/KG	0	0%	0	48	1.22E+06				73 U	78 U	73 U	72 U	72 U	71 U
2,4-Dinitrophenol	UG/KG	0	0%	0	47	1.22E+05		200		180 U	190 U	180 U	180 U	170 U	170 U
2,4-Dinitrotoluene	UG/KG	45	2%	1	48	1.22E+05				45 J	78 U	73 U	72 U	72 U	71 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	48	6.11E+04		1000		73 U	78 U	73 U	72 U	72 U	71 U
2-Chloronaphthalene	UG/KG	0	0%	0	48	4.94E+06				73 U	78 U	73 U	72 U	72 U	71 U
2-Chlorophenol	UG/KG	0	0%	0	48	6.34E+04		800		73 U	78 U	73 U	72 U	72 U	71 U
2-Methylnaphthalene	UG/KG	610	19%	9	48			36400		8.6 J	78 U	4.3 J	5.5 J	72 U	71 U
2-Methylphenol	UG/KG	0	0%	0	48	3.06E+06		100		73 U	78 U	73 U	72 U	72 U	71 U
2-Nitroaniline	UG/KG	0	0%	0	48	1.83E+05		430		180 U	190 U	180 U	180 U	170 U	170 U
2-Nitrophenol	UG/KG	0	0%	0	48			330		73 U	78 U	73 U	72 U	72 U	71 U
3 or 4-Methylphenol	UG/KG	0	0%	0	40										
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	48	1.08E+03				73 U	78 U	73 U	72 U	72 U	71 U
3-Nitroaniline	UG/KG	0	0%	0	48	1.83E+04		500		180 U	190 U	180 U	180 U	170 U	170 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	48	6.11E+03				180 U	190 U	180 U	180 U	170 U	170 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	48					73 U	78 U	73 U	72 U	72 U	71 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	48			240		73 U	78 U	73 U	72 U	72 U	71 U
4-Chloroaniline	UG/KG	0	0%	0	48	2.44E+05		220		73 U	78 U	73 U	72 U	72 U	71 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	48					73 U	78 U	73 U	72 U	72 U	71 U
4-Methylphenol	UG/KG	0	0%	0	8	3.06E+05		900		73 U	78 U	73 U	72 U	72 U	71 U
4-Nitroaniline	UG/KG	0	0%	0	48	2.32E+04				180 U	190 U	180 U	180 U	170 U	170 U
4-Nitrophenol	UG/KG	0	0%	0	48			100		180 U	190 U	180 U	180 U	170 U	170 U
Acenaphthene	UG/KG	2600	23%	11	48	3.68E+06		50000		32 J	78 U	6.8 J	72 U	72 U	71 U
Acenaphthylene	UG/KG	2500	21%	10	48			41000		73 U	78 U	73 U	72 U	72 U	71 U
Anthracene	UG/KG	7100	42%	20	48	2.19E+07		50000		52 J	78 U	15 J	72 U	72 U	71 U
Benzo(a)anthracene	UG/KG	10000	55%	26	47	6.21E+02	4	224	14	180	78 U	76	8.2 J	3.9 J	7 J
Benzo(a)pyrene	UG/KG	8700	51%	24	47	6.21E+01	21	61	21	150	78 U	57 J	8.1 J	72 U	71 U
Benzo(b)fluoranthene	UG/KG	12000	64%	30	47	6.21E+02	9	1100	5	200	78 U	95	13 J	13 J	71 U
Benzo(ghi)perylene	UG/KG	3150[4]	53%	25	47			50000		98	78 U	42 J	11 J	72 U	71 U
Benzo(k)fluoranthene	UG/KG	7500	47%	22	47	6.21E+03	1	1100	4	150	78 U	67 J	7 J	72 U	71 U
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	48					73 U	78 U	73 U	72 U	72 U	71 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	48	2.18E+02				73 U	78 U	73 U	72 U	72 U	71 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	48	2.88E+03				73 U	78 U	73 U	72 U	72 U	71 U
Bis(2-Ethylhexyl)phthalate	UG/KG	200	56%	27	48	3.47E+04		50000		73 U	13 J	73 U	9.2 J	9.3 J	13 J
Butylbenzylphthalate	UG/KG	120	13%	6	48	1.22E+07		50000		73 U	78 U	73 U	72 U	72 U	71 U
Carbazole	UG/KG	4200	35%	17	48	2.43E+04				73 J	78 U	17 J	72 U	72 U	71 U
Chrysene	UG/KG	9100	53%	25	47	6.21E+04		400	10	210	78 U	90	11 J	8.8 J	12 J
Di-n-butylphthalate	UG/KG	132[4]	10%	5	48	6.11E+06		8100		73 U	78 U	73 U	72 U	72 U	3.7 J
Di-n-octylphthalate	UG/KG	23[4]	4%	2	48	2.44E+06		50000		73 U	9.9 J	73 U	72 U	72 U	71 U
Dibenz(a,h)anthracene	UG/KG	470[4]	26%	12	47	6.21E+01	7	14	11	43 J	78 U	21 J	72 U	72 U	71 U
Dibenzofuran	UG/KG	1700	21%	10	48	1.45E+05		6200		19 J	78 U	5.1 J	72 U	72 U	71 U
Diethyl phthalate	UG/KG	21[4]	13%	6	48	4.89E+07		7100		73 U	5.8 J	73 U	8.5 J	8.1 J	10 J
Dimethylphthalate	UG/KG	0	0%	0	48	1.00E+08		2000		73 U	78 U	73 U	72 U	72 U	71 U
Fluoranthene	UG/KG	27000	73%	35	48	2.29E+06		50000		520	78 U	180	13 J	7.4 J	10 J

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SB121C-2	SB121C-1	SB121C-1	SB121C-3	SB121C-4	SB121C-4
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB226	EB231	EB014	EB233	EB020	EB229
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998
QC Code										SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	EBS	EBS	EBS	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**[1]	**Region IX PRG Criteria Value**[2]	**Exceedances**	**NYSDEC Criteria Value**[3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Fluorene	UG/KG	3500	27%	13	48	2.75E+06		50000		32 J	78 U	8 J	72 U	72 U	71 U
Hexachlorobenzene	UG/KG	8.5	2%	1	48	3.04E+02		410		8.5 J	78 U	73 U	72 U	72 U	71 U
Hexachlorobutadiene	UG/KG	0	0%	0	48	6.24E+03				73 U	78 U	73 U	72 U	72 U	71 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	48	3.65E+05				73 U	78 U	73 U	72 U	72 U	71 U
Hexachloroethane	UG/KG	0	0%	0	48	3.47E+04				73 U	78 U	73 U	72 U	72 U	71 U
Indeno(1,2,3-cd)pyrene	UG/KG	970 [4]	46%	22	48	6.21E+02	3	3200		94	78 U	41 J	8.6 J	72 U	71 U
Isophorone	UG/KG	0	0%	0	48	5.12E+05		4400		73 U	78 U	73 U	72 U	72 U	71 U
N-Nitrosodiphenylamine	UG/KG	4.8	2%	1	48	9.93E+04				4.8 J	78 U	73 U	72 U	72 U	71 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	48	6.95E+01				73 U	78 U	73 U	72 U	72 U	71 U
Naphthalene	UG/KG	400	19%	9	48	5.59E+04		13000		11 J	78 U	73 U	72 U	72 U	71 U
Nitrobenzene	UG/KG	0	0%	0	48	1.96E+04		200		73 U	78 U	73 U	72 U	72 U	71 U
Pentachlorophenol	UG/KG	0	0%	0	48	2.98E+03		1000		180 U	190 UJ	180 U	180 U	170 U	170 U
Phenanthrene	UG/KG	29000	52%	25	48			50000		360	78 U	96	8.8 J	8.8 J	7.6 J
Phenol	UG/KG	0	0%	0	48	1.83E+07		30		73 U	78 U	73 U	72 U	72 U	71 U
Pyrene	UG/KG	34000	67%	32	48	2.32E+06		50000		380	78 U	170	13 J	8.3 J	14 J
Pesticides/PCBs															
4,4'-DDD	UG/KG	44	12%	5	43	2.44E+03		2900		3.7 U	3.9 U	3.7 U	3.6 U	3.6 U	3.5 U
4,4'-DDE	UG/KG	69	32%	15	47	1.72E+03		2100		13	3.9 U	29	3.6 U	3.8	4.5
4,4'-DDT	UG/KG	100	28%	13	47	1.72E+03		2100		18	3.9 U	35	3.6 U	1.9 J	2.3 J
Aldrin	UG/KG	14 [4]	6%	3	48	2.86E+01		41		1.8 U	2 U	1.8 U	1.9 U	1.8 U	1.8 U
Alpha-BHC	UG/KG	0	0%	0	48	9.02E+01		110		1.8 U	2 U	2 R	1.9 U	1.8 U	1.8 U
Alpha-Chlordane	UG/KG	63 [4]	8%	4	48					1.8 U	2 U	1.8 U	1.9 U	1.8 U	1.8 U
Beta-BHC	UG/KG	0	0%	0	48	3.16E+02		200		1.8 U	2 U	1.8 UJ	1.9 U	1.8 U	1.8 U
Chlordane	UG/KG	0	0%	0	40										
Delta-BHC	UG/KG	2	6%	3	48			300		1.8 U	2 U	0.95 J	1.9 U	1.8 U	1.8 U
Dieldrin	UG/KG	41 [4]	4%	2	48	3.04E+01	2	44		3.7 U	3.9 U	3.7 UJ	3.6 U	3.6 U	3.5 U
Endosulfan I	UG/KG	185 [4]	38%	18	48			900		1.8 U	2 U	1.8 UJ	1.9 U	1.8 U	1.8 U
Endosulfan II	UG/KG	9	2%	1	47			900		3.7 U	3.9 U	3.7 UJ	3.6 U	3.6 U	3.5 U
Endosulfan sulfate	UG/KG	0	0%	0	48			1000		3.7 U	3.9 U	3.7 UJ	3.6 U	3.6 U	3.5 U
Endrin	UG/KG	21.5	2%	1	47	1.83E+04		100		3.7 U	3.9 U	3.7 UJ	3.6 U	3.6 U	3.5 U
Endrin aldehyde	UG/KG	0	0%	0	48					3.7 U	3.9 U	3.7 UJ	3.6 U	3.6 U	3.5 U
Endrin ketone	UG/KG	7.5 [4]	6%	3	48					3.7 U	3.9 U	3.7 UJ	3.6 U	3.6 U	3.5 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	48	4.37E+02		60		1.8 U	2 U	1.8 UJ	1.9 U	1.8 U	1.8 U
Gamma-Chlordane	UG/KG	1.2	2%	1	48			540		1.8 U	2 U	1.8 UJ	1.9 U	1.8 U	1.8 U
Heptachlor	UG/KG	14	4%	2	47	1.08E+02		100		1.8 U	2 U	1.8 UJ	1.9 U	1.8 U	1.8 U
Heptachlor epoxide	UG/KG	2.8	4%	2	46	5.34E+01		20		1.8 U	2 U	1.8 UJ	1.9 U	1.8 U	1.8 U
Methoxychlor	UG/KG	0	0%	0	48	3.06E+05				18 U	20 U	18 UJ	19 U	18 U	18 U
Toxaphene	UG/KG	0	0%	0	48	4.42E+02				180 U	200 U	180 UJ	190 U	180 U	180 U
Aroclor-1016	UG/KG	0	0%	0	48	3.93E+03				37 U	39 U	37 UJ	36 U	36 U	35 U
Aroclor-1221	UG/KG	0	0%	0	48					74 U	79 U	74 UJ	74 U	73 U	72 U
Aroclor-1232	UG/KG	0	0%	0	48					37 U	39 U	37 UJ	36 U	36 U	35 U
Aroclor-1242	UG/KG	58	2%	1	48					37 U	39 U	37 UJ	36 U	36 U	35 U
Aroclor-1248	UG/KG	0	0%	0	48					37 U	39 U	37 UJ	36 U	36 U	35 U
Aroclor-1254	UG/KG	930	19%	9	48	2.22E+02	3	10000		37 U	39 U	37 UJ	36 U	36 U	35 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SB121C-2	SB121C-1	SB121C-1	SB121C-3	SB121C-4	SB121C-4
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB226	EB231	EB014	EB233	EB020	EB229
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998	3/9/1998
QC Code										SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	EBS	EBS	EBS	EBS
Aroclor-1260	UG/KG	85	10%	5	48			10000		37 U	39 U	30 J	36 U	36 U	35 U
Metals and Cyanide															
Aluminum	MG/KG	17000	100%	48	48	7.61E+04		19300		15100	12800	14500	1730	14400	13000
Antimony	MG/KG	236	81%	39	48	3.13E+01	2	5.9	11	17.3 J	1.1 J	19.3 J	0.93 J	1.7 J	0.81 J
Arsenic	MG/KG	11.6	100%	48	48	3.90E-01	48	8.2	2	6.5	5.5	6.1	3.8	5	3.7
Barium	MG/KG	2030	100%	48	48	5.37E+03		300	7	1420	64.9	1600	18.1	86.6	69.6
Beryllium	MG/KG	1.2	100%	48	48	1.54E+02		1.1	1	0.47	0.52	0.4	0.25	0.57	0.49
Cadmium	MG/KG	29.1	60%	29	48	3.70E+01		2.3	14	2.3	0.07 U	2.7	0.07 U	0.07 U	0.05 U
Calcium	MG/KG	296000	100%	48	48			121000	6	23400	2580	31300	283000	17200	25500
Chromium	MG/KG	74.8	100%	48	48			29.6	12	35.2	20.9	32.9	3.8	27.8	22.6
Cobalt	MG/KG	17	100%	35	35	9.03E+02		30		15.7	12.8	16.5	3.5	17.6	12.5
Copper	MG/KG	9750	100%	48	48	3.13E+03	3	33	35	9750	19.7 J	7690	8.8 J	39.1 J	33 J
Cyanide	MG/KG	0	0%	0	8	1.22E+06		0.35		0.56 U	0.63 U	0.59 U	0.58 U	0.56 U	0.61 U
Cyanide, Amenable	MG/KG	0	0%	0	40										
Cyanide, Total	MG/KG	0	0%	0	40										
Iron	MG/KG	51700	100%	48	48	2.35E+04	23	36500	5	41500	25700	41100	4230	32000	25900
Lead	MG/KG	18900	100%	48	48	4.00E+02	7	24.8	40	5080	11.8 J	5280	11.7 J	27.1	23.5 J
Magnesium	MG/KG	20700	100%	48	48			21500		6810	4590	6820	10200	6980	5630
Manganese	MG/KG	858	100%	48	48	1.76E+03		1060		525	598	612	213	413	359
Mercury	MG/KG	0.47	92%	44	48	2.35E+01		0.1	8	0.07	0.06 U	0.05 U	0.04 U	0.04 U	0.04 U
Nickel	MG/KG	224	100%	48	48	1.56E+03		49	9	58.5 J	40.5	54.2 J	11.6	61.8	49.3
Potassium	MG/KG	1990	100%	48	48			2380		1990	1600	1840	1150	1980	1450
Selenium	MG/KG	1.3	21%	10	48	3.91E+02		2		1 UJ	1.1 U	0.92 UJ	1 U	1 U	0.8 U
Silver	MG/KG	21.8	38%	18	48	3.91E+02		0.75	13	0.46 U	0.48 U	0.41 U	0.46 U	0.46 U	0.36 U
Sodium	MG/KG	478	88%	42	48			172	26	392	139 U	606	132 U	132 U	110
Thallium	MG/KG	1.1	21%	10	48	5.16E+00		0.7	3	1.4 U	1.4 UJ	1.2 U	1.4 UJ	1.4 J	1.1 UJ
Vanadium	MG/KG	25.4	100%	48	48	7.82E+01		150		20.9 J	20.8	19.5 J	5.1	21	17
Zinc	MG/KG	3610	100%	48	48	2.35E+04		110	28	1350	80.3	1280	29.8	153	196
Other															
Total Organic Carbon	MG/KG	9000	100%	40	40										
Total Petroleum Hydrocarbons	MG/KG	7600	25%	10	40										

NOTES:

1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.

2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)

3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.

4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-10	SBDRMO-11	SBDRMO-12	SBDRMO-13	SBDRMO-14	SBDRMO-15
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1056	DRMO-1059	DRMO-1062	DRMO-1065	DRMO-1068	DRMO-1071
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/25/2002	10/26/2002	10/25/2002	10/26/2002	10/25/2002	10/26/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**[1]	**Region IX PRG Criteria Value**[2]	**Exceedances**	**NYSDEC Criteria Value**[3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	48	1.20E+06		800		2.9 UJ	2.8 U	2.9 UJ	3.3 U	2.5 UJ	2.7 U
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	48	4.08E+02		600		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
1,1,2-Trichloroethane	UG/KG	0	0%	0	48	7.29E+02				2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
1,1-Dichloroethane	UG/KG	0	0%	0	48	5.06E+05		200		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
1,1-Dichloroethene	UG/KG	0	0%	0	48	1.24E+05		400		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
1,2-Dichloroethane	UG/KG	0	0%	0	48	2.78E+02		100		2.9 UJ	2.8 U	2.9 UJ	3.3 U	2.5 UJ	2.7 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	8										
1,2-Dichloropropane	UG/KG	0	0%	0	48	3.42E+02				2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Acetone	UG/KG	13	28%	13	47	1.41E+07		200		20 UJ	11 J	3.2 J	3.3 U	7.3 UJ	2.7 U
Benzene	UG/KG	41	2%	1	48	6.43E+02		60		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Bromodichloromethane	UG/KG	0	0%	0	48	8.24E+02				2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Bromoform	UG/KG	0	0%	0	48	6.16E+04				2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Carbon disulfide	UG/KG	4.7	4%	2	48	3.55E+05		2700		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Carbon tetrachloride	UG/KG	0	0%	0	48	2.51E+02		600		2.9 UJ	2.8 UJ	2.9 UJ	3.3 UJ	2.5 UJ	2.7 UJ
Chlorobenzene	UG/KG	0	0%	0	48	1.51E+05		1700		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Chlorodibromomethane	UG/KG	0	0%	0	48	1.11E+03				2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Chloroethane	UG/KG	0	0%	0	48	3.03E+03		1900		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Chloroform	UG/KG	4.8[4]	4%	2	48	2.21E+02		300		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	40	4.29E+04				2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	48					2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Ethyl benzene	UG/KG	3300	4%	2	48	3.95E+05		5500		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Meta/Para Xylene	UG/KG	4400	8%	3	40					2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Methyl bromide	UG/KG	0	0%	0	48	3.90E+03				2.9 UJ	2.8 UJ	2.9 UJ	3.3 UJ	2.5 UJ	2.7 UJ
Methyl butyl ketone	UG/KG	0	0%	0	48					2.9 UJ	2.8 UJ	2.9 UJ	3.3 UJ	2.5 UJ	2.7 UJ
Methyl chloride	UG/KG	0	0%	0	48	4.69E+04				2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 UJ
Methyl ethyl ketone	UG/KG	0	0%	0	48	2.23E+07		300		2.9 UJ	2.8 UJ	2.9 U	3.3 UJ	2.5 UJ	2.7 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	48	5.28E+06		1000		2.9 UJ	2.8 UJ	2.9 U	3.3 UJ	2.5 UJ	2.7 U
Methylene chloride	UG/KG	2.6	2%	1	48	9.11E+03		100		2.9 UJ	2.7 U	2.9 U	2.9 U	2.5 UJ	2.7 U
Ortho Xylene	UG/KG	16	3%	1	40					2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Styrene	UG/KG	0	0%	0	48	1.70E+06				2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Tetrachloroethene	UG/KG	0	0%	0	48	4.84E+02		1400		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Toluene	UG/KG	28	19%	9	48	5.20E+05		1500		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Total Xylenes	UG/KG	0	0%	0	8	2.71E+05		1200							
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	40	6.95E+04		300		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	48					2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Trichloroethene	UG/KG	0	0%	0	48	5.30E+01		700		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Vinyl chloride	UG/KG	0	0%	0	48	7.91E+01		200		2.9 UJ	2.8 U	2.9 U	3.3 U	2.5 UJ	2.7 U
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	48	6.22E+04		3400		390 U	420 U	380 U	430 U	360 U	360 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	48	6.00E+05		7900		390 U	420 U	380 U	430 U	360 U	360 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	48	5.31E+05		1600		390 U	420 U	380 U	430 U	360 U	360 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	48	3.45E+03		8500		390 U	420 U	380 U	430 U	360 U	360 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+06		100		990 U	1100 U	970 U	1100 U	910 U	890 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+03				390 U	420 U	380 U	430 U	360 U	360 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-10	SBDRMO-11	SBDRMO-12	SBDRMO-13	SBDRMO-14	SBDRMO-15
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1056	DRMO-1059	DRMO-1062	DRMO-1065	DRMO-1068	DRMO-1071
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/25/2002	10/26/2002	10/25/2002	10/26/2002	10/25/2002	10/26/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dichlorophenol	UG/KG	0	0%	0	48	1.83E+05		400		390 U	420 U	380 U	430 U	360 U	360 U
2,4-Dimethylphenol	UG/KG	0	0%	0	48	1.22E+06				390 U	420 U	380 U	430 U	360 U	360 U
2,4-Dinitrophenol	UG/KG	0	0%	0	47	1.22E+05		200		990 UJ	1100 UJ	970 R	1100 U	910 UJ	890 UJ
2,4-Dinitrotoluene	UG/KG	45	2%	1	48	1.22E+05				390 U	420 U	380 U	430 U	360 U	360 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	48	6.11E+04		1000		390 U	420 U	380 U	430 U	360 U	360 U
2-Chloronaphthalene	UG/KG	0	0%	0	48	4.94E+06				390 U	420 U	380 U	430 U	360 U	360 U
2-Chlorophenol	UG/KG	0	0%	0	48	6.34E+04		800		390 U	420 U	380 U	430 U	360 U	360 U
2-Methylnaphthalene	UG/KG	610	19%	9	48			36400		390 U	420 U	380 U	430 U	360 U	360 U
2-Methylphenol	UG/KG	0	0%	0	48	3.06E+06		100		390 U	420 U	380 U	430 U	360 U	360 U
2-Nitroaniline	UG/KG	0	0%	0	48	1.83E+05		430		990 U	1100 U	970 UJ	1100 UJ	910 U	890 U
2-Nitrophenol	UG/KG	0	0%	0	48			330		390 U	420 U	380 U	430 U	360 U	360 U
3 or 4-Methylphenol	UG/KG	0	0%	0	40					390 U	420 U	380 U	430 U	360 U	360 U
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	48	1.08E+03				390 U	420 U	380 U	430 U	360 UJ	360 UJ
3-Nitroaniline	UG/KG	0	0%	0	48	1.83E+04		500		990 U	1100 U	970 U	1100 U	910 U	890 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	48	6.11E+03				990 UJ	1100 UJ	970 UJ	1100 U	910 U	890 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	48					390 U	420 U	380 U	430 U	360 U	360 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	48			240		390 U	420 U	380 U	430 U	360 U	360 U
4-Chloroaniline	UG/KG	0	0%	0	48	2.44E+05		220		390 U	420 U	380 U	430 U	360 U	360 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	48					390 U	420 U	380 U	430 U	360 U	360 U
4-Methylphenol	UG/KG	0	0%	0	8	3.06E+05		900							
4-Nitroaniline	UG/KG	0	0%	0	48	2.32E+04				990 U	1100 U	970 U	1100 UJ	910 U	890 U
4-Nitrophenol	UG/KG	0	0%	0	48			100		990 U	1100 U	970 UJ	1100 U	910 U	890 U
Acenaphthene	UG/KG	2600	23%	11	48	3.68E+06		50000		390 U	420 U	380 U	430 U	360 U	360 U
Acenaphthylene	UG/KG	2500	21%	10	48			41000		390 U	420 U	380 U	430 U	360 U	360 U
Anthracene	UG/KG	7100	42%	20	48	2.19E+07		50000		390 U	420 U	380 U	430 U	360 U	66 J
Benzo(a)anthracene	UG/KG	10000	55%	26	47	6.21E+02	4	224	14	390 U	86 J	380 U	430 U	45 J	140 J
Benzo(a)pyrene	UG/KG	8700	51%	24	47	6.21E+01	21	61	21	390 U	84 J	380 U	430 U	360 UJ	120 J
Benzo(b)fluoranthene	UG/KG	12000	64%	30	47	6.21E+02	9	1100	5	390 U	86 J	380 U	430 U	60 J	160 J
Benzo(ghi)perylene	UG/KG	3150[4]	53%	25	47			50000		390 U	72 J	380 UJ	430 UJ	67 J	110 J
Benzo(k)fluoranthene	UG/KG	7500	47%	22	47	6.21E+03	1	1100	4	390 U	420 U	380 U	430 U	360 UJ	150 J
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	48					390 U	420 U	380 U	430 U	360 U	360 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	48	2.18E+02				390 U	420 U	380 U	430 U	360 U	360 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	48	2.88E+03				390 U	420 U	380 U	430 U	360 U	360 U
Bis(2-Ethylhexyl)phthalate	UG/KG	200	56%	27	48	3.47E+04		50000		390 U	420 U	380 U	130 J	50 J	96 J
Butylbenzylphthalate	UG/KG	120	13%	6	48	1.22E+07		50000		390 U	420 U	380 U	49 J	360 UJ	48 J
Carbazole	UG/KG	4200	35%	17	48	2.43E+04				390 U	420 U	380 U	430 U	360 U	49 J
Chrysene	UG/KG	9100	53%	25	47	6.21E+04		400	10	390 U	96 J	380 U	430 U	60 J	200 J
Di-n-butylphthalate	UG/KG	132[4]	10%	5	48	6.11E+06		8100		390 U	420 U	380 U	430 U	360 U	360 U
Di-n-octylphthalate	UG/KG	23[4]	4%	2	48	2.44E+06		50000		390 U	420 U	380 U	430 U	360 UJ	360 UJ
Dibenz(a,h)anthracene	UG/KG	470[4]	26%	12	47	6.21E+01	7	14	11	390 U	420 U	380 UJ	430 UJ	360 UJ	360 UJ
Dibenzofuran	UG/KG	1700	21%	10	48	1.45E+05		6200		390 U	420 U	380 U	430 U	360 U	360 U
Diethyl phthalate	UG/KG	21[4]	13%	6	48	4.89E+07		7100		390 U	420 U	380 U	430 U	360 U	360 U
Dimethylphthalate	UG/KG	0	0%	0	48	1.00E+08		2000		390 U	420 U	380 U	430 U	360 U	360 U
Fluoranthene	UG/KG	27000	73%	35	48	2.29E+06		50000		390 U	180 J	75 J	430 U	76 J	310 J

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	NYSDEC Criteria Value [3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-10	SBDRMO-11	SBDRMO-12	SBDRMO-13	SBDRMO-14	SBDRMO-15
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1056	DRMO-1059	DRMO-1062	DRMO-1065	DRMO-1068	DRMO-1071
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/25/2002	10/26/2002	10/25/2002	10/26/2002	10/25/2002	10/26/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Fluorene	UG/KG	3500	27%	13	48	2.75E+06		50000		390 U	420 U	380 U	430 U	360 U	360 U
Hexachlorobenzene	UG/KG	8.5	2%	1	48	3.04E+02		410		390 U	420 U	380 U	430 U	360 U	360 U
Hexachlorobutadiene	UG/KG	0	0%	0	48	6.24E+03				390 U	420 U	380 U	430 U	360 U	360 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	48	3.65E+05				390 UJ	420 UJ	380 UJ	430 U	360 UJ	360 UJ
Hexachloroethane	UG/KG	0	0%	0	48	3.47E+04				390 U	420 U	380 U	430 U	360 U	360 U
Indeno(1,2,3-cd)pyrene	UG/KG	970 [4]	46%	22	48	6.21E+02	3	3200		390 U	420 U	380 UJ	430 UJ	360 UJ	74 J
Isophorone	UG/KG	0	0%	0	48	5.12E+05		4400		390 U	420 U	380 U	430 U	360 U	360 U
N-Nitrosodiphenylamine	UG/KG	4.8	2%	1	48	9.93E+04				390 U	420 U	380 U	430 U	360 U	360 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	48	6.95E+01				390 U	420 U	380 UJ	430 UJ	360 U	360 U
Naphthalene	UG/KG	400	19%	9	48	5.59E+04		13000		390 U	420 U	380 U	430 U	360 U	360 U
Nitrobenzene	UG/KG	0	0%	0	48	1.96E+04		200		390 U	420 U	380 U	430 U	360 U	360 U
Pentachlorophenol	UG/KG	0	0%	0	48	2.98E+03		1000		990 U	1100 U	970 U	1100 U	910 U	890 U
Phenanthrene	UG/KG	29000	52%	25	48			50000		390 U	72 J	380 U	430 U	360 U	240 J
Phenol	UG/KG	0	0%	0	48	1.83E+07		30		390 U	420 U	380 U	430 U	360 U	360 U
Pyrene	UG/KG	34000	67%	32	48	2.32E+06		50000		390 U	120 J	67 J	430 UJ	110 J	600 J
Pesticides/PCBs															
4,4'-DDD	UG/KG	44	12%	5	43	2.44E+03		2900		2 R	2.2 UJ	2 R	2.2 UJ	1.8 R	1.8 UJ
4,4'-DDE	UG/KG	69	32%	15	47	1.72E+03		2100		2 UJ	2.2 UJ	2 UJ	2.2 UJ	1.8 UJ	20 J
4,4'-DDT	UG/KG	100	28%	13	47	1.72E+03		2100		2 UJ	2.2 UJ	2 UJ	2.2 UJ	1.8 UJ	11 NJ
Aldrin	UG/KG	14 [4]	6%	3	48	2.86E+01		41		2 UJ	2.2 UJ	2 UJ	2.2 UJ	1.8 UJ	1.8 UJ
Alpha-BHC	UG/KG	0	0%	0	48	9.02E+01		110		2 UJ	2.2 UJ	2 UJ	2.2 UJ	1.8 UJ	1.8 UJ
Alpha-Chlordane	UG/KG	63 [4]	8%	4	48					2 UJ	2.2 UJ	2 UJ	2.2 UJ	1.8 UJ	1.8 UJ
Beta-BHC	UG/KG	0	0%	0	48	3.16E+02		200		2 U	2.2 UJ	2 U	2.2 UJ	1.8 U	1.8 UJ
Chlordane	UG/KG	0	0%	0	40					20 U	22 U	20 U	22 U	18 U	18 U
Delta-BHC	UG/KG	2	6%	3	48			300		2 UJ	2.2 UJ	2 UJ	2.2 UJ	1.8 UJ	1.8 UJ
Dieldrin	UG/KG	41 [4]	4%	2	48	3.04E+01	2	44		2 UJ	2.2 UJ	2 UJ	2.2 UJ	1.8 UJ	1.8 UJ
Endosulfan I	UG/KG	185 [4]	38%	18	48			900		2 U	2.2 U	11	2.2 U	8.7 J	17 J
Endosulfan II	UG/KG	9	2%	1	47			900		2 U	2.2 U	2 U	2.2 U	1.8 U	1.8 U
Endosulfan sulfate	UG/KG	0	0%	0	48			1000		2 U	2.2 U	2 U	2.2 U	1.8 U	1.8 U
Endrin	UG/KG	21.5	2%	1	47	1.83E+04		100		2 UJ	2.2 U	2 UJ	2.2 U	1.8 UJ	1.8 U
Endrin aldehyde	UG/KG	0	0%	0	48					2 U	2.2 U	2 U	2.2 U	1.8 U	1.8 U
Endrin ketone	UG/KG	7.5 [4]	6%	3	48					2 U	2.2 U	2 U	2.2 U	1.8 U	1.8 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	48	4.37E+02		60		2 UJ	2.2 UJ	2 UJ	2.2 UJ	1.8 UJ	1.8 UJ
Gamma-Chlordane	UG/KG	1.2	2%	1	48			540		2 U	2.2 UJ	2 U	2.2 UJ	1.8 U	1.8 UJ
Heptachlor	UG/KG	14	4%	2	47	1.08E+02		100		2 U	2.2 UJ	2 U	2.2 UJ	1.8 U	1.8 UJ
Heptachlor epoxide	UG/KG	2.8	4%	2	46	5.34E+01		20		2 U	2.2 UJ	2 U	2.2 UJ	1.8 U	1.8 UJ
Methoxychlor	UG/KG	0	0%	0	48	3.06E+05				2 UJ	2.2 U	2 UJ	2.2 U	1.8 UJ	1.8 U
Toxaphene	UG/KG	0	0%	0	48	4.42E+02				20 U	22 U	20 U	22 U	18 U	18 U
Aroclor-1016	UG/KG	0	0%	0	48	3.93E+03				20 UJ	22 U	20 UJ	22 U	19 UJ	18 U
Aroclor-1221	UG/KG	0	0%	0	48					20 U	22 U	20 U	22 U	19 U	18 U
Aroclor-1232	UG/KG	0	0%	0	48					20 UJ	22 U	20 UJ	22 U	19 UJ	18 U
Aroclor-1242	UG/KG	58	2%	1	48					20 UJ	22 U	20 UJ	22 U	19 UJ	18 U
Aroclor-1248	UG/KG	0	0%	0	48					20 U	22 U	20 U	22 U	19 U	18 U
Aroclor-1254	UG/KG	930	19%	9	48	2.22E+02	3	10000		20 U	22 U	20 U	22 U	19 U	18 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-10	SBDRMO-11	SBDRMO-12	SBDRMO-13	SBDRMO-14	SBDRMO-15
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1056	DRMO-1059	DRMO-1062	DRMO-1065	DRMO-1068	DRMO-1071
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/25/2002	10/26/2002	10/25/2002	10/26/2002	10/25/2002	10/26/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aroclor-1260	UG/KG	85	10%	5	48			10000		20 UJ	22 U	20 UJ	22 U	19 UJ	18 U
Metals and Cyanide															
Aluminum	MG/KG	17000	100%	48	48	7.61E+04		19300		11500	11200	10700	11500	8570	9170
Antimony	MG/KG	236	81%	39	48	3.13E+01	2	5.9	11	1.1 U	1.2 U	3.6	1.2 U	1.1	6.9
Arsenic	MG/KG	11.6	100%	48	48	3.90E-01	48	8.2	2	5	4.8	5.6	3.4	5.4	6
Barium	MG/KG	2030	100%	48	48	5.37E+03		300	7	83.5 J	84 J	49.2 J	71 J	39.1 J	275 J
Beryllium	MG/KG	1.2	100%	48	48	1.54E+02		1.1	1	0.76	0.7	0.61	0.74	0.52 J	0.46 J
Cadmium	MG/KG	29.1	60%	29	48	3.70E+01		2.3	14	0.14 U	0.3 J	0.14 U	0.16 U	1.3	16.3
Calcium	MG/KG	296000	100%	48	48			121000	6	4850 J	28000 J	24800 J	8080 J	18600 J	107000 J
Chromium	MG/KG	74.8	100%	48	48			29.6	12	17.6	19.6	19	17.7	19.1	47.2
Cobalt	MG/KG	17	100%	35	35	9.03E+02		30		12.4	13.3	14.2	9.9	13.3	11.3
Copper	MG/KG	9750	100%	48	48	3.13E+03	3	33	35	16.2 J	30.1 J	43.8 J	18.8 J	62.5 J	407 J
Cyanide	MG/KG	0	0%	0	8	1.22E+06		0.35							
Cyanide, Amenable	MG/KG	0	0%	0	40					0.59 U	0.65 U	0.59 U	0.66 U	0.55 U	0.54 U
Cyanide, Total	MG/KG	0	0%	0	40					0.595 U	0.653 U	0.589 U	0.656 U	0.548 U	0.543 U
Iron	MG/KG	51700	100%	48	48	2.35E+04	23	36500	5	22500	23200	22300	21100	21500 *	24400
Lead	MG/KG	18900	100%	48	48	4.00E+02	7	24.8	40	14.7	37.1	60.2	12.4	51.5	371
Magnesium	MG/KG	20700	100%	48	48			21500		3610	5410	5350	3700	4860 *	6870
Manganese	MG/KG	858	100%	48	48	1.76E+03		1060		668	349	484	526	289	403
Mercury	MG/KG	0.47	92%	44	48	2.35E+01		0.1	8	0.05	0.03	0.04	0.04	0.04	0.08
Nickel	MG/KG	224	100%	48	48	1.56E+03		49	9	23.9 J	31.4 J	36.1 J	23.9 J	38.4 J	52.5 J
Potassium	MG/KG	1990	100%	48	48			2380		911 J	982 J	1280 J	829 J	1000 J	1430 J
Selenium	MG/KG	1.3	21%	10	48	3.91E+02		2		0.5 U	0.55 U	0.49 U	0.55 U	0.46 U	0.44 U
Silver	MG/KG	21.8	38%	18	48	3.91E+02		0.75	13	0.32 U	0.35	0.32 U	0.35 U	0.29 U	18.1
Sodium	MG/KG	478	88%	42	48			172	26	132	130 U	242	199	143	439
Thallium	MG/KG	1.1	21%	10	48	5.16E+00		0.7	3	0.37 U	0.4 U	0.36 U	0.4 U	0.34 U	0.33 U
Vanadium	MG/KG	25.4	100%	48	48	7.82E+01		150		22.4	18.9	17.9	20.2	14.7	14.1
Zinc	MG/KG	3610	100%	48	48	2.35E+04		110	28	67.1	133	636	53.9	225	3610
Other															
Total Organic Carbon	MG/KG	9000	100%	40	40					6700	6800	5100	9000	3300	6200
Total Petroleum Hydrocarbons	MG/KG	7600	25%	10	40					48 UJ	52 UJ	47 UJ	52 UJ	44 UJ	43 UJ

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-16	SBDRMO-16	SBDRMO-17	SBDRMO-18	SBDRMO-19	SBDRMO-20
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1074	DRMO-1080	DRMO-1077	DRMO-1081	DRMO-1084	DRMO-1087
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/27/2002	10/27/2002	10/28/2002	10/27/2002	10/27/2002	10/26/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	48	1.20E+06		800		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	48	4.08E+02		600		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	48	7.29E+02				2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	48	5.06E+05		200		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	48	1.24E+05		400		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	48	2.78E+02		100		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	8										
1,2-Dichloropropane	UG/KG	0	0%	0	48	3.42E+02				2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Acetone	UG/KG	13	28%	13	47	1.41E+07		200		2.6 UJ	2.8 UJ	6 UJ	2.6 UJ	13 J	2.6 UJ
Benzene	UG/KG	41	2%	1	48	6.43E+02		60		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Bromodichloromethane	UG/KG	0	0%	0	48	8.24E+02				2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Bromoform	UG/KG	0	0%	0	48	6.16E+04				2.6 UJ	2.8 UJ	3.1 UJ	2.6 UJ	3 UJ	2.6 UJ
Carbon disulfide	UG/KG	4.7	4%	2	48	3.55E+05		2700		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Carbon tetrachloride	UG/KG	0	0%	0	48	2.51E+02		600		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Chlorobenzene	UG/KG	0	0%	0	48	1.51E+05		1700		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Chlorodibromomethane	UG/KG	0	0%	0	48	1.11E+03				2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Chloroethane	UG/KG	0	0%	0	48	3.03E+03		1900		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Chloroform	UG/KG	4.8[4]	4%	2	48	2.21E+02		300		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	40	4.29E+04				2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	48					2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Ethyl benzene	UG/KG	3300	4%	2	48	3.95E+05		5500		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Meta/Para Xylene	UG/KG	4400	8%	3	40					2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Methyl bromide	UG/KG	0	0%	0	48	3.90E+03				2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Methyl butyl ketone	UG/KG	0	0%	0	48					2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Methyl chloride	UG/KG	0	0%	0	48	4.69E+04				2.6 UJ	2.8 UJ	3.1 UJ	2.6 UJ	3 UJ	2.6 UJ
Methyl ethyl ketone	UG/KG	0	0%	0	48	2.23E+07		300		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	48	5.28E+06		1000		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Methylene chloride	UG/KG	2.6	2%	1	48	9.11E+03		100		2.6 U	2.8 U	4.1 UJ	2.6 UJ	3 U	2.6 UJ
Ortho Xylene	UG/KG	16	3%	1	40					2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Styrene	UG/KG	0	0%	0	48	1.70E+06				2.6 UJ	2.8 UJ	3.1 UJ	2.6 UJ	3 UJ	2.6 UJ
Tetrachloroethene	UG/KG	0	0%	0	48	4.84E+02		1400		2.6 UJ	2.8 UJ	3.1 UJ	2.6 UJ	3 UJ	2.6 UJ
Toluene	UG/KG	28	19%	9	48	5.20E+05		1500		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Total Xylenes	UG/KG	0	0%	0	8	2.71E+05		1200							
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	40	6.95E+04		300		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	48					2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Trichloroethene	UG/KG	0	0%	0	48	5.30E+01		700		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Vinyl chloride	UG/KG	0	0%	0	48	7.91E+01		200		2.6 U	2.8 U	3.1 UJ	2.6 UJ	3 U	2.6 UJ
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	48	6.22E+04		3400		360 U	360 U	1800 U	350 U	390 UJ	350 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	48	6.00E+05		7900		360 U	360 U	1800 U	350 U	390 U	350 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	48	5.31E+05		1600		360 U	360 U	1800 U	350 U	390 U	350 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	48	3.45E+03		8500		360 U	360 U	1800 U	350 U	390 U	350 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+06		100		900 U	900 U	4600 U	890 U	980 U	890 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+03				360 U	360 U	1800 U	350 U	390 U	350 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	NYSDEC Criteria Value [3]	Exceedances						
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-16	SBDRMO-16	SBDRMO-17	SBDRMO-18	SBDRMO-19	SBDRMO-20
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1074	DRMO-1080	DRMO-1077	DRMO-1081	DRMO-1084	DRMO-1087
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/27/2002	10/27/2002	10/28/2002	10/27/2002	10/27/2002	10/26/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dichlorophenol	UG/KG	0	0%	0	48	1.83E+05		400		360 U	360 U	1800 U	350 U	390 U	350 U
2,4-Dimethylphenol	UG/KG	0	0%	0	48	1.22E+06				360 U	360 U	1800 U	350 U	390 U	350 U
2,4-Dinitrophenol	UG/KG	0	0%	0	47	1.22E+05		200		900 U	900 UJ	4600 U	890 U	980 UJ	890 UJ
2,4-Dinitrotoluene	UG/KG	45	2%	1	48	1.22E+05				360 U	360 U	1800 U	350 U	390 U	350 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	48	6.11E+04		1000		360 U	360 U	1800 U	350 U	390 U	350 U
2-Chloronaphthalene	UG/KG	0	0%	0	48	4.94E+06				360 U	360 U	1800 U	350 U	390 U	350 U
2-Chlorophenol	UG/KG	0	0%	0	48	6.34E+04		800		360 U	360 U	1800 U	350 U	390 UJ	350 U
2-Methylnaphthalene	UG/KG	610	19%	9	48			36400		200 J	210 J	1800 U	350 U	390 U	350 U
2-Methylphenol	UG/KG	0	0%	0	48	3.06E+06		100		360 U	360 U	1800 U	350 U	390 U	350 U
2-Nitroaniline	UG/KG	0	0%	0	48	1.83E+05		430		900 U	900 U	4600 U	890 U	980 U	890 U
2-Nitrophenol	UG/KG	0	0%	0	48			330		360 U	360 U	1800 U	350 U	390 U	350 U
3 or 4-Methylphenol	UG/KG	0	0%	0	40					360 U	360 U	1800 U	350 U	390 U	350 U
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	48	1.08E+03				360 U	360 UJ	1800 UJ	350 U	390 U	350 UJ
3-Nitroaniline	UG/KG	0	0%	0	48	1.83E+04		500		900 U	900 U	4600 U	890 U	980 U	890 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	48	6.11E+03				900 U	900 U	4600 U	890 U	980 UJ	890 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	48					360 U	360 U	1800 U	350 U	390 U	350 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	48			240		360 U	360 U	1800 U	350 U	390 U	350 U
4-Chloroaniline	UG/KG	0	0%	0	48	2.44E+05		220		360 U	360 U	1800 U	350 U	390 U	350 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	48					360 U	360 U	1800 U	350 U	390 U	350 U
4-Methylphenol	UG/KG	0	0%	0	8	3.06E+05		900							
4-Nitroaniline	UG/KG	0	0%	0	48	2.32E+04				900 U	900 U	4600 U	890 U	980 U	890 U
4-Nitrophenol	UG/KG	0	0%	0	48			100		900 U	900 U	4600 U	890 U	980 U	890 U
Acenaphthene	UG/KG	2600	23%	11	48	3.68E+06		50000		160 J	170 J	1800 U	350 U	390 U	350 U
Acenaphthylene	UG/KG	2500	21%	10	48			41000		1100	750	1800 U	350 U	390 U	95 J
Anthracene	UG/KG	7100	42%	20	48	2.19E+07		50000		1100	950	1800 U	81 J	390 U	86 J
Benzo(a)anthracene	UG/KG	10000	55%	26	47	6.21E+02	4	224	14	5500 J	2900 J	1800 UJ	380	390 U	170 J
Benzo(a)pyrene	UG/KG	8700	51%	24	47	6.21E+01	21	61	21	4800 J	2700 J	1800 R	330 J	390 U	410 J
Benzo(b)fluoranthene	UG/KG	12000	64%	30	47	6.21E+02	9	1100	5	6600 J	3700 J	1800 R	410	390 U	310 J
Benzo(ghi)perylene	UG/KG	3150 [4]	53%	25	47			50000		1700 J	740 J	1800 R	160 J	390 UJ	460 J
Benzo(k)fluoranthene	UG/KG	7500	47%	22	47	6.21E+03	1	1100	4	3000 J	1700 J	1800 R	250 J	390 U	490 J
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	48					360 U	360 U	1800 U	350 U	390 UJ	350 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	48	2.18E+02				360 U	360 U	1800 U	350 U	390 U	350 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	48	2.88E+03				360 U	360 U	1800 U	350 U	390 U	350 U
Bis(2-Ethylhexyl)phthalate	UG/KG	200	56%	27	48	3.47E+04		50000		97 J	74 J	1800 UJ	160 J	390 U	98 J
Butylbenzylphthalate	UG/KG	120	13%	6	48	1.22E+07		50000		360 U	360 UJ	1800 UJ	350 U	390 U	350 UJ
Carbazole	UG/KG	4200	35%	17	48	2.43E+04				170 J	130 J	1800 U	56 J	390 U	350 U
Chrysene	UG/KG	9100	53%	25	47	6.21E+04		400	10	5000 J	2700 J	1800 UJ	430	390 U	410 J
Di-n-butylphthalate	UG/KG	132 [4]	10%	5	48	6.11E+06		8100		360 U	360 U	1800 U	350 U	390 U	350 U
Di-n-octylphthalate	UG/KG	23 [4]	4%	2	48	2.44E+06		50000		360 U	360 UJ	1800 UJ	350 U	390 UJ	350 UJ
Dibenz(a,h)anthracene	UG/KG	470 [4]	26%	12	47	6.21E+01	7	14	11	250 J	100 J	1800 R	350 U	390 UJ	89 J
Dibenzofuran	UG/KG	1700	21%	10	48	1.45E+05		6200		170 J	190 J	1800 U	350 U	390 U	350 U
Diethyl phthalate	UG/KG	21 [4]	13%	6	48	4.89E+07		7100		360 U	360 U	1800 U	350 U	390 U	350 U
Dimethylphthalate	UG/KG	0	0%	0	48	1.00E+08		2000		360 U	360 U	1800 U	350 U	390 U	350 U
Fluoranthene	UG/KG	27000	73%	35	48	2.29E+06		50000		8200 J	5100 J	1800 U	610	390 U	150 J

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-16	SBDRMO-16	SBDRMO-17	SBDRMO-18	SBDRMO-19	SBDRMO-20
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1074	DRMO-1080	DRMO-1077	DRMO-1081	DRMO-1084	DRMO-1087
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/27/2002	10/27/2002	10/28/2002	10/27/2002	10/27/2002	10/26/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Fluorene	UG/KG	3500	27%	13	48	2.75E+06		50000		650	690	1800 U	350 U	390 U	350 U
Hexachlorobenzene	UG/KG	8.5	2%	1	48	3.04E+02		410		360 U	360 U	1800 U	350 U	390 U	350 U
Hexachlorobutadiene	UG/KG	0	0%	0	48	6.24E+03				360 U	360 U	1800 U	350 U	390 UJ	350 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	48	3.65E+05				360 U	360 U	1800 U	350 U	390 U	350 UJ
Hexachloroethane	UG/KG	0	0%	0	48	3.47E+04				360 U	360 U	1800 U	350 U	390 U	350 U
Indeno(1,2,3-cd)pyrene	UG/KG	970[4]	46%	22	48	6.21E+02	3	3200		760	330 J	1800 UJ	160 J	390 UJ	390 J
Isophorone	UG/KG	0	0%	0	48	5.12E+05		4400		360 U	360 U	1800 U	350 U	390 UJ	350 U
N-Nitrosodiphenylamine	UG/KG	4.8	2%	1	48	9.93E+04				360 U	360 U	1800 U	350 U	390 U	350 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	48	6.95E+01				360 U	360 U	1800 U	350 U	390 U	350 U
Naphthalene	UG/KG	400	19%	9	48	5.59E+04		13000		100 J	82 J	1800 U	350 U	390 UJ	350 U
Nitrobenzene	UG/KG	0	0%	0	48	1.96E+04		200		360 U	360 U	1800 U	350 U	390 UJ	350 U
Pentachlorophenol	UG/KG	0	0%	0	48	2.98E+03		1000		900 U	900 U	4600 U	890 U	980 U	890 U
Phenanthrene	UG/KG	29000	52%	25	48			50000		4400 J	4000 J	1800 U	340 J	390 U	120 J
Phenol	UG/KG	0	0%	0	48	1.83E+07		30		360 U	360 U	1800 U	350 U	390 U	350 U
Pyrene	UG/KG	34000	67%	32	48	2.32E+06		50000		12000 J	5300 J	1800 UJ	660	390 U	280 J
Pesticides/PCBs															
4,4'-DDD	UG/KG	44	12%	5	43	2.44E+03		2900		1.8 UJ	6 J	0.22 U	44 J	2 UJ	1.8 UJ
4,4'-DDE	UG/KG	69	32%	15	47	1.72E+03		2100		1.8 UJ	41 R	0.22 UJ	83 R	2 UJ	11 J
4,4'-DDT	UG/KG	100	28%	13	47	1.72E+03		2100		19 J	21 J	0.22 UJ	73 R	2 UJ	1.8 UJ
Aldrin	UG/KG	14[4]	6%	3	48	2.86E+01		41		9.9 J	19 NJ	0.11 U	11 J	2 UJ	1.8 UJ
Alpha-BHC	UG/KG	0	0%	0	48	9.02E+01		110		1.8 UJ	1.8 UJ	1.3 U	1.8 UJ	2 UJ	1.8 UJ
Alpha-Chlordane	UG/KG	63[4]	8%	4	48					63 J	71 R	0.34 U	21 NJ	2 UJ	1.8 UJ
Beta-BHC	UG/KG	0	0%	0	48	3.16E+02		200		1.8 UJ	1.8 UJ	0.11 U	1.8 UJ	2 UJ	1.8 UJ
Chlordane	UG/KG	0	0%	0	40					18 U	18 U	2.1 U	18 U	20 U	18 U
Delta-BHC	UG/KG	2	6%	3	48			300		1.8 UJ	1.8 UJ	0.22 UJ	1.8 UJ	2 UJ	1.8 UJ
Dieldrin	UG/KG	41[4]	4%	2	48	3.04E+01	2	44		41 J	32 R	0.11 UJ	39 J	2 UJ	1.8 UJ
Endosulfan I	UG/KG	185[4]	38%	18	48			900		65	69 J	0.56 U	27	2 U	18 J
Endosulfan II	UG/KG	9	2%	1	47			900		1.8 U	1.8 U	0.34 U	16 R	2 U	1.8 U
Endosulfan sulfate	UG/KG	0	0%	0	48			1000		1.8 U	1.8 U	0.67 U	1.8 U	2 U	1.8 U
Endrin	UG/KG	21.5	2%	1	47	1.83E+04		100		17 J	26 J	0.9 UJ	26 R	2 UJ	1.8 U
Endrin aldehyde	UG/KG	0	0%	0	48					1.8 U	1.8 U	0.9 UJ	1.8 U	2 U	1.8 U
Endrin ketone	UG/KG	7.5[4]	6%	3	48					7.5 J	10 R	0.11 U	3.4 NJ	2 U	1.8 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	48	4.37E+02		60		1.8 UJ	1.8 UJ	0.11 U	1.8 UJ	2 UJ	1.8 UJ
Gamma-Chlordane	UG/KG	1.2	2%	1	48			540		1.8 UJ	1.8 UJ	0.34 U	1.8 UJ	2 UJ	1.8 UJ
Heptachlor	UG/KG	14	4%	2	47	1.08E+02		100		1.8 UJ	1.8 UJ	1.1 U	14 J	2 UJ	5.5 R
Heptachlor epoxide	UG/KG	2.8	4%	2	46	5.34E+01		20		20 R	1.8 UJ	0.34 U	27 R	2 UJ	1.8 UJ
Methoxychlor	UG/KG	0	0%	0	48	3.06E+05				1.8 U	1.8 U	0.11 U	1.8 U	2 U	1.8 U
Toxaphene	UG/KG	0	0%	0	48	4.42E+02				18 U	18 U	3.6 U	18 U	20 U	18 U
Aroclor-1016	UG/KG	0	0%	0	48	3.93E+03				18 UJ	18 UJ	5.8 UJ	18 UJ	20 UJ	18 U
Aroclor-1221	UG/KG	0	0%	0	48					18 U	18 U	1.5 U	18 U	20 U	18 U
Aroclor-1232	UG/KG	0	0%	0	48					18 UJ	18 UJ	8.9 UJ	18 UJ	20 UJ	18 U
Aroclor-1242	UG/KG	58	2%	1	48					18 UJ	18 UJ	2.5 U	18 UJ	20 U	18 U
Aroclor-1248	UG/KG	0	0%	0	48					18 U	18 U	6.1 U	18 U	20 U	18 U
Aroclor-1254	UG/KG	930	19%	9	48	2.22E+02	3	10000		18 UJ	18 UJ	12 UJ	930	20 U	130

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances						
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-16	SBDRMO-16	SBDRMO-17	SBDRMO-18	SBDRMO-19	SBDRMO-20
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1074	DRMO-1080	DRMO-1077	DRMO-1081	DRMO-1084	DRMO-1087
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/27/2002	10/27/2002	10/28/2002	10/27/2002	10/27/2002	10/26/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aroclor-1260	UG/KG	85	10%	5	48			10000		22 J	35 J	2.2 UJ	18 UJ	20 U	18 U
Metals and Cyanide															
Aluminum	MG/KG	17000	100%	48	48	7.61E+04		19300		3100	3760	10100 J	7610	12000	10100
Antimony	MG/KG	236	81%	39	48	3.13E+01	2	5.9	11	0.98 U	0.99	2.7 J	12.3	1.1 U	5.1
Arsenic	MG/KG	11.6	100%	48	48	3.90E-01	48	8.2	2	4.8	5.5	4.4 J	7.8	4.8	5.2
Barium	MG/KG	2030	100%	48	48	5.37E+03		300	7	42	45.6	56 J	320	89	191 J
Beryllium	MG/KG	1.2	100%	48	48	1.54E+02		1.1	1	0.26 J	0.32 J	0.6 J	0.32 J	0.75	0.55
Cadmium	MG/KG	29.1	60%	29	48	3.70E+01		2.3	14	0.56	0.49 J	0.06 U	19	0.14 U	10
Calcium	MG/KG	296000	100%	48	48			121000	6	199000	157000	84500 J	167000	3790	38300 J
Chromium	MG/KG	74.8	100%	48	48			29.6	12	13	13.8	33.1 J	74.8	19.7	47.4
Cobalt	MG/KG	17	100%	35	35	9.03E+02		30		5.9	6.1	11.5 J	13.3	10.6	13.5
Copper	MG/KG	9750	100%	48	48	3.13E+03	3	33	35	28.8	34.3	33.8 J	456	14.8	301 J
Cyanide	MG/KG	0	0%	0	8	1.22E+06		0.35							
Cyanide, Amenable	MG/KG	0	0%	0	40					0.54 U	0.55 U	0.56 U	0.54 U	0.61 U	0.54 U
Cyanide, Total	MG/KG	0	0%	0	40					0.542 U	0.545 U	0.559 U	0.536 U	0.605 U	0.539 U
Iron	MG/KG	51700	100%	48	48	2.35E+04	23	36500	5	8710	10500	17000 J	51700	24900	36400
Lead	MG/KG	18900	100%	48	48	4.00E+02	7	24.8	40	89.3	94.5	30.9 J	720	19.7	305
Magnesium	MG/KG	20700	100%	48	48			21500		17900	13000	8370 J	14800	3740	6400
Manganese	MG/KG	858	100%	48	48	1.76E+03		1060		425	390	487 J	567	529	424
Mercury	MG/KG	0.47	92%	44	48	2.35E+01		0.1	8	0.07	0.07	0.04	0.47	0.07	0.13
Nickel	MG/KG	224	100%	48	48	1.56E+03		49	9	19.4 J	22.1 J	32.5 J	77.7	25.9 J	53.5 J
Potassium	MG/KG	1990	100%	48	48			2380		934 J	882 J	1780 J	1300 J	904 J	1560 J
Selenium	MG/KG	1.3	21%	10	48	3.91E+02		2		0.46 U	0.45 U	0.36 U	0.45 U	0.5 U	0.44 U
Silver	MG/KG	21.8	38%	18	48	3.91E+02		0.75	13	0.29 U	0.29 U	0.41 U	2.9	0.32 U	5.2
Sodium	MG/KG	478	88%	42	48			172	26	276	232	152	273	121	268
Thallium	MG/KG	1.1	21%	10	48	5.16E+00		0.7	3	0.34 U	0.33 U	0.64 U	0.33 U	0.37 U	0.32 U
Vanadium	MG/KG	25.4	100%	48	48	7.82E+01		150		11 J	10.7 J	18.1 J	14.3 J	22.4 J	18.8
Zinc	MG/KG	3610	100%	48	48	2.35E+04		110	28	130 J	135 J	93.7 J	1590 J	85.1 J	1750
Other															
Total Organic Carbon	MG/KG	9000	100%	40	40					5200	5300	4600	3900	3900	6900
Total Petroleum Hydrocarbons	MG/KG	7600	25%	10	40					2800 J	6200 J	7600 J	710 J	48 UJ	43 UJ

NOTES:

1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.

2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)

3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.

4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-21	SBDRMO-22	SBDRMO-23	SBDRMO-24	SBDRMO-5	SBDRMO-6
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1090	DRMO-1091	DRMO-1095	DRMO-1098	DRMO-1040	DRMO-1043
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/27/2002	10/27/2002	10/28/2002	10/28/2002	10/27/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	48	1.20E+06		800		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	48	4.08E+02		600		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	48	7.29E+02				3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	48	5.06E+05		200		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	48	1.24E+05		400		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	48	2.78E+02		100		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	8										
1,2-Dichloropropane	UG/KG	0	0%	0	48	3.42E+02				3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Acetone	UG/KG	13	28%	13	47	1.41E+07		200		3.1 U	3 UJ	16 UJ	3.4 UJ	8.8 J	2.6 UJ
Benzene	UG/KG	41	2%	1	48	6.43E+02		60		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Bromodichloromethane	UG/KG	0	0%	0	48	8.24E+02				3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Bromoform	UG/KG	0	0%	0	48	6.16E+04				3.1 U	3 UJ	2.8 UJ	2.7 UJ	2.7 UJ	2.6 UJ
Carbon disulfide	UG/KG	4.7	4%	2	48	3.55E+05		2700		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Carbon tetrachloride	UG/KG	0	0%	0	48	2.51E+02		600		3.1 UJ	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Chlorobenzene	UG/KG	0	0%	0	48	1.51E+05		1700		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Chlorodibromomethane	UG/KG	0	0%	0	48	1.11E+03				3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Chloroethane	UG/KG	0	0%	0	48	3.03E+03		1900		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Chloroform	UG/KG	4.8[4]	4%	2	48	2.21E+02		300		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	40	4.29E+04				3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	48					3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Ethyl benzene	UG/KG	3300	4%	2	48	3.95E+05		5500		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	0.66 J
Meta/Para Xylene	UG/KG	4400	8%	3	40					2 J	3 U	2.8 UJ	2.7 UJ	2.7 U	4.1 J
Methyl bromide	UG/KG	0	0%	0	48	3.90E+03				3.1 UJ	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Methyl butyl ketone	UG/KG	0	0%	0	48					3.1 UJ	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Methyl chloride	UG/KG	0	0%	0	48	4.69E+04				3.1 U	3 UJ	2.8 UJ	2.7 UJ	2.7 UJ	2.6 UJ
Methyl ethyl ketone	UG/KG	0	0%	0	48	2.23E+07		300		3.1 UJ	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	48	5.28E+06		1000		3.1 UJ	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Methylene chloride	UG/KG	2.6	2%	1	48	9.11E+03		100		2.9 UJ	3 U	3.9 UJ	3.7 UJ	2.7 U	2.6 UJ
Ortho Xylene	UG/KG	16	3%	1	40					3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Styrene	UG/KG	0	0%	0	48	1.70E+06				3.1 U	3 UJ	2.8 UJ	2.7 UJ	2.7 UJ	2.6 UJ
Tetrachloroethene	UG/KG	0	0%	0	48	4.84E+02		1400		3.1 U	3 UJ	2.8 UJ	2.7 UJ	2.7 UJ	2.6 UJ
Toluene	UG/KG	28	19%	9	48	5.20E+05		1500		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Total Xylenes	UG/KG	0	0%	0	8	2.71E+05		1200							
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	40	6.95E+04		300		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	48					3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Trichloroethene	UG/KG	0	0%	0	48	5.30E+01		700		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Vinyl chloride	UG/KG	0	0%	0	48	7.91E+01		200		3.1 U	3 U	2.8 UJ	2.7 UJ	2.7 U	2.6 UJ
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	48	6.22E+04		3400		410 U	400 U	390 U	350 U	360 U	340 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	48	6.00E+05		7900		410 U	400 U	390 U	350 U	360 U	340 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	48	5.31E+05		1600		410 U	400 U	390 U	350 U	360 U	340 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	48	3.45E+03		8500		410 U	400 U	390 U	350 U	360 U	340 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+06		100		1000 U	1000 U	980 U	890 U	900 U	870 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+03				410 U	400 U	390 U	350 U	360 U	340 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-21	SBDRMO-22	SBDRMO-23	SBDRMO-24	SBDRMO-5	SBDRMO-6
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1090	DRMO-1091	DRMO-1095	DRMO-1098	DRMO-1040	DRMO-1043
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/27/2002	10/27/2002	10/28/2002	10/28/2002	10/27/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dichlorophenol	UG/KG	0	0%	0	48	1.83E+05		400		410 U	400 U	390 U	350 U	360 U	340 U
2,4-Dimethylphenol	UG/KG	0	0%	0	48	1.22E+06				410 U	400 U	390 U	350 U	360 U	340 U
2,4-Dinitrophenol	UG/KG	0	0%	0	47	1.22E+05		200		1000 U	1000 U	980 UJ	890 U	900 U	870 R
2,4-Dinitrotoluene	UG/KG	45	2%	1	48	1.22E+05				410 U	400 U	390 U	350 U	360 U	340 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	48	6.11E+04		1000		410 U	400 U	390 U	350 U	360 U	340 U
2-Chloronaphthalene	UG/KG	0	0%	0	48	4.94E+06				410 U	400 U	390 U	350 U	360 U	340 U
2-Chlorophenol	UG/KG	0	0%	0	48	6.34E+04		800		410 U	400 U	390 U	350 U	360 U	340 U
2-Methylnaphthalene	UG/KG	610	19%	9	48			36400		410 U	400 U	390 U	69 J	360 U	340 U
2-Methylphenol	UG/KG	0	0%	0	48	3.06E+06		100		410 U	400 U	390 U	350 U	360 U	340 U
2-Nitroaniline	UG/KG	0	0%	0	48	1.83E+05		430		1000 UJ	1000 U	980 U	890 U	900 U	870 UJ
2-Nitrophenol	UG/KG	0	0%	0	48			330		410 U	400 U	390 U	350 U	360 U	340 U
3 or 4-Methylphenol	UG/KG	0	0%	0	40					410 U	400 U	390 U	350 U	360 U	340 U
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	48	1.08E+03				410 U	400 U	390 U	350 U	360 U	340 UJ
3-Nitroaniline	UG/KG	0	0%	0	48	1.83E+04		500		1000 U	1000 U	980 U	890 U	900 U	870 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	48	6.11E+03				1000 U	1000 U	980 U	890 U	900 U	870 UJ
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	48					410 U	400 U	390 U	350 U	360 U	340 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	48			240		410 U	400 U	390 U	350 U	360 U	340 U
4-Chloroaniline	UG/KG	0	0%	0	48	2.44E+05		220		410 U	400 U	390 U	350 U	360 U	340 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	48					410 U	400 U	390 U	350 U	360 U	340 U
4-Methylphenol	UG/KG	0	0%	0	8	3.06E+05		900							
4-Nitroaniline	UG/KG	0	0%	0	48	2.32E+04				1000 UJ	1000 U	980 U	890 U	900 U	870 U
4-Nitrophenol	UG/KG	0	0%	0	48			100		1000 U	1000 U	980 U	890 U	900 U	870 UJ
Acenaphthene	UG/KG	2600	23%	11	48	3.68E+06		50000		410 U	400 U	390 U	190 J	360 U	340 U
Acenaphthylene	UG/KG	2500	21%	10	48			41000		410 U	400 U	390 U	2500	360 U	340 U
Anthracene	UG/KG	7100	42%	20	48	2.19E+07		50000		410 U	400 U	390 U	1200	90 J	340 U
Benzo(a)anthracene	UG/KG	10000	55%	26	47	6.21E+02	4	224	14	410 U	400 U	390 U		410	340 U
Benzo(a)pyrene	UG/KG	8700	51%	24	47	6.21E+01	21	61	21	410 U	400 U	390 U	6800	320 J	340 UJ
Benzo(b)fluoranthene	UG/KG	12000	64%	30	47	6.21E+02	9	1100	5	410 U	400 U	390 U	8000	400	50 J
Benzo(ghi)perylene	UG/KG	3150[4]	53%	25	47			50000		410 UJ	400 UJ	390 U	2100 J	180 J	110 J
Benzo(k)fluoranthene	UG/KG	7500	47%	22	47	6.21E+03	1	1100	4	410 U	400 U	390 U	2700 J	200 J	340 UJ
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	48					410 U	400 U	390 U	350 U	360 U	340 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	48	2.18E+02				410 U	400 UJ	390 U	350 U	360 U	340 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	48	2.88E+03				410 U	400 U	390 U	350 U	360 U	340 U
Bis(2-Ethylhexyl)phthalate	UG/KG	200	56%	27	48	3.47E+04		50000		410 UJ	400 U	390 U	66 J	53 J	340 UJ
Butylbenzylphthalate	UG/KG	120	13%	6	48	1.22E+07		50000		410 UJ	400 U	390 U	350 U	360 U	340 UJ
Carbazole	UG/KG	4200	35%	17	48	2.43E+04				410 U	400 U	390 U	88 J	360 U	340 U
Chrysene	UG/KG	9100	53%	25	47	6.21E+04		400	10	410 U	400 U	390 U		400	340 UJ
Di-n-butylphthalate	UG/KG	132[4]	10%	5	48	6.11E+06		8100		410 U	400 U	390 U	350 U	360 U	340 U
Di-n-octylphthalate	UG/KG	23[4]	4%	2	48	2.44E+06		50000		410 U	400 U	390 U	350 U	360 U	340 UJ
Dibenz(a,h)anthracene	UG/KG	470[4]	26%	12	47	6.21E+01	7	14	11	410 UJ	400 UJ	390 U	210 J	360 U	340 UJ
Dibenzofuran	UG/KG	1700	21%	10	48	1.45E+05		6200		410 U	400 U	390 U	140 J	360 U	340 U
Diethyl phthalate	UG/KG	21[4]	13%	6	48	4.89E+07		7100		410 U	400 U	390 U	350 U	360 U	340 U
Dimethylphthalate	UG/KG	0	0%	0	48	1.00E+08		2000		410 U	400 U	390 U	350 U	360 U	340 U
Fluoranthene	UG/KG	27000	73%	35	48	2.29E+06		50000		410 U	400 U	390 U	7700	670	53 J

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-21	SBDRMO-22	SBDRMO-23	SBDRMO-24	SBDRMO-5	SBDRMO-6
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1090	DRMO-1091	DRMO-1095	DRMO-1098	DRMO-1040	DRMO-1043
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/27/2002	10/27/2002	10/28/2002	10/28/2002	10/27/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Fluorene	UG/KG	3500	27%	13	48	2.75E+06		50000		410 U	400 U	390 U	560	360 U	340 U
Hexachlorobenzene	UG/KG	8.5	2%	1	48	3.04E+02		410		410 U	400 U	390 U	350 U	360 U	340 U
Hexachlorobutadiene	UG/KG	0	0%	0	48	6.24E+03				410 U	400 U	390 U	350 U	360 U	340 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	48	3.65E+05				410 U	400 U	390 U	350 UJ	360 U	340 UJ
Hexachloroethane	UG/KG	0	0%	0	48	3.47E+04				410 U	400 U	390 U	350 U	360 U	340 U
Indeno(1,2,3-cd)pyrene	UG/KG	970[4]	46%	22	48	6.21E+02	3	3200		410 UJ	400 UJ	390 U	740	170 J	60 J
Isophorone	UG/KG	0	0%	0	48	5.12E+05		4400		410 U	400 U	390 U	350 U	360 U	340 U
N-Nitrosodiphenylamine	UG/KG	4.8	2%	1	48	9.93E+04				410 U	400 U	390 U	350 U	360 U	340 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	48	6.95E+01				410 U	400 U	390 U	350 U	360 U	340 UJ
Naphthalene	UG/KG	400	19%	9	48	5.59E+04		13000		410 U	400 U	390 U	59 J	360 U	340 U
Nitrobenzene	UG/KG	0	0%	0	48	1.96E+04		200		410 U	400 U	390 U	350 U	360 U	340 U
Pentachlorophenol	UG/KG	0	0%	0	48	2.98E+03		1000		1000 U	1000 U	980 U	890 U	900 U	870 U
Phenanthrene	UG/KG	29000	52%	25	48			50000		410 U	400 U	390 U	4400	440	340 U
Phenol	UG/KG	0	0%	0	48	1.83E+07		30		410 U	400 U	390 U	350 U	360 U	340 U
Pyrene	UG/KG	34000	67%	32	48	2.32E+06		50000		410 UJ	400 U	390 U	16000	700	130 J
Pesticides/PCBs															
4,4'-DDD	UG/KG	44	12%	5	43	2.44E+03		2900		2.1 UJ	2 UJ	0.24 U	0.22 U	1.8 UJ	1.8 R
4,4'-DDE	UG/KG	69	32%	15	47	1.72E+03		2100		2.1 UJ	2 UJ	0.24 UJ	0.22 UJ	47 J	6.1 J
4,4'-DDT	UG/KG	100	28%	13	47	1.72E+03		2100		2.1 UJ	2 UJ	0.24 UJ	0.22 UJ	27 J	1.8 UJ
Aldrin	UG/KG	14[4]	6%	3	48	2.86E+01		41		2.1 UJ	2 UJ	0.12 U	0.11 U	1.8 UJ	1.8 UJ
Alpha-BHC	UG/KG	0	0%	0	48	9.02E+01		110		2.1 UJ	2 UJ	1.4 U	1.3 U	1.8 UJ	1.8 UJ
Alpha-Chlordane	UG/KG	63[4]	8%	4	48					2.1 UJ	2 UJ	0.35 U	0.32 U	1.8 UJ	6.1 J
Beta-BHC	UG/KG	0	0%	0	48	3.16E+02		200		2.1 UJ	2 UJ	0.12 U	0.11 U	1.8 UJ	1.8 U
Chlordane	UG/KG	0	0%	0	40					21 U	20 U	2.2 U	2.1 U	18 U	18 U
Delta-BHC	UG/KG	2	6%	3	48			300		2.1 UJ	2 UJ	0.24 UJ	0.22 UJ	1.8 UJ	1.8 UJ
Dieldrin	UG/KG	41[4]	4%	2	48	3.04E+01	2	44		2.1 UJ	2 UJ	0.12 UJ	0.11 UJ	1.8 UJ	1.8 UJ
Endosulfan I	UG/KG	185[4]	38%	18	48			900		2.1 U	2 U	0.59 U	0.54 U	14 J	6.1
Endosulfan II	UG/KG	9	2%	1	47			900		2.1 U	2 U	0.35 U	9	1.8 U	1.8 U
Endosulfan sulfate	UG/KG	0	0%	0	48			1000		2.1 U	2 U	0.71 U	0.65 U	1.8 U	1.8 U
Endrin	UG/KG	21.5	2%	1	47	1.83E+04		100		2.1 U	2 UJ	0.94 UJ	0.86 UJ	1.8 UJ	1.8 UJ
Endrin aldehyde	UG/KG	0	0%	0	48					2.1 U	2 U	0.94 UJ	0.86 UJ	1.8 U	1.8 U
Endrin ketone	UG/KG	7.5[4]	6%	3	48					2.1 U	2 U	0.12 U	0.11 U	1.8 U	1.8 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	48	4.37E+02		60		2.1 UJ	2 UJ	0.12 U	0.11 U	1.8 UJ	1.8 UJ
Gamma-Chlordane	UG/KG	1.2	2%	1	48			540		2.1 UJ	2 UJ	0.35 U	0.32 U	1.8 UJ	1.8 U
Heptachlor	UG/KG	14	4%	2	47	1.08E+02		100		2.1 UJ	2 UJ	1.2 U	1.1 U	1.8 UJ	1.8 U
Heptachlor epoxide	UG/KG	2.8	4%	2	46	5.34E+01		20		2.1 UJ	2 UJ	0.35 U	0.32 U	18 R	1.8 U
Methoxychlor	UG/KG	0	0%	0	48	3.06E+05				2.1 U	2 U	0.12 U	0.11 U	1.8 U	1.8 UJ
Toxaphene	UG/KG	0	0%	0	48	4.42E+02				21 U	20 U	3.8 U	3.5 U	18 U	18 U
Aroclor-1016	UG/KG	0	0%	0	48	3.93E+03				21 UJ	20 UJ	6.1 UJ	5.6 UJ	18 UJ	18 U
Aroclor-1221	UG/KG	0	0%	0	48					21 U	20 U	1.5 U	1.4 U	18 U	18 U
Aroclor-1232	UG/KG	0	0%	0	48					21 UJ	20 UJ	9.5 UJ	8.6 UJ	18 UJ	18 U
Aroclor-1242	UG/KG	58	2%	1	48					21 UJ	20 UJ	2.6 U	2.4 U	18 U	18 U
Aroclor-1248	UG/KG	0	0%	0	48					21 U	20 U	6.5 U	5.9 U	18 U	18 U
Aroclor-1254	UG/KG	930	19%	9	48	2.22E+02	3	10000		21 U	20 UJ	13 UJ	11 UJ	570	18 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-21	SBDRMO-22	SBDRMO-23	SBDRMO-24	SBDRMO-5	SBDRMO-6
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1090	DRMO-1091	DRMO-1095	DRMO-1098	DRMO-1040	DRMO-1043
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										10/27/2002	10/27/2002	10/28/2002	10/28/2002	10/27/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**[1]	**Region IX PRG Criteria Value**[2]	**Exceedances**	**NYSDEC Criteria Value**[3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aroclor-1260	UG/KG	85	10%	5	48			10000		21 UJ	9 J	2.4 UJ	2.1 UJ	18 U	18 U
Metals and Cyanide															
Aluminum	MG/KG	17000	100%	48	48	7.61E+04		19300		11800	11500	9940 J	8510 J	8650	8030
Antimony	MG/KG	236	81%	39	48	3.13E+01	2	5.9	11	1.1 U	1.1 U	0.65 J	8.5 J	67.3	1.5
Arsenic	MG/KG	11.6	100%	48	48	3.90E-01	48	8.2	2	4.1	7.3	3.7 J	5 J	6.1	3.7
Barium	MG/KG	2030	100%	48	48	5.37E+03		300	7	134 J	103	105 J	1680	273	37.9 J
Beryllium	MG/KG	1.2	100%	48	48	1.54E+02		1.1	1	0.73	0.68	0.57 J	0.46 J	0.46 J	0.44 J
Cadmium	MG/KG	29.1	60%	29	48	3.70E+01		2.3	14	0.15 U	0.14 U	0.06 U	17.9 J	10.7	0.2 J
Calcium	MG/KG	296000	100%	48	48			121000	6	29400 J	37700	56300 J	114000 J	97900	36500 J
Chromium	MG/KG	74.8	100%	48	48			29.6	12	16.3	19.3	16.4 J	37.7 J	20.4	38.8
Cobalt	MG/KG	17	100%	35	35	9.03E+02		30		9.3	12.5	7.8 J	14 J	11.7	9.5
Copper	MG/KG	9750	100%	48	48	3.13E+03	3	33	35	18.9 J	26	21.7 J	347 J	168	34.6 J
Cyanide	MG/KG	0	0%	0	8	1.22E+06		0.35							
Cyanide, Amenable	MG/KG	0	0%	0	40					0.62 U	0.6 U	0.59 U	0.54 U	0.54 U	0.52 U
Cyanide, Total	MG/KG	0	0%	0	40					0.62 U	0.603 U	0.594 U	0.544 U	0.542 U	0.525 U
Iron	MG/KG	51700	100%	48	48	2.35E+04	23	36500	5	19300	23500	14900 J	25100 J	22900	18300
Lead	MG/KG	18900	100%	48	48	4.00E+02	7	24.8	40	12.8	28.5	17.5 J	399 J	2690	66.9
Magnesium	MG/KG	20700	100%	48	48			21500		13100	8150	15600 J	9010 J	8170	5080
Manganese	MG/KG	858	100%	48	48	1.76E+03		1060		472	536	419 J	728 J	369	348
Mercury	MG/KG	0.47	92%	44	48	2.35E+01		0.1	8	0.05	0.07	0.04	0.06	0.08	0.04
Nickel	MG/KG	224	100%	48	48	1.56E+03		49	9	22.5 J	29.8 J	22 J	37 J	35.8 J	31.8 J
Potassium	MG/KG	1990	100%	48	48			2380		1020 J	1030 J	1510 J	1530 J	1490 J	1220 J
Selenium	MG/KG	1.3	21%	10	48	3.91E+02		2		0.52 U	0.51 U	0.39 U	0.36 U	0.44 U	0.44 U
Silver	MG/KG	21.8	38%	18	48	3.91E+02		0.75	13	0.33 U	0.33 U	0.44 UJ	0.55 J	0.85 J	0.28 U
Sodium	MG/KG	478	88%	42	48			172	26	137	120 U	157	241	240	223
Thallium	MG/KG	1.1	21%	10	48	5.16E+00		0.7	3	0.38 U	0.37 U	0.68 U	1.1 J	0.33 U	0.33 U
Vanadium	MG/KG	25.4	100%	48	48	7.82E+01		150		20	20.8 J	16.9 J	12.2 J	17.1 J	12.9
Zinc	MG/KG	3610	100%	48	48	2.35E+04		110	28	63.9	89.6 J	55.3 J	786 J	541 J	123
Other															
Total Organic Carbon	MG/KG	9000	100%	40	40					6300	5800	2800	4900	4200	3300
Total Petroleum Hydrocarbons	MG/KG	7600	25%	10	40					50 UJ	48 UJ	48 UJ	44 UJ	520 J	42 UJ

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-6	SBDRMO-7	SBDRMO-8	SBDRMO-9	SS121C-1	SS121C-2
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1050	DRMO-1046	DRMO-1049	DRMO-1053	EB235	EB236
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	0.2	0.2
Sample Date										10/25/2002	10/27/2002	10/25/2002	10/25/2002	3/9/1998	3/9/1998
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	EBS	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	48	1.20E+06		800		2.7 U	2.8 U	3.3 UJ	3 UJ	11 UJ	11 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	48	4.08E+02		600		2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	48	7.29E+02				2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	48	5.06E+05		200		2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	48	1.24E+05		400		2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	48	2.78E+02		100		2.7 UJ	2.8 U	3.3 UJ	3 UJ	11 UJ	11 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	8									11 UJ	11 UJ
1,2-Dichloropropane	UG/KG	0	0%	0	48	3.42E+02				2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Acetone	UG/KG	13	28%	13	47	1.41E+07		200		4.6 U	8.5 J	11 J	3 UJ	10 J	11 UJ
Benzene	UG/KG	41	2%	1	48	6.43E+02		60		2.7 U	2.8 U	3.3 U	41	11 UJ	11 UJ
Bromodichloromethane	UG/KG	0	0%	0	48	8.24E+02				2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Bromoform	UG/KG	0	0%	0	48	6.16E+04				2.7 U	2.8 UJ	3.3 U	3 UJ	11 UJ	11 UJ
Carbon disulfide	UG/KG	4.7	4%	2	48	3.55E+05		2700		2.7 U	2.8 U	3.3 U	4.7	11 UJ	11 UJ
Carbon tetrachloride	UG/KG	0	0%	0	48	2.51E+02		600		2.7 UJ	2.8 U	3.3 UJ	3 UJ	11 UJ	11 UJ
Chlorobenzene	UG/KG	0	0%	0	48	1.51E+05		1700		2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Chlorodibromomethane	UG/KG	0	0%	0	48	1.11E+03				2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Chloroethane	UG/KG	0	0%	0	48	3.03E+03		1900		2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Chloroform	UG/KG	4.8[4]	4%	2	48	2.21E+02		300		2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	40	4.29E+04				2.7 U	2.8 U	3.3 U	3 UJ		
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	48					2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Ethyl benzene	UG/KG	3300	4%	2	48	3.95E+05		5500		2.7 U	2.8 U	3.3 U	3300 J	11 UJ	11 UJ
Meta/Para Xylene	UG/KG	4400	8%	3	40					2.7 U	2.8 U	3.3 U	4400 J		
Methyl bromide	UG/KG	0	0%	0	48	3.90E+03				2.7 UJ	2.8 U	3.3 UJ	3 UJ	11 UJ	11 UJ
Methyl butyl ketone	UG/KG	0	0%	0	48					2.7 UJ	2.8 U	3.3 UJ	3 UJ	11 UJ	11 UJ
Methyl chloride	UG/KG	0	0%	0	48	4.69E+04				2.7 UJ	2.8 UJ	3.3 U	3 UJ	11 UJ	11 UJ
Methyl ethyl ketone	UG/KG	0	0%	0	48	2.23E+07		300		2.7 UJ	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	48	5.28E+06		1000		2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Methylene chloride	UG/KG	2.6	2%	1	48	9.11E+03		100		2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Ortho Xylene	UG/KG	16	3%	1	40					2.7 U	2.8 U	3.3 U	16		
Styrene	UG/KG	0	0%	0	48	1.70E+06				2.7 U	2.8 UJ	3.3 U	3 UJ	11 UJ	11 UJ
Tetrachloroethene	UG/KG	0	0%	0	48	4.84E+02		1400		2.7 U	2.8 UJ	3.3 U	3 UJ	11 UJ	11 UJ
Toluene	UG/KG	28	19%	9	48	5.20E+05		1500		2.7 U	2.8 U	3.3 U	4.9	9 J	28 J
Total Xylenes	UG/KG	0	0%	0	8	2.71E+05		1200						11 UJ	11 UJ
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	40	6.95E+04		300		2.7 U	2.8 U	3.3 U	3 UJ		
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	48					2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Trichloroethene	UG/KG	0	0%	0	48	5.30E+01		700		2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Vinyl chloride	UG/KG	0	0%	0	48	7.91E+01		200		2.7 U	2.8 U	3.3 U	3 UJ	11 UJ	11 UJ
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	48	6.22E+04		3400		350 U	370 U	400 U	390 U	72 U	69 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	48	6.00E+05		7900		350 U	370 U	400 U	390 U	72 U	69 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	48	5.31E+05		1600		350 U	370 U	400 U	390 U	72 U	69 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	48	3.45E+03		8500		350 U	370 U	400 U	390 U	72 U	69 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+06		100		880 U	920 U	1000 U	990 U	180 U	170 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+03				350 U	370 U	400 U	390 U	72 U	69 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-6	SBDRMO-7	SBDRMO-8	SBDRMO-9	SS121C-1	SS121C-2
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1050	DRMO-1046	DRMO-1049	DRMO-1053	EB235	EB236
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	0.2	0.2
Sample Date										10/25/2002	10/27/2002	10/25/2002	10/25/2002	3/9/1998	3/9/1998
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	EBS	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dichlorophenol	UG/KG	0	0%	0	48	1.83E+05		400		350 U	370 U	400 U	390 U	72 U	69 U
2,4-Dimethylphenol	UG/KG	0	0%	0	48	1.22E+06				350 U	370 U	400 U	390 U	72 U	69 U
2,4-Dinitrophenol	UG/KG	0	0%	0	47	1.22E+05		200		880 UJ	920 U	1000 U	990 UJ	180 U	170 U
2,4-Dinitrotoluene	UG/KG	45	2%	1	48	1.22E+05				350 U	370 U	400 U	390 U	72 U	69 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	48	6.11E+04		1000		350 U	370 U	400 U	390 U	72 U	69 U
2-Chloronaphthalene	UG/KG	0	0%	0	48	4.94E+06				350 U	370 U	400 U	390 U	72 U	69 U
2-Chlorophenol	UG/KG	0	0%	0	48	6.34E+04		800		350 U	370 U	400 U	390 U	72 U	69 U
2-Methylnaphthalene	UG/KG	610	19%	9	48			36400		350 U	370 U	400 U	390 U	72 U	69 U
2-Methylphenol	UG/KG	0	0%	0	48	3.06E+06		100		350 U	370 U	400 U	390 U	72 U	69 U
2-Nitroaniline	UG/KG	0	0%	0	48	1.83E+05		430		880 U	920 U	1000 UJ	990 U	180 U	170 U
2-Nitrophenol	UG/KG	0	0%	0	48			330		350 U	370 U	400 U	390 U	72 U	69 U
3 or 4-Methylphenol	UG/KG	0	0%	0	40					350 U	370 U	400 U	390 U		
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	48	1.08E+03				350 UJ	370 U	400 U	390 U	72 U	69 U
3-Nitroaniline	UG/KG	0	0%	0	48	1.83E+04		500		880 U	920 U	1000 U	990 U	180 U	170 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	48	6.11E+03				880 UJ	920 U	1000 U	990 U	180 U	170 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	48					350 U	370 U	400 U	390 U	72 U	69 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	48			240		350 U	370 U	400 U	390 U	72 U	69 U
4-Chloroaniline	UG/KG	0	0%	0	48	2.44E+05		220		350 U	370 U	400 U	390 U	72 U	69 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	48					350 U	370 U	400 U	390 U	72 U	69 U
4-Methylphenol	UG/KG	0	0%	0	8	3.06E+05		900						72 U	69 U
4-Nitroaniline	UG/KG	0	0%	0	48	2.32E+04				880 U	920 U	1000 UJ	990 U	180 U	170 U
4-Nitrophenol	UG/KG	0	0%	0	48			100		880 U	920 U	1000 U	990 U	180 U	170 U
Acenaphthene	UG/KG	2600	23%	11	48	3.68E+06		50000		350 U	370 U	400 U	390 U	72 U	6.5 J
Acenaphthylene	UG/KG	2500	21%	10	48			41000		350 U	370 U	400 U	390 U	72 U	69 U
Anthracene	UG/KG	7100	42%	20	48	2.19E+07		50000		350 U	370 U	400 U	390 U	72 U	6.5 J
Benzo(a)anthracene	UG/KG	10000	55%	26	47	6.21E+02	4	224	14	350 UJ	370 U	400 U	390 U	72 U	30 J
Benzo(a)pyrene	UG/KG	8700	51%	24	47	6.21E+01	21	61	21	350 UJ	370 U	400 U	390 U	72 U	28 J
Benzo(b)fluoranthene	UG/KG	12000	64%	30	47	6.21E+02	9	1100	5	350 UJ	370 U	400 U	390 U	72 U	40 J
Benzo(ghi)perylene	UG/KG	3150[4]	53%	25	47			50000		57 J	370 U	400 UJ	390 U	72 U	15 J
Benzo(k)fluoranthene	UG/KG	7500	47%	22	47	6.21E+03	1	1100	4	350 UJ	370 U	400 U	390 U	72 U	29 J
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	48					350 U	370 U	400 U	390 U	72 U	69 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	48	2.18E+02				350 U	370 U	400 U	390 U	72 U	69 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	48	2.88E+03				350 U	370 U	400 U	390 U	72 U	69 U
Bis(2-Ethylhexyl)phthalate	UG/KG	200	56%	27	48	3.47E+04		50000		350 UJ	370 U	49 J	46 J	7.2 J	9.2 J
Butylbenzylphthalate	UG/KG	120	13%	6	48	1.22E+07		50000		350 UJ	370 U	400 UJ	390 U	72 U	7.8 J
Carbazole	UG/KG	4200	35%	17	48	2.43E+04				350 U	370 U	400 U	390 U	72 U	14 J
Chrysene	UG/KG	9100	53%	25	47	6.21E+04		400	10	350 UJ	370 U	400 U	390 U	72 U	35 J
Di-n-butylphthalate	UG/KG	132[4]	10%	5	48	6.11E+06		8100		350 U	370 U	400 U	390 U	8.2 J	69 U
Di-n-octylphthalate	UG/KG	23[4]	4%	2	48	2.44E+06		50000		350 UJ	370 U	400 U	390 U	72 U	3.8 J
Dibenz(a,h)anthracene	UG/KG	470[4]	26%	12	47	6.21E+01	7	14	11	350 UJ	370 U	400 UJ	390 U	72 U	7.6 J
Dibenzofuran	UG/KG	1700	21%	10	48	1.45E+05		6200		350 U	370 U	400 U	390 U	72 U	69 U
Diethyl phthalate	UG/KG	21[4]	13%	6	48	4.89E+07		7100		350 U	370 U	400 U	390 U	11 J	9.4 J
Dimethylphthalate	UG/KG	0	0%	0	48	1.00E+08		2000		350 U	370 U	400 U	390 U	72 U	69 U
Fluoranthene	UG/KG	27000	73%	35	48	2.29E+06		50000		38 J	370 U	400 U	390 U	72 U	65 J

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-6	SBDRMO-7	SBDRMO-8	SBDRMO-9	SS121C-1	SS121C-2
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1050	DRMO-1046	DRMO-1049	DRMO-1053	EB235	EB236
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	0.2	0.2
Sample Date										10/25/2002	10/27/2002	10/25/2002	10/25/2002	3/9/1998	3/9/1998
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	EBS	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Fluorene	UG/KG	3500	27%	13	48	2.75E+06		50000		350 U	370 U	400 U	390 U	72 U	5 J
Hexachlorobenzene	UG/KG	8.5	2%	1	48	3.04E+02		410		350 U	370 U	400 U	390 U	72 U	69 U
Hexachlorobutadiene	UG/KG	0	0%	0	48	6.24E+03				350 U	370 U	400 U	390 U	72 U	69 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	48	3.65E+05				350 UJ	370 UJ	400 U	390 UJ	72 U	69 U
Hexachloroethane	UG/KG	0	0%	0	48	3.47E+04				350 U	370 U	400 U	390 U	72 U	69 U
Indeno(1,2,3-cd)pyrene	UG/KG	970 [4]	46%	22	48	6.21E+02	3	3200		350 UJ	370 U	400 UJ	390 U	72 U	17 J
Isophorone	UG/KG	0	0%	0	48	5.12E+05		4400		350 U	370 U	400 U	390 U	72 U	69 U
N-Nitrosodiphenylamine	UG/KG	4.8	2%	1	48	9.93E+04				350 U	370 U	400 U	390 U	72 U	69 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	48	6.95E+01				350 U	370 U	400 UJ	390 U	72 U	69 U
Naphthalene	UG/KG	400	19%	9	48	5.59E+04		13000		350 U	370 U	400 U	390 U	72 U	4 J
Nitrobenzene	UG/KG	0	0%	0	48	1.96E+04		200		350 U	370 U	400 U	390 U	72 U	69 U
Pentachlorophenol	UG/KG	0	0%	0	48	2.98E+03		1000		880 U	920 U	1000 U	990 U	180 U	170 UJ
Phenanthrene	UG/KG	29000	52%	25	48			50000		350 U	370 U	400 U	390 U	72 U	38 J
Phenol	UG/KG	0	0%	0	48	1.83E+07		30		350 U	370 U	400 U	390 U	72 U	69 U
Pyrene	UG/KG	34000	67%	32	48	2.32E+06		50000		78 J	370 U	400 UJ	390 U	72 U	53 J
Pesticides/PCBs															
4,4'-DDD	UG/KG	44	12%	5	43	2.44E+03		2900		1.8 UJ	1.9 UJ	2 R	2 R	3.6 U	3.5 U
4,4'-DDE	UG/KG	69	32%	15	47	1.72E+03		2100		6.3 J	1.9 UJ	2 UJ	2 UJ	3.6 U	3.5 U
4,4'-DDT	UG/KG	100	28%	13	47	1.72E+03		2100		1.8 UJ	1.9 UJ	2 UJ	2 UJ	3.6 U	3.5 U
Aldrin	UG/KG	14 [4]	6%	3	48	2.86E+01		41		1.8 UJ	1.9 UJ	2 UJ	2 UJ	1.9 U	1.8 U
Alpha-BHC	UG/KG	0	0%	0	48	9.02E+01		110		1.8 UJ	1.9 UJ	2 UJ	2 UJ	1.9 U	1.8 U
Alpha-Chlordane	UG/KG	63 [4]	8%	4	48					4.7 J	1.9 UJ	2 UJ	2 UJ	1.9 U	1.8 U
Beta-BHC	UG/KG	0	0%	0	48	3.16E+02		200		1.8 UJ	1.9 UJ	2 U	2 U	1.9 U	1.8 U
Chlordane	UG/KG	0	0%	0	40					18 U	19 U	20 U	20 U		
Delta-BHC	UG/KG	2	6%	3	48			300		1.8 UJ	1.9 UJ	2 UJ	2 UJ	1.9 U	1.8 U
Dieldrin	UG/KG	41 [4]	4%	2	48	3.04E+01	2	44		1.8 UJ	1.9 UJ	2 UJ	2 UJ	3.6 U	3.5 U
Endosulfan I	UG/KG	185 [4]	38%	18	48			900		5.4	1.9 U	2 U	2 U	1.9 U	1.8 U
Endosulfan II	UG/KG	9	2%	1	47			900		1.8 U	1.9 U	2 U	2 U	3.6 U	3.5 U
Endosulfan sulfate	UG/KG	0	0%	0	48			1000		1.8 U	1.9 U	2 U	2 U	3.6 U	3.5 U
Endrin	UG/KG	21.5	2%	1	47	1.83E+04		100		1.8 U	1.9 UJ	2 UJ	2 UJ	3.6 U	3.5 U
Endrin aldehyde	UG/KG	0	0%	0	48					1.8 U	1.9 U	2 U	2 U	3.6 U	3.5 U
Endrin ketone	UG/KG	7.5 [4]	6%	3	48					1.8 U	1.9 U	2 U	2 U	3.6 U	3.5 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	48	4.37E+02		60		1.8 UJ	1.9 UJ	2 UJ	2 UJ	1.9 U	1.8 U
Gamma-Chlordane	UG/KG	1.2	2%	1	48			540		1.8 UJ	1.9 UJ	2 U	2 U	1.9 U	1.8 U
Heptachlor	UG/KG	14	4%	2	47	1.08E+02		100		1.8 UJ	1.9 UJ	2 U	2 U	1.9 U	1.8 U
Heptachlor epoxide	UG/KG	2.8	4%	2	46	5.34E+01		20		1.8 UJ	1.9 UJ	2 U	2 U	1.9 U	1.8 U
Methoxychlor	UG/KG	0	0%	0	48	3.06E+05				1.8 U	1.9 U	2 UJ	2 UJ	19 U	18 U
Toxaphene	UG/KG	0	0%	0	48	4.42E+02				18 U	19 U	20 U	20 U	190 U	180 U
Aroclor-1016	UG/KG	0	0%	0	48	3.93E+03				18 U	19 UJ	20 UJ	20 UJ	36 U	35 U
Aroclor-1221	UG/KG	0	0%	0	48					18 U	19 U	20 U	20 U	74 U	70 U
Aroclor-1232	UG/KG	0	0%	0	48					18 U	19 UJ	20 UJ	20 UJ	36 U	35 U
Aroclor-1242	UG/KG	58	2%	1	48					18 U	19 U	20 UJ	20 UJ	36 U	35 U
Aroclor-1248	UG/KG	0	0%	0	48					18 U	19 U	20 U	20 U	36 U	35 U
Aroclor-1254	UG/KG	930	19%	9	48	2.22E+02	3	10000		18 U	19 U	20 U	20 U	36 U	35 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	NYSDEC Criteria Value [3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-6	SBDRMO-7	SBDRMO-8	SBDRMO-9	SS121C-1	SS121C-2
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1050	DRMO-1046	DRMO-1049	DRMO-1053	EB235	EB236
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	0.2	0.2
Sample Date										10/25/2002	10/27/2002	10/25/2002	10/25/2002	3/9/1998	3/9/1998
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	EBS	EBS
Aroclor-1260	UG/KG	85	10%	5	48			10000		18 U	19 U	20 UJ	20 UJ	36 U	35 U
Metals and Cyanide															
Aluminum	MG/KG	17000	100%	48	48	7.61E+04		19300		11100	12600	17000	11900	12800	12600
Antimony	MG/KG	236	81%	39	48	3.13E+01	2	5.9	11	0.96 U	1.3	1.1 U	1.1 U	2.5 J	2.2 J
Arsenic	MG/KG	11.6	100%	48	48	3.90E-01	48	8.2	2	4.7	6.1	4.9	5.4	5.2	6.3
Barium	MG/KG	2030	100%	48	48	5.37E+03		300	7	66.7 J	101	75.1 J	82.6 J	57.7	252
Beryllium	MG/KG	1.2	100%	48	48	1.54E+02		1.1	1	0.6	0.74	1.2	0.68	0.56	0.48
Cadmium	MG/KG	29.1	60%	29	48	3.70E+01		2.3	14	0.13 U	0.13 U	0.14 U	0.14 U	21.1	7.1
Calcium	MG/KG	296000	100%	48	48			121000	6	41400 J	19300	2100 J	41800 J	11800	53100
Chromium	MG/KG	74.8	100%	48	48			29.6	12	38.6	22.5	28.4	20.8	32.9	45.7
Cobalt	MG/KG	17	100%	35	35	9.03E+02		30		14.2	15.2	17	12.7	14	15.5
Copper	MG/KG	9750	100%	48	48	3.13E+03	3	33	35	39.6 J	35	21.4 J	26.2 J	139 J	324 J
Cyanide	MG/KG	0	0%	0	8	1.22E+06		0.35						0.62 U	0.53 U
Cyanide, Amenable	MG/KG	0	0%	0	40					0.53 U	0.56 U	0.6 U	0.61 U		
Cyanide, Total	MG/KG	0	0%	0	40					0.535 U	0.558 U	0.602 U	0.606 U		
Iron	MG/KG	51700	100%	48	48	2.35E+04	23	36500	5	24200	27900	32700	22200	41300	43600
Lead	MG/KG	18900	100%	48	48	4.00E+02	7	24.8	40	56.3	43.4	7.3	28.3	78.2 J	251
Magnesium	MG/KG	20700	100%	48	48			21500		6940	6510	5780	6590	6220	12800
Manganese	MG/KG	858	100%	48	48	1.76E+03		1060		376	620	444	424	364	403
Mercury	MG/KG	0.47	92%	44	48	2.35E+01		0.1	8	0.03	0.06	0.03	0.03	0.05 U	0.1
Nickel	MG/KG	224	100%	48	48	1.56E+03		49	9	44.4 J	43.8 J	45.9 J	34.2 J	58.6	224
Potassium	MG/KG	1990	100%	48	48			2380		1770 J	1080 J	972 J	1650 J	1480	1890
Selenium	MG/KG	1.3	21%	10	48	3.91E+02		2		0.45 U	0.47 U	0.5 U	0.5 U	1 U	0.99 U
Silver	MG/KG	21.8	38%	18	48	3.91E+02		0.75	13	0.29 U	0.3 U	0.32 U	0.32 U	21.8	1.3
Sodium	MG/KG	478	88%	42	48			172	26	277	146	154	191	223	196
Thallium	MG/KG	1.1	21%	10	48	5.16E+00		0.7	3	0.33 U	0.34 U	0.37 U	0.37 U	1.4 UJ	1.3 UJ
Vanadium	MG/KG	25.4	100%	48	48	7.82E+01		150		17.9	22.5 J	25.4	20.4	18.6	20.1
Zinc	MG/KG	3610	100%	48	48	2.35E+04		110	28	196	91.7 J	67.6	106	585	431
Other															
Total Organic Carbon	MG/KG	9000	100%	40	40					8500	3200	4200	3800		
Total Petroleum Hydrocarbons	MG/KG	7600	25%	10	40					43 UJ	45 UJ	48 UJ	600 UJ		

NOTES:

1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.

2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)

3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.

4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SS121C-3	SS121C-4	SSDRMO-10	SSDRMO-11	SSDRMO-12	SSDRMO-13
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB237	EB241	DRMO-1006	DRMO-1007	DRMO-1008	DRMO-1009
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										3/9/1998	3/10/1998	10/23/2002	10/23/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	PID-RI	PID-RI	PID-RI	PID-RI
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	48	1.20E+06		800		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	48	4.08E+02		600		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	48	7.29E+02				11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	48	5.06E+05		200		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	48	1.24E+05		400		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	48	2.78E+02		100		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	8					11 U	11 U				
1,2-Dichloropropane	UG/KG	0	0%	0	48	3.42E+02				11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Acetone	UG/KG	13	28%	13	47	1.41E+07		200		11 U	11 U	2.9 UJ	10 J	2.7 UJ	2.9 UJ
Benzene	UG/KG	41	2%	1	48	6.43E+02		60		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Bromodichloromethane	UG/KG	0	0%	0	48	8.24E+02				11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Bromoform	UG/KG	0	0%	0	48	6.16E+04				11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Carbon disulfide	UG/KG	4.7	4%	2	48	3.55E+05		2700		11 U	11 U	2.9 UJ	2.2 J	2.7 UJ	2.9 UJ
Carbon tetrachloride	UG/KG	0	0%	0	48	2.51E+02		600		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Chlorobenzene	UG/KG	0	0%	0	48	1.51E+05		1700		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Chlorodibromomethane	UG/KG	0	0%	0	48	1.11E+03				11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Chloroethane	UG/KG	0	0%	0	48	3.03E+03		1900		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Chloroform	UG/KG	4.8[4]	4%	2	48	2.21E+02		300		11 U	4 J	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	40	4.29E+04						2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	48					11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Ethyl benzene	UG/KG	3300	4%	2	48	3.95E+05		5500		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Meta/Para Xylene	UG/KG	4400	8%	3	40							2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Methyl bromide	UG/KG	0	0%	0	48	3.90E+03				11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Methyl butyl ketone	UG/KG	0	0%	0	48					11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Methyl chloride	UG/KG	0	0%	0	48	4.69E+04				11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Methyl ethyl ketone	UG/KG	0	0%	0	48	2.23E+07		300		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	48	5.28E+06		1000		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Methylene chloride	UG/KG	2.6	2%	1	48	9.11E+03		100		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Ortho Xylene	UG/KG	16	3%	1	40							2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Styrene	UG/KG	0	0%	0	48	1.70E+06				11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Tetrachloroethene	UG/KG	0	0%	0	48	4.84E+02		1400		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Toluene	UG/KG	28	19%	9	48	5.20E+05		1500		4 J	16	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Total Xylenes	UG/KG	0	0%	0	8	2.71E+05		1200		11 U	11 U				
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	40	6.95E+04		300				2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	48					11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Trichloroethene	UG/KG	0	0%	0	48	5.30E+01		700		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Vinyl chloride	UG/KG	0	0%	0	48	7.91E+01		200		11 U	11 U	2.9 UJ	2.7 UJ	2.7 UJ	2.9 UJ
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	48	6.22E+04		3400		180 U	170 U	380 U	370 U	350 U	360 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	48	6.00E+05		7900		180 U	170 U	380 U	370 U	350 U	360 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	48	5.31E+05		1600		180 U	170 U	380 U	370 U	350 U	360 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	48	3.45E+03		8500		180 U	170 U	380 U	370 U	350 U	360 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+06		100		440 U	420 U	960 U	920 U	890 U	890 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+03				180 U	170 U	380 U	370 U	350 U	360 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SS121C-3	SS121C-4	SSDRMO-10	SSDRMO-11	SSDRMO-12	SSDRMO-13
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB237	EB241	DRMO-1006	DRMO-1007	DRMO-1008	DRMO-1009
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										3/9/1998	3/10/1998	10/23/2002	10/23/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**[1]	**Region IX PRG Criteria Value**[2]	**Exceedances**	**NYSDEC Criteria Value**[3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dichlorophenol	UG/KG	0	0%	0	48	1.83E+05		400		180 U	170 U	380 U	370 U	350 U	360 U
2,4-Dimethylphenol	UG/KG	0	0%	0	48	1.22E+06				180 U	170 U	380 U	370 U	350 U	360 U
2,4-Dinitrophenol	UG/KG	0	0%	0	47	1.22E+05		200		440 U	420 U	960 U	920 UJ	890 U	890 U
2,4-Dinitrotoluene	UG/KG	45	2%	1	48	1.22E+05				180 U	170 U	380 U	370 U	350 U	360 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	48	6.11E+04		1000		180 U	170 U	380 U	370 U	350 U	360 U
2-Chloronaphthalene	UG/KG	0	0%	0	48	4.94E+06				180 U	170 U	380 U	370 U	350 U	360 U
2-Chlorophenol	UG/KG	0	0%	0	48	6.34E+04		800		180 U	170 U	380 U	370 U	350 U	360 U
2-Methylnaphthalene	UG/KG	610	19%	9	48			36400		18 J	9.9 J	380 U	370 U	610	360 U
2-Methylphenol	UG/KG	0	0%	0	48	3.06E+06		100		180 U	170 U	380 U	370 U	350 U	360 U
2-Nitroaniline	UG/KG	0	0%	0	48	1.83E+05		430		440 U	420 U	960 U	920 U	890 U	890 U
2-Nitrophenol	UG/KG	0	0%	0	48			330		180 U	170 U	380 U	370 U	350 U	360 U
3 or 4-Methylphenol	UG/KG	0	0%	0	40							380 U	370 U	350 U	360 U
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	48	1.08E+03				180 U	170 U	380 U	370 U	350 UJ	360 U
3-Nitroaniline	UG/KG	0	0%	0	48	1.83E+04		500		440 U	420 U	960 U	920 UJ	890 U	890 UJ
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	48	6.11E+03				440 U	420 U	960 U	920 U	890 U	890 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	48					180 U	170 U	380 U	370 U	350 U	360 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	48			240		180 U	170 U	380 U	370 U	350 U	360 U
4-Chloroaniline	UG/KG	0	0%	0	48	2.44E+05		220		180 U	170 U	380 U	370 U	350 U	360 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	48					180 U	170 U	380 U	370 U	350 U	360 U
4-Methylphenol	UG/KG	0	0%	0	8	3.06E+05		900		180 U	170 U				
4-Nitroaniline	UG/KG	0	0%	0	48	2.32E+04				440 U	420 U	960 U	920 U	890 U	890 U
4-Nitrophenol	UG/KG	0	0%	0	48			100		440 U	420 U	960 U	920 U	890 U	890 U
Acenaphthene	UG/KG	2600	23%	11	48	3.68E+06		50000		50 J	52 J	380 U	370 U	2600	360 U
Acenaphthylene	UG/KG	2500	21%	10	48			41000		180 U	170 U	380 U	370 U	61 J	360 U
Anthracene	UG/KG	7100	42%	20	48	2.19E+07		50000		96 J	70 J	380 U	370 U	7100	360 U
Benzo(a)anthracene	UG/KG	10000	55%	26	47	6.21E+02	4	224	14	420	320	380 U	370 U	10000 J	360 U
Benzo(a)pyrene	UG/KG	8700	51%	24	47	6.21E+01	21	61	21	370	260	380 U	370 U	8700 J	360 U
Benzo(b)fluoranthene	UG/KG	12000	64%	30	47	6.21E+02	9	1100	5	530	310	47 J	40 J	12000 J	360 U
Benzo(ghi)perylene	UG/KG	3150[4]	53%	25	47			50000		380	190	380 U	370 UJ	2800 J	360 UJ
Benzo(k)fluoranthene	UG/KG	7500	47%	22	47	6.21E+03	1	1100	4	340	390	380 UJ	370 UJ	7500 J	360 UJ
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	48					180 U	170 U	380 U	370 UJ	350 U	360 UJ
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	48	2.18E+02				180 U	170 U	380 U	370 UJ	350 U	360 UJ
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	48	2.88E+03				180 U	170 U	380 U	370 U	350 U	360 U
Bis(2-Ethylhexyl)phthalate	UG/KG	200	56%	27	48	3.47E+04		50000		200	52 J	57 J	37 J	91 J	360 U
Butylbenzylphthalate	UG/KG	120	13%	6	48	1.22E+07		50000		24 J	10 J	380 UJ	370 U	350 UJ	360 U
Carbazole	UG/KG	4200	35%	17	48	2.43E+04				130 J	100 J	380 U	370 U	4200	360 U
Chrysene	UG/KG	9100	53%	25	47	6.21E+04		400	10	510	360	380 U	370 U	9100 J	360 U
Di-n-butylphthalate	UG/KG	132[4]	10%	5	48	6.11E+06		8100		50 J	20 J	380 U	370 U	350 U	360 U
Di-n-octylphthalate	UG/KG	23[4]	4%	2	48	2.44E+06		50000		180 U	170 U	380 U	370 U	350 UJ	360 U
Dibenz(a,h)anthracene	UG/KG	470[4]	26%	12	47	6.21E+01	7	14	11	150 J	79 J	380 U	370 U	370 J	360 U
Dibenzofuran	UG/KG	1700	21%	10	48	1.45E+05		6200		22 J	22 J	380 U	370 U	1700	360 U
Diethyl phthalate	UG/KG	21[4]	13%	6	48	4.89E+07		7100		11 J	170 U	380 U	370 U	350 U	360 U
Dimethylphthalate	UG/KG	0	0%	0	48	1.00E+08		2000		180 U	170 U	380 U	370 U	350 U	360 U
Fluoranthene	UG/KG	27000	73%	35	48	2.29E+06		50000		820	760	83 J	56 J	27000	43 J

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SS121C-3	SS121C-4	SSDRMO-10	SSDRMO-11	SSDRMO-12	SSDRMO-13
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB237	EB241	DRMO-1006	DRMO-1007	DRMO-1008	DRMO-1009
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										3/9/1998	3/10/1998	10/23/2002	10/23/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Fluorene	UG/KG	3500	27%	13	48	2.75E+06		50000		41 J	43 J	380 U	370 U	3500	360 U
Hexachlorobenzene	UG/KG	8.5	2%	1	48	3.04E+02		410		180 U	170 U	380 U	370 U	350 U	360 U
Hexachlorobutadiene	UG/KG	0	0%	0	48	6.24E+03				180 U	170 U	380 UJ	370 UJ	350 UJ	360 UJ
Hexachlorocyclopentadiene	UG/KG	0	0%	0	48	3.65E+05				180 U	170 U	380 U	370 U	350 U	360 U
Hexachloroethane	UG/KG	0	0%	0	48	3.47E+04				180 U	170 U	380 U	370 U	350 U	360 U
Indeno(1,2,3-cd)pyrene	UG/KG	970 [4]	46%	22	48	6.21E+02	3	3200		350	180	380 UJ	370 UJ	740 J	360 UJ
Isophorone	UG/KG	0	0%	0	48	5.12E+05		4400		180 U	170 U	380 UJ	370 UJ	350 UJ	360 UJ
N-Nitrosodiphenylamine	UG/KG	4.8	2%	1	48	9.93E+04				180 U	170 U	380 U	370 U	350 U	360 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	48	6.95E+01				180 U	170 U	380 U	370 U	350 U	360 U
Naphthalene	UG/KG	400	19%	9	48	5.59E+04		13000		14 J	12 J	380 U	370 U	400	360 U
Nitrobenzene	UG/KG	0	0%	0	48	1.96E+04		200		180 U	170 U	380 UJ	370 UJ	350 UJ	360 UJ
Pentachlorophenol	UG/KG	0	0%	0	48	2.98E+03		1000		440 U	420 U	960 U	920 U	890 U	890 U
Phenanthrene	UG/KG	29000	52%	25	48			50000		520	440	380 U	370 U	29000	360 U
Phenol	UG/KG	0	0%	0	48	1.83E+07		30		180 U	170 U	380 U	370 U	350 U	360 U
Pyrene	UG/KG	34000	67%	32	48	2.32E+06		50000		820	580	61 J	42 J	34000 J	360 U
Pesticides/PCBs															
4,4'-DDD	UG/KG	44	12%	5	43	2.44E+03		2900		7.4	3.5 U	2 UJ	1.9 J	5.5 J	1.8 UJ
4,4'-DDE	UG/KG	69	32%	15	47	1.72E+03		2100		69 J	50	2 UJ	7.1 J	13 NJ	1.8 UJ
4,4'-DDT	UG/KG	100	28%	13	47	1.72E+03		2100		100 J	37	2 UJ	3.5 J	19 J	1.8 UJ
Aldrin	UG/KG	14 [4]	6%	3	48	2.86E+01		41		1.9 U	1.8 U	2 U	1.9 U	4.5	1.8 U
Alpha-BHC	UG/KG	0	0%	0	48	9.02E+01		110		1.9 U	1.8 U	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Alpha-Chlordane	UG/KG	63 [4]	8%	4	48					1.9 U	1 J	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Beta-BHC	UG/KG	0	0%	0	48	3.16E+02		200		1.9 U	1.8 U	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Chlordane	UG/KG	0	0%	0	40							20 U	19 U	18 U	18 U
Delta-BHC	UG/KG	2	6%	3	48			300		1.2 J	2 J	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Dieldrin	UG/KG	41 [4]	4%	2	48	3.04E+01	2	44		3.6 U	3.5 U	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Endosulfan I	UG/KG	185 [4]	38%	18	48			900		1.9 U	1.8 U	2 UJ	9.6 J	25 J	1.8 UJ
Endosulfan II	UG/KG	9	2%	1	47			900		3.6 U	3.5 U	2 U	1.9 U	1.8 U	1.8 U
Endosulfan sulfate	UG/KG	0	0%	0	48			1000		3.6 U	3.5 U	2 U	1.9 U	1.8 U	1.8 U
Endrin	UG/KG	21.5	2%	1	47	1.83E+04		100		3.6 U	3.5 U	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Endrin aldehyde	UG/KG	0	0%	0	48					3.6 U	3.5 U	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Endrin ketone	UG/KG	7.5 [4]	6%	3	48					3.8 J	3.5 U	2 U	1.9 U	1.8 U	1.8 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	48	4.37E+02		60		1.9 U	1.8 U	2 UJ	1.9 UJ	1.8 UJ	1.8 U
Gamma-Chlordane	UG/KG	1.2	2%	1	48			540		1.9 U	1.2 J	2 U	1.9 U	1.8 U	1.8 UJ
Heptachlor	UG/KG	14	4%	2	47	1.08E+02		100		2.1 J	1.8 U	2 U	1.9 U	1.8 U	1.8 U
Heptachlor epoxide	UG/KG	2.8	4%	2	46	5.34E+01		20		2.8 J	1.4 J	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Methoxychlor	UG/KG	0	0%	0	48	3.06E+05				19 U	18 U	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Toxaphene	UG/KG	0	0%	0	48	4.42E+02				190 U	180 U	20 U	19 U	18 U	18 U
Aroclor-1016	UG/KG	0	0%	0	48	3.93E+03				36 U	35 U	20 U	19 U	18 U	18 U
Aroclor-1221	UG/KG	0	0%	0	48					74 U	71 U	20 U	19 U	18 U	18 U
Aroclor-1232	UG/KG	0	0%	0	48					36 U	35 U	20 U	19 U	18 U	18 U
Aroclor-1242	UG/KG	58	2%	1	48					36 U	58 J	20 U	19 U	18 U	18 U
Aroclor-1248	UG/KG	0	0%	0	48					36 U	35 U	20 U	19 U	18 U	18 U
Aroclor-1254	UG/KG	930	19%	9	48	2.22E+02	3	10000		72	79	20 UJ	19 UJ	230 J	18 UJ

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SS121C-3	SS121C-4	SSDRMO-10	SSDRMO-11	SSDRMO-12	SSDRMO-13
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB237	EB241	DRMO-1006	DRMO-1007	DRMO-1008	DRMO-1009
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										3/9/1998	3/10/1998	10/23/2002	10/23/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aroclor-1260	UG/KG	85	10%	5	48			10000		85 J	36 J	20 UJ	19 UJ	18 UJ	18 UJ
Metals and Cyanide															
Aluminum	MG/KG	17000	100%	48	48	7.61E+04		19300		7650	2700	11300	9400	9050	8530
Antimony	MG/KG	236	81%	39	48	3.13E+01	2	5.9	11	3.4 J	2.9 J	2.7 J	1.6 J	3.2 J	1.2 J
Arsenic	MG/KG	11.6	100%	48	48	3.90E-01	48	8.2	2	6.4	5.4	5.9	5.9	5.8	5
Barium	MG/KG	2030	100%	48	48	5.37E+03		300	7	394	90.6	68.6 J	91.6 J	53.7 J	38.5
Beryllium	MG/KG	1.2	100%	48	48	1.54E+02		1.1	1	0.3	0.21	0.63	0.51	0.47	0.42
Cadmium	MG/KG	29.1	60%	29	48	3.70E+01		2.3	14	18.5	12.6	1	1.7	4.3	0.47
Calcium	MG/KG	296000	100%	48	48			121000	6	129000	296000	30700 J	35600 J	38800 J	38800 J
Chromium	MG/KG	74.8	100%	48	48			29.6	12	49.2	9.2	20 J	17.7 J	26 J	16.9 J
Cobalt	MG/KG	17	100%	35	35	9.03E+02		30		11.3	9.6	11.5 R	15.5 R	12.3 R	12.6 R
Copper	MG/KG	9750	100%	48	48	3.13E+03	3	33	35	383 J	532 J	33.6 J	34.3 J	77.2 J	38.5 J
Cyanide	MG/KG	0	0%	0	8	1.22E+06		0.35		0.59 U	0.54 U				
Cyanide, Amenable	MG/KG	0	0%	0	40							0.58 U	0.56 U	0.54 U	0.54 U
Cyanide, Total	MG/KG	0	0%	0	40							0.582 U	0.556 U	0.54 U	0.542 U
Iron	MG/KG	51700	100%	48	48	2.35E+04	23	36500	5	35000	8050	25100	24200	26000	21600
Lead	MG/KG	18900	100%	48	48	4.00E+02	7	24.8	40	577 J	171 J	46.1	33.5	129	28.6
Magnesium	MG/KG	20700	100%	48	48			21500		8770	15400	5270	5250	6070	6010
Manganese	MG/KG	858	100%	48	48	1.76E+03		1060		494	407	534	858	376	314
Mercury	MG/KG	0.47	92%	44	48	2.35E+01		0.1	8	0.15	0.13	0.04	0.04	0.06	0.03
Nickel	MG/KG	224	100%	48	48	1.56E+03		49	9	62.5	19.5	31.7 J	40.9 J	42.3 J	38.7 J
Potassium	MG/KG	1990	100%	48	48			2380		1600	1290	980 J	891 J	958 J	820 J
Selenium	MG/KG	1.3	21%	10	48	3.91E+02		2		1 U	1 U	0.5 J	0.93	1	1.2
Silver	MG/KG	21.8	38%	18	48	3.91E+02		0.75	13	4.7	2.1	0.31 U	0.29 U	0.56	0.29 U
Sodium	MG/KG	478	88%	42	48			172	26	255	147	205	191	195	106 U
Thallium	MG/KG	1.1	21%	10	48	5.16E+00		0.7	3	1.4 UJ	1.3 UJ	0.36 U	0.55	0.55 J	0.58 J
Vanadium	MG/KG	25.4	100%	48	48	7.82E+01		150		21.5	8.5	19.4 J	17 J	15.2 J	13.2 J
Zinc	MG/KG	3610	100%	48	48	2.35E+04		110	28	525	250	82.6 J	309 J	247 J	134 J
Other															
Total Organic Carbon	MG/KG	9000	100%	40	40							5100	5500	7600	4600
Total Petroleum Hydrocarbons	MG/KG	7600	25%	10	40							47 U	44 U	43 U	43 U

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-14	SSDRMO-15	SSDRMO-16	SSDRMO-17	SSDRMO-18	SSDRMO-19
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1010	DRMO-1011	DRMO-1012	DRMO-1013	DRMO-1014	DRMO-1015
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/30/2002	10/30/2002	10/30/2002	10/30/2002	10/30/2002
QC Code						Region IX				SA	SA	SA	SA	SA	SA
Study ID			Frequency	Number	Number	PRG		NYSDEC		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	of	of Times	of	Criteria		Criteria							
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses[1]**	**Value[2]**	**Exceedances**	**Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	48	1.20E+06		800		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	48	4.08E+02		600		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	48	7.29E+02				3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	48	5.06E+05		200		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	48	1.24E+05		400		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	48	2.78E+02		100		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	8										
1,2-Dichloropropane	UG/KG	0	0%	0	48	3.42E+02				3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Acetone	UG/KG	13	28%	13	47	1.41E+07		200		3.1 UJ	21 U	11 U	5.2 U	19 U	9.9 J
Benzene	UG/KG	41	2%	1	48	6.43E+02		60		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Bromodichloromethane	UG/KG	0	0%	0	48	8.24E+02				3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Bromoform	UG/KG	0	0%	0	48	6.16E+04				3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Carbon disulfide	UG/KG	4.7	4%	2	48	3.55E+05		2700		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Carbon tetrachloride	UG/KG	0	0%	0	48	2.51E+02		600		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Chlorobenzene	UG/KG	0	0%	0	48	1.51E+05		1700		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Chlorodibromomethane	UG/KG	0	0%	0	48	1.11E+03				3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Chloroethane	UG/KG	0	0%	0	48	3.03E+03		1900		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Chloroform	UG/KG	4.8[4]	4%	2	48	2.21E+02		300		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	40	4.29E+04				3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	48					3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Ethyl benzene	UG/KG	3300	4%	2	48	3.95E+05		5500		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Meta/Para Xylene	UG/KG	4400	8%	3	40					3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Methyl bromide	UG/KG	0	0%	0	48	3.90E+03				3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Methyl butyl ketone	UG/KG	0	0%	0	48					3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Methyl chloride	UG/KG	0	0%	0	48	4.69E+04				3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Methyl ethyl ketone	UG/KG	0	0%	0	48	2.23E+07		300		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	48	5.28E+06		1000		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Methylene chloride	UG/KG	2.6	2%	1	48	9.11E+03		100		3.1 UJ	4.1 U	3.9 U	3.8 U	4.5 U	3.2 UJ
Ortho Xylene	UG/KG	16	3%	1	40					3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Styrene	UG/KG	0	0%	0	48	1.70E+06				3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Tetrachloroethene	UG/KG	0	0%	0	48	4.84E+02		1400		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Toluene	UG/KG	28	19%	9	48	5.20E+05		1500		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Total Xylenes	UG/KG	0	0%	0	8	2.71E+05		1200							
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	40	6.95E+04		300		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	48					3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Trichloroethene	UG/KG	0	0%	0	48	5.30E+01		700		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Vinyl chloride	UG/KG	0	0%	0	48	7.91E+01		200		3.1 UJ	3.1 U	2.9 U	3.3 U	3.2 U	3.2 UJ
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	48	6.22E+04		3400		360 U	400 U	380 U	380 U	410 U	410 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	48	6.00E+05		7900		360 U	400 U	380 U	380 U	410 U	410 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	48	5.31E+05		1600		360 U	400 U	380 U	380 U	410 U	410 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	48	3.45E+03		8500		360 U	400 U	380 U	380 U	410 U	410 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+06		100		910 U	1000 U	960 U	960 U	1000 U	1000 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+03				360 U	400 U	380 U	380 U	410 U	410 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-14	SSDRMO-15	SSDRMO-16	SSDRMO-17	SSDRMO-18	SSDRMO-19
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1010	DRMO-1011	DRMO-1012	DRMO-1013	DRMO-1014	DRMO-1015
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/30/2002	10/30/2002	10/30/2002	10/30/2002	10/30/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
2,4-Dichlorophenol	UG/KG	0	0%	0	48	1.83E+05		400		360 U	400 U	380 U	380 U	410 U	410 U
2,4-Dimethylphenol	UG/KG	0	0%	0	48	1.22E+06				360 U	400 U	380 U	380 U	410 U	410 U
2,4-Dinitrophenol	UG/KG	0	0%	0	47	1.22E+05		200		910 UJ	1000 UJ	960 UJ	960 UJ	1000 UJ	1000 UJ
2,4-Dinitrotoluene	UG/KG	45	2%	1	48	1.22E+05				360 U	400 U	380 U	380 U	410 U	410 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	48	6.11E+04		1000		360 U	400 U	380 U	380 U	410 U	410 U
2-Chloronaphthalene	UG/KG	0	0%	0	48	4.94E+06				360 U	400 U	380 U	380 U	410 U	410 U
2-Chlorophenol	UG/KG	0	0%	0	48	6.34E+04		800		360 U	400 U	380 U	380 U	410 U	410 U
2-Methylnaphthalene	UG/KG	610	19%	9	48			36400		360 U	400 U	380 U	380 U	410 U	410 U
2-Methylphenol	UG/KG	0	0%	0	48	3.06E+06		100		360 U	400 U	380 U	380 U	410 U	410 U
2-Nitroaniline	UG/KG	0	0%	0	48	1.83E+05		430		910 UJ	1000 U	960 U	960 U	1000 U	1000 U
2-Nitrophenol	UG/KG	0	0%	0	48			330		360 U	400 U	380 U	380 U	410 U	410 U
3 or 4-Methylphenol	UG/KG	0	0%	0	40					360 U	400 U	380 U	380 U	410 U	410 U
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	48	1.08E+03				360 U	400 U	380 U	380 U	410 U	410 U
3-Nitroaniline	UG/KG	0	0%	0	48	1.83E+04		500		910 U	1000 U	960 U	960 U	1000 U	1000 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	48	6.11E+03				910 U	1000 U	960 U	960 UJ	1000 U	1000 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	48					360 U	400 U	380 U	380 U	410 U	410 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	48			240		360 U	400 U	380 U	380 U	410 U	410 U
4-Chloroaniline	UG/KG	0	0%	0	48	2.44E+05		220		360 U	400 U	380 U	380 U	410 U	410 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	48					360 U	400 U	380 U	380 U	410 U	410 U
4-Methylphenol	UG/KG	0	0%	0	8	3.06E+05		900							
4-Nitroaniline	UG/KG	0	0%	0	48	2.32E+04				910 U	1000 U	960 U	960 U	1000 U	1000 U
4-Nitrophenol	UG/KG	0	0%	0	48			100		910 U	1000 U	960 U	960 U	1000 U	1000 U
Acenaphthene	UG/KG	2600	23%	11	48	3.68E+06		50000		360 U	400 U	380 U	380 U	410 U	410 U
Acenaphthylene	UG/KG	2500	21%	10	48			41000		360 U	400 U	380 U	380 U	410 U	410 U
Anthracene	UG/KG	7100	42%	20	48	2.19E+07		50000		86 J	400 U	380 U	380 U	410 U	410 U
Benzo(a)anthracene	UG/KG	10000	55%	26	47	6.21E+02	4	224	14	320 J	78 J	380 U	380 U	55 J	410 U
Benzo(a)pyrene	UG/KG	8700	51%	24	47	6.21E+01	21	61	21	360 J	74 J	380 U	380 U	410 U	410 U
Benzo(b)fluoranthene	UG/KG	12000	64%	30	47	6.21E+02	9	1100	5	540	98 J	380 U	380 U	77 J	410 U
Benzo(ghi)perylene	UG/KG	3150[4]	53%	25	47			50000		120 J	400 U	380 U	380 U	410 U	410 U
Benzo(k)fluoranthene	UG/KG	7500	47%	22	47	6.21E+03	1	1100	4	230 J	400 UJ	380 UJ	380 U	410 UJ	410 UJ
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	48					360 UJ	400 U	380 U	380 U	410 U	410 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	48	2.18E+02				360 U	400 UJ	380 UJ	380 U	410 UJ	410 UJ
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	48	2.88E+03				360 U	400 U	380 U	380 U	410 U	410 U
Bis(2-Ethylhexyl)phthalate	UG/KG	200	56%	27	48	3.47E+04		50000		98 J	400 U	380 U	380 U	410 U	410 U
Butylbenzylphthalate	UG/KG	120	13%	6	48	1.22E+07		50000		120 J	400 U	380 U	380 U	410 U	410 U
Carbazole	UG/KG	4200	35%	17	48	2.43E+04				56 J	400 U	380 U	380 U	410 U	410 U
Chrysene	UG/KG	9100	53%	25	47	6.21E+04		400	10	340 J	94 J	380 U	380 U	410 U	410 U
Di-n-butylphthalate	UG/KG	132[4]	10%	5	48	6.11E+06		8100		360 U	400 U	380 U	380 U	410 U	410 U
Di-n-octylphthalate	UG/KG	23[4]	4%	2	48	2.44E+06		50000		360 U	400 U	380 U	380 U	410 U	410 U
Dibenz(a,h)anthracene	UG/KG	470[4]	26%	12	47	6.21E+01	7	14	11	360 U	400 U	380 U	380 U	410 U	410 U
Dibenzofuran	UG/KG	1700	21%	10	48	1.45E+05		6200		360 U	400 U	380 U	380 U	410 U	410 U
Diethyl phthalate	UG/KG	21[4]	13%	6	48	4.89E+07		7100		360 U	400 U	380 U	380 U	410 U	410 U
Dimethylphthalate	UG/KG	0	0%	0	48	1.00E+08		2000		360 U	400 U	380 U	380 U	410 U	410 U
Fluoranthene	UG/KG	27000	73%	35	48	2.29E+06		50000		710	170 J	39 J	380 U	110 J	410 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-14	SSDRMO-15	SSDRMO-16	SSDRMO-17	SSDRMO-18	SSDRMO-19
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1010	DRMO-1011	DRMO-1012	DRMO-1013	DRMO-1014	DRMO-1015
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/30/2002	10/30/2002	10/30/2002	10/30/2002	10/30/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Fluorene	UG/KG	3500	27%	13	48	2.75E+06		50000		360 U	400 U	380 U	380 U	410 U	410 U
Hexachlorobenzene	UG/KG	8.5	2%	1	48	3.04E+02		410		360 U	400 U	380 U	380 U	410 U	410 U
Hexachlorobutadiene	UG/KG	0	0%	0	48	6.24E+03				360 UJ	400 U	380 U	380 U	410 U	410 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	48	3.65E+05				360 U	400 U	380 U	380 UJ	410 U	410 U
Hexachloroethane	UG/KG	0	0%	0	48	3.47E+04				360 U	400 U	380 UJ	380 U	410 UJ	410 UJ
Indeno(1,2,3-cd)pyrene	UG/KG	970 [4]	46%	22	48	6.21E+02	3	3200		67 J	400 U	380 U	380 U	410 U	410 U
Isophorone	UG/KG	0	0%	0	48	5.12E+05		4400		360 UJ	400 U	380 U	380 U	410 U	410 U
N-Nitrosodiphenylamine	UG/KG	4.8	2%	1	48	9.93E+04				360 U	400 U	380 U	380 U	410 U	410 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	48	6.95E+01				360 U	400 U	380 U	380 U	410 U	410 U
Naphthalene	UG/KG	400	19%	9	48	5.59E+04		13000		360 U	400 U	380 U	380 U	410 U	410 U
Nitrobenzene	UG/KG	0	0%	0	48	1.96E+04		200		360 UJ	400 UJ	380 UJ	380 U	410 UJ	410 UJ
Pentachlorophenol	UG/KG	0	0%	0	48	2.98E+03		1000		910 U	1000 U	960 U	960 U	1000 U	1000 U
Phenanthrene	UG/KG	29000	52%	25	48			50000		370	110 J	380 U	380 U	410 U	410 U
Phenol	UG/KG	0	0%	0	48	1.83E+07		30		360 U	400 U	380 U	380 U	410 U	410 U
Pyrene	UG/KG	34000	67%	32	48	2.32E+06		50000		530	150 J	380 U	380 U	87 J	410 U
Pesticides/PCBs															
4,4'-DDD	UG/KG	44	12%	5	43	2.44E+03		2900		1.9 UJ	0.25 U	0.23 U	0.23 U	0.25 U	0.25 U
4,4'-DDE	UG/KG	69	32%	15	47	1.72E+03		2100		6.6 J	0.25 UJ	0.23 UJ	0.23 UJ	0.25 UJ	0.25 UJ
4,4'-DDT	UG/KG	100	28%	13	47	1.72E+03		2100		1.9 UJ	0.25 UJ	0.23 UJ	0.23 UJ	0.25 UJ	0.25 UJ
Aldrin	UG/KG	14 [4]	6%	3	48	2.86E+01		41		1.9 U	0.12 U	0.11 U	0.12 U	0.12 U	0.13 U
Alpha-BHC	UG/KG	0	0%	0	48	9.02E+01		110		1.9 UJ	1.5 U	1.4 U	1.4 UJ	1.5 UJ	1.5 UJ
Alpha-Chlordane	UG/KG	63 [4]	8%	4	48					1.9 UJ	0.37 U	0.34 U	0.35 U	0.37 U	0.38 U
Beta-BHC	UG/KG	0	0%	0	48	3.16E+02		200		1.9 UJ	0.12 U	0.11 U	0.12 U	0.12 U	0.13 U
Chlordane	UG/KG	0	0%	0	40					19 U	2.3 U	2.2 U	2.2 U	2.3 U	2.4 U
Delta-BHC	UG/KG	2	6%	3	48			300		1.9 UJ	0.25 UJ	0.23 UJ	0.23 UJ	0.25 UJ	0.25 UJ
Dieldrin	UG/KG	41 [4]	4%	2	48	3.04E+01	2	44		1.9 UJ	0.12 UJ	0.11 UJ	0.12 UJ	0.12 UJ	0.13 UJ
Endosulfan I	UG/KG	185 [4]	38%	18	48			900		13 J	0.62 U	0.57 U	0.59 U	0.61 U	0.63 U
Endosulfan II	UG/KG	9	2%	1	47			900		1.9 U	0.37 U	0.34 U	0.35 U	0.37 U	0.38 U
Endosulfan sulfate	UG/KG	0	0%	0	48			1000		1.9 U	0.74 U	0.69 U	0.7 UJ	0.74 UJ	0.75 UJ
Endrin	UG/KG	21.5	2%	1	47	1.83E+04		100		1.9 UJ	0.98 UJ	0.92 UJ	0.94 UJ	0.98 UJ	1 UJ
Endrin aldehyde	UG/KG	0	0%	0	48					1.9 UJ	0.98 UJ	0.92 UJ	0.94 UJ	0.98 UJ	1 UJ
Endrin ketone	UG/KG	7.5 [4]	6%	3	48					1.9 U	0.12 U	0.11 U	0.12 U	0.12 U	0.13 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	48	4.37E+02		60		1.9 U	0.12 U	0.11 U	0.12 UJ	0.12 UJ	0.13 UJ
Gamma-Chlordane	UG/KG	1.2	2%	1	48			540		1.9 UJ	0.37 U	0.34 U	0.35 U	0.37 U	0.38 U
Heptachlor	UG/KG	14	4%	2	47	1.08E+02		100		1.9 U	1.2 U	1.1 U	1.2 UJ	1.2 UJ	1.3 UJ
Heptachlor epoxide	UG/KG	2.8	4%	2	46	5.34E+01		20		1.9 UJ	0.37 U	0.34 U	0.35 U	0.37 U	0.38 U
Methoxychlor	UG/KG	0	0%	0	48	3.06E+05				1.9 UJ	0.12 U	0.11 U	0.12 U	0.12 U	0.13 U
Toxaphene	UG/KG	0	0%	0	48	4.42E+02				19 U	3.9 U	3.7 U	3.8 U	3.9 U	4 U
Aroclor-1016	UG/KG	0	0%	0	48	3.93E+03				19 U	6.4 UJ	6 UJ	6.1 UJ	6.3 UJ	6.5 UJ
Aroclor-1221	UG/KG	0	0%	0	48					19 U	1.6 U	1.5 U	1.5 U	1.6 U	1.6 U
Aroclor-1232	UG/KG	0	0%	0	48					19 U	9.8 UJ	9.3 UJ	9.3 UJ	9.7 UJ	10 UJ
Aroclor-1242	UG/KG	58	2%	1	48					19 U	2.7 U	2.5 U	2.6 UJ	2.7 UJ	2.8 UJ
Aroclor-1248	UG/KG	0	0%	0	48					19 U	6.7 U	6.4 U	6.4 U	6.7 U	6.9 U
Aroclor-1254	UG/KG	930	19%	9	48	2.22E+02	3	10000		120 J	13 UJ	12 UJ	12 U	13 U	13 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-14	SSDRMO-15	SSDRMO-16	SSDRMO-17	SSDRMO-18	SSDRMO-19
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1010	DRMO-1011	DRMO-1012	DRMO-1013	DRMO-1014	DRMO-1015
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/30/2002	10/30/2002	10/30/2002	10/30/2002	10/30/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aroclor-1260	UG/KG	85	10%	5	48			10000		19 UJ	2.4 UJ	2.3 UJ	2.3 UJ	2.4 UJ	2.5 UJ
Metals and Cyanide															
Aluminum	MG/KG	17000	100%	48	48	7.61E+04		19300		7860	14300 J	14900 J	11800 J	12300 J	10600 J
Antimony	MG/KG	236	81%	39	48	3.13E+01	2	5.9	11	16.2	28.5 J	0.72 J	0.32 J	15.5 J	1.6 J
Arsenic	MG/KG	11.6	100%	48	48	3.90E-01	48	8.2	2	9.2	4.7 J	3.8 J	5.3 J	4.7 J	5.5 J
Barium	MG/KG	2030	100%	48	48	5.37E+03		300	7	686 J	119 J	50.8 J	76.6 J	76.3 J	99.2 J
Beryllium	MG/KG	1.2	100%	48	48	1.54E+02		1.1	1	0.37	0.83 J	0.78 J	0.7 J	0.73 J	0.64 J
Cadmium	MG/KG	29.1	60%	29	48	3.70E+01		2.3	14	29.1	0.7 J	0.56 J	0.06 U	0.06 U	0.06 U
Calcium	MG/KG	296000	100%	48	48			121000	6	101000 J	4670 J	14900 J	22800 J	7720 J	20000 J
Chromium	MG/KG	74.8	100%	48	48			29.6	12	46.8 J	29.9 J	24.8 J	18.2 J	26.5 J	16 J
Cobalt	MG/KG	17	100%	35	35	9.03E+02		30		12.4 R	11.3 J	12.7 J	11.9 J	12.7 J	9.1 J
Copper	MG/KG	9750	100%	48	48	3.13E+03	3	33	35	1450 J	195 J	33.5 J	21.2 J	64.9 J	40.2 J
Cyanide	MG/KG	0	0%	0	8	1.22E+06		0.35							
Cyanide, Amenable	MG/KG	0	0%	0	40					0.56 U	0.62 U	0.58 U	0.59 U	0.62 U	0.63 U
Cyanide, Total	MG/KG	0	0%	0	40					0.556 U	0.619 U	0.583 U	0.589 U	0.615 U	0.633 U
Iron	MG/KG	51700	100%	48	48	2.35E+04	23	36500	5	50000	23600 J	23300 J	19500 J	23300 J	16900 J
Lead	MG/KG	18900	100%	48	48	4.00E+02	7	24.8	40	653	250 J	31.7 J	13.1 J	170 J	51.1 J
Magnesium	MG/KG	20700	100%	48	48			21500		7610	4480 J	6110 J	6940 J	5570 J	12000 J
Manganese	MG/KG	858	100%	48	48	1.76E+03		1060		579	474 J	503 J	537 J	415 J	250 J
Mercury	MG/KG	0.47	92%	44	48	2.35E+01		0.1	8	0.3	0.09	0.04	0.04	0.05	0.29
Nickel	MG/KG	224	100%	48	48	1.56E+03		49	9	54 J	32.6 J	39.4 J	29.6 J	39.7 J	24.4 J
Potassium	MG/KG	1990	100%	48	48			2380		1140 J	1470 J	1680 J	1590 J	1660 J	1980 J
Selenium	MG/KG	1.3	21%	10	48	3.91E+02		2		1.3	0.4 U	0.38 U	0.39 U	0.41 U	0.41 U
Silver	MG/KG	21.8	38%	18	48	3.91E+02		0.75	13	5.5	2.2 J	0.43 U	0.44 U	0.46 J	0.46 U
Sodium	MG/KG	478	88%	42	48			172	26	478	162 J	88 J	94.1	58.2	63.9
Thallium	MG/KG	1.1	21%	10	48	5.16E+00		0.7	3	0.59 J	0.7 U	0.87 J	0.68 U	0.72 U	0.73 U
Vanadium	MG/KG	25.4	100%	48	48	7.82E+01		150		14.7 J	21.4 J	19.1 J	16.7 J	18.5 J	15.2 J
Zinc	MG/KG	3610	100%	48	48	2.35E+04		110	28	2910 J	1120 J	213 J	57.8 J	124 J	103 J
Other															
Total Organic Carbon	MG/KG	9000	100%	40	40					6400	5600	4200	7200	8700	5800
Total Petroleum Hydrocarbons	MG/KG	7600	25%	10	40					370	50 UJ	47 UJ	47 UJ	49 UJ	51 UJ

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-20	SSDRMO-21	SSDRMO-22	SSDRMO-23	SSDRMO-24	SSDRMO-5
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1016	DRMO-1017	DRMO-1018	DRMO-1019	DRMO-1020	DRMO-1000
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/30/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	48	1.20E+06		800		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	48	4.08E+02		600		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	48	7.29E+02				2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	48	5.06E+05		200		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	48	1.24E+05		400		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	48	2.78E+02		100		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	8										
1,2-Dichloropropane	UG/KG	0	0%	0	48	3.42E+02				2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Acetone	UG/KG	13	28%	13	47	1.41E+07		200		2.8 UJ	11 J	10 J	13 UJ	2.7 UJ	3.1 UJ
Benzene	UG/KG	41	2%	1	48	6.43E+02		60		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Bromodichloromethane	UG/KG	0	0%	0	48	8.24E+02				2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Bromoform	UG/KG	0	0%	0	48	6.16E+04				2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Carbon disulfide	UG/KG	4.7	4%	2	48	3.55E+05		2700		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Carbon tetrachloride	UG/KG	0	0%	0	48	2.51E+02		600		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Chlorobenzene	UG/KG	0	0%	0	48	1.51E+05		1700		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Chlorodibromomethane	UG/KG	0	0%	0	48	1.11E+03				2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Chloroethane	UG/KG	0	0%	0	48	3.03E+03		1900		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Chloroform	UG/KG	4.8[4]	4%	2	48	2.21E+02		300		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	40	4.29E+04				2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	48					2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Ethyl benzene	UG/KG	3300	4%	2	48	3.95E+05		5500		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Meta/Para Xylene	UG/KG	4400	8%	3	40					2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Methyl bromide	UG/KG	0	0%	0	48	3.90E+03				2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Methyl butyl ketone	UG/KG	0	0%	0	48					2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Methyl chloride	UG/KG	0	0%	0	48	4.69E+04				2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Methyl ethyl ketone	UG/KG	0	0%	0	48	2.23E+07		300		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	48	5.28E+06		1000		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Methylene chloride	UG/KG	2.6	2%	1	48	9.11E+03		100		2.8 UJ	2.6 J	2.8 UJ	5 UJ	2.7 UJ	3.1 UJ
Ortho Xylene	UG/KG	16	3%	1	40					2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Styrene	UG/KG	0	0%	0	48	1.70E+06				2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Tetrachloroethene	UG/KG	0	0%	0	48	4.84E+02		1400		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Toluene	UG/KG	28	19%	9	48	5.20E+05		1500		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Total Xylenes	UG/KG	0	0%	0	8	2.71E+05		1200							
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	40	6.95E+04		300		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	48					2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Trichloroethene	UG/KG	0	0%	0	48	5.30E+01		700		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Vinyl chloride	UG/KG	0	0%	0	48	7.91E+01		200		2.8 UJ	3.1 UJ	2.8 UJ	3 UJ	2.7 UJ	3.1 UJ
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	48	6.22E+04		3400		380 U	430 U	390 U	400 U	360 UJ	360 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	48	6.00E+05		7900		380 U	430 U	390 U	400 U	360 UJ	360 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	48	5.31E+05		1600		380 U	430 U	390 U	400 U	360 UJ	360 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	48	3.45E+03		8500		380 U	430 U	390 U	400 U	360 UJ	360 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+06		100		940 U	1100 U	980 U	1000 U	900 UJ	910 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+03				380 U	430 U	390 U	400 U	360 UJ	360 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-20	SSDRMO-21	SSDRMO-22	SSDRMO-23	SSDRMO-24	SSDRMO-5
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1016	DRMO-1017	DRMO-1018	DRMO-1019	DRMO-1020	DRMO-1000
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/30/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
2,4-Dichlorophenol	UG/KG	0	0%	0	48	1.83E+05		400		380 U	430 U	390 U	400 U	360 UJ	360 U
2,4-Dimethylphenol	UG/KG	0	0%	0	48	1.22E+06				380 U	430 U	390 U	400 U	360 UJ	360 U
2,4-Dinitrophenol	UG/KG	0	0%	0	47	1.22E+05		200		940 UJ	1100 U	980 U	1000 UJ	900 UJ	910 UJ
2,4-Dinitrotoluene	UG/KG	45	2%	1	48	1.22E+05				380 U	430 U	390 U	400 U	360 UJ	360 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	48	6.11E+04		1000		380 U	430 U	390 U	400 U	360 UJ	360 U
2-Chloronaphthalene	UG/KG	0	0%	0	48	4.94E+06				380 U	430 U	390 U	400 U	360 UJ	360 U
2-Chlorophenol	UG/KG	0	0%	0	48	6.34E+04		800		380 U	430 U	390 U	400 U	360 UJ	360 U
2-Methylnaphthalene	UG/KG	610	19%	9	48			36400		380 U	430 U	390 U	400 U	360 UJ	360 U
2-Methylphenol	UG/KG	0	0%	0	48	3.06E+06		100		380 U	430 U	390 U	400 U	360 UJ	360 U
2-Nitroaniline	UG/KG	0	0%	0	48	1.83E+05		430		940 U	1100 U	980 U	1000 U	900 UJ	910 U
2-Nitrophenol	UG/KG	0	0%	0	48			330		380 U	430 U	390 U	400 U	360 UJ	360 U
3 or 4-Methylphenol	UG/KG	0	0%	0	40					380 U	430 U	390 U	400 U	360 UJ	360 U
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	48	1.08E+03				380 U	430 U	390 UJ	400 U	360 UJ	360 UJ
3-Nitroaniline	UG/KG	0	0%	0	48	1.83E+04		500		940 UJ	1100 U	980 U	1000 U	900 UJ	910 UJ
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	48	6.11E+03				940 U	1100 U	980 U	1000 U	900 UJ	910 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	48					380 U	430 U	390 U	400 U	360 UJ	360 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	48			240		380 U	430 U	390 U	400 U	360 UJ	360 U
4-Chloroaniline	UG/KG	0	0%	0	48	2.44E+05		220		380 U	430 U	390 U	400 U	360 UJ	360 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	48					380 U	430 U	390 U	400 U	360 UJ	360 U
4-Methylphenol	UG/KG	0	0%	0	8	3.06E+05		900							
4-Nitroaniline	UG/KG	0	0%	0	48	2.32E+04				940 U	1100 U	980 U	1000 U	900 UJ	910 U
4-Nitrophenol	UG/KG	0	0%	0	48			100		940 U	1100 U	980 U	1000 U	900 UJ	910 U
Acenaphthene	UG/KG	2600	23%	11	48	3.68E+06		50000		85 J	430 U	390 U	400 U	360 UJ	360 U
Acenaphthylene	UG/KG	2500	21%	10	48			41000		180 J	430 U	230 J	400 U	360 UJ	78 J
Anthracene	UG/KG	7100	42%	20	48	2.19E+07		50000		250 J	430 U	230 J	400 U	110 J	51 J
Benzo(a)anthracene	UG/KG	10000	55%	26	47	6.21E+02	4	224	14	950	430 U	610 J	400 U	380 J	320 J
Benzo(a)pyrene	UG/KG	8700	51%	24	47	6.21E+01	21	61	21	1400 J	430 U	910 J	400 U	420 J	510 J
Benzo(b)fluoranthene	UG/KG	12000	64%	30	47	6.21E+02	9	1100	5	1800 J	430 U	1100 J	400 U	480 J	730 J
Benzo(ghi)perylene	UG/KG	3150[4]	53%	25	47			50000		620 J	430 U	660 J	400 U	130 J	270 J
Benzo(k)fluoranthene	UG/KG	7500	47%	22	47	6.21E+03	1	1100	4	1100 J	430 UJ	500 J	400 UJ	360 J	340 J
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	48					380 UJ	430 U	390 U	400 U	360 UJ	360 UJ
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	48	2.18E+02				380 U	430 U	390 U	400 U	360 UJ	360 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	48	2.88E+03				380 U	430 U	390 U	400 U	360 UJ	360 U
Bis(2-Ethylhexyl)phthalate	UG/KG	200	56%	27	48	3.47E+04		50000		56 J	430 U	68 J	400 U	81 J	360 UJ
Butylbenzylphthalate	UG/KG	120	13%	6	48	1.22E+07		50000		380 U	430 UJ	390 UJ	400 U	360 UJ	360 UJ
Carbazole	UG/KG	4200	35%	17	48	2.43E+04				140 J	430 U	76 J	400 U	44 J	360 U
Chrysene	UG/KG	9100	53%	25	47	6.21E+04		400	10	1000	430 U	620 J	400 U	360 J	360 J
Di-n-butylphthalate	UG/KG	132[4]	10%	5	48	6.11E+06		8100		380 U	430 U	390 U	400 U	360 UJ	360 U
Di-n-octylphthalate	UG/KG	23[4]	4%	2	48	2.44E+06		50000		380 U	430 U	390 UJ	400 U	360 UJ	360 UJ
Dibenz(a,h)anthracene	UG/KG	470[4]	26%	12	47	6.21E+01	7	14	11	59 J	430 U	390 UJ	400 U	360 UJ	58 J
Dibenzofuran	UG/KG	1700	21%	10	48	1.45E+05		6200		39 J	430 U	390 U	400 U	360 UJ	360 U
Diethyl phthalate	UG/KG	21[4]	13%	6	48	4.89E+07		7100		380 U	430 U	390 U	400 U	360 UJ	360 U
Dimethylphthalate	UG/KG	0	0%	0	48	1.00E+08		2000		380 U	430 U	390 U	400 U	360 UJ	360 U
Fluoranthene	UG/KG	27000	73%	35	48	2.29E+06		50000		1900	58 J	890	54 J	870 J	590

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-20	SSDRMO-21	SSDRMO-22	SSDRMO-23	SSDRMO-24	SSDRMO-5
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1016	DRMO-1017	DRMO-1018	DRMO-1019	DRMO-1020	DRMO-1000
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/30/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Fluorene	UG/KG	3500	27%	13	48	2.75E+06		50000		110 J	430 U	87 J	400 U	360 UJ	360 U
Hexachlorobenzene	UG/KG	8.5	2%	1	48	3.04E+02		410		380 U	430 U	390 U	400 U	360 UJ	360 U
Hexachlorobutadiene	UG/KG	0	0%	0	48	6.24E+03				380 UJ	430 UJ	390 UJ	400 U	360 UJ	360 UJ
Hexachlorocyclopentadiene	UG/KG	0	0%	0	48	3.65E+05				380 U	430 U	390 U	400 U	360 UJ	360 U
Hexachloroethane	UG/KG	0	0%	0	48	3.47E+04				380 U	430 U	390 U	400 UJ	360 UJ	360 U
Indeno(1,2,3-cd)pyrene	UG/KG	970[4]	46%	22	48	6.21E+02	3	3200		160 J	430 UJ	160 J	400 U	84 J	62 J
Isophorone	UG/KG	0	0%	0	48	5.12E+05		4400		380 UJ	430 UJ	390 UJ	400 U	360 UJ	360 UJ
N-Nitrosodiphenylamine	UG/KG	4.8	2%	1	48	9.93E+04				380 U	430 U	390 U	400 U	360 UJ	360 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	48	6.95E+01				380 U	430 U	390 U	400 U	360 UJ	360 U
Naphthalene	UG/KG	400	19%	9	48	5.59E+04		13000		380 U	430 U	390 U	400 U	360 UJ	360 U
Nitrobenzene	UG/KG	0	0%	0	48	1.96E+04		200		380 UJ	430 UJ	390 UJ	400 UJ	360 UJ	360 UJ
Pentachlorophenol	UG/KG	0	0%	0	48	2.98E+03		1000		940 U	1100 U	980 U	1000 U	900 UJ	910 U
Phenanthrene	UG/KG	29000	52%	25	48			50000		1200	430 U	700	400 U	490 J	260 J
Phenol	UG/KG	0	0%	0	48	1.83E+07		30		380 U	430 U	390 U	400 U	360 UJ	360 U
Pyrene	UG/KG	34000	67%	32	48	2.32E+06		50000		86 J	430 U	1900 J	44 J	600 J	1000 J
Pesticides/PCBs															
4,4'-DDD	UG/KG	44	12%	5	43	2.44E+03		2900		1.9 UJ	2.2 UJ	2 UJ	0.24 UJ	1.8 UJ	1.9 UJ
4,4'-DDE	UG/KG	69	32%	15	47	1.72E+03		2100		1.9 UJ	2.2 UJ	2 UJ	0.24 UJ	1.8 UJ	1.9 UJ
4,4'-DDT	UG/KG	100	28%	13	47	1.72E+03		2100		9.5 NJ	2.2 UJ	2 UJ	0.24 U	1.8 UJ	1.9 UJ
Aldrin	UG/KG	14[4]	6%	3	48	2.86E+01		41		1.9 U	2.2 U	2 U	0.12 U	1.8 U	1.9 U
Alpha-BHC	UG/KG	0	0%	0	48	9.02E+01		110		1.9 UJ	2.2 UJ	2 UJ	1.4 UJ	1.8 UJ	1.9 UJ
Alpha-Chlordane	UG/KG	63[4]	8%	4	48					1.9 UJ	2.2 UJ	2 UJ	0.36 U	1.8 UJ	1.9 UJ
Beta-BHC	UG/KG	0	0%	0	48	3.16E+02		200		1.9 UJ	2.2 UJ	2 UJ	0.12 U	1.8 UJ	1.9 UJ
Chlordane	UG/KG	0	0%	0	40					19 U	22 U	20 U	2.3 U	18 U	19 U
Delta-BHC	UG/KG	2	6%	3	48			300		1.9 UJ	2.2 UJ	2 UJ	0.24 UJ	1.8 UJ	1.9 UJ
Dieldrin	UG/KG	41[4]	4%	2	48	3.04E+01	2	44		1.9 UJ	2.2 UJ	2 UJ	0.12 UJ	1.8 UJ	1.9 UJ
Endosulfan I	UG/KG	185[4]	38%	18	48			900		37 J	2.2 UJ	21 J	0.6 U	1.8 UJ	8.3 J
Endosulfan II	UG/KG	9	2%	1	47			900		1.9 U	2.2 U	2 U	0.36 U	1.8 U	1.9 U
Endosulfan sulfate	UG/KG	0	0%	0	48			1000		1.9 U	2.2 U	2 U	0.72 UJ	1.8 U	1.9 U
Endrin	UG/KG	21.5	2%	1	47	1.83E+04		100		1.9 UJ	2.2 UJ	2 UJ	0.96 UJ	1.8 UJ	1.9 UJ
Endrin aldehyde	UG/KG	0	0%	0	48					1.9 UJ	2.2 UJ	2 UJ	0.96 UJ	1.8 UJ	1.9 UJ
Endrin ketone	UG/KG	7.5[4]	6%	3	48					1.9 U	2.2 U	2 U	0.12 U	1.8 U	1.9 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	48	4.37E+02		60		1.9 U	2.2 U	2 U	0.12 UJ	1.8 U	1.9 U
Gamma-Chlordane	UG/KG	1.2	2%	1	48			540		1.9 UJ	2.2 UJ	2 UJ	0.36 U	1.8 UJ	1.9 UJ
Heptachlor	UG/KG	14	4%	2	47	1.08E+02		100		1.9 U	2.2 U	2 U	1.2 UJ	1.8 U	1.9 U
Heptachlor epoxide	UG/KG	2.8	4%	2	46	5.34E+01		20		1.9 UJ	2.2 UJ	2 UJ	0.36 U	1.8 UJ	1.9 UJ
Methoxychlor	UG/KG	0	0%	0	48	3.06E+05				1.9 UJ	2.2 UJ	2 UJ	0.12 U	1.8 UJ	1.9 UJ
Toxaphene	UG/KG	0	0%	0	48	4.42E+02				19 U	22 U	20 U	3.9 U	18 U	19 U
Aroclor-1016	UG/KG	0	0%	0	48	3.93E+03				19 U	22 U	20 U	6.3 UJ	18 U	19 U
Aroclor-1221	UG/KG	0	0%	0	48					19 U	22 U	20 U	1.6 U	18 U	19 U
Aroclor-1232	UG/KG	0	0%	0	48					19 U	22 U	20 U	9.6 UJ	18 U	19 U
Aroclor-1242	UG/KG	58	2%	1	48					19 U	22 U	20 U	2.6 UJ	18 U	19 U
Aroclor-1248	UG/KG	0	0%	0	48					19 U	22 U	20 U	6.6 U	18 U	19 U
Aroclor-1254	UG/KG	930	19%	9	48	2.22E+02	3	10000		44 J	22 UJ	20 UJ	13 U	18 UJ	19 UJ

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-20	SSDRMO-21	SSDRMO-22	SSDRMO-23	SSDRMO-24	SSDRMO-5
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1016	DRMO-1017	DRMO-1018	DRMO-1019	DRMO-1020	DRMO-1000
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/30/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aroclor-1260	UG/KG	85	10%	5	48			10000		19 UJ	22 UJ	20 UJ	2.4 UJ	18 UJ	19 UJ
Metals and Cyanide															
Aluminum	MG/KG	17000	100%	48	48	7.61E+04		19300		3540	11200	10500	11100 J	8110	5520
Antimony	MG/KG	236	81%	39	48	3.13E+01	2	5.9	11	1 U	1.6 J	8.1	1.4 J	236	4.4 J
Arsenic	MG/KG	11.6	100%	48	48	3.90E-01	48	8.2	2	4.1	7	6.7	4.1 J	11.6	3.9
Barium	MG/KG	2030	100%	48	48	5.37E+03		300	7	35.2 J	105 J	113 J	99.3 J	2030 J	46.5 J
Beryllium	MG/KG	1.2	100%	48	48	1.54E+02		1.1	1	0.24	0.75	0.65	0.65 J	0.43	0.31
Cadmium	MG/KG	29.1	60%	29	48	3.70E+01		2.3	14	1.1	0.16 U	0.14 U	0.06 U	4.3	0.55
Calcium	MG/KG	296000	100%	48	48			121000	6	197000 J	12100 J	20400 J	11700 J	48800 J	59700 J
Chromium	MG/KG	74.8	100%	48	48			29.6	12	9.8	19.2 J	19.5 J	17.7 J	26.8 J	12.3 J
Cobalt	MG/KG	17	100%	35	35	9.03E+02		30		5.5	9.4 R	11.5 R	8.6 J	17.5 R	6.7 R
Copper	MG/KG	9750	100%	48	48	3.13E+03	3	33	35	40.5 J	25.1 J	55.4 J	43.8 J	5050 J	44.2 J
Cyanide	MG/KG	0	0%	0	8	1.22E+06		0.35							
Cyanide, Amenable	MG/KG	0	0%	0	40					0.57 U	0.66 U	0.59 U	0.61 U	0.54 U	0.55 U
Cyanide, Total	MG/KG	0	0%	0	40					0.571 U	0.661 U	0.588 U	0.612 U	0.545 U	0.548 U
Iron	MG/KG	51700	100%	48	48	2.35E+04	23	36500	5	10200	22700	23700	17300 J	28800	13900
Lead	MG/KG	18900	100%	48	48	4.00E+02	7	24.8	40	62.3	29.5	344	59.2 J	18900	195
Magnesium	MG/KG	20700	100%	48	48			21500		10500	4660	5130	4700 J	6060	20700
Manganese	MG/KG	858	100%	48	48	1.76E+03		1060		315	279	513	266 J	532	364
Mercury	MG/KG	0.47	92%	44	48	2.35E+01		0.1	8	0.03	0.05	0.14	0.08	0.31	0.07
Nickel	MG/KG	224	100%	48	48	1.56E+03		49	9	16.2 J	27.1 J	29.4 J	25 J	45.7 J	20.8 J
Potassium	MG/KG	1990	100%	48	48			2380		841 J	909 J	949 J	1430 J	910 J	891 J
Selenium	MG/KG	1.3	21%	10	48	3.91E+02		2		0.48 U	1.1	0.53 J	0.39 U	1	0.46 U
Silver	MG/KG	21.8	38%	18	48	3.91E+02		0.75	13	0.34	2.9	0.31 U	0.44 U	0.76	0.29 U
Sodium	MG/KG	478	88%	42	48			172	26	289	197	116 U	65.2	108 U	240
Thallium	MG/KG	1.1	21%	10	48	5.16E+00		0.7	3	0.35 U	0.4 U	0.5 J	0.69 U	0.52 J	0.34 U
Vanadium	MG/KG	25.4	100%	48	48	7.82E+01		150		7.8 J	20.7 J	18.7 J	16.1 J	16.1 J	10.7 J
Zinc	MG/KG	3610	100%	48	48	2.35E+04		110	28	104 J	85.2 J	103 J	111 J	990 J	137 J
Other															
Total Organic Carbon	MG/KG	9000	100%	40	40					4100	6200	7400	7500	4000	3600
Total Petroleum Hydrocarbons	MG/KG	7600	25%	10	40					46 U	53 U	59	49 UJ	44 U	830

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-6	SSDRMO-7	SSDRMO-7	SSDRMO-8	SSDRMO-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1001	DRMO-1002	DRMO-1003	DRMO-1004	DRMO-1005
Sample Depth to Top of Sample										0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Volatile Organic Compounds														
1,1,1-Trichloroethane	UG/KG	0	0%	0	48	1.20E+06		800		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	48	4.08E+02		600		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	48	7.29E+02				2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	48	5.06E+05		200		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	48	1.24E+05		400		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	48	2.78E+02		100		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	8									
1,2-Dichloropropane	UG/KG	0	0%	0	48	3.42E+02				2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Acetone	UG/KG	13	28%	13	47	1.41E+07		200		2.7 R	3.1 UJ	2.9 R	2.5 UJ	2.7 UJ
Benzene	UG/KG	41	2%	1	48	6.43E+02		60		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Bromodichloromethane	UG/KG	0	0%	0	48	8.24E+02				2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Bromoform	UG/KG	0	0%	0	48	6.16E+04				2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Carbon disulfide	UG/KG	4.7	4%	2	48	3.55E+05		2700		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Carbon tetrachloride	UG/KG	0	0%	0	48	2.51E+02		600		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Chlorobenzene	UG/KG	0	0%	0	48	1.51E+05		1700		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Chlorodibromomethane	UG/KG	0	0%	0	48	1.11E+03				2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Chloroethane	UG/KG	0	0%	0	48	3.03E+03		1900		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Chloroform	UG/KG	4.8[4]	4%	2	48	2.21E+02		300		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	40	4.29E+04				2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	48					2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Ethyl benzene	UG/KG	3300	4%	2	48	3.95E+05		5500		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Meta/Para Xylene	UG/KG	4400	8%	3	40					2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Methyl bromide	UG/KG	0	0%	0	48	3.90E+03				2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Methyl butyl ketone	UG/KG	0	0%	0	48					2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Methyl chloride	UG/KG	0	0%	0	48	4.69E+04				2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Methyl ethyl ketone	UG/KG	0	0%	0	48	2.23E+07		300		2.7 UJ	3.1 UJ	2.9 UJ	2.5 UJ	2.7 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	48	5.28E+06		1000		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Methylene chloride	UG/KG	2.6	2%	1	48	9.11E+03		100		0.84 U	3.1 UJ	1.7 U	2.5 UJ	2.7 UJ
Ortho Xylene	UG/KG	16	3%	1	40					2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Styrene	UG/KG	0	0%	0	48	1.70E+06				2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Tetrachloroethene	UG/KG	0	0%	0	48	4.84E+02		1400		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Toluene	UG/KG	28	19%	9	48	5.20E+05		1500		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Total Xylenes	UG/KG	0	0%	0	8	2.71E+05		1200						
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	40	6.95E+04		300		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	48					2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Trichloroethene	UG/KG	0	0%	0	48	5.30E+01		700		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Vinyl chloride	UG/KG	0	0%	0	48	7.91E+01		200		2.7 U	3.1 UJ	2.9 U	2.5 UJ	2.7 UJ
Semivolatile Organic Compounds														
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	48	6.22E+04		3400		350 U	380 U	380 U	350 U	360 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	48	6.00E+05		7900		350 U	380 U	380 U	350 U	360 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	48	5.31E+05		1600		350 U	380 U	380 U	350 U	360 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	48	3.45E+03		8500		350 U	380 U	380 U	350 U	360 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+06		100		870 U	960 U	950 U	880 U	900 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	48	6.11E+03				350 U	380 U	380 U	350 U	360 U

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-6	SSDRMO-7	SSDRMO-7	SSDRMO-8	SSDRMO-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1001	DRMO-1002	DRMO-1003	DRMO-1004	DRMO-1005
Sample Depth to Top of Sample										0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dichlorophenol	UG/KG	0	0%	0	48	1.83E+05		400		350 U	380 U	380 U	350 U	360 U
2,4-Dimethylphenol	UG/KG	0	0%	0	48	1.22E+06				350 U	380 U	380 U	350 U	360 U
2,4-Dinitrophenol	UG/KG	0	0%	0	47	1.22E+05		200		870 UJ	960 U	950 U	880 UJ	900 U
2,4-Dinitrotoluene	UG/KG	45	2%	1	48	1.22E+05				350 U	380 U	380 U	350 U	360 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	48	6.11E+04		1000		350 U	380 U	380 U	350 U	360 U
2-Chloronaphthalene	UG/KG	0	0%	0	48	4.94E+06				350 U	380 U	380 U	350 U	360 U
2-Chlorophenol	UG/KG	0	0%	0	48	6.34E+04		800		350 U	380 U	380 U	350 U	360 U
2-Methylnaphthalene	UG/KG	610	19%	9	48			36400		350 U	140 J	110 J	350 U	360 U
2-Methylphenol	UG/KG	0	0%	0	48	3.06E+06		100		350 U	380 U	380 U	350 U	360 U
2-Nitroaniline	UG/KG	0	0%	0	48	1.83E+05		430		870 U	960 U	950 U	880 U	900 U
2-Nitrophenol	UG/KG	0	0%	0	48			330		350 U	380 U	380 U	350 U	360 U
3 or 4-Methylphenol	UG/KG	0	0%	0	40					350 U	380 U	380 U	350 U	360 U
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	48	1.08E+03				350 U	380 UJ	380 UJ	350 U	360 U
3-Nitroaniline	UG/KG	0	0%	0	48	1.83E+04		500		870 UJ	960 U	950 U	880 UJ	900 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	48	6.11E+03				870 U	960 U	950 U	880 U	900 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	48					350 U	380 U	380 U	350 U	360 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	48			240		350 U	380 U	380 U	350 U	360 U
4-Chloroaniline	UG/KG	0	0%	0	48	2.44E+05		220		350 U	380 U	380 U	350 U	360 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	48					350 U	380 U	380 U	350 U	360 U
4-Methylphenol	UG/KG	0	0%	0	8	3.06E+05		900						
4-Nitroaniline	UG/KG	0	0%	0	48	2.32E+04				870 U	960 U	950 U	880 U	900 U
4-Nitrophenol	UG/KG	0	0%	0	48			100		870 U	960 U	950 U	880 U	900 U
Acenaphthene	UG/KG	2600	23%	11	48	3.68E+06		50000		95 J	310 J	190 J	350 U	360 U
Acenaphthylene	UG/KG	2500	21%	10	48			41000		42 J	1000	810	65 J	360 U
Anthracene	UG/KG	7100	42%	20	48	2.19E+07		50000		160 J	1600	850	110 J	360 U
Benzo(a)anthracene	UG/KG	10000	55%	26	47	6.21E+02	4	224	14	460	6700 J	3900 J	360	160 J
Benzo(a)pyrene	UG/KG	8700	51%	24	47	6.21E+01	21	61	21	610 J	7600 J	5000 J	520 J	180 J
Benzo(b)fluoranthene	UG/KG	12000	64%	30	47	6.21E+02	9	1100	5	880 J	11000 J	6600 J	720 J	240 J
Benzo(ghi)perylene	UG/KG	3150[4]	53%	25	47			50000		230 J	3800 J	2500 J	210 J	53 J
Benzo(k)fluoranthene	UG/KG	7500	47%	22	47	6.21E+03	1	1100	4	530 J	4900 J	3100 J	490 J	130 J
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	48					350 UJ	380 U	380 U	350 UJ	360 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	48	2.18E+02				350 U	380 U	380 U	350 U	360 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	48	2.88E+03				350 U	380 U	380 U	350 U	360 U
Bis(2-Ethylhexyl)phthalate	UG/KG	200	56%	27	48	3.47E+04		50000		350 U	200 J	97 J	58 J	64 J
Butylbenzylphthalate	UG/KG	120	13%	6	48	1.22E+07		50000		350 U	380 UJ	380 UJ	350 U	360 UJ
Carbazole	UG/KG	4200	35%	17	48	2.43E+04				200 J	910	550	73 J	360 U
Chrysene	UG/KG	9100	53%	25	47	6.21E+04		400	10	500	6800 J	4300 J	430	160 J
Di-n-butylphthalate	UG/KG	132[4]	10%	5	48	6.11E+06		8100		350 U	380 U	73 J	350 U	360 U
Di-n-octylphthalate	UG/KG	23[4]	4%	2	48	2.44E+06		50000		350 U	380 UJ	380 UJ	350 U	360 U
Dibenz(a,h)anthracene	UG/KG	470[4]	26%	12	47	6.21E+01	7	14	11	350 UJ	570 J	370 J	350 UJ	360 U
Dibenzofuran	UG/KG	1700	21%	10	48	1.45E+05		6200		63 J	330 J	160 J	350 U	360 U
Diethyl phthalate	UG/KG	21[4]	13%	6	48	4.89E+07		7100		350 U	380 U	380 U	350 U	360 U
Dimethylphthalate	UG/KG	0	0%	0	48	1.00E+08		2000		350 U	380 U	380 U	350 U	360 U
Fluoranthene	UG/KG	27000	73%	35	48	2.29E+06		50000		1500	15000	8800	950	350 J

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-6	SSDRMO-7	SSDRMO-7	SSDRMO-8	SSDRMO-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1001	DRMO-1002	DRMO-1003	DRMO-1004	DRMO-1005
Sample Depth to Top of Sample										0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Fluorene	UG/KG	3500	27%	13	48	2.75E+06		50000		84 J	1000	560	51 J	360 U
Hexachlorobenzene	UG/KG	8.5	2%	1	48	3.04E+02		410		350 U	380 U	380 U	350 U	360 U
Hexachlorobutadiene	UG/KG	0	0%	0	48	6.24E+03				350 UJ	380 UJ	380 UJ	350 UJ	360 UJ
Hexachlorocyclopentadiene	UG/KG	0	0%	0	48	3.65E+05				350 U	380 U	380 U	350 U	360 U
Hexachloroethane	UG/KG	0	0%	0	48	3.47E+04				350 U	380 U	380 U	350 U	360 U
Indeno(1,2,3-cd)pyrene	UG/KG	970[4]	46%	22	48	6.21E+02	3	3200		79 J	1100 J	840 J	83 J	360 UJ
Isophorone	UG/KG	0	0%	0	48	5.12E+05		4400		350 UJ	380 UJ	380 UJ	350 UJ	360 UJ
N-Nitrosodiphenylamine	UG/KG	4.8	2%	1	48	9.93E+04				350 U	380 U	380 U	350 U	360 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	48	6.95E+01				350 U	380 U	380 U	350 U	360 U
Naphthalene	UG/KG	400	19%	9	48	5.59E+04		13000		57 J	97 J	74 J	350 U	360 U
Nitrobenzene	UG/KG	0	0%	0	48	1.96E+04		200		350 UJ	380 UJ	380 UJ	350 UJ	360 UJ
Pentachlorophenol	UG/KG	0	0%	0	48	2.98E+03		1000		870 U	960 U	950 U	880 U	900 U
Phenanthrene	UG/KG	29000	52%	25	48			50000		1100	13000	7600	550	160 J
Phenol	UG/KG	0	0%	0	48	1.83E+07		30		350 U	380 U	380 U	350 U	360 U
Pyrene	UG/KG	34000	67%	32	48	2.32E+06		50000		1200	24000 J	14000 J	720	250 J
Pesticides/PCBs														
4,4'-DDD	UG/KG	44	12%	5	43	2.44E+03		2900		1.9 UJ	2 UJ	1.9 UJ	5.4 J	1.8 UJ
4,4'-DDE	UG/KG	69	32%	15	47	1.72E+03		2100		9.1 J	2 UJ	1.9 UJ	26 J	12 J
4,4'-DDT	UG/KG	100	28%	13	47	1.72E+03		2100		3.1 NJ	2 UJ	1.9 UJ	9 NJ	1.8 UJ
Aldrin	UG/KG	14[4]	6%	3	48	2.86E+01		41		1.8 U	2 U	1.9 U	1.8 U	1.8 U
Alpha-BHC	UG/KG	0	0%	0	48	9.02E+01		110		1.8 UJ	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Alpha-Chlordane	UG/KG	63[4]	8%	4	48					1.8 UJ	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Beta-BHC	UG/KG	0	0%	0	48	3.16E+02		200		1.8 UJ	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Chlordane	UG/KG	0	0%	0	40					18 U	20 U	19 U	18 U	18 U
Delta-BHC	UG/KG	2	6%	3	48			300		1.8 UJ	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Dieldrin	UG/KG	41[4]	4%	2	48	3.04E+01	2	44		1.8 UJ	2 UJ	1.9 UJ	1.8 UJ	1.8 UJ
Endosulfan I	UG/KG	185[4]	38%	18	48			900		6.6 J	190 J	180 J	23 NJ	7.5 J
Endosulfan II	UG/KG	9	2%	1	47			900		1.8 U	2 U	1.9 U	1.8 U	1.8 U
Endosulfan sulfate	UG/KG	0	0%	0	48			1000		1.8 U	2 U	1.9 U	1.8 U	1.8 U
Endrin	UG/KG	21.5	2%	1	47	1.83E+04		100		1.8 UJ	2 U	1.9 UJ	1.8 UJ	1.8 UJ
Endrin aldehyde	UG/KG	0	0%	0	48					1.8 UJ	2 U	1.9 UJ	1.8 UJ	1.8 UJ
Endrin ketone	UG/KG	7.5[4]	6%	3	48					1.8 U	2 U	1.9 U	1.8 U	1.8 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	48	4.37E+02		60		1.8 U	2 U	1.9 U	1.8 U	1.8 U
Gamma-Chlordane	UG/KG	1.2	2%	1	48			540		1.8 UJ	2 U	1.9 UJ	1.8 UJ	1.8 UJ
Heptachlor	UG/KG	14	4%	2	47	1.08E+02		100		1.8 U	2 U	1.9 U	1.8 U	1.8 U
Heptachlor epoxide	UG/KG	2.8	4%	2	46	5.34E+01		20		1.8 UJ	2 U	1.9 UJ	1.8 UJ	1.8 UJ
Methoxychlor	UG/KG	0	0%	0	48	3.06E+05				1.8 UJ	2 U	1.9 UJ	1.8 UJ	1.8 UJ
Toxaphene	UG/KG	0	0%	0	48	4.42E+02				18 U	20 U	19 U	18 U	18 U
Aroclor-1016	UG/KG	0	0%	0	48	3.93E+03				18 U	20 U	19 U	18 U	18 U
Aroclor-1221	UG/KG	0	0%	0	48					18 U	20 U	19 U	18 U	18 U
Aroclor-1232	UG/KG	0	0%	0	48					18 U	20 U	19 U	18 U	18 U
Aroclor-1242	UG/KG	58	2%	1	48					18 U	20 U	19 U	18 U	18 U
Aroclor-1248	UG/KG	0	0%	0	48					18 U	20 U	19 U	18 U	18 U
Aroclor-1254	UG/KG	930	19%	9	48	2.22E+02	3	10000		18 UJ	20 UJ	19 UJ	18 UJ	74 J

Table C-2
SURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	NYSDEC Criteria Value [3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SSDRMO-6	SSDRMO-7	SSDRMO-7	SSDRMO-8	SSDRMO-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1001	DRMO-1002	DRMO-1003	DRMO-1004	DRMO-1005
Sample Depth to Top of Sample										0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Aroclor-1260	UG/KG	85	10%	5	48			10000		18 UJ	20 UJ	19 UJ	18 UJ	18 UJ
Metals and Cyanide														
Aluminum	MG/KG	17000	100%	48	48	7.61E+04		19300		10900	7420	8280	7840	10200
Antimony	MG/KG	236	81%	39	48	3.13E+01	2	5.9	11	2 J	3.2 J	1.4 J	1.8 J	3.2 J
Arsenic	MG/KG	11.6	100%	48	48	3.90E-01	48	8.2	2	4.6	6.2	5.4	5.1	5.3
Barium	MG/KG	2030	100%	48	48	5.37E+03		300	7	57.1 J	80.9 J	84.5 J	41.1 J	71.1 J
Beryllium	MG/KG	1.2	100%	48	48	1.54E+02		1.1	1	0.53	0.5	0.53	0.4	0.47
Cadmium	MG/KG	29.1	60%	29	48	3.70E+01		2.3	14	7.8	0.57	0.44	0.97	3
Calcium	MG/KG	296000	100%	48	48			121000	6	34700 J	63600 J	61200 J	94200 J	92500 J
Chromium	MG/KG	74.8	100%	48	48			29.6	12	22.9 J	17.6 J	18.8 J	17.6 J	22.6 J
Cobalt	MG/KG	17	100%	35	35	9.03E+02		30		14.4 R	8.6 R	8.7 R	11.5 R	11.4 R
Copper	MG/KG	9750	100%	48	48	3.13E+03	3	33	35	49.3 J	39.8 J	32.8 J	46.1 J	216 J
Cyanide	MG/KG	0	0%	0	8	1.22E+06		0.35						
Cyanide, Amenable	MG/KG	0	0%	0	40					0.53 U	0.58 U	0.57 U	0.53 U	0.54 U
Cyanide, Total	MG/KG	0	0%	0	40					0.534 U	0.582 U	0.575 U	0.532 U	0.542 U
Iron	MG/KG	51700	100%	48	48	2.35E+04	23	36500	5	24700	18500	18700	18100	25000
Lead	MG/KG	18900	100%	48	48	4.00E+02	7	24.8	40	130	117	93.8	66.8	122
Magnesium	MG/KG	20700	100%	48	48			21500		6840	12700	6180	8290	7770
Manganese	MG/KG	858	100%	48	48	1.76E+03		1060		468	480	553	610	581
Mercury	MG/KG	0.47	92%	44	48	2.35E+01		0.1	8	0.07	0.07	0.06	0.06	0.04
Nickel	MG/KG	224	100%	48	48	1.56E+03		49	9	42.5 J	22.4 J	23.5 J	31 J	32.9 J
Potassium	MG/KG	1990	100%	48	48			2380		1200 J	862 J	712 J	1070 J	1120 J
Selenium	MG/KG	1.3	21%	10	48	3.91E+02		2		0.64	0.49 U	0.47 U	0.44 U	0.49 J
Silver	MG/KG	21.8	38%	18	48	3.91E+02		0.75	13	0.29 U	0.31 U	0.3 U	0.28 U	1.4
Sodium	MG/KG	478	88%	42	48			172	26	204	191	194	302	235 J
Thallium	MG/KG	1.1	21%	10	48	5.16E+00		0.7	3	0.55 J	0.36 U	0.35 U	0.33 U	0.33 U
Vanadium	MG/KG	25.4	100%	48	48	7.82E+01		150		17 J	15.3 J	14.4 J	12.4 J	14.1 J
Zinc	MG/KG	3610	100%	48	48	2.35E+04		110	28	77.5 J	107 J	96.8 J	93.2 J	157 J
Other														
Total Organic Carbon	MG/KG	9000	100%	40	40					4600	5800	6000	5300	6000
Total Petroleum Hydrocarbons	MG/KG	7600	25%	10	40					43 U	190	46 U	43 U	140

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-3
DITCHSOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SDDRMO-1	SDDRMO-2	SDDRMO-3	SDDRMO-4	SDDRMO-5	SDDRMO-8
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										DRMO-4000	DRMO-4001	DRMO-4002	DRMO-4003	DRMO-4004	DRMO-4005
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code						**Region IX**				SA	SA	SA	SA	SA	SA
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**NYSDEC**		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**		1	1	1	1	1	1
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses [1]**	**Value [2]**	**Exceedances**	**Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	10	1.20E+06		800		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	10	4.08E+02		600		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	10	7.29E+02				2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	10	5.06E+05		200		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	10	1.24E+05		400		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	10	2.78E+02		100		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
1,2-Dichloropropane	UG/KG	0	0%	0	10	3.42E+02				2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Acetone	UG/KG	150	70%	7	10	1.41E+07		200		14 J	53 J	150 J	12 UJ	12 J	21 J
Benzene	UG/KG	0	0%	0	10	6.43E+02		60		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Bromodichloromethane	UG/KG	0	0%	0	10	8.24E+02				2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Bromoform	UG/KG	0	0%	0	10	6.16E+04				2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Carbon disulfide	UG/KG	12	20%	2	10	3.55E+05		2700		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Carbon tetrachloride	UG/KG	0	0%	0	10	2.51E+02		600		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Chlorobenzene	UG/KG	0	0%	0	10	1.51E+05		1700		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Chlorodibromomethane	UG/KG	0	0%	0	10	1.11E+03				2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Chloroethane	UG/KG	0	0%	0	10	3.03E+03		1900		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Chloroform	UG/KG	0	0%	0	10	2.21E+02		300		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	10	4.29E+04				2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	10					2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Ethyl benzene	UG/KG	0	0%	0	10	3.95E+05		5500		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Meta/Para Xylene	UG/KG	0	0%	0	10					2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Methyl bromide	UG/KG	0	0%	0	10	3.90E+03				2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Methyl butyl ketone	UG/KG	0	0%	0	10					2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Methyl chloride	UG/KG	0	0%	0	10	4.69E+04				2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Methyl ethyl ketone	UG/KG	130	30%	3	10	2.23E+07		300		3.6 J	12 UJ	26 UJ	130 J	6.5 UJ	6.6 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	10	5.28E+06		1000		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Methylene chloride	UG/KG	0	0%	0	10	9.11E+03		100		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Ortho Xylene	UG/KG	0	0%	0	10					2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Styrene	UG/KG	0	0%	0	10	1.70E+06				2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Tetrachloroethene	UG/KG	0	0%	0	10	4.84E+02		1400		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Toluene	UG/KG	0	0%	0	10	5.20E+05		1500		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	10	6.95E+04		300		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	10					2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Trichloroethene	UG/KG	0	0%	0	10	5.30E+01		700		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Vinyl chloride	UG/KG	0	0%	0	10	7.91E+01		200		2.8 UJ	12 UJ	26 UJ	12 UJ	6.5 UJ	6.6 UJ
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	10	6.22E+04		3400		360 U	1600 UJ	1700 UJ	1600 UJ	840 UJ	650 UJ
1,2-Dichlorobenzene	UG/KG	0	0%	0	10	6.00E+05		7900		360 U	1600 UJ	1700 UJ	1600 UJ	840 UJ	650 UJ
1,3-Dichlorobenzene	UG/KG	0	0%	0	10	5.31E+05		1600		360 U	1600 UJ	1700 UJ	1600 UJ	840 UJ	650 UJ
1,4-Dichlorobenzene	UG/KG	0	0%	0	10	3.45E+03		8500		360 U	1600 UJ	1700 UJ	1600 UJ	840 UJ	650 UJ
2,4,5-Trichlorophenol	UG/KG	0	0%	0	10	6.11E+06		100		910 U	4100 UJ	4300 UJ	3900 UJ	2100 UJ	1600 UJ
2,4,6-Trichlorophenol	UG/KG	0	0%	0	10	6.11E+03				360 U	1600 UJ	1700 UJ	1600 UJ	840 UJ	650 UJ
2,4-Dichlorophenol	UG/KG	0	0%	0	10	1.83E+05		400		360 U	1600 UJ	1700 UJ	1600 UJ	840 UJ	650 UJ
2,4-Dimethylphenol	UG/KG	0	0%	0	10	1.22E+06				360 U	1600 UJ	1700 UJ	1600 UJ	840 UJ	650 UJ
2,4-Dinitrophenol	UG/KG	0	0%	0	10	1.22E+05		200		910 U	4100 UJ	4300 UJ	3900 UJ	2100 UJ	1600 UJ
2,4-Dinitrotoluene	UG/KG	0	0%	0	10	1.22E+05				360 U	1600 UJ	1700 UJ	1600 UJ	840 UJ	650 UJ
2,6-Dinitrotoluene	UG/KG	0	0%	0	10	6.11E+04		1000		360 U	1600 UJ	1700 UJ	1600 UJ	840 UJ	650 UJ

Table C-3
DITCHSOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses ^{1}	Region IX PRG Criteria Value ^{2}	Exceedances	NYSDEC Criteria Value ^{3}	Exceedances	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Facility										SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID										SDDRMO-1		SDDRMO-2		SDDRMO-3		SDDRMO-4		SDDRMO-5		SDDRMO-8	
Matrix										DITCHSOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL	
Sample ID										DRMO-4000		DRMO-4001		DRMO-4002		DRMO-4003		DRMO-4004		DRMO-4005	
Sample Depth to Top of Sample										0		0		0		0		0		0	
Sample Depth to Bottom of Sample										2		2		2		2		2		2	
Sample Date										11/5/2002		11/5/2002		11/5/2002		11/5/2002		11/5/2002		11/5/2002	
QC Code										SA		SA		SA		SA		SA		SA	
Study ID										PID-RI		PID-RI		PID-RI		PID-RI		PID-RI		PID-RI	
										1		1		1		1		1		1	
2-Chloronaphthalene	UG/KG	0	0%	0	10	4.94E+06				360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
2-Chlorophenol	UG/KG	0	0%	0	10	6.34E+04		800		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
2-Methylnaphthalene	UG/KG	0	0%	0	10			36400		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
2-Methylphenol	UG/KG	0	0%	0	10	3.06E+06		100		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
2-Nitroaniline	UG/KG	0	0%	0	10	1.83E+05		430		910	U	4100	UJ	4300	UJ	3900	UJ	2100	UJ	1600	UJ
2-Nitrophenol	UG/KG	0	0%	0	10			330		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
3 or 4-Methylphenol	UG/KG	790	10%	1	10					360	U	1600	UJ	790	J	1600	UJ	840	UJ	650	UJ
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	10	1.08E+03				360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
3-Nitroaniline	UG/KG	0	0%	0	10	1.83E+04		500		910	U	4100	UJ	4300	UJ	3900	UJ	2100	UJ	1600	UJ
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	10	6.11E+03				910	U	4100	UJ	4300	UJ	3900	UJ	2100	UJ	1600	UJ
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	10					360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
4-Chloro-3-methylphenol	UG/KG	0	0%	0	10			240		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
4-Chloroaniline	UG/KG	0	0%	0	10	2.44E+05		220		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	10					360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
4-Nitroaniline	UG/KG	0	0%	0	10	2.32E+04				910	U	4100	UJ	4300	UJ	3900	UJ	2100	UJ	1600	UJ
4-Nitrophenol	UG/KG	0	0%	0	10			100		910	U	4100	UJ	4300	UJ	3900	UJ	2100	UJ	1600	UJ
Acenaphthene	UG/KG	0	0%	0	10	3.68E+06		50000		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Acenaphthylene	UG/KG	0	0%	0	10			41000		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Anthracene	UG/KG	250	20%	2	10	2.19E+07		50000		360	U	250	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Benzo(a)anthracene	UG/KG	1100	20%	2	10	6.21E+02	1	224	2	360	U	1100	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Benzo(a)pyrene	UG/KG	900	20%	2	10	6.21E+01	2	61	2	360	U	900	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Benzo(b)fluoranthene	UG/KG	1100	20%	2	10	6.21E+02	1	1100		360	U	1100	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Benzo(ghi)perylene	UG/KG	290	10%	1	10			50000		360	U	290	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Benzo(k)fluoranthene	UG/KG	580	10%	1	10	6.21E+03		1100		360	U	580	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	10					360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	10	2.18E+02				360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	10	2.88E+03				360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Bis(2-Ethylhexyl)phthalate	UG/KG	0	0%	0	10	3.47E+04		50000		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Butylbenzylphthalate	UG/KG	0	0%	0	10	1.22E+07		50000		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Carbazole	UG/KG	0	0%	0	10	2.43E+04				360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Chrysene	UG/KG	1200	20%	2	10	6.21E+04		400	1	360	U	1200	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Di-n-butylphthalate	UG/KG	0	0%	0	10	6.11E+06		8100		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Di-n-octylphthalate	UG/KG	0	0%	0	10	2.44E+06		50000		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Dibenz(a,h)anthracene	UG/KG	0	0%	0	10	6.21E+01		14		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Dibenzofuran	UG/KG	0	0%	0	10	1.45E+05		6200		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Diethyl phthalate	UG/KG	0	0%	0	10	4.89E+07		7100		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Dimethylphthalate	UG/KG	0	0%	0	10	1.00E+08		2000		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Fluoranthene	UG/KG	2100	20%	2	10	2.29E+06		50000		360	U	2100	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Fluorene	UG/KG	0	0%	0	10	2.75E+06		50000		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Hexachlorobenzene	UG/KG	0	0%	0	10	3.04E+02		410		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Hexachlorobutadiene	UG/KG	0	0%	0	10	6.24E+03				360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Hexachlorocyclopentadiene	UG/KG	0	0%	0	10	3.65E+05				360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Hexachloroethane	UG/KG	0	0%	0	10	3.47E+04				360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Indeno(1,2,3-cd)pyrene	UG/KG	270	10%	1	10	6.21E+02		3200		360	U	270	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Isophorone	UG/KG	0	0%	0	10	5.12E+05		4400		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
N-Nitrosodiphenylamine	UG/KG	0	0%	0	10	9.93E+04				360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
N-Nitrosodipropylamine	UG/KG	0	0%	0	10	6.95E+01				360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Naphthalene	UG/KG	0	0%	0	10	5.59E+04		13000		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ

Table C-3
DITCHSOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	NYSDEC Criteria Value [3]	Exceedances	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Facility										SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID										SDDRMO-1		SDDRMO-2		SDDRMO-3		SDDRMO-4		SDDRMO-5		SDDRMO-8	
Matrix										DITCHSOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL	
Sample ID										DRMO-4000		DRMO-4001		DRMO-4002		DRMO-4003		DRMO-4004		DRMO-4005	
Sample Depth to Top of Sample										0		0		0		0		0		0	
Sample Depth to Bottom of Sample										2		2		2		2		2		2	
Sample Date										11/5/2002		11/5/2002		11/5/2002		11/5/2002		11/5/2002		11/5/2002	
QC Code										SA		SA		SA		SA		SA		SA	
Study ID										PID-RI		PID-RI		PID-RI		PID-RI		PID-RI		PID-RI	
										1		1		1		1		1		1	
Nitrobenzene	UG/KG	0	0%	0	10	1.96E+04		200		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Pentachlorophenol	UG/KG	0	0%	0	10	2.98E+03		1000		910	U	4100	UJ	4300	UJ	3900	UJ	2100	UJ	1600	UJ
Phenanthrene	UG/KG	1100	20%	2	10			50000		360	U	1100	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Phenol	UG/KG	0	0%	0	10	1.83E+07		30		360	U	1600	UJ	1700	UJ	1600	UJ	840	UJ	650	UJ
Pyrene	UG/KG	2100	20%	2	10	2.32E+06		50000		360	U	2100	J	1700	UJ	1600	UJ	840	UJ	650	UJ
Pesticides/PCBs																					
4,4'-DDD	UG/KG	0	0%	0	10	2.44E+03		2900		0.22	UJ	1	UJ	1.1	UJ	0.95	UJ	0.51	UJ	0.4	UJ
4,4'-DDE	UG/KG	0	0%	0	10	1.72E+03		2100		0.22	UJ	1	UJ	1.1	UJ	0.95	UJ	0.51	UJ	0.4	UJ
4,4'-DDT	UG/KG	0	0%	0	10	1.72E+03		2100		0.22	UJ	1	UJ	1.1	UJ	0.95	UJ	0.51	UJ	0.4	UJ
Aldrin	UG/KG	0	0%	0	10	2.86E+01		41		0.11	U	0.5	UJ	0.53	UJ	0.48	UJ	0.26	UJ	0.2	UJ
Alpha-BHC	UG/KG	0	0%	0	10	9.02E+01		110		1.3	UJ	6	UJ	6.3	UJ	5.7	UJ	3.1	UJ	2.4	UJ
Alpha-Chlordane	UG/KG	0	0%	0	10					0.33	UJ	1.5	UJ	1.6	UJ	1.4	UJ	0.77	UJ	0.6	UJ
Beta-BHC	UG/KG	0	0%	0	10	3.16E+02		200		0.11	U	0.5	UJ	0.53	UJ	0.48	UJ	0.26	UJ	0.2	UJ
Chlordane	UG/KG	0	0%	0	10					2.1	U	9.5	UJ	10	UJ	9	UJ	4.9	UJ	3.8	UJ
Delta-BHC	UG/KG	0	0%	0	10			300		0.22	UJ	1	UJ	1.1	UJ	0.95	UJ	0.51	UJ	0.4	UJ
Dieldrin	UG/KG	0	0%	0	10	3.04E+01		44		0.11	UJ	0.5	UJ	0.53	UJ	0.48	UJ	0.26	UJ	0.2	UJ
Endosulfan I	UG/KG	0	0%	0	10			900		0.55	UJ	2.5	UJ	2.6	UJ	2.4	UJ	1.3	UJ	1	UJ
Endosulfan II	UG/KG	0	0%	0	10			900		0.33	U	1.5	UJ	1.6	UJ	1.4	UJ	0.77	UJ	0.6	UJ
Endosulfan sulfate	UG/KG	0	0%	0	10			1000		0.66	UJ	3	UJ	3.2	UJ	2.9	UJ	1.5	UJ	1.2	UJ
Endrin	UG/KG	0	0%	0	10	1.83E+04		100		0.88	U	4	UJ	4.2	UJ	3.8	UJ	2.1	UJ	1.6	UJ
Endrin aldehyde	UG/KG	0	0%	0	10					0.88	UJ	4	UJ	4.2	UJ	3.8	UJ	2.1	UJ	1.6	UJ
Endrin ketone	UG/KG	0	0%	0	10					0.11	UJ	0.5	UJ	0.53	UJ	0.48	UJ	0.26	UJ	0.2	UJ
Gamma-BHC/Lindane	UG/KG	0	0%	0	10	4.37E+02		60		0.11	UJ	0.5	UJ	0.53	UJ	0.48	UJ	0.26	UJ	0.2	UJ
Gamma-Chlordane	UG/KG	0	0%	0	10			540		0.33	UJ	1.5	UJ	1.6	UJ	1.4	UJ	0.77	UJ	0.6	UJ
Heptachlor	UG/KG	0	0%	0	10	1.08E+02		100		1.1	U	5	UJ	5.3	UJ	4.8	UJ	2.6	UJ	2	UJ
Heptachlor epoxide	UG/KG	0	0%	0	10	5.34E+01		20		0.33	U	1.5	UJ	1.6	UJ	1.4	UJ	0.77	UJ	0.6	UJ
Methoxychlor	UG/KG	0	0%	0	10	3.06E+05				0.11	U	0.5	UJ	0.53	UJ	0.48	UJ	0.26	UJ	0.2	UJ
Toxaphene	UG/KG	0	0%	0	10	4.42E+02				3.5	U	16	UJ	17	UJ	15	UJ	8.2	UJ	6.4	UJ
Aroclor-1016	UG/KG	0	0%	0	9	3.93E+03				5.7	U	26	UJ	27	UJ	24	UJ	13	UJ	10	UJ
Aroclor-1221	UG/KG	0	0%	0	9					1.4	U	6.4	UJ	6.8	UJ	6.1	UJ	3.3	UJ	2.6	UJ
Aroclor-1232	UG/KG	0	0%	0	9					8.7	U	39	UJ	42	UJ	38	UJ	20	UJ	16	UJ
Aroclor-1242	UG/KG	0	0%	0	9					2.4	U	11	UJ	11	UJ	10	UJ	5.6	UJ	4.3	UJ
Aroclor-1248	UG/KG	0	0%	0	9					6	U	27	UJ	29	UJ	26	UJ	14	UJ	11	UJ
Aroclor-1254	UG/KG	0	0%	0	9	2.22E+02		10000		12	U	52	UJ	55	UJ	50	UJ	27	UJ	21	UJ
Aroclor-1260	UG/KG	0	0%	0	9			10000		2.2	UJ	9.9	UJ	10	UJ	9.4	UJ	5.1	UJ	3.9	UJ
Metals and Cyanide																					
Aluminum	MG/KG	21500	100%	10	10	7.61E+04		19300	1	2850		5600	J	5100	J	9540	J	9770	J	10100	
Antimony	MG/KG	4.9	50%	5	10	3.13E+01		5.9		0.97	J	4.5	J	4.7	J	4.3	UJ	2.5	J	1.8	UJ
Arsenic	MG/KG	6.1	100%	10	10	3.90E-01	1	8.2		1.1		6.1	J	1.2	J	2.2	J	5.1	J	2.1	
Barium	MG/KG	291	100%	10	10	5.37E+03		300		36.6	J	111	J	41.9	J	131	J	96.3	J	72.2	J
Beryllium	MG/KG	0.8 [4]	80%	8	10	1.54E+02		1.1		0.2		0.64	UJ	0.68	UJ	0.67	J	0.6	J	0.63	
Cadmium	MG/KG	14.3	50%	5	10	3.70E+01		2.3	3	0.13	U	1.5	J	3.4	J	2.1	J	5.8	J	0.24	U
Calcium	MG/KG	161000	100%	10	10			121000	2	28900		133000	J	45400	J	61200	J	56000	J	24000	
Chromium	MG/KG	29.8	100%	10	10			29.6	1	7.3		29.8	J	15.9	J	29.3	J	26.5	J	22.6	
Cobalt	MG/KG	15.8 [4]	100%	10	10	9.03E+02		30		3		10.2	J	7.2	J	10.2	J	14.7	J	11.4	
Copper	MG/KG	1190	100%	10	10	3.13E+03		33	7	19.1		117	J	77.4	J	96.8	J	133	J	34	
Cyanide, Amenable	MG/KG	2.36	10%	1	10					0.55	U	2.49	UJ	2.63	UJ	2.36	J	1.29	UJ	1.1	U

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Table C-3
DITCHSOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SDDRMO-1	SDDRMO-2	SDDRMO-3	SDDRMO-4	SDDRMO-5	SDDRMO-8
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										DRMO-4000	DRMO-4001	DRMO-4002	DRMO-4003	DRMO-4004	DRMO-4005
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Cyanide, Total	MG/KG	2.36	10%	1	10					0.552 U	2.49 UJ	2.63 UJ	2.36 J	1.29 UJ	1.1 U
Iron	MG/KG	27300 [4]	100%	10	10	2.35E+04	1	36500		5650	18400 J	13800 J	20400 J	23300 J	20500
Lead	MG/KG	436	100%	10	10	4.00E+02	1	24.8	8	34.3	200 J	148 J	197 J	196 J	58.3
Magnesium	MG/KG	17600	100%	10	10			21500		3340	13100 J	5780 J	7480 J	6810 J	5150
Manganese	MG/KG	918	100%	10	10	1.76E+03		1060		126	754 J	271 J	616 J	918 J	471
Mercury	MG/KG	0.3	100%	10	10	2.35E+01		0.1	6	0.09	0.3 J	0.14 J	0.2 J	0.09 J	0.11
Nickel	MG/KG	42.7	100%	10	10	1.56E+03		49		8.2	32.5 J	22.8 J	29.3 J	42.7 J	30.9
Potassium	MG/KG	1410	100%	10	10			2380		368	880 J	1070 J	1370 J	1410 J	905
Selenium	MG/KG	2.5	40%	4	10	3.91E+02		2	2	0.73	2.1 UJ	2.3 J	2.5 J	1.6 J	0.82 U
Silver	MG/KG	2.6	50%	5	10	3.91E+02		0.75	5	0.93	1.3 UJ	1.4 UJ	2.1 J	2.6 J	0.65
Sodium	MG/KG	1120	100%	10	10			172	9	258	1090 J	985 J	1120 J	465 J	388
Thallium	MG/KG	0	0%	0	10	5.16E+00		0.7		0.33 U	1.5 UJ	1.6 UJ	1.5 UJ	0.77 UJ	0.61 U
Vanadium	MG/KG	29.1	100%	10	10	7.82E+01		150		8.6	29.1 J	16.1 J	23.6 J	20.9 J	17.8
Zinc	MG/KG	566	100%	10	10	2.35E+04		110	7	57.9 J	540	314	390	566	135 J
Other															
Total Organic Carbon	MG/KG	9100	100%	10	10					4600	6400 J	7500 J	6300 J	6200 J	7100 J
Total Petroleum Hydrocarbons	MG/KG	2600	20%	2	10					1000	2600 J	211 UJ	190 UJ	100 UJ	80 UJ

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample DRMO-4008 and its duplicate
DRMO-4005 at Loc ID SDDRMO-8.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process

Table C-3
DITCHSOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SDDRMO-8	SDDRMO-6	SDDRMO-7	SDDRMO-9	SDDRMO-10
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										DRMO-4008	DRMO-4006	DRMO-4007	DRMO-4009	DRMO-4010
Sample Depth to Top of Sample										0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses** [1]	**Region IX PRG Criteria Value** [2]	**Exceedances**	**NYSDEC Criteria Value** [3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds														
1,1,1-Trichloroethane	UG/KG	0	0%	0	10	1.20E+06		800		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	10	4.08E+02		600		11 UJ	3.7 UJ	2.9 UJ	4.6 UJ	7.1 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	10	7.29E+02				11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	10	5.06E+05		200		11 UJ	3.7 UJ	2.9 UJ	4.6 UJ	7.1 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	10	1.24E+05		400		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	10	2.78E+02		100		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
1,2-Dichloropropane	UG/KG	0	0%	0	10	3.42E+02				11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Acetone	UG/KG	150	70%	7	10	1.41E+07		200		72 J	3.7 U	2.9 U	25 J	33 J
Benzene	UG/KG	0	0%	0	10	6.43E+02		60		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Bromodichloromethane	UG/KG	0	0%	0	10	8.24E+02				11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Bromoform	UG/KG	0	0%	0	10	6.16E+04				11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Carbon disulfide	UG/KG	12	20%	2	10	3.55E+05		2700		6.7 J	12 J	2.9 UJ	4.6 UJ	7.1 UJ
Carbon tetrachloride	UG/KG	0	0%	0	10	2.51E+02		600		11 UJ	3.7 UJ	2.9 UJ	4.6 UJ	7.1 UJ
Chlorobenzene	UG/KG	0	0%	0	10	1.51E+05		1700		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Chlorodibromomethane	UG/KG	0	0%	0	10	1.11E+03				11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Chloroethane	UG/KG	0	0%	0	10	3.03E+03		1900		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Chloroform	UG/KG	0	0%	0	10	2.21E+02		300		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	10	4.29E+04				11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	10					11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Ethyl benzene	UG/KG	0	0%	0	10	3.95E+05		5500		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Meta/Para Xylene	UG/KG	0	0%	0	10					11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Methyl bromide	UG/KG	0	0%	0	10	3.90E+03				11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Methyl butyl ketone	UG/KG	0	0%	0	10					11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Methyl chloride	UG/KG	0	0%	0	10	4.69E+04				11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Methyl ethyl ketone	UG/KG	130	30%	3	10	2.23E+07		300		11 UJ	3.7 U	2.9 U	4.6 UJ	7.2 J
Methyl isobutyl ketone	UG/KG	0	0%	0	10	5.28E+06		1000		11 UJ	3.7 UJ	2.9 UJ	4.6 UJ	7.1 UJ
Methylene chloride	UG/KG	0	0%	0	10	9.11E+03		100		11 UJ	3.7 UJ	2.9 UJ	4.6 UJ	7.1 UJ
Ortho Xylene	UG/KG	0	0%	0	10					11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Styrene	UG/KG	0	0%	0	10	1.70E+06				11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Tetrachloroethene	UG/KG	0	0%	0	10	4.84E+02		1400		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Toluene	UG/KG	0	0%	0	10	5.20E+05		1500		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	10	6.95E+04		300		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	10					11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Trichloroethene	UG/KG	0	0%	0	10	5.30E+01		700		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Vinyl chloride	UG/KG	0	0%	0	10	7.91E+01		200		11 UJ	3.7 U	2.9 U	4.6 UJ	7.1 UJ
Semivolatile Organic Compounds														
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	10	6.22E+04		3400		1100 UJ	460 U	430 U	550 U	910 UJ
1,2-Dichlorobenzene	UG/KG	0	0%	0	10	6.00E+05		7900		1100 UJ	460 U	430 U	550 U	910 UJ
1,3-Dichlorobenzene	UG/KG	0	0%	0	10	5.31E+05		1600		1100 UJ	460 U	430 U	550 U	910 UJ
1,4-Dichlorobenzene	UG/KG	0	0%	0	10	3.45E+03		8500		1100 UJ	460 U	430 U	550 U	910 UJ
2,4,5-Trichlorophenol	UG/KG	0	0%	0	10	6.11E+06		100		2600 UJ	1200 U	1100 U	1400 U	2300 UJ
2,4,6-Trichlorophenol	UG/KG	0	0%	0	10	6.11E+03				1100 UJ	460 U	430 U	550 U	910 UJ
2,4-Dichlorophenol	UG/KG	0	0%	0	10	1.83E+05		400		1100 UJ	460 U	430 U	550 U	910 UJ
2,4-Dimethylphenol	UG/KG	0	0%	0	10	1.22E+06				1100 UJ	460 U	430 U	550 U	910 UJ
2,4-Dinitrophenol	UG/KG	0	0%	0	10	1.22E+05		200		2600 UJ	1200 U	1100 U	1400 U	2300 UJ
2,4-Dinitrotoluene	UG/KG	0	0%	0	10	1.22E+05				1100 UJ	460 U	430 U	550 U	910 UJ
2,6-Dinitrotoluene	UG/KG	0	0%	0	10	6.11E+04		1000		1100 UJ	460 U	430 U	550 U	910 UJ

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Table C-3
DITCHSOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SDDRMO-8	SDDRMO-6	SDDRMO-7	SDDRMO-9	SDDRMO-10
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										DRMO-4008	DRMO-4006	DRMO-4007	DRMO-4009	DRMO-4010
Sample Depth to Top of Sample										0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2-Chloronaphthalene	UG/KG	0	0%	0	10	4.94E+06				1100 UJ	460 U	430 U	550 U	910 UJ
2-Chlorophenol	UG/KG	0	0%	0	10	6.34E+04		800		1100 UJ	460 U	430 U	550 U	910 UJ
2-Methylnaphthalene	UG/KG	0	0%	0	10			36400		1100 UJ	460 U	430 U	550 U	910 UJ
2-Methylphenol	UG/KG	0	0%	0	10	3.06E+06		100		1100 UJ	460 U	430 U	550 U	910 UJ
2-Nitroaniline	UG/KG	0	0%	0	10	1.83E+05		430		2600 UJ	1200 U	1100 U	1400 U	2300 UJ
2-Nitrophenol	UG/KG	0	0%	0	10			330		1100 UJ	460 U	430 U	550 U	910 UJ
3 or 4-Methylphenol	UG/KG	790	10%	1	10					1100 UJ	460 U	430 U	550 U	910 UJ
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	10	1.08E+03				1100 UJ	460 U	430 U	550 U	910 UJ
3-Nitroaniline	UG/KG	0	0%	0	10	1.83E+04		500		2600 UJ	1200 U	1100 U	1400 U	2300 UJ
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	10	6.11E+03				2600 UJ	1200 U	1100 U	1400 U	2300 UJ
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	10					1100 UJ	460 U	430 U	550 U	910 UJ
4-Chloro-3-methylphenol	UG/KG	0	0%	0	10			240		1100 UJ	460 U	430 U	550 U	910 UJ
4-Chloroaniline	UG/KG	0	0%	0	10	2.44E+05		220		1100 UJ	460 U	430 U	550 U	910 UJ
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	10					1100 UJ	460 UJ	430 UJ	550 U	910 UJ
4-Nitroaniline	UG/KG	0	0%	0	10	2.32E+04				2600 UJ	1200 U	1100 U	1400 U	2300 UJ
4-Nitrophenol	UG/KG	0	0%	0	10			100		2600 UJ	1200 U	1100 U	1400 U	2300 UJ
Acenaphthene	UG/KG	0	0%	0	10	3.68E+06		50000		1100 UJ	460 U	430 U	550 U	910 UJ
Acenaphthylene	UG/KG	0	0%	0	10			41000		1100 UJ	460 U	430 U	550 U	910 UJ
Anthracene	UG/KG	250	20%	2	10	2.19E+07		50000		1100 UJ	460 U	430 U	100 J	910 UJ
Benzo(a)anthracene	UG/KG	1100	20%	2	10	6.21E+02	1	224	2	1100 UJ	460 U	430 U	230 J	910 UJ
Benzo(a)pyrene	UG/KG	900	20%	2	10	6.21E+01	2	61	2	1100 UJ	460 U	430 U	170 J	910 UJ
Benzo(b)fluoranthene	UG/KG	1100	20%	2	10	6.21E+02	1	1100		1100 UJ	460 UJ	430 UJ	180 J	910 UJ
Benzo(ghi)perylene	UG/KG	290	10%	1	10			50000		1100 UJ	460 U	430 U	550 U	910 UJ
Benzo(k)fluoranthene	UG/KG	580	10%	1	10	6.21E+03		1100		1100 UJ	460 U	430 U	550 U	910 UJ
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	10					1100 UJ	460 U	430 U	550 U	910 UJ
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	10	2.18E+02				1100 UJ	460 U	430 U	550 U	910 UJ
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	10	2.88E+03				1100 UJ	460 U	430 U	550 U	910 UJ
Bis(2-Ethylhexyl)phthalate	UG/KG	0	0%	0	10	3.47E+04		50000		1100 UJ	460 U	430 U	550 U	910 UJ
Butylbenzylphthalate	UG/KG	0	0%	0	10	1.22E+07		50000		1100 UJ	460 U	430 U	550 U	910 UJ
Carbazole	UG/KG	0	0%	0	10	2.43E+04				1100 UJ	460 U	430 U	550 U	910 UJ
Chrysene	UG/KG	1200	20%	2	10	6.21E+04		400	1	1100 UJ	460 U	430 U	240 J	910 UJ
Di-n-butylphthalate	UG/KG	0	0%	0	10	6.11E+06		8100		1100 UJ	460 U	430 U	550 U	910 UJ
Di-n-octylphthalate	UG/KG	0	0%	0	10	2.44E+06		50000		1100 UJ	460 U	430 U	550 U	910 UJ
Dibenz(a,h)anthracene	UG/KG	0	0%	0	10	6.21E+01		14		1100 UJ	460 U	430 U	550 U	910 UJ
Dibenzofuran	UG/KG	0	0%	0	10	1.45E+05		6200		1100 UJ	460 UJ	430 UJ	550 U	910 UJ
Diethyl phthalate	UG/KG	0	0%	0	10	4.89E+07		7100		1100 UJ	460 U	430 U	550 U	910 UJ
Dimethylphthalate	UG/KG	0	0%	0	10	1.00E+08		2000		1100 UJ	460 U	430 U	550 U	910 UJ
Fluoranthene	UG/KG	2100	20%	2	10	2.29E+06		50000		1100 UJ	460 U	430 U	520 J	910 UJ
Fluorene	UG/KG	0	0%	0	10	2.75E+06		50000		1100 UJ	460 U	430 U	550 U	910 UJ
Hexachlorobenzene	UG/KG	0	0%	0	10	3.04E+02		410		1100 UJ	460 U	430 U	550 U	910 UJ
Hexachlorobutadiene	UG/KG	0	0%	0	10	6.24E+03				1100 UJ	460 U	430 U	550 U	910 UJ
Hexachlorocyclopentadiene	UG/KG	0	0%	0	10	3.65E+05				1100 UJ	460 UJ	430 UJ	550 U	910 UJ
Hexachloroethane	UG/KG	0	0%	0	10	3.47E+04				1100 UJ	460 U	430 U	550 U	910 UJ
Indeno(1,2,3-cd)pyrene	UG/KG	270	10%	1	10	6.21E+02		3200		1100 UJ	460 U	430 U	550 U	910 UJ
Isophorone	UG/KG	0	0%	0	10	5.12E+05		4400		1100 UJ	460 U	430 U	550 U	910 UJ
N-Nitrosodiphenylamine	UG/KG	0	0%	0	10	9.93E+04				1100 UJ	460 U	430 U	550 U	910 UJ
N-Nitrosodipropylamine	UG/KG	0	0%	0	10	6.95E+01				1100 UJ	460 UJ	430 UJ	550 U	910 UJ
Naphthalene	UG/KG	0	0%	0	10	5.59E+04		13000		1100 UJ	460 U	430 U	550 U	910 UJ

Table C-3
DITCHSOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID										SDDRMO-8		SDDRMO-6		SDDRMO-7		SDDRMO-9		SDDRMO-10	
Matrix										DITCHSOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL	
Sample ID										DRMO-4008		DRMO-4006		DRMO-4007		DRMO-4009		DRMO-4010	
Sample Depth to Top of Sample										0		0		0		0		0	
Sample Depth to Bottom of Sample										2		2		2		2		2	
Sample Date										11/5/2002		11/5/2002		11/5/2002		11/5/2002		11/5/2002	
QC Code										SA		SA		SA		SA		SA	
Study ID										PID-RI		PID-RI		PID-RI		PID-RI		PID-RI	
										1		1		1		1		1	
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Nitrobenzene	UG/KG	0	0%	0	10	1.96E+04		200		1100	UJ	460	U	430	U	550	U	910	UJ
Pentachlorophenol	UG/KG	0	0%	0	10	2.98E+03		1000		2600	UJ	1200	U	1100	U	1400	U	2300	UJ
Phenanthrene	UG/KG	1100	20%	2	10			50000		1100	UJ	460	U	430	U	410	J	910	UJ
Phenol	UG/KG	0	0%	0	10	1.83E+07		30		1100	UJ	460	U	430	U	550	U	910	UJ
Pyrene	UG/KG	2100	20%	2	10	2.32E+06		50000		1100	UJ	460	U	430	U	440	J	910	UJ
Pesticides/PCBs																			
4,4'-DDD	UG/KG	0	0%	0	10	2.44E+03		2900		0.65	UJ	0.29	UJ	0.26	UJ	0.34	UJ	0.56	UJ
4,4'-DDE	UG/KG	0	0%	0	10	1.72E+03		2100		0.65	UJ	0.29	U	0.26	U	0.34	U	0.56	UJ
4,4'-DDT	UG/KG	0	0%	0	10	1.72E+03		2100		0.65	UJ	0.29	UJ	0.26	UJ	0.34	UJ	0.56	UJ
Aldrin	UG/KG	0	0%	0	10	2.86E+01		41		0.32	UJ	0.14	UJ	0.13	UJ	0.17	UJ	0.28	UJ
Alpha-BHC	UG/KG	0	0%	0	10	9.02E+01		110		3.9	UJ	1.7	UJ	1.6	UJ	2	UJ	3.3	UJ
Alpha-Chlordane	UG/KG	0	0%	0	10					0.97	UJ	0.43	UJ	0.39	UJ	0.51	UJ	0.83	UJ
Beta-BHC	UG/KG	0	0%	0	10	3.16E+02		200		0.32	UJ	0.14	U	0.13	U	0.17	U	0.28	UJ
Chlordane	UG/KG	0	0%	0	10					6.1	UJ	2.7	U	2.5	U	3.2	U	5.3	UJ
Delta-BHC	UG/KG	0	0%	0	10			300		0.65	UJ	0.29	UJ	0.26	UJ	0.34	UJ	0.56	UJ
Dieldrin	UG/KG	0	0%	0	10	3.04E+01		44		0.32	UJ	0.14	UJ	0.13	UJ	0.17	UJ	0.28	UJ
Endosulfan I	UG/KG	0	0%	0	10			900		1.6	UJ	0.71	UJ	0.66	UJ	0.85	UJ	1.4	UJ
Endosulfan II	UG/KG	0	0%	0	10			900		0.97	UJ	0.43	UJ	0.39	UJ	0.51	UJ	0.83	UJ
Endosulfan sulfate	UG/KG	0	0%	0	10			1000		1.9	UJ	0.86	UJ	0.79	UJ	1	UJ	1.7	UJ
Endrin	UG/KG	0	0%	0	10	1.83E+04		100		2.6	UJ	1.1	UJ	1.1	UJ	1.4	UJ	2.2	UJ
Endrin aldehyde	UG/KG	0	0%	0	10					2.6	UJ	1.1	UJ	1.1	UJ	1.4	UJ	2.2	UJ
Endrin ketone	UG/KG	0	0%	0	10					0.32	UJ	0.14	UJ	0.13	UJ	0.17	UJ	0.28	UJ
Gamma-BHC/Lindane	UG/KG	0	0%	0	10	4.37E+02		60		0.32	UJ	0.14	UJ	0.13	UJ	0.17	UJ	0.28	UJ
Gamma-Chlordane	UG/KG	0	0%	0	10			540		0.97	UJ	0.43	UJ	0.39	UJ	0.51	UJ	0.83	UJ
Heptachlor	UG/KG	0	0%	0	10	1.08E+02		100		3.2	UJ	1.4	UJ	1.3	UJ	1.7	UJ	2.8	UJ
Heptachlor epoxide	UG/KG	0	0%	0	10	5.34E+01		20		0.97	UJ	0.43	U	0.39	U	0.51	U	0.83	UJ
Methoxychlor	UG/KG	0	0%	0	10	3.06E+05				0.32	UJ	0.14	U	0.13	U	0.17	U	0.28	UJ
Toxaphene	UG/KG	0	0%	0	10	4.42E+02				10	UJ	4.6	U	4.2	U	5.4	U	8.9	UJ
Aroclor-1016	UG/KG	0	0%	0	9	3.93E+03				17	UJ	7.4	U	6.7	U	8.7	U	14	R
Aroclor-1221	UG/KG	0	0%	0	9					4.2	UJ	1.8	U	1.7	U	2.2	U	3.6	R
Aroclor-1232	UG/KG	0	0%	0	9					26	UJ	11	U	10	U	13	U	22	R
Aroclor-1242	UG/KG	0	0%	0	9					7	UJ	3.1	U	2.8	U	3.7	U	6.1	R
Aroclor-1248	UG/KG	0	0%	0	9					18	UJ	7.8	U	7.1	U	9.2	U	15	R
Aroclor-1254	UG/KG	0	0%	0	9	2.22E+02		10000		34	UJ	15	U	14	U	18	U	29	R
Aroclor-1260	UG/KG	0	0%	0	9			10000		6.4	UJ	2.8	UJ	2.6	UJ	3.4	U	5.5	R
Metals and Cyanide																			
Aluminum	MG/KG	21500	100%	10	10	7.61E+04		19300	1	14700	J	9670		7620		21500		9680	J
Antimony	MG/KG	4.9	50%	5	10	3.13E+01		5.9		2.9	UJ	1.3	UJ	1.2	UJ	4.9	J	2.5	UJ
Arsenic	MG/KG	6.1	100%	10	10	3.90E-01	1	8.2		5.9	J	3.3		3.6		4.3		2.2	J
Barium	MG/KG	291	100%	10	10	5.37E+03		300		122	J	47.1	J	50.9	J	291		120	J
Beryllium	MG/KG	0.8 [4]	80%	8	10	1.54E+02		1.1		1	J	0.6		0.52		0.33		0.69	J
Cadmium	MG/KG	14.3	50%	5	10	3.70E+01		2.3	3	0.39	UJ	0.17	U	0.16	U	14.3		0.33	UJ
Calcium	MG/KG	161000	100%	10	10			121000	2	34500	J	13200		16300		161000		21600	J
Chromium	MG/KG	29.8	100%	10	10			29.6	1	32.7	J	17.1		14		18.3		27.9	J
Cobalt	MG/KG	15.8 [4]	100%	10	10	9.03E+02		30		20.2	J	10.6		11.5		8.5		10	J
Copper	MG/KG	1190	100%	10	10	3.13E+03		33	7	50.6	J	16.2		18.8		1190		55.1	J
Cyanide, Amenable	MG/KG	2.36	10%	1	10					1.59	UJ	0.71	U	0.66	U	0.84	U	1.4	UJ

Table C-3
DITCHSOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID										SDDRMO-8		SDDRMO-6		SDDRMO-7		SDDRMO-9		SDDRMO-10	
Matrix										DITCHSOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL		DITCHSOIL	
Sample ID										DRMO-4008		DRMO-4006		DRMO-4007		DRMO-4009		DRMO-4010	
Sample Depth to Top of Sample										0		0		0		0		0	
Sample Depth to Bottom of Sample										2		2		2		2		2	
Sample Date										11/5/2002		11/5/2002		11/5/2002		11/5/2002		11/5/2002	
QC Code										SA		SA		SA		SA		SA	
Study ID										PID-RI		PID-RI		PID-RI		PID-RI		PID-RI	
										1		1		1		1		1	
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Cyanide, Total	MG/KG	2.36	10%	1	10					1.59	UJ	0.713	U	0.662	U	0.84	U	1.4	UJ
Iron	MG/KG	27300 [4]	100%	10	10	2.35E+04	1	36500		34100	J	21200		20500		15400		17100	J
Lead	MG/KG	436	100%	10	10	4.00E+02	1	24.8	8	85.2	J	14		13.3		436		132	J
Magnesium	MG/KG	17600	100%	10	10			21500		7310	J	4480		3540		17600		7810	J
Manganese	MG/KG	918	100%	10	10	1.76E+03		1060		885	J	610		577		504		510	J
Mercury	MG/KG	0.3	100%	10	10	2.35E+01		0.1	6	0.18	J	0.04		0.09		0.26		0.12	J
Nickel	MG/KG	42.7	100%	10	10	1.56E+03		49		45.3	J	29.5		24		32.1		29	J
Potassium	MG/KG	1410	100%	10	10			2380		1270	J	810		558		1020		1070	J
Selenium	MG/KG	2.5	40%	4	10	3.91E+02		2	2	1.4	UJ	0.59	U	0.55	U	0.69	U	1.2	UJ
Silver	MG/KG	2.6	50%	5	10	3.91E+02		0.75	5	1	J	0.38	U	0.35	U	1.8		0.75	UJ
Sodium	MG/KG	1120	100%	10	10			172	9	656	J	297		167		398		595	J
Thallium	MG/KG	0	0%	0	10	5.16E+00		0.7		1	UJ	0.43	U	0.4	U	0.51	U	0.86	UJ
Vanadium	MG/KG	29.1	100%	10	10	7.82E+01		150		27.3	J	15.6		13.9		10.8		19.1	J
Zinc	MG/KG	566	100%	10	10	2.35E+04		110	7	195	J	62.8	J	51.4	J	528		236	J
Other																			
Total Organic Carbon	MG/KG	9100	100%	10	10					7100	J	4900		4200		8300		9100	J
Total Petroleum Hydrocarbons	MG/KG	2600	20%	2	10					130	UJ	57	U	53	U	68	U	110	UJ

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 199
4) The maximum detected concentration was obtained from the average of the sample DRMO-4008 and its duplicate DRMO-4005 at Loc ID SDDRMO-8.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses	Region IX PRG Criteria Value ^{1}	Exceedances	NYSDEC Criteria Value ^{2}	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SB121C-1	SB121C-2	SB121C-3	SB121C-4	SBDRMO-10	SBDRMO-11	SBDRMO-12
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB232	EB228	EB234	EB230	DRMO-1057	DRMO-1060	DRMO-1063
Sample Depth to Top of Sample										2.5	2	2.5	2.5	2	2	2
Sample Depth to Bottom of Sample										3	2.5	3	3	6	6	6
Sample Date										3/9/1998	3/9/1998	3/9/1998	3/9/1998	10/25/2002	10/26/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	EBS	EBS	PID-RI	PID-RI	PID-RI
Volatile Organic Compounds																
1,1,1-Trichloroethane	UG/KG	0	0%	0	20	1.20E+06		800		12 U	11 UJ	11 U	11 UJ	2.6 UJ	2.8 UJ	3.1 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	20	4.08E+02		600		12 U	11 UJ	11 U	11 U	2.6 U	2.8 UJ	3.1 U
1,1,2-Trichloroethane	UG/KG	0	0%	0	20	7.29E+02				12 U	11 UJ	11 U	11 U	2.6 U	2.8 UJ	3.1 U
1,1-Dichloroethane	UG/KG	0	0%	0	20	5.06E+05		200		12 U	11 UJ	11 U	11 U	2.6 U	2.8 UJ	3.1 U
1,1-Dichloroethene	UG/KG	0	0%	0	20	1.24E+05		400		12 U	11 UJ	11 U	11 U	2.6 U	2.8 UJ	3.1 U
1,2-Dichloroethane	UG/KG	0	0%	0	20	2.78E+02		100		12 U	11 UJ	11 U	11 U	2.6 UJ	2.8 UJ	3.1 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	4					12 U	11 UJ	11 U	11 U			
1,2-Dichloropropane	UG/KG	0	0%	0	20	3.42E+02				12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Acetone	UG/KG	28	45%	9	20	1.41E+07		200		14	11 UJ	16	28 J	2.6 U	2.8 UJ	24 J
Benzene	UG/KG	1800	10%	2	20	6.43E+02	1	60	1	12 U	2 J	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Bromodichloromethane	UG/KG	0	0%	0	20	8.24E+02				12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Bromoform	UG/KG	0	0%	0	20	6.16E+04				12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Carbon disulfide	UG/KG	0	0%	0	20	3.55E+05		2700		12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Carbon tetrachloride	UG/KG	0	0%	0	20	2.51E+02		600		12 U	11 UJ	11 U	11 UJ	2.6 UJ	2.8 UJ	3.1 U
Chlorobenzene	UG/KG	0	0%	0	20	1.51E+05		1700		12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Chlorodibromomethane	UG/KG	0	0%	0	20	1.11E+03				12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Chloroethane	UG/KG	0	0%	0	20	3.03E+03		1900		12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Chloroform	UG/KG	4	10%	2	20	2.21E+02		300		12 U	4 J	11 U	2 J	2.6 U	2.8 UJ	3.1 U
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	16	4.29E+04								2.6 U	2.8 UJ	3.1 U
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	20					12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Ethyl benzene	UG/KG	24000	5%	1	20	3.95E+05		5500	1	12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Meta/Para Xylene	UG/KG	130000	6%	1	16									2.6 U	2.8 UJ	3.1 U
Methyl bromide	UG/KG	0	0%	0	20	3.90E+03				12 U	11 UJ	11 U	11 UJ	2.6 UJ	2.8 UJ	3.1 UJ
Methyl butyl ketone	UG/KG	0	0%	0	20					12 U	11 UJ	11 U	11 UJ	2.6 UJ	2.8 UJ	3.1 UJ
Methyl chloride	UG/KG	0	0%	0	20	4.69E+04				12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Methyl ethyl ketone	UG/KG	7.6	10%	2	20	2.23E+07		300		12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Methyl isobutyl ketone	UG/KG	0	0%	0	20	5.28E+06		1000		12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Methylene chloride	UG/KG	3.5	10%	2	20	9.11E+03		100		12 U	11 UJ	11 U	11 UJ	2.6 U	3.5 UJ	2.6 J
Ortho Xylene	UG/KG	75	6%	1	16									2.6 U	2.8 UJ	3.1 U
Styrene	UG/KG	2.7	5%	1	20	1.70E+06				12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Tetrachloroethene	UG/KG	0	0%	0	20	4.84E+02		1400		12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Toluene	UG/KG	84	20%	4	20	5.20E+05		1500		7 J	5 UJ	9 J	4 J	2.6 U	2.8 UJ	3.1 U
Total Xylenes	UG/KG	0	0%	0	4	2.71E+05		1200		12 U	11 UJ	11 U	11 UJ			
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	16	6.95E+04		300						2.6 U	2.8 UJ	3.1 U
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	20					12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Trichloroethene	UG/KG	0	0%	0	20	5.30E+01		700		12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Vinyl chloride	UG/KG	0	0%	0	20	7.91E+01		200		12 U	11 UJ	11 U	11 UJ	2.6 U	2.8 UJ	3.1 U
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	20	6.22E+04		3400		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
1,2-Dichlorobenzene	UG/KG	0	0%	0	20	6.00E+05		7900		77 U	75 U	77 U	76 U	370 U	370 U	410 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	20	5.31E+05		1600		77 U	75 U	77 U	76 U	370 U	370 U	410 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	20	3.45E+03		8500		77 U	75 U	77 U	76 U	370 U	370 U	410 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	20	6.11E+06		100		190 U	180 U	190 U	180 U	920 U	920 U	1000 UJ
2,4,6-Trichlorophenol	UG/KG	0	0%	0	20	6.11E+03				77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
2,4-Dichlorophenol	UG/KG	0	0%	0	20	1.83E+05		400		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
2,4-Dimethylphenol	UG/KG	0	0%	0	20	1.22E+06				77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
2,4-Dinitrophenol	UG/KG	0	0%	0	19	1.22E+05		200		190 U	180 U	190 U	180 U	920 UJ	920 UJ	1000 UJ
2,4-Dinitrotoluene	UG/KG	0	0%	0	20	1.22E+05				77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
2,6-Dinitrotoluene	UG/KG	0	0%	0	20	6.11E+04		1000		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
2-Chloronaphthalene	UG/KG	0	0%	0	20	4.94E+06				77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
2-Chlorophenol	UG/KG	0	0%	0	20	6.34E+04		800		77 U	75 U	77 U	76 U	370 U	370 U	410 U

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SB121C-1	SB121C-2	SB121C-3	SB121C-4	SBDRMO-10	SBDRMO-11	SBDRMO-12
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB232	EB228	EB234	EB230	DRMO-1057	DRMO-1060	DRMO-1063
Sample Depth to Top of Sample										2.5	2	2.5	2.5	2	2	2
Sample Depth to Bottom of Sample										3	2.5	3	3	6	6	6
Sample Date										3/9/1998	3/9/1998	3/9/1998	3/9/1998	10/25/2002	10/26/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	EBS	EBS	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**	**Region IX PRG Criteria Value [1]**	**Exceedances**	**NYSDEC Criteria Value [2]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2-Methylnaphthalene	UG/KG	2500	20%	4	20			36400		77 U	7 J	8.3 J	76 U	370 U	370 U	2500 J
2-Methylphenol	UG/KG	0	0%	0	20	3.06E+06		100		77 U	75 U	77 U	76 U	370 U	370 U	410 U
2-Nitroaniline	UG/KG	0	0%	0	20	1.83E+05		430		190 U	180 U	190 U	180 U	920 U	920 U	1000 UJ
2-Nitrophenol	UG/KG	0	0%	0	20			330		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
3 or 4-Methylphenol	UG/KG	0	0%	0	16									370 U	370 U	410 UJ
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	20	1.08E+03				77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
3-Nitroaniline	UG/KG	0	0%	0	20	1.83E+04		500		190 U	180 U	190 U	180 U	920 U	920 U	1000 UJ
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	20	6.11E+03				190 U	180 U	190 U	180 U	920 UJ	920 U	1000 UJ
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	20					77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
4-Chloro-3-methylphenol	UG/KG	0	0%	0	20			240		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
4-Chloroaniline	UG/KG	0	0%	0	20	2.44E+05		220		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	20					77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
4-Methylphenol	UG/KG	0	0%	0	4	3.06E+05		900		77 U	75 U	77 U	76 U			
4-Nitroaniline	UG/KG	0	0%	0	20	2.32E+04				190 U	180 U	190 U	180 U	920 U	920 U	1000 UJ
4-Nitrophenol	UG/KG	0	0%	0	20			100		190 U	180 U	190 U	180 U	920 U	920 U	1000 UJ
Acenaphthene	UG/KG	50	15%	3	20	3.68E+06		50000		77 U	20 J	13 J	76 U	370 U	370 U	410 UJ
Acenaphthylene	UG/KG	220	10%	2	20			41000		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
Anthracene	UG/KG	240	15%	3	20	2.19E+07		50000		77 U	41 J	19 J	76 U	370 U	370 U	410 UJ
Benzo(a)anthracene	UG/KG	5200	35%	7	20	6.21E+02	2	224	2	4.6 J	140	68 J	4.6 J	370 U	370 U	410 UJ
Benzo(a)pyrene	UG/KG	920	32%	6	19	6.21E+01	3	61	3	6.3 J	100	58 J	6 J	370 U	370 U	410 R
Benzo(b)fluoranthene	UG/KG	1300	42%	8	19	6.21E+02	1	1100	1	6.6 J	110	74 J	5.8 J	370 U	370 U	410 R
Benzo(ghi)perylene	UG/KG	210	37%	7	19			50000		12 J	65 J	54 J	6.2 J	370 U	370 U	410 R
Benzo(k)fluoranthene	UG/KG	490	32%	6	19	6.21E+03		1100		5.7 J	120	70 J	6.7 J	370 U	370 U	410 R
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	20					77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	20	2.18E+02				77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	20	2.88E+03				77 U	75 U	77 U	76 U	370 U	370 U	410 U
Bis(2-Ethylhexyl)phthalate	UG/KG	87	40%	8	20	3.47E+04		50000		10 J	21 J	39 J	14 J	370 U	370 U	410 UJ
Butylbenzylphthalate	UG/KG	39	10%	2	20	1.22E+07		50000		77 U	6.4 J	77 U	76 U	39 J	370 U	410 UJ
Carbazole	UG/KG	56	15%	3	20	2.43E+04				77 U	56 J	34 J	76 U	370 U	370 U	410 UJ
Chrysene	UG/KG	4900	35%	7	20	6.21E+04		400	2	5.5 J	160	82	7.8 J	370 U	370 U	410 UJ
Di-n-butylphthalate	UG/KG	19	10%	2	20	6.11E+06		8100		77 U	19 J	5.3 J	76 U	370 U	370 U	410 UJ
Di-n-octylphthalate	UG/KG	17	15%	3	20	2.44E+06		50000		9.8 J	17 J	77 U	3.9 J	370 U	370 U	410 UJ
Dibenz(a,h)anthracene	UG/KG	33	16%	3	19	6.21E+01		14	2	9.7 J	33 J	26 J	76 U	370 U	370 U	410 R
Dibenzofuran	UG/KG	45	15%	3	20	1.45E+05		6200		77 U	13 J	8 J	76 U	370 U	370 U	410 UJ
Diethyl phthalate	UG/KG	250	25%	5	20	4.89E+07		7100		8.9 J	6.8 J	18 J	4.7 J	370 U	370 U	410 UJ
Dimethylphthalate	UG/KG	0	0%	0	20	1.00E+08		2000		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
Fluoranthene	UG/KG	1600	40%	8	20	2.29E+06		50000		4.8 J	390	160	9.6 J	370 U	370 U	410 UJ
Fluorene	UG/KG	160	20%	4	20	2.75E+06		50000		77 U	22 J	12 J	76 U	370 U	370 U	410 UJ
Hexachlorobenzene	UG/KG	0	0%	0	20	3.04E+02		410		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
Hexachlorobutadiene	UG/KG	0	0%	0	20	6.24E+03				77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
Hexachlorocyclopentadiene	UG/KG	0	0%	0	20	3.65E+05				77 U	75 U	77 U	76 U	370 UJ	370 UJ	410 UJ
Hexachloroethane	UG/KG	0	0%	0	20	3.47E+04				77 U	75 U	77 U	76 U	370 U	370 U	410 U
Indeno(1,2,3-cd)pyrene	UG/KG	150	30%	6	20	6.21E+02		3200		8.6 J	58 J	48 J	5.9 J	370 U	370 U	410 UJ
Isophorone	UG/KG	0	0%	0	20	5.12E+05		4400		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
N-Nitrosodiphenylamine	UG/KG	0	0%	0	20	9.93E+04				77 U	75 U	77 U	76 U	370 U	370 U	410 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	20	6.95E+01				77 U	75 U	77 U	76 U	370 U	370 U	410 U
Naphthalene	UG/KG	1900	20%	4	20	5.59E+04		13000		77 U	12 J	6.9 J	76 U	370 U	370 U	1900 J
Nitrobenzene	UG/KG	0	0%	0	20	1.96E+04		200		77 U	75 U	77 U	76 U	370 U	370 U	410 UJ
Pentachlorophenol	UG/KG	0	0%	0	20	2.98E+03		1000		190 U	180 UJ	190 U	180 UJ	920 U	920 U	1000 UJ
Phenanthrene	UG/KG	1000	40%	8	20			50000		77 U	280	110	5.9 J	370 U	370 U	74 J
Phenol	UG/KG	0	0%	0	20	1.83E+07		30		77 U	75 U	77 U	76 U	370 U	370 U	410 U
Pyrene	UG/KG	1700	40%	8	20	2.32E+06		50000		4.7 J	290	130	8.1 J	370 U	370 U	410 U

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SB121C-1	SB121C-2	SB121C-3	SB121C-4	SBDRMO-10	SBDRMO-11	SBDRMO-12
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB232	EB228	EB234	EB230	DRMO-1057	DRMO-1060	DRMO-1063
Sample Depth to Top of Sample										2.5	2	2.5	2.5	2	2	2
Sample Depth to Bottom of Sample										3	2.5	3	3	6	6	6
Sample Date										3/9/1998	3/9/1998	3/9/1998	3/9/1998	10/25/2002	10/26/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	EBS	EBS	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**	**Region IX PRG Criteria Value [1]**	**Exceedances**	**NYSDEC Criteria Value [2]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Pesticides/PCBs																
4,4'-DDD	UG/KG	0	0%	0	16	2.44E+03		2900		3.8 U	3.8 U	3.8 U	3.8 U	1.9 R	1.9 UJ	2.1 R
4,4'-DDE	UG/KG	17	15%	3	20	1.72E+03		2100		3.8 U	13	17	2.5 J	1.9 UJ	1.9 UJ	2.1 UJ
4,4'-DDT	UG/KG	16	15%	3	20	1.72E+03		2100		3.8 U	9.8	16	3.8 U	1.9 UJ	1.9 UJ	2.1 UJ
Aldrin	UG/KG	11	5%	1	20	2.86E+01		41		2 U	1.9 U	2 U	2 U	1.9 UJ	1.9 UJ	2.1 UJ
Alpha-BHC	UG/KG	0	0%	0	20	9.02E+01		110		2 U	1.9 U	2 U	2 U	1.9 UJ	1.9 UJ	2.1 UJ
Alpha-Chlordane	UG/KG	0	0%	0	20					2 U	1.9 U	2 U	2 U	1.9 UJ	1.9 UJ	2.1 UJ
Beta-BHC	UG/KG	0	0%	0	20	3.16E+02		200		2 U	1.9 U	2 U	2 U	1.9 U	1.9 UJ	2.1 U
Chlordane	UG/KG	0	0%	0	16									19 U	19 U	21 U
Delta-BHC	UG/KG	1.3	5%	1	20			300		2 U	1.3 J	2 U	2 U	1.9 UJ	1.9 UJ	2.1 UJ
Dieldrin	UG/KG	0	0%	0	19	3.04E+01		44		3.8 U	3.8 U	3.8 U	3.8 U	1.9 UJ	1.9 UJ	2.1 UJ
Endosulfan I	UG/KG	78	5%	1	20			900		2 U	1.9 U	2 U	2 U	1.9 U	1.9 U	2.1 U
Endosulfan II	UG/KG	0	0%	0	20			900		3.8 U	3.8 U	3.8 U	3.8 U	1.9 U	1.9 U	2.1 U
Endosulfan sulfate	UG/KG	0	0%	0	20			1000		3.8 U	3.8 U	3.8 U	3.8 U	1.9 U	1.9 U	2.1 U
Endrin	UG/KG	23	5%	1	20	1.83E+04		100		3.8 U	3.8 U	3.8 U	3.8 U	1.9 UJ	1.9 U	2.1 UJ
Endrin aldehyde	UG/KG	0	0%	0	20					3.8 U	3.8 U	3.8 U	3.8 U	1.9 U	1.9 U	2.1 U
Endrin ketone	UG/KG	9.7	5%	1	20					3.8 U	3.8 U	3.8 U	3.8 U	1.9 U	1.9 U	2.1 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	20	4.37E+02		60		2 U	1.9 U	2 U	2 U	1.9 UJ	1.9 UJ	2.1 UJ
Gamma-Chlordane	UG/KG	0	0%	0	20			540		2 U	1.9 U	2 U	2 U	1.9 U	1.9 UJ	2.1 U
Heptachlor	UG/KG	0	0%	0	20	1.08E+02		100		2 U	1.9 U	2 U	2 U	1.9 U	1.9 UJ	2.1 U
Heptachlor epoxide	UG/KG	1.1	5%	1	19	5.34E+01		20		2 U	1.1 J	2 U	2 U	1.9 U	1.9 UJ	2.1 U
Methoxychlor	UG/KG	0	0%	0	20	3.06E+05				20 U	19 U	20 U	20 U	1.9 UJ	1.9 U	2.1 UJ
Toxaphene	UG/KG	0	0%	0	20	4.42E+02				200 U	190 U	200 U	200 U	19 U	19 U	21 U
Aroclor-1016	UG/KG	0	0%	0	20	3.93E+03				38 U	38 U	38 U	38 U	19 UJ	19 U	21 UJ
Aroclor-1221	UG/KG	0	0%	0	20					78 U	76 U	78 U	77 U	19 U	19 U	21 U
Aroclor-1232	UG/KG	0	0%	0	20					38 U	38 U	38 U	38 U	19 UJ	19 U	21 UJ
Aroclor-1242	UG/KG	0	0%	0	20					38 U	38 U	38 U	38 U	19 UJ	19 U	21 UJ
Aroclor-1248	UG/KG	0	0%	0	20					38 U	38 U	38 U	38 U	19 U	19 U	21 U
Aroclor-1254	UG/KG	0	0%	0	20	2.22E+02		10000		38 U	38 U	38 U	38 U	19 U	19 U	21 U
Aroclor-1260	UG/KG	200	15%	3	20			10000		38 U	200	21 J	38 U	19 UJ	19 U	21 UJ
Metals and Cyanide																
Aluminum	MG/KG	17600	100%	20	20	7.61E+04		19300		13400	16200	8880	15700	15000	10100	16100
Antimony	MG/KG	11.5	20%	4	20	3.13E+01		5.9	1	1.4 J	11.5 J	0.98 J	0.69 UJ	0.99 U	1 U	1.1 U
Arsenic	MG/KG	8.1	100%	20	20	3.90E-01	20	8.2		4.4	8.1	4.6	6.4	5.7	4.6	6.9
Barium	MG/KG	1050	100%	20	20	5.37E+03		300	1	64.2	1050	46.3	72.4	58.6 J	55.2 J	64.9 J
Beryllium	MG/KG	1	100%	20	20	1.54E+02		1.1		0.72	0.43	0.32	0.63	0.87	0.63	1
Cadmium	MG/KG	8.1	10%	2	20	3.70E+01		2.3	1	0.07 U	8.1	0.07 U	0.06 U	0.13 U	0.13 U	0.15 U
Calcium	MG/KG	97200	100%	20	20			121000		2280	31600	97200	13000	23000 J	43800 J	6830 J
Chromium	MG/KG	37	100%	20	20			29.6	3	21	37	13.1	30	25.6	17	26.3
Cobalt	MG/KG	19.7	100%	20	20	9.03E+02		30		9.4	16	7.7	19.7	15.8	11.1	18.7
Copper	MG/KG	2440	100%	20	20	3.13E+03		33	6	18.7 J	2440 J	20.6 J	39.1 J	26.4 J	35.7 J	27.3 J
Cyanide	MG/KG	0	0%	0	4	1.22E+06		0.35		0.65 U	0.63 U	0.58 U	0.63 U			
Cyanide, Amenable	MG/KG	0	0%	0	16									0.56 U	0.56 U	0.62 U
Cyanide, Total	MG/KG	0	0%	0	16									0.565 U	0.56 U	0.623 U
Iron	MG/KG	54100	100%	20	20	2.35E+04	15	36500	1	23800	54100	16500	35600	30700	21100	34400
Lead	MG/KG	1780	100%	20	20	4.00E+02	1	24.8	7	14.1 J	1780	39.9 J	26 J	8.4	14.4	11.3
Magnesium	MG/KG	24900	100%	20	20			21500	1	4040	6480	8000	7500	6700	11700	5890
Manganese	MG/KG	790	100%	20	20	1.76E+03		1060		299	752	473	394	550	378	591
Mercury	MG/KG	0.07	95%	18	19	2.35E+01		0.1		0.05	0.07	0.06 U	0.06	0.02	0.03	0.03
Nickel	MG/KG	69.7	100%	20	20	1.56E+03		49	3	35.8	56.6	22.3	69.7	44.5 J	32.1 J	41.9 J
Potassium	MG/KG	1870	100%	20	20			2380		1670	1220	1500	1870	1360 J	951 J	1220 J
Selenium	MG/KG	0	0%	0	20	3.91E+02		2		1.1 U	0.97 U	1.1 U	0.92 U	0.46 U	0.47 U	0.52 U

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses	Region IX PRG Criteria Value [1]	Exceedances	NYSDEC Criteria Value [2]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SB121C-1	SB121C-2	SB121C-3	SB121C-4	SBDRMO-10	SBDRMO-11	SBDRMO-12
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										EB232	EB228	EB234	EB230	DRMO-1057	DRMO-1060	DRMO-1063
Sample Depth to Top of Sample										2.5	2	2.5	2.5	2	2	2
Sample Depth to Bottom of Sample										3	2.5	3	3	6	6	6
Sample Date										3/9/1998	3/9/1998	3/9/1998	3/9/1998	10/25/2002	10/26/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	EBS	EBS	PID-RI	PID-RI	PID-RI
Silver	MG/KG	0.72	10%	2	20	3.91E+02		0.75		0.48 U	0.43 U	0.49 U	0.41 U	0.3 U	0.3 U	0.34 U
Sodium	MG/KG	214	70%	14	20			172	2	138 U	214	141 U	119 U	166	203	125 U
Thallium	MG/KG	1.8	10%	2	20	5.16E+00		0.7	2	1.4 UJ	1.3 UJ	1.5 UJ	1.2 UJ	0.34 U	0.35 U	0.39 U
Vanadium	MG/KG	27	100%	20	20	7.82E+01		150		21.8	19.3	14.4	21.7	23	15.8	25.3
Zinc	MG/KG	691	100%	20	20	2.35E+04		110	7	70.5	691	77.6	158	85.1	66.7	123
Other																
Total Organic Carbon	MG/KG	9500	100%	16	16									4600	5000	4000
Total Petroleum Hydrocarbons	MG/KG	3700	25%	4	16									45 UJ	45 UJ	50 UJ

NOTES:
1) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004
2) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994

U = compound was not detectec
J = the reported value is an estimated concentratioi
UJ = the compound was not detected; the associated reporting limit is approximat
R = the data was rejected in the data validating proces
NJ = compound was "tentatively identified" and the associated numerical value is approxima

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses	Region IX PRG Criteria Value [1]	Exceedances	NYSDEC Criteria Value [2]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-13	SBDRMO-14	SBDRMO-16	SBDRMO-17	SBDRMO-18	SBDRMO-20	SBDRMO-21
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1066	DRMO-1069	DRMO-1075	DRMO-1078	DRMO-1082	DRMO-1088	DRMO-1102
Sample Depth to Top of Sample										2	2	2	2	2	2	2
Sample Depth to Bottom of Sample										6	6	6	6	6	6	6
Sample Date										10/26/2002	10/25/2002	10/27/2002	10/28/2002	10/27/2002	10/26/2002	10/27/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Volatile Organic Compounds																
1,1,1-Trichloroethane	UG/KG	0	0%	0	20	1.20E+06		800		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 UJ	2.9 U
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	20	4.08E+02		600		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 UJ	2.9 U
1,1,2-Trichloroethane	UG/KG	0	0%	0	20	7.29E+02				3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
1,1-Dichloroethane	UG/KG	0	0%	0	20	5.06E+05		200		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
1,1-Dichloroethene	UG/KG	0	0%	0	20	1.24E+05		400		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
1,2-Dichloroethane	UG/KG	0	0%	0	20	2.78E+02		100		3.1 U	3 UJ	3 U	2.7 UJ	2.7 U	2.8 UJ	2.9 U
1,2-Dichloroethene (total)	UG/KG	0	0%	0	4											
1,2-Dichloropropane	UG/KG	0	0%	0	20	3.42E+02				3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Acetone	UG/KG	28	45%	9	20	1.41E+07		200		13 J	30 UJ	3 UJ	8.8 UJ	17 J	3.7 J	2.9 U
Benzene	UG/KG	1800	10%	2	20	6.43E+02	1	60	1	3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Bromodichloromethane	UG/KG	0	0%	0	20	8.24E+02				3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 UJ	2.9 U
Bromoform	UG/KG	0	0%	0	20	6.16E+04				3.1 UJ	3 U	3 UJ	2.7 UJ	2.7 UJ	2.8 U	2.9 U
Carbon disulfide	UG/KG	0	0%	0	20	3.55E+05		2700		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Carbon tetrachloride	UG/KG	0	0%	0	20	2.51E+02		600		3.1 U	3 UJ	3 U	2.7 UJ	2.7 U	2.8 UJ	2.9 UJ
Chlorobenzene	UG/KG	0	0%	0	20	1.51E+05		1700		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Chlorodibromomethane	UG/KG	0	0%	0	20	1.11E+03				3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Chloroethane	UG/KG	0	0%	0	20	3.03E+03		1900		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Chloroform	UG/KG	4	10%	2	20	2.21E+02		300		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	16	4.29E+04				3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	20					3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Ethyl benzene	UG/KG	24000	5%	1	20	3.95E+05		5500	1	3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Meta/Para Xylene	UG/KG	130000	6%	1	16					3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Methyl bromide	UG/KG	0	0%	0	20	3.90E+03				3.1 U	3 UJ	3 U	2.7 UJ	2.7 U	2.8 UJ	2.9 UJ
Methyl butyl ketone	UG/KG	0	0%	0	20					3.1 U	3 UJ	3 U	2.7 UJ	2.7 U	2.8 UJ	2.9 UJ
Methyl chloride	UG/KG	0	0%	0	20	4.69E+04				3.1 UJ	3 UJ	3 UJ	2.7 UJ	2.7 UJ	2.8 UJ	2.9 U
Methyl ethyl ketone	UG/KG	7.6	10%	2	20	2.23E+07		300		3.1 U	7.6 J	3 U	2.7 UJ	2.7 U	2.8 UJ	2.9 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	20	5.28E+06		1000		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 UJ	2.9 UJ
Methylene chloride	UG/KG	3.5	10%	2	20	9.11E+03		100		3.1 U	3 U	3 U	3.7 UJ	2.7 U	2.8 U	3 UJ
Ortho Xylene	UG/KG	75	6%	1	16					3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Styrene	UG/KG	2.7	5%	1	20	1.70E+06				3.1 UJ	3 U	3 UJ	2.7 UJ	2.7 UJ	2.8 U	2.9 U
Tetrachloroethene	UG/KG	0	0%	0	20	4.84E+02		1400		3.1 UJ	3 U	3 UJ	2.7 UJ	2.7 UJ	2.8 U	2.9 U
Toluene	UG/KG	84	20%	4	20	5.20E+05		1500		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Total Xylenes	UG/KG	0	0%	0	4	2.71E+05		1200								
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	16	6.95E+04		300		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	20					3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Trichloroethene	UG/KG	0	0%	0	20	5.30E+01		700		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Vinyl chloride	UG/KG	0	0%	0	20	7.91E+01		200		3.1 U	3 U	3 U	2.7 UJ	2.7 U	2.8 U	2.9 U
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	20	6.22E+04		3400		400 U	410 U	360 U	370 U	350 U	400 U	390 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	20	6.00E+05		7900		400 U	410 U	360 U	370 U	350 U	400 U	390 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	20	5.31E+05		1600		400 U	410 U	360 U	370 U	350 U	400 U	390 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	20	3.45E+03		8500		400 U	410 U	360 U	370 U	350 U	400 U	390 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	20	6.11E+06		100		1000 U	1000 U	900 U	930 U	880 U	1000 U	970 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	20	6.11E+03				400 U	410 U	360 U	370 U	350 U	400 U	390 U
2,4-Dichlorophenol	UG/KG	0	0%	0	20	1.83E+05		400		400 U	410 U	360 U	370 U	350 U	400 U	390 U
2,4-Dimethylphenol	UG/KG	0	0%	0	20	1.22E+06				400 U	410 U	360 U	370 U	350 U	400 U	390 U
2,4-Dinitrophenol	UG/KG	0	0%	0	19	1.22E+05		200		1000 U	1000 R	900 U	930 UJ	880 U	1000 UJ	970 U
2,4-Dinitrotoluene	UG/KG	0	0%	0	20	1.22E+05				400 U	410 U	360 U	370 U	350 U	400 U	390 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	20	6.11E+04		1000		400 U	410 U	360 U	370 U	350 U	400 U	390 U
2-Chloronaphthalene	UG/KG	0	0%	0	20	4.94E+06				400 U	410 U	360 U	370 U	350 U	400 U	390 U
2-Chlorophenol	UG/KG	0	0%	0	20	6.34E+04		800		400 U	410 U	360 U	370 U	350 U	400 U	390 U

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-13	SBDRMO-14	SBDRMO-16	SBDRMO-17	SBDRMO-18	SBDRMO-20	SBDRMO-21
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1066	DRMO-1069	DRMO-1075	DRMO-1078	DRMO-1082	DRMO-1088	DRMO-1102
Sample Depth to Top of Sample										2	2	2	2	2	2	2
Sample Depth to Bottom of Sample										6	6	6	6	6	6	6
Sample Date										10/26/2002	10/25/2002	10/27/2002	10/28/2002	10/27/2002	10/26/2002	10/27/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**	**Region IX PRG Criteria Value [1]**	**Exceedances**	**NYSDEC Criteria Value [2]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2-Methylnaphthalene	UG/KG	2500	20%	4	20			36400		400 U	410 U	360 U	370 U	350 U	400 U	390 U
2-Methylphenol	UG/KG	0	0%	0	20	3.06E+06		100		400 U	410 U	360 U	370 U	350 U	400 U	390 U
2-Nitroaniline	UG/KG	0	0%	0	20	1.83E+05		430		1000 U	1000 UJ	900 U	930 U	880 U	1000 U	970 UJ
2-Nitrophenol	UG/KG	0	0%	0	20			330		400 U	410 U	360 U	370 U	350 U	400 U	390 U
3 or 4-Methylphenol	UG/KG	0	0%	0	16					400 U	410 U	360 U	370 U	350 U	400 U	390 U
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	20	1.08E+03				400 U	410 U	360 U	370 U	350 U	400 U	390 U
3-Nitroaniline	UG/KG	0	0%	0	20	1.83E+04		500		1000 U	1000 U	900 U	930 U	880 U	1000 U	970 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	20	6.11E+03				1000 U	1000 UJ	900 U	930 U	880 U	1000 UJ	970 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	20					400 U	410 U	360 U	370 U	350 U	400 U	390 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	20			240		400 U	410 U	360 U	370 U	350 U	400 U	390 U
4-Chloroaniline	UG/KG	0	0%	0	20	2.44E+05		220		400 U	410 U	360 U	370 U	350 U	400 U	390 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	20					400 U	410 U	360 U	370 U	350 U	400 U	390 U
4-Methylphenol	UG/KG	0	0%	0	4	3.06E+05		900								
4-Nitroaniline	UG/KG	0	0%	0	20	2.32E+04				1000 U	1000 U	900 U	930 U	880 U	1000 U	970 UJ
4-Nitrophenol	UG/KG	0	0%	0	20			100		1000 U	1000 UJ	900 U	930 U	880 U	1000 U	970 U
Acenaphthene	UG/KG	50	15%	3	20	3.68E+06		50000		400 U	410 U	360 U	370 U	350 U	400 U	390 U
Acenaphthylene	UG/KG	220	10%	2	20			41000		400 U	410 U	220 J	370 U	350 U	400 U	390 U
Anthracene	UG/KG	240	15%	3	20	2.19E+07		50000		400 U	410 U	240 J	370 U	350 U	400 U	390 U
Benzo(a)anthracene	UG/KG	5200	35%	7	20	6.21E+02	2	224	2	400 U	410 U	940	370 U	350 U	400 U	390 U
Benzo(a)pyrene	UG/KG	920	32%	6	19	6.21E+01	3	61	3	400 U	410 U	920 J	370 UJ	350 U	400 U	390 U
Benzo(b)fluoranthene	UG/KG	1300	42%	8	19	6.21E+02	1	1100	1	400 U	54 J	1300 J	370 UJ	350 U	400 U	390 U
Benzo(ghi)perylene	UG/KG	210	37%	7	19			50000		400 U	67 J	210 J	370 UJ	350 UJ	400 U	390 UJ
Benzo(k)fluoranthene	UG/KG	490	32%	6	19	6.21E+03		1100		400 U	410 U	490 J	370 UJ	350 U	400 U	390 U
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	20					400 U	410 U	360 U	370 U	350 U	400 U	390 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	20	2.18E+02				400 U	410 U	360 UJ	370 U	350 UJ	400 U	390 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	20	2.88E+03				400 U	410 U	360 U	370 U	350 U	400 U	390 U
Bis(2-Ethylhexyl)phthalate	UG/KG	87	40%	8	20	3.47E+04		50000		400 U	410 U	37 J	370 U	41 J	400 U	66 J
Butylbenzylphthalate	UG/KG	39	10%	2	20	1.22E+07		50000		400 U	410 U	360 U	370 U	350 U	400 U	390 UJ
Carbazole	UG/KG	56	15%	3	20	2.43E+04				400 U	410 U	45 J	370 U	350 U	400 U	390 U
Chrysene	UG/KG	4900	35%	7	20	6.21E+04		400	2	400 U	410 U	880	370 U	350 U	400 U	390 U
Di-n-butylphthalate	UG/KG	19	10%	2	20	6.11E+06		8100		400 U	410 U	360 U	370 U	350 U	400 U	390 U
Di-n-octylphthalate	UG/KG	17	15%	3	20	2.44E+06		50000		400 U	410 U	360 U	370 U	350 U	400 U	390 U
Dibenz(a,h)anthracene	UG/KG	33	16%	3	19	6.21E+01		14	2	400 U	410 UJ	360 UJ	370 UJ	350 UJ	400 U	390 UJ
Dibenzofuran	UG/KG	45	15%	3	20	1.45E+05		6200		400 U	410 U	45 J	370 U	350 U	400 U	390 U
Diethyl phthalate	UG/KG	250	25%	5	20	4.89E+07		7100		400 U	410 U	360 U	370 U	350 U	400 U	390 U
Dimethylphthalate	UG/KG	0	0%	0	20	1.00E+08		2000		400 U	410 U	360 U	370 U	350 U	400 U	390 U
Fluoranthene	UG/KG	1600	40%	8	20	2.29E+06		50000		400 U	110 J	1600	370 U	350 U	400 U	390 U
Fluorene	UG/KG	160	20%	4	20	2.75E+06		50000		400 U	410 U	160 J	370 U	350 U	400 U	390 U
Hexachlorobenzene	UG/KG	0	0%	0	20	3.04E+02		410		400 U	410 U	360 U	370 U	350 U	400 U	390 U
Hexachlorobutadiene	UG/KG	0	0%	0	20	6.24E+03				400 U	410 U	360 U	370 U	350 U	400 U	390 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	20	3.65E+05				400 UJ	410 UJ	360 U	370 UJ	350 U	400 UJ	390 U
Hexachloroethane	UG/KG	0	0%	0	20	3.47E+04				400 U	410 U	360 U	370 U	350 U	400 U	390 U
Indeno(1,2,3-cd)pyrene	UG/KG	150	30%	6	20	6.21E+02		3200		400 U	410 UJ	150 J	370 U	350 UJ	400 U	390 UJ
Isophorone	UG/KG	0	0%	0	20	5.12E+05		4400		400 U	410 U	360 U	370 U	350 U	400 U	390 U
N-Nitrosodiphenylamine	UG/KG	0	0%	0	20	9.93E+04				400 U	410 U	360 U	370 U	350 U	400 U	390 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	20	6.95E+01				400 U	410 UJ	360 U	370 U	350 U	400 U	390 UJ
Naphthalene	UG/KG	1900	20%	4	20	5.59E+04		13000		400 U	410 U	360 U	370 U	350 U	400 U	390 U
Nitrobenzene	UG/KG	0	0%	0	20	1.96E+04		200		400 U	410 U	360 U	370 U	350 U	400 U	390 U
Pentachlorophenol	UG/KG	0	0%	0	20	2.98E+03		1000		1000 U	1000 U	900 U	930 U	880 U	1000 U	970 U
Phenanthrene	UG/KG	1000	40%	8	20			50000		400 U	66 J	1000	370 U	350 U	400 U	390 U
Phenol	UG/KG	0	0%	0	20	1.83E+07		30		400 U	410 U	360 U	370 U	350 U	400 U	390 U
Pyrene	UG/KG	1700	40%	8	20	2.32E+06		50000		400 U	120 J	1700	370 U	350 U	400 U	390 UJ

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-13	SBDRMO-14	SBDRMO-16	SBDRMO-17	SBDRMO-18	SBDRMO-20	SBDRMO-21
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1066	DRMO-1069	DRMO-1075	DRMO-1078	DRMO-1082	DRMO-1088	DRMO-1102
Sample Depth to Top of Sample										2	2	2	2	2	2	2
Sample Depth to Bottom of Sample										6	6	6	6	6	6	6
Sample Date										10/26/2002	10/25/2002	10/27/2002	10/28/2002	10/27/2002	10/26/2002	10/27/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**	**Region IX PRG Criteria Value [1]**	**Exceedances**	**NYSDEC Criteria Value [2]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Pesticides/PCBs																
4,4'-DDD	UG/KG	0	0%	0	16	2.44E+03		2900		2 UJ	2.1 R	1.9 UJ	0.22 U	1.8 UJ	2.1 UJ	2 UJ
4,4'-DDE	UG/KG	17	15%	3	20	1.72E+03		2100		2 UJ	2.1 UJ	1.9 UJ	0.22 UJ	1.8 UJ	2.1 UJ	2 UJ
4,4'-DDT	UG/KG	16	15%	3	20	1.72E+03		2100		2 UJ	2.1 UJ	14 J	0.22 UJ	1.8 UJ	2.1 UJ	2 UJ
Aldrin	UG/KG	11	5%	1	20	2.86E+01		41		2 UJ	2.1 UJ	11 J	0.11 U	1.8 UJ	2.1 UJ	2 UJ
Alpha-BHC	UG/KG	0	0%	0	20	9.02E+01		110		2 UJ	2.1 UJ	1.9 UJ	1.3 U	1.8 UJ	2.1 UJ	2 UJ
Alpha-Chlordane	UG/KG	0	0%	0	20					2 UJ	2.1 UJ	1.9 UJ	0.34 U	1.8 UJ	2.1 UJ	2 UJ
Beta-BHC	UG/KG	0	0%	0	20	3.16E+02		200		2 UJ	2.1 U	1.9 UJ	0.11 U	1.8 UJ	2.1 UJ	2 UJ
Chlordane	UG/KG	0	0%	0	16					20 U	21 U	19 U	2.1 U	18 U	21 U	20 U
Delta-BHC	UG/KG	1.3	5%	1	20			300		2 UJ	2.1 UJ	1.9 UJ	0.22 UJ	1.8 UJ	2.1 UJ	2 UJ
Dieldrin	UG/KG	0	0%	0	19	3.04E+01		44		2 UJ	2.1 UJ	65 R	0.11 UJ	1.8 UJ	2.1 UJ	2 UJ
Endosulfan I	UG/KG	78	5%	1	20			900		2 U	2.1 U	78	0.56 U	1.8 U	2.1 U	2 U
Endosulfan II	UG/KG	0	0%	0	20			900		2 U	2.1 U	1.9 U	0.34 U	1.8 U	2.1 U	2 U
Endosulfan sulfate	UG/KG	0	0%	0	20			1000		2 U	2.1 U	1.9 U	0.67 U	1.8 U	2.1 U	2 U
Endrin	UG/KG	23	5%	1	20	1.83E+04		100		2 UJ	2.1 UJ	23 J	0.9 UJ	1.8 UJ	2.1 U	2 U
Endrin aldehyde	UG/KG	0	0%	0	20					2 U	2.1 U	1.9 U	0.9 UJ	1.8 U	2.1 U	2 U
Endrin ketone	UG/KG	9.7	5%	1	20					2 U	2.1 U	9.7 NJ	0.11 U	1.8 U	2.1 U	2 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	20	4.37E+02		60		2 UJ	2.1 UJ	1.9 UJ	0.11 U	1.8 UJ	2.1 UJ	2 UJ
Gamma-Chlordane	UG/KG	0	0%	0	20			540		2 UJ	2.1 U	1.9 UJ	0.34 U	1.8 UJ	2.1 UJ	2 UJ
Heptachlor	UG/KG	0	0%	0	20	1.08E+02		100		2 UJ	2.1 U	1.9 UJ	1.1 U	1.8 UJ	2.1 UJ	2 UJ
Heptachlor epoxide	UG/KG	1.1	5%	1	19	5.34E+01		20		2 UJ	2.1 U	24 R	0.34 U	1.8 UJ	2.1 UJ	2 UJ
Methoxychlor	UG/KG	0	0%	0	20	3.06E+05				2 U	2.1 UJ	1.9 U	0.11 U	1.8 U	2.1 U	2 U
Toxaphene	UG/KG	0	0%	0	20	4.42E+02				20 U	21 U	19 U	3.6 U	18 U	21 U	20 U
Aroclor-1016	UG/KG	0	0%	0	20	3.93E+03				20 UJ	21 UJ	19 UJ	5.8 UJ	18 UJ	21 U	20 UJ
Aroclor-1221	UG/KG	0	0%	0	20					20 U	21 U	19 U	1.5 U	18 U	21 U	20 U
Aroclor-1232	UG/KG	0	0%	0	20					20 UJ	21 UJ	19 UJ	9 UJ	18 UJ	21 U	20 UJ
Aroclor-1242	UG/KG	0	0%	0	20					20 U	21 UJ	19 UJ	2.5 U	18 UJ	21 U	20 UJ
Aroclor-1248	UG/KG	0	0%	0	20					20 U	21 U	19 U	6.2 U	18 U	21 U	20 U
Aroclor-1254	UG/KG	0	0%	0	20	2.22E+02		10000		20 U	21 U	19 UJ	12 UJ	18 UJ	21 U	20 U
Aroclor-1260	UG/KG	200	15%	3	20			10000		20 U	21 UJ	22 J	2.2 UJ	18 UJ	21 U	20 UJ
Metals and Cyanide																
Aluminum	MG/KG	17600	100%	20	20	7.61E+04		19300		17600	12500	10300	15200 J	13800	15500	12500
Antimony	MG/KG	11.5	20%	4	20	3.13E+01		5.9	1	1.1 U	1.1 U	0.99 U	0.78 J	0.96 U	1.1 U	1.1 U
Arsenic	MG/KG	8.1	100%	20	20	3.90E-01	20	8.2		6	4.6	4.7	4.4 J	5.2	4.2	5.9
Barium	MG/KG	1050	100%	20	20	5.37E+03		300	1	78	103 J	57.5	81 J	64.4	95.7 J	115 J
Beryllium	MG/KG	1	100%	20	20	1.54E+02		1.1		1	0.76	0.55	0.85 J	0.68	0.96	0.8
Cadmium	MG/KG	8.1	10%	2	20	3.70E+01		2.3	1	0.14 U	0.15 U	0.14 J	0.06 U	0.13 U	0.14 U	0.14 U
Calcium	MG/KG	97200	100%	20	20			121000		18400	2890 J	66000	18300 J	26200	9560 J	22100 J
Chromium	MG/KG	37	100%	20	20			29.6	3	28.1	22.7	20	28.9 J	25.8	24.8	19.2
Cobalt	MG/KG	19.7	100%	20	20	9.03E+02		30		18.2	11.3	11.5	14.5 J	14.7	14.1	14.3
Copper	MG/KG	2440	100%	20	20	3.13E+03		33	6	25.7	16.7 J	24.9	27 J	38.7	20.8 J	20.9 J
Cyanide	MG/KG	0	0%	0	4	1.22E+06		0.35								
Cyanide, Amenable	MG/KG	0	0%	0	16					0.6 U	0.63 U	0.55 U	0.57 U	0.54 U	0.6 U	0.59 U
Cyanide, Total	MG/KG	0	0%	0	16					0.6 U	0.631 U	0.549 U	0.568 U	0.539 U	0.613 U	0.588 U
Iron	MG/KG	54100	100%	20	20	2.35E+04	15	36500	1	33700	24000	21000	27100 J	30000	27900	26200
Lead	MG/KG	1780	100%	20	20	4.00E+02	1	24.8	7	11.3	16.6	45.5	11.3 J	31	18	16.1
Magnesium	MG/KG	24900	100%	20	20			21500	1	6490	4110	8760	6590 J	7720	5230	6630
Manganese	MG/KG	790	100%	20	20	1.76E+03		1060		754	402	475	643 J	470	658	724
Mercury	MG/KG	0.07	95%	18	19	2.35E+01		0.1			0.01	0.03	0.03	0.04	0.04 J	0.03
Nickel	MG/KG	69.7	100%	20	20	1.56E+03		49	3	44.3 J	29.1 J	31.5	42.6 J	44.7 J	34.1 J	32.5 J
Potassium	MG/KG	1870	100%	20	20			2380		1570 J	1160 J	1330 J	1560 J	1220 J	1640 E	1210 J
Selenium	MG/KG	0	0%	0	20	3.91E+02		2		0.5 U	0.52 U	0.46 U	0.38 U	0.45 U	0.5 U	0.49 U

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses	Region IX PRG Criteria Value [1]	Exceedances	NYSDEC Criteria Value [2]	Exceedances							
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-13	SBDRMO-14	SBDRMO-16	SBDRMO-17	SBDRMO-18	SBDRMO-20	SBDRMO-21
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1066	DRMO-1069	DRMO-1075	DRMO-1078	DRMO-1082	DRMO-1088	DRMO-1102
Sample Depth to Top of Sample										2	2	2	2	2	2	2
Sample Depth to Bottom of Sample										6	6	6	6	6	6	6
Sample Date										10/26/2002	10/25/2002	10/27/2002	10/28/2002	10/27/2002	10/26/2002	10/27/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Silver	MG/KG	0.72	10%	2	20	3.91E+02		0.75		0.32 U	0.33 U	0.3 U	0.72 J	0.29 U	0.32 U	0.32 U
Sodium	MG/KG	214	70%	14	20			172	2	141	133	161	104	152	119 U	129
Thallium	MG/KG	1.8	10%	2	20	5.16E+00		0.7	2	0.37 U	0.38 U	0.34 U	1.1 J	0.33 U	0.37 U	0.36 U
Vanadium	MG/KG	27	100%	20	20	7.82E+01		150		27 J	20.7	18.1 J	20.6 J	20.3 J	25.3	23
Zinc	MG/KG	691	100%	20	20	2.35E+04		110	7	89.1 J	110	105 J	75 J	130 J	86.5	70.7
Other																
Total Organic Carbon	MG/KG	9500	100%	16	16					5100	5400	4200	6700	3500	5900	6900
Total Petroleum Hydrocarbons	MG/KG	3700	25%	4	16					48 UJ	51 UJ	3700 J	2200 J	43 J	49 UJ	47 UJ

NOTES:

1) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004

2) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximat
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approxima

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-23	SBDRMO-24	SBDRMO-5	SBDRMO-6	SBDRMO-7	SBDRMO-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1096	DRMO-1099	DRMO-1041	DRMO-1044	DRMO-1047	DRMO-1054
Sample Depth to Top of Sample										2	2	2	2	2	2
Sample Depth to Bottom of Sample										6	6	6	6	6	6
Sample Date										10/28/2002	10/28/2002	10/27/2002	10/25/2002	10/27/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**	**Region IX PRG Criteria Value [1]**	**Exceedances**	**NYSDEC Criteria Value [2]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	20	1.20E+06		800		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	20	4.08E+02		600		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	20	7.29E+02				2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	20	5.06E+05		200		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	20	1.24E+05		400		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	20	2.78E+02		100		2.8 UJ	3.2 U	2.8 U	2.2 UJ	2.6 U	2.9 UJ
1,2-Dichloroethene (total)	UG/KG	0	0%	0	4										
1,2-Dichloropropane	UG/KG	0	0%	0	20	3.42E+02				2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Acetone	UG/KG	28	45%	9	20	1.41E+07		200		5.7 UJ	22	14 J	2.2 U	2.6 UJ	2.9 UJ
Benzene	UG/KG	1800	10%	2	20	6.43E+02	1	60	1	2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	1800 J
Bromodichloromethane	UG/KG	0	0%	0	20	8.24E+02				2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Bromoform	UG/KG	0	0%	0	20	6.16E+04				2.8 UJ	3.2 U	2.8 UJ	2.2 U	2.6 UJ	2.9 UJ
Carbon disulfide	UG/KG	0	0%	0	20	3.55E+05		2700		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Carbon tetrachloride	UG/KG	0	0%	0	20	2.51E+02		600		2.8 UJ	3.2 U	2.8 U	2.2 UJ	2.6 U	2.9 UJ
Chlorobenzene	UG/KG	0	0%	0	20	1.51E+05		1700		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Chlorodibromomethane	UG/KG	0	0%	0	20	1.11E+03				2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Chloroethane	UG/KG	0	0%	0	20	3.03E+03		1900		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Chloroform	UG/KG	4	10%	2	20	2.21E+02		300		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	16	4.29E+04				2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	20					2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Ethyl benzene	UG/KG	24000	5%	1	20	3.95E+05		5500	1	2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	24000 J
Meta/Para Xylene	UG/KG	130000	6%	1	16					2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	130000 J
Methyl bromide	UG/KG	0	0%	0	20	3.90E+03				2.8 UJ	3.2 U	2.8 U	2.2 UJ	2.6 U	2.9 UJ
Methyl butyl ketone	UG/KG	0	0%	0	20					2.8 UJ	3.2 U	2.8 U	2.2 UJ	2.6 U	2.9 UJ
Methyl chloride	UG/KG	0	0%	0	20	4.69E+04				2.8 UJ	3.2 U	2.8 UJ	2.2 UJ	2.6 UJ	2.9 UJ
Methyl ethyl ketone	UG/KG	7.6	10%	2	20	2.23E+07		300		2.8 UJ	3.2	2.8 U	2.2 UJ	2.6 U	2.9 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	20	5.28E+06		1000		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Methylene chloride	UG/KG	3.5	10%	2	20	9.11E+03		100		3.9 UJ	3.5	2.8 U	2.2 U	2.6 U	2.9 UJ
Ortho Xylene	UG/KG	75	6%	1	16					2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	75
Styrene	UG/KG	2.7	5%	1	20	1.70E+06				2.8 UJ	3.2 U	2.8 UJ	2.2 U	2.6 UJ	2.7 J
Tetrachloroethene	UG/KG	0	0%	0	20	4.84E+02		1400		2.8 UJ	3.2 U	2.8 UJ	2.2 U	2.6 UJ	2.9 UJ
Toluene	UG/KG	84	20%	4	20	5.20E+05		1500		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	84
Total Xylenes	UG/KG	0	0%	0	4	2.71E+05		1200							
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	16	6.95E+04		300		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	20					2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Trichloroethene	UG/KG	0	0%	0	20	5.30E+01		700		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Vinyl chloride	UG/KG	0	0%	0	20	7.91E+01		200		2.8 UJ	3.2 U	2.8 U	2.2 U	2.6 U	2.9 UJ
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	20	6.22E+04		3400		370 U	400 U	370 U	350 U	350 UJ	390 UJ
1,2-Dichlorobenzene	UG/KG	0	0%	0	20	6.00E+05		7900		370 U	400 U	370 U	350 U	350 U	390 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	20	5.31E+05		1600		370 U	400 U	370 U	350 U	350 U	390 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	20	3.45E+03		8500		370 U	400 U	370 U	350 U	350 U	390 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	20	6.11E+06		100		940 U	1000 U	920 U	890 U	890 U	970 UJ
2,4,6-Trichlorophenol	UG/KG	0	0%	0	20	6.11E+03				370 U	400 U	370 U	350 U	350 U	390 UJ
2,4-Dichlorophenol	UG/KG	0	0%	0	20	1.83E+05		400		370 U	400 U	370 U	350 U	350 U	390 UJ
2,4-Dimethylphenol	UG/KG	0	0%	0	20	1.22E+06				370 U	400 U	370 U	350 U	350 U	390 UJ
2,4-Dinitrophenol	UG/KG	0	0%	0	19	1.22E+05		200		940 UJ	1000 UJ	920 U	890 UJ	890 UJ	970 UJ
2,4-Dinitrotoluene	UG/KG	0	0%	0	20	1.22E+05				370 U	400 U	370 U	350 U	350 U	390 UJ
2,6-Dinitrotoluene	UG/KG	0	0%	0	20	6.11E+04		1000		370 U	400 U	370 U	350 U	350 U	390 UJ
2-Chloronaphthalene	UG/KG	0	0%	0	20	4.94E+06				370 U	400 U	370 U	350 U	350 U	390 UJ
2-Chlorophenol	UG/KG	0	0%	0	20	6.34E+04		800		370 U	400 U	370 U	350 U	350 UJ	390 U

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-23	SBDRMO-24	SBDRMO-5	SBDRMO-6	SBDRMO-7	SBDRMO-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1096	DRMO-1099	DRMO-1041	DRMO-1044	DRMO-1047	DRMO-1054
Sample Depth to Top of Sample										2	2	2	2	2	2
Sample Depth to Bottom of Sample										6	6	6	6	6	6
Sample Date										10/28/2002	10/28/2002	10/27/2002	10/25/2002	10/27/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**	**Region IX PRG Criteria Value [1]**	**Exceedances**	**NYSDEC Criteria Value [2]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2-Methylnaphthalene	UG/KG	2500	20%	4	20			36400		370 U	400 U	370 U	350 U	350 U	1600 J
2-Methylphenol	UG/KG	0	0%	0	20	3.06E+06		100		370 U	400 U	370 U	350 U	350 U	390 U
2-Nitroaniline	UG/KG	0	0%	0	20	1.83E+05		430		940 U	1000 U	920 U	890 U	890 U	970 UJ
2-Nitrophenol	UG/KG	0	0%	0	20			330		370 U	400 U	370 U	350 U	350 U	390 UJ
3 or 4-Methylphenol	UG/KG	0	0%	0	16					370 U	400 U	370 U	350 U	350 U	390 UJ
3,3'-Dichlorobenzidine	UG/KG	0	0%	0	20	1.08E+03				370 U	400 U	370 U	350 UJ	350 U	390 UJ
3-Nitroaniline	UG/KG	0	0%	0	20	1.83E+04		500		940 UJ	1000 U	920 U	890 U	890 U	970 UJ
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	20	6.11E+03				940 UJ	1000 U	920 U	890 UJ	890 UJ	970 UJ
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	20					370 U	400 U	370 U	350 U	350 U	390 UJ
4-Chloro-3-methylphenol	UG/KG	0	0%	0	20			240		370 U	400 U	370 U	350 U	350 U	390 UJ
4-Chloroaniline	UG/KG	0	0%	0	20	2.44E+05		220		370 U	400 U	370 U	350 U	350 U	390 UJ
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	20					370 U	400 U	370 U	350 U	350 U	390 UJ
4-Methylphenol	UG/KG	0	0%	0	4	3.06E+05		900							
4-Nitroaniline	UG/KG	0	0%	0	20	2.32E+04				940 U	1000 U	920 U	890 U	890 U	970 UJ
4-Nitrophenol	UG/KG	0	0%	0	20			100		940 U	1000 U	920 U	890 U	890 U	970 UJ
Acenaphthene	UG/KG	50	15%	3	20	3.68E+06		50000		370 U	50 J	370 U	350 U	350 U	390 UJ
Acenaphthylene	UG/KG	220	10%	2	20			41000		370 U	73 J	370 U	350 U	350 U	390 UJ
Anthracene	UG/KG	240	15%	3	20	2.19E+07		50000		370 U	400 U	370 U	350 U	350 U	390 UJ
Benzo(a)anthracene	UG/KG	5200	35%	7	20	6.21E+02	2	224	2	5200	130 J	370 U	350 UJ	350 U	390 UJ
Benzo(a)pyrene	UG/KG	920	32%	6	19	6.21E+01	3	61	3	370 U	200 J	370 U	350 UJ	350 U	390 UJ
Benzo(b)fluoranthene	UG/KG	1300	42%	8	19	6.21E+02	1	1100	1	370 U	170 J	43 J	350 UJ	350 U	390 UJ
Benzo(ghi)perylene	UG/KG	210	37%	7	19			50000		370 UJ	100 J	370 UJ	350 UJ	350 UJ	390 UJ
Benzo(k)fluoranthene	UG/KG	490	32%	6	19	6.21E+03		1100		370 U	120 J	370 U	350 UJ	350 U	390 UJ
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	20					370 U	400 U	370 U	350 U	350 UJ	390 UJ
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	20	2.18E+02				370 UJ	400 UJ	370 UJ	350 U	350 U	390 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	20	2.88E+03				370 U	400 U	370 U	350 U	350 U	390 UJ
Bis(2-Ethylhexyl)phthalate	UG/KG	87	40%	8	20	3.47E+04		50000		370 U	400 U	87 J	350 UJ	350 U	390 UJ
Butylbenzylphthalate	UG/KG	39	10%	2	20	1.22E+07		50000		370 U	400 U	370 U	350 UJ	350 U	390 UJ
Carbazole	UG/KG	56	15%	3	20	2.43E+04				370 U	400 U	370 U	350 U	350 U	390 UJ
Chrysene	UG/KG	4900	35%	7	20	6.21E+04		400	2	4900	140 J	370 U	350 UJ	350 U	390 UJ
Di-n-butylphthalate	UG/KG	19	10%	2	20	6.11E+06		8100		370 U	400 U	370 U	350 U	350 U	390 UJ
Di-n-octylphthalate	UG/KG	17	15%	3	20	2.44E+06		50000		370 U	400 U	370 U	350 UJ	350 UJ	390 UJ
Dibenz(a,h)anthracene	UG/KG	33	16%	3	19	6.21E+01		14	2	370 UJ	400 U	370 UJ	350 UJ	350 UJ	390 UJ
Dibenzofuran	UG/KG	45	15%	3	20	1.45E+05		6200		370 U	400 U	370 U	350 U	350 U	390 UJ
Diethyl phthalate	UG/KG	250	25%	5	20	4.89E+07		7100		370 U	250 J	370 U	350 U	350 U	390 UJ
Dimethylphthalate	UG/KG	0	0%	0	20	1.00E+08		2000		370 U	400 U	370 U	350 U	350 U	390 UJ
Fluoranthene	UG/KG	1600	40%	8	20	2.29E+06		50000		370 U	210 J	62 J	350 U	350 U	390 UJ
Fluorene	UG/KG	160	20%	4	20	2.75E+06		50000		370 U	54 J	370 U	350 U	350 U	390 UJ
Hexachlorobenzene	UG/KG	0	0%	0	20	3.04E+02		410		370 U	400 U	370 U	350 U	350 U	390 UJ
Hexachlorobutadiene	UG/KG	0	0%	0	20	6.24E+03				370 UJ	400 U	370 U	350 U	350 UJ	390 UJ
Hexachlorocyclopentadiene	UG/KG	0	0%	0	20	3.65E+05				370 U	400 U	370 U	350 UJ	350 U	390 UJ
Hexachloroethane	UG/KG	0	0%	0	20	3.47E+04				370 U	400 U	370 U	350 U	350 U	390 U
Indeno(1,2,3-cd)pyrene	UG/KG	150	30%	6	20	6.21E+02		3200		370 U	99 J	370 UJ	350 UJ	350 UJ	390 UJ
Isophorone	UG/KG	0	0%	0	20	5.12E+05		4400		370 UJ	400 U	370 U	350 U	350 UJ	390 UJ
N-Nitrosodiphenylamine	UG/KG	0	0%	0	20	9.93E+04				370 U	400 U	370 U	350 U	350 U	390 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	20	6.95E+01				370 U	400 U	370 U	350 U	350 U	390 U
Naphthalene	UG/KG	1900	20%	4	20	5.59E+04		13000		370 U	400 U	370 U	350 U	350 UJ	1200 J
Nitrobenzene	UG/KG	0	0%	0	20	1.96E+04		200		370 UJ	400 UJ	370 U	350 U	350 UJ	390 UJ
Pentachlorophenol	UG/KG	0	0%	0	20	2.98E+03		1000		940 U	1000 U	920 U	890 U	890 U	970 UJ
Phenanthrene	UG/KG	1000	40%	8	20			50000		370 U	170 J	370 U	350 U	350 U	62 J
Phenol	UG/KG	0	0%	0	20	1.83E+07		30		370 U	400 U	370 U	350 U	350 U	390 U
Pyrene	UG/KG	1700	40%	8	20	2.32E+06		50000		370 U	260 J	50 J	350 UJ	350 U	390 UJ

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-23	SBDRMO-24	SBDRMO-5	SBDRMO-6	SBDRMO-7	SBDRMO-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1096	DRMO-1099	DRMO-1041	DRMO-1044	DRMO-1047	DRMO-1054
Sample Depth to Top of Sample										2	2	2	2	2	2
Sample Depth to Bottom of Sample										6	6	6	6	6	6
Sample Date										10/28/2002	10/28/2002	10/27/2002	10/25/2002	10/27/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**	**Region IX PRG Criteria Value [1]**	**Exceedances**	**NYSDEC Criteria Value [2]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Pesticides/PCBs															
4,4'-DDD	UG/KG	0	0%	0	16	2.44E+03		2900		0.23 U	0.24 U	1.9 UJ	1.8 UJ	1.8 UJ	2 R
4,4'-DDE	UG/KG	17	15%	3	20	1.72E+03		2100		0.23 UJ	0.24 UJ	1.9 UJ	1.8 UJ	1.8 UJ	2 UJ
4,4'-DDT	UG/KG	16	15%	3	20	1.72E+03		2100		0.23 UJ	0.24 UJ	1.9 UJ	1.8 UJ	1.8 UJ	2 UJ
Aldrin	UG/KG	11	5%	1	20	2.86E+01		41		0.11 U	0.12 U	1.9 UJ	1.8 UJ	1.8 UJ	2 UJ
Alpha-BHC	UG/KG	0	0%	0	20	9.02E+01		110		1.4 U	1.5 U	1.9 UJ	1.8 UJ	1.8 UJ	2 UJ
Alpha-Chlordane	UG/KG	0	0%	0	20					0.34 U	0.37 U	1.9 UJ	1.8 UJ	1.8 UJ	2 UJ
Beta-BHC	UG/KG	0	0%	0	20	3.16E+02		200		0.11 U	0.12 U	1.9 UJ	1.8 UJ	1.8 UJ	2 U
Chlordane	UG/KG	0	0%	0	16					2.1 U	2.3 U	19 U	18 U	18 U	20 U
Delta-BHC	UG/KG	1.3	5%	1	20			300		0.23 UJ	0.24 UJ	1.9 UJ	1.8 UJ	1.8 UJ	2 UJ
Dieldrin	UG/KG	0	0%	0	19	3.04E+01		44		0.11 UJ	0.12 UJ	1.9 UJ	1.8 UJ	1.8 UJ	2 UJ
Endosulfan I	UG/KG	78	5%	1	20			900		0.56 U	0.61 U	1.9 U	1.8 U	1.8 U	2 U
Endosulfan II	UG/KG	0	0%	0	20			900		0.34 U	0.37 U	1.9 U	1.8 U	1.8 U	2 U
Endosulfan sulfate	UG/KG	0	0%	0	20			1000		0.68 U	0.73 U	1.9 U	1.8 U	1.8 U	2 U
Endrin	UG/KG	23	5%	1	20	1.83E+04		100		0.9 UJ	0.97 UJ	1.9 UJ	1.8 U	1.8 UJ	2 UJ
Endrin aldehyde	UG/KG	0	0%	0	20					0.9 UJ	0.97 UJ	1.9 U	1.8 U	1.8 U	2 U
Endrin ketone	UG/KG	9.7	5%	1	20					0.11 U	0.12 U	1.9 U	1.8 U	1.8 U	2 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	20	4.37E+02		60		0.11 U	0.12 U	1.9 UJ	1.8 UJ	1.8 UJ	2 UJ
Gamma-Chlordane	UG/KG	0	0%	0	20			540		0.34 U	0.37 U	1.9 UJ	1.8 UJ	1.8 UJ	2 U
Heptachlor	UG/KG	0	0%	0	20	1.08E+02		100		1.1 U	1.2 U	1.9 UJ	1.8 UJ	1.8 UJ	2 U
Heptachlor epoxide	UG/KG	1.1	5%	1	19	5.34E+01		20		0.34 U	0.37 U	1.9 UJ	1.8 UJ	1.8 UJ	2 U
Methoxychlor	UG/KG	0	0%	0	20	3.06E+05				0.11 U	0.12 U	1.9 U	1.8 U	1.8 U	2 UJ
Toxaphene	UG/KG	0	0%	0	20	4.42E+02				3.6 U	3.9 U	19 U	18 U	18 U	20 U
Aroclor-1016	UG/KG	0	0%	0	20	3.93E+03				5.9 UJ	6.3 UJ	19 UJ	18 U	18 UJ	20 U
Aroclor-1221	UG/KG	0	0%	0	20					1.5 U	1.6 U	19 U	18 U	18 U	20 U
Aroclor-1232	UG/KG	0	0%	0	20					9.1 UJ	9.7 UJ	19 UJ	18 U	18 UJ	20 U
Aroclor-1242	UG/KG	0	0%	0	20					2.5 U	2.7 U	19 U	18 U	18 U	20 U
Aroclor-1248	UG/KG	0	0%	0	20					6.2 U	6.7 U	19 U	18 U	18 U	20 U
Aroclor-1254	UG/KG	0	0%	0	20	2.22E+02		10000		12 UJ	13 UJ	19 U	18 U	18 U	20 U
Aroclor-1260	UG/KG	200	15%	3	20			10000		2.3 UJ	2.4 UJ	19 U	18 U	18 U	20 U
Metals and Cyanide															
Aluminum	MG/KG	17600	100%	20	20	7.61E+04		19300		7070 J	14900 J	14100	11600	16100	12300
Antimony	MG/KG	11.5	20%	4	20	3.13E+01		5.9	1	0.26 U	0.28 U	1 U	0.96 U	0.97 U	1.1 U
Arsenic	MG/KG	8.1	100%	20	20	3.90E-01	20	8.2		2.4 J	6.1 J	7	5	7.5	4.5
Barium	MG/KG	1050	100%	20	20	5.37E+03		300	1	67.5 J	107 J	95.7	61 J	54.4	82.3 J
Beryllium	MG/KG	1	100%	20	20	1.54E+02		1.1		0.4 J	0.86 J	0.76	0.65	0.81	0.72
Cadmium	MG/KG	8.1	10%	2	20	3.70E+01		2.3	1	0.06 U	0.06 U	0.13 U	0.13 U	0.13 U	0.14 U
Calcium	MG/KG	97200	100%	20	20			121000		56200 J	12600 J	18800	22100 J	7870	19000 J
Chromium	MG/KG	37	100%	20	20			29.6	3	11.1 J	25.4 J	26.1	30.2	29.6	22.3
Cobalt	MG/KG	19.7	100%	20	20	9.03E+02		30		6.8 J	15 J	17.9	13.6	17.9	12
Copper	MG/KG	2440	100%	20	20	3.13E+03		33	6	16.4 J	19.2 J	37.6	96.7 J	32.3	22.3 J
Cyanide	MG/KG	0	0%	0	4	1.22E+06		0.35							
Cyanide, Amenable	MG/KG	0	0%	0	16					0.57 U	0.62 U	0.56 U	0.54 U	0.54 U	0.59 U
Cyanide, Total	MG/KG	0	0%	0	16					0.569 U	0.618 U	0.564 U	0.539 U	0.54 U	0.59 U
Iron	MG/KG	54100	100%	20	20	2.35E+04	15	36500	1	10700 J	28100 J	32800	25300	34600	23400
Lead	MG/KG	1780	100%	20	20	4.00E+02	1	24.8	7	6.2 J	13.6 J	33.8	19.3	19	26.2
Magnesium	MG/KG	24900	100%	20	20			21500	1	24900 J	6220 J	6880	5960	8740	5040
Manganese	MG/KG	790	100%	20	20	1.76E+03		1060		324 J	646 J	790	526	323	438
Mercury	MG/KG	0.07	95%	18	19	2.35E+01		0.1		0.02	0.04	0.04	0.02	0.03	0.03
Nickel	MG/KG	69.7	100%	20	20	1.56E+03		49	3	18 J	38.7 J	46.4 J	40.2 J	53.7 J	31.5 J
Potassium	MG/KG	1870	100%	20	20			2380		1010 J	1370 J	1260 J	1490 J	1380 J	1360 J
Selenium	MG/KG	0	0%	0	20	3.91E+02		2		0.37 U	0.4 U	0.47 U	0.45 U	0.45 U	0.49 U

Table C-4
SUBSURFACE SOIL SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses	Region IX PRG Criteria Value [1]	Exceedances	NYSDEC Criteria Value [2]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SBDRMO-23	SBDRMO-24	SBDRMO-5	SBDRMO-6	SBDRMO-7	SBDRMO-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										DRMO-1096	DRMO-1099	DRMO-1041	DRMO-1044	DRMO-1047	DRMO-1054
Sample Depth to Top of Sampl										2	2	2	2	2	2
Sample Depth to Bottom of Sampl										6	6	6	6	6	6
Sample Date										10/28/2002	10/28/2002	10/27/2002	10/25/2002	10/27/2002	10/25/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Silver	MG/KG	0.72	10%	2	20	3.91E+02		0.75		0.42 U	0.72 J	0.3 U	0.29 U	0.29 U	0.32 U
Sodium	MG/KG	214	70%	14	20			172	2	163	124	122	162	107 U	167
Thallium	MG/KG	1.8	10%	2	20	5.16E+00		0.7	2	0.65 U	1.8 J	0.34 U	0.33 U	0.33 U	0.36 U
Vanadium	MG/KG	27	100%	20	20	7.82E+01		150		11 J	23.2 J	24.7 J	17.4	24.5 J	21
Zinc	MG/KG	691	100%	20	20	2.35E+04		110	7	52.8 J	126 J	117 J	68.3	167 J	73.9
Other															
Total Organic Carbon	MG/KG	9500	100%	16	16					2900	6400	4000	3600	9500	3600
Total Petroleum Hydrocarbon	MG/KG	3700	25%	4	16					46 UJ	49 UJ	45 UJ	43 UJ	43 UJ	1900 J

NOTES:
1) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 200
2) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 199

U = compound was not detecte
J = the reported value is an estimated concentratio
UJ = the compound was not detected; the associated reporting limit is approximat
R = the data was rejected in the data validating proces
NJ = compound was "tentatively identified" and the associated numerical value is approxima

Table C-5A
EBS GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	Lowest GW Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C
Location ID										MW121C-1	MW121C-1	MW121C-2
Matrix										GW	GW	GW
Sample ID										EB023	EB153	EB154
Sample Depth to Top of Sample										2.1	2.1	1.6
Sample Depth to Bottom of Sample										9.7	9.7	5.1
Sample Date										3/17/1998	3/17/1998	3/17/1998
QC Code										SA	SA	SA
Study ID										EBS	EBS	EBS
Volatile Organic Compounds												
1,1,1-Trichloroethane	UG/L	0	0%	0	2	3.17E+03		5		1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	0	2	5.53E-02		5		1 U	1 U	1 U
1,1,2-Trichloroethane	UG/L	0	0%	0	2	2.00E-01		1		1 U	1 U	1 U
1,1-Dichloroethane	UG/L	0	0%	0	2	8.11E+02		5		1 U	1 U	1 U
1,1-Dichloroethene	UG/L	0	0%	0	2	3.39E+02		5		1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0	2	4.76E-02		0.04		1 U	1 U	1 U
1,2-Dibromoethane	UG/L	0	0%	0	2	5.60E-03		0.0006		1 U	1 U	1 U
1,2-Dichlorobenzene	UG/L	0	0%	0	2	3.70E+02		3		1 U	1 U	1 U
1,2-Dichloroethane	UG/L	0	0%	0	2	1.23E-01		0.6		1 U	1 U	1 U
1,2-Dichloropropane	UG/L	0	0%	0	2	1.65E-01		1		1 U	1 U	1 U
1,3-Dichlorobenzene	UG/L	0	0%	0	2	1.83E+02		3		1 U	1 U	1 U
1,4-Dichlorobenzene	UG/L	36	50%	1	2	5.02E-01	1	3	1	1 U	1 U	36
Acetone	UG/L	57[4]	50%	1	2	5.48E+03				52	61	1 U
Benzene	UG/L	0	0%	0	2	3.54E-01		1		1 U	1 U	1 U
Bromochloromethane	UG/L	1	50%	1	2			5		1 U	1 U	1
Bromodichloromethane	UG/L	0	0%	0	2	1.81E-01		80		1 U	1 U	1 U
Bromoform	UG/L	4	50%	1	2	8.51E+00		80		1 U	1 U	4
Carbon disulfide	UG/L	2[4]	50%	1	2	1.04E+03				2	2	1 U
Carbon tetrachloride	UG/L	0	0%	0	2	1.71E-01		5		1 U	1 U	1 U
Chlorobenzene	UG/L	2	50%	1	2	1.06E+02		5		1 U	1 U	2
Chlorodibromomethane	UG/L	0	0%	0	2	1.33E-01		80		1 U	1 U	1 U
Chloroethane	UG/L	0	0%	0	2	4.64E+00		5		1 U	1 U	1 U
Chloroform	UG/L	0	0%	0	2	1.66E-01		7		1 U	1 U	1 U
Cis-1,2-Dichloroethene	UG/L	0	0%	0	2	6.08E+01		5		1 U	1 U	1 U
Cis-1,3-Dichloropropene	UG/L	0	0%	0	2			0.4		1 U	1 U	1 U
Ethyl benzene	UG/L	0	0%	0	2	1.34E+03		5		1 U	1 U	1 U
Meta/Para Xylene	UG/L	0	0%	0	0							
Methyl bromide	UG/L	0	0%	0	2	8.66E+00		5		1 U	1 U	5 U
Methyl butyl ketone	UG/L	0	0%	0	2					5 U	5 U	1 U
Methyl chloride	UG/L	0	0%	0	2	1.58E+02		5		1 U	1 U	5 U
Methyl ethyl ketone	UG/L	0	0%	0	2	6.97E+03				5 U	5 U	5 U
Methyl isobutyl ketone	UG/L	0	0%	0	2	1.99E+03				5 U	5 U	2 U
Methylene chloride	UG/L	0	0%	0	2	4.28E+00		5		2 U	2 U	1 U
Ortho Xylene	UG/L	0	0%	0	0			5				
Styrene	UG/L	0	0%	0	2	1.64E+03		5		1 U	1 U	1 U
Tetrachloroethene	UG/L	0	0%	0	2	1.04E-01		5		1 U	1 U	1 U
Toluene	UG/L	0	0%	0	2	7.23E+02		5		1 U	1 U	1 U
Total Xylenes	UG/L	0	0%	0	2	2.06E+02		5		1 U	1 U	1 U
Trans-1,2-Dichloroethene	UG/L	0	0%	0	2	1.22E+02		5		1 U	1 U	1 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0	2			0.4		1 U	1 U	1 U

Table C-5A
EBS GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C
Location ID										MW121C-1	MW121C-1	MW121C-2
Matrix										GW	GW	GW
Sample ID										EB023	EB153	EB154
Sample Depth to Top of Sample										2.1	2.1	1.6
Sample Depth to Bottom of Sample										9.7	9.7	5.1
Sample Date										3/17/1998	3/17/1998	3/17/1998
QC Code										SA	SA	SA
Study ID										EBS	EBS	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**Lowest GW Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)
Trichloroethene	UG/L	0	0%	0	2	2.80E-02		5		1 U	1 U	1 U
Vinyl chloride	UG/L	1	50%	1	2	1.98E-02	1	2		1 U	1 U	1
Semivolatile Organic Compounds												
1,2,4-Trichlorobenzene	UG/L	0	0%	0	2	7.16E+00		5			1.1 U	1.1 U
1,2-Dichlorobenzene	UG/L	0	0%	0	2	3.70E+02		3			1.1 U	1.1 U
1,3-Dichlorobenzene	UG/L	0	0%	0	2	1.83E+02		3			1.1 U	1.1 U
1,4-Dichlorobenzene	UG/L	0	0%	0	2	5.02E-01		3			1.1 U	1.1 U
2,4,5-Trichlorophenol	UG/L	0	0%	0	2	3.65E+03		1			2.7 U	2.8 U
2,4,6-Trichlorophenol	UG/L	0	0%	0	2	3.65E+00		1			1.1 U	1.1 U
2,4-Dichlorophenol	UG/L	0	0%	0	2	1.09E+02		5			1.1 U	1.1 U
2,4-Dimethylphenol	UG/L	0	0%	0	2	7.30E+02					1.1 U	1.1 U
2,4-Dinitrophenol	UG/L	0	0%	0	2	7.30E+01					2.7 U	2.8 U
2,4-Dinitrotoluene	UG/L	0	0%	0	2	7.30E+01		5			1.1 U	1.1 U
2,6-Dinitrotoluene	UG/L	0	0%	0	2	3.65E+01		5			1.1 U	1.1 U
2-Chloronaphthalene	UG/L	0	0%	0	2	4.87E+02					1.1 U	1.1 U
2-Chlorophenol	UG/L	0	0%	0	2	3.04E+01					1.1 U	1.1 U
2-Methylnaphthalene	UG/L	0	0%	0	2						1.1 U	1.1 U
2-Methylphenol	UG/L	0	0%	0	2	1.82E+03					1.1 U	1.1 U
2-Nitroaniline	UG/L	0	0%	0	2	1.09E+02		5			2.7 U	2.8 U
2-Nitrophenol	UG/L	0	0%	0	2			1			1.1 U	1.1 U
3 or 4-Methylphenol	UG/L	0	0%	0	0			1				
3,3'-Dichlorobenzidine	UG/L	0	0%	0	2	1.49E-01		5			1.1 U	1.1 U
3-Nitroaniline	UG/L	0	0%	0	2	3.20E+00		5			2.7 U	2.8 U
4,6-Dinitro-2-methylphenol	UG/L	0	0%	0	2	3.65E+00		1			2.7 U	2.8 U
4-Bromophenyl phenyl ether	UG/L	0	0%	0	2						1.1 U	1.1 U
4-Chloro-3-methylphenol	UG/L	0	0%	0	2			1			1.1 U	1.1 U
4-Chloroaniline	UG/L	0	0%	0	2	1.46E+02		5			1.1 U	1.1 U
4-Chlorophenyl phenyl ether	UG/L	0	0%	0	2						1.1 U	1.1 U
4-Methylphenol	UG/L	0	0%	0	2	1.82E+02					1.1 U	1.1 U
4-Nitroaniline	UG/L	0	0%	0	2	3.20E+00		5			2.7 U	2.8 U
4-Nitrophenol	UG/L	0	0%	0	2			1			2.7 U	2.8 U
Acenaphthene	UG/L	0	0%	0	2	3.65E+02					1.1 U	1.1 U
Acenaphthylene	UG/L	0	0%	0	2						1.1 U	1.1 U
Anthracene	UG/L	0	0%	0	2	1.83E+03					1.1 U	1.1 U
Benzo(a)anthracene	UG/L	0	0%	0	2	9.21E-02					1.1 U	1.1 U
Benzo(a)pyrene	UG/L	0	0%	0	2	9.21E-03		0			1.1 U	1.1 U
Benzo(b)fluoranthene	UG/L	0	0%	0	2	9.21E-02					1.1 U	1.1 U
Benzo(ghi)perylene	UG/L	0	0%	0	2						1.1 U	1.1 U
Benzo(k)fluoranthene	UG/L	0	0%	0	2	9.21E-01					1.1 U	1.1 U
Bis(2-Chloroethoxy)methane	UG/L	0	0%	0	2			5			1.1 U	1.1 U
Bis(2-Chloroethyl)ether	UG/L	0	0%	0	2	1.02E-02		1			1.1 U	1.1 U

Table C-5A
EBS GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C
Location ID										MW121C-1	MW121C-1	MW121C-2
Matrix										GW	GW	GW
Sample ID										EB023	EB153	EB154
Sample Depth to Top of Sample										2.1	2.1	1.6
Sample Depth to Bottom of Sample										9.7	9.7	5.1
Sample Date										3/17/1998	3/17/1998	3/17/1998
QC Code										SA	SA	SA
Study ID										EBS	EBS	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses ^{1}**	**Region IX PRG Criteria Value ^{2}**	**Exceedances**	**Lowest GW Criteria Value ^{3}**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)
Bis(2-Chloroisopropyl)ether	UG/L	0	0%	0	2	2.74E-01		5			1.1 U	1.1 U
Bis(2-Ethylhexyl)phthalate	UG/L	0.4	100%	2	2	4.80E+00		5			0.23 J	0.4 J
Butylbenzylphthalate	UG/L	0.12 ^{4}	50%	1	2	7.30E+03					0.12 J	1.1 U
Carbazole	UG/L	0	0%	0	2	3.36E+00					1.1 U	1.1 U
Chrysene	UG/L	0	0%	0	2	9.21E+00					1.1 U	1.1 U
Di-n-butylphthalate	UG/L	1.7 ^{4}	100%	2	2	3.65E+03		50			1.7	0.79 J
Di-n-octylphthalate	UG/L	0	0%	0	2	1.46E+03					1.1 U	1.1 U
Dibenz(a,h)anthracene	UG/L	0	0%	0	2	9.21E-03					1.1 UJ	1.1 U
Dibenzofuran	UG/L	0	0%	0	2	1.22E+01					1.1 U	1.1 U
Diethyl phthalate	UG/L	0.057 ^{4}	50%	1	2	2.92E+04					0.057 J	1.1 U
Dimethylphthalate	UG/L	0	0%	0	2	3.65E+05					1.1 U	1.1 U
Fluoranthene	UG/L	0	0%	0	2	1.46E+03					1.1 U	1.1 U
Fluorene	UG/L	0.48	50%	1	2	2.43E+02					1.1 U	0.48 J
Hexachlorobenzene	UG/L	0	0%	0	2	4.20E-02		0.04			1.1 U	1.1 U
Hexachlorobutadiene	UG/L	0.4	100%	2	2	8.62E-01		0.5			0.061 J	0.4 J
Hexachlorocyclopentadiene	UG/L	0	0%	0	2	2.19E+02		5			1.1 UJ	1.1 U
Hexachloroethane	UG/L	0	0%	0	2	4.80E+00		5			1.1 U	1.1 U
Indeno(1,2,3-cd)pyrene	UG/L	0	0%	0	2	9.21E-02					1.1 U	1.1 U
Isophorone	UG/L	0	0%	0	2	7.08E+01					1.1 U	1.1 U
N-Nitrosodiphenylamine	UG/L	0	0%	0	2	1.37E+01					1.1 U	1.1 U
N-Nitrosodipropylamine	UG/L	0	0%	0	2	9.60E-03					1.1 U	1.1 U
Naphthalene	UG/L	0	0%	0	2	6.20E+00					1.1 U	1.1 U
Nitrobenzene	UG/L	0	0%	0	2	3.40E+00		0.4			1.1 U	1.1 U
Pentachlorophenol	UG/L	0	0%	0	2	5.60E-01		1			2.7 U	2.8 U
Phenanthrene	UG/L	0.24	50%	1	2						1.1 U	0.24 J
Phenol	UG/L	0	0%	0	2	1.09E+04		1			1.1 U	1.1 U
Pyrene	UG/L	0.13	50%	1	2	1.83E+02					1.1 U	0.13 J
Pesticides/PCBs												
4,4'-DDD	UG/L	0.81	100%	2	2	2.80E-01	2	0.3	2	0.9	0.11 U	0.81 J
4,4'-DDE	UG/L	0.3	100%	2	2	1.98E-01	2	0.2	1	0.27 J	0.093 J	0.3 J
4,4'-DDT	UG/L	0.56	100%	2	2	1.98E-01	3	0.2	2	0.29 J	0.28	0.56 J
Aldrin	UG/L	0	0%	0	2	3.95E-03		0		0.057 U	0.057 U	0.054 U
Alpha-BHC	UG/L	0.059	100%	2	2	1.07E-02	2	0.01	2	0.057 U	0.036 J	0.059 J
Alpha-Chlordane	UG/L	0.082 ^{4}	50%	1	2					0.096	0.068	0.054 U
Beta-BHC	UG/L	0.33 ^{4}	100%	2	2	3.74E-02	3	0.04	2	0.56 J	0.096 J	0.061 J
Chlordane	UG/L	0	100%	0	0							
Delta-BHC	UG/L	0.16 ^{4}	100%	2	2			0.04	2	0.23 J	0.094	0.16 J
Dieldrin	UG/L	0.2	100%	2	2	4.20E-03	2	0.004	2	0.11 U	0.052 J	0.2 J
Endosulfan I	UG/L	0.10 ^{4}	50%	1	2					0.11 J	0.08 J	0.054 U
Endosulfan II	UG/L	0.28	100%	2	2					0.28 J	0.11 U	0.28

Table C-5A
EBS GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	Lowest GW Criteria Value [3]	Exceedances	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121C	SEAD-121C	SEAD-121C
Location ID										MW121C-1	MW121C-1	MW121C-2
Matrix										GW	GW	GW
Sample ID										EB023	EB153	EB154
Sample Depth to Top of Sample										2.1	2.1	1.6
Sample Depth to Bottom of Sample										9.7	9.7	5.1
Sample Date										3/17/1998	3/17/1998	3/17/1998
QC Code										SA	SA	SA
Study ID										EBS	EBS	EBS
Endosulfan sulfate	UG/L	0.69	100%	2	2					0.28 J	0.14 J	0.69 J
Endrin	UG/L	0.71	50%	1	2	1.09E+01				0.11 U	0.11 U	0.71 J
Endrin aldehyde	UG/L	0.97	100%	2	2			5		0.22 J	0.073 J	0.97 J
Endrin ketone	UG/L	0.2	50%	1	2			5		0.11 U	0.11 U	0.2
Gamma-BHC/Lindane	UG/L	0.038	50%	1	2	5.17E-02		0.05		0.057 U	0.057 U	0.038 J
Gamma-Chlordane	UG/L	0.28 [4]	100%	2	2					0.47	0.086 J	0.17 J
Heptachlor	UG/L	0.14 [4]	50%	1	2	1.49E-02	2	0.04	1	0.23 J	0.058 J	0.054 U
Heptachlor epoxide	UG/L	0.11	100%	2	2	7.39E-03	2	0.03	2	0.057 U	0.072 J	0.11 J
Methoxychlor	UG/L	0.62	100%	2	2	1.82E+02		35		0.57	0.57 U	0.62 J
Toxaphene	UG/L	0	0%	0	2	6.11E-02		0.06		5.7 U	5.7 U	5.4 U
Aroclor-1016	UG/L	0	0%	0	2	9.60E-01		0.09		1.1 U	1.1 U	1.1 U
Aroclor-1221	UG/L	0	0%	0	2			0.09		2.3 U	2.3 U	2.2 U
Aroclor-1232	UG/L	0	0%	0	2			0.09		1.1 U	1.1 U	1.1 U
Aroclor-1242	UG/L	0	0%	0	2			0.09		1.1 U	1.1 U	1.1 U
Aroclor-1248	UG/L	0	0%	0	2			0.09		1.1 U	1.1 U	1.1 U
Aroclor-1254	UG/L	0	0%	0	2	3.36E-02		0.09		1.1 U	1.1 U	1.1 U
Aroclor-1260	UG/L	0	0%	0	2			0.09		1.1 U	1.1 U	1.1 U
Metals and Cyanide												
Aluminum	UG/L	5350	100%	2	2	3.65E+04		50	2	133	738 J	5350 J
Antimony	UG/L	0	0%	0	2	1.46E+01		3		5.1 U	5.1 U	5.1 U
Arsenic	UG/L	2.8 [4]	50%	1	2	4.48E-02	1	10		3.7 U	3.8	3.7 U
Barium	UG/L	106	100%	2	2	2.55E+03		1000		39.5	38	106
Beryllium	UG/L	0.1	50%	1	2	7.30E+01		4		0.1 U	0.1 U	0.1
Cadmium	UG/L	0.27 [4]	50%	1	2	1.82E+01		5		0.39	0.3 U	0.3 U
Calcium	UG/L	167500 [4]	100%	2	2					172000 J	163000	162000 J
Chromium	UG/L	6.5	100%	2	2			50		1.2	2.4	6.5
Cobalt	UG/L	3.6	100%	2	2	7.30E+02				1.4 U	1.6	3.6
Copper	UG/L	5.2	100%	2	2	1.46E+03		200		1.2 U	2	5.2
Cyanide	UG/L	0	0%	0	2	7.30E+02				5 U	5 U	5 U
Cyanide, Amenable	MG/L	0	0%	0	0							
Cyanide, Total	MG/L	0	0%	0	0							
Iron	UG/L	5620	100%	2	2	1.09E+04		300	2	346	1430	5620
Lead	UG/L	0	0%	0	2			15		1.8 U	1.8 U	1.8 U
Magnesium	UG/L	23950 [4]	100%	2	2					23800	24100	23200
Manganese	UG/L	1365 [4]	100%	2	2	8.76E+02	3	50	2	1590	1140	1100
Mercury	UG/L	0	0%	0	2	1.09E+01		0.7		0.1 U	0.1 U	0.1 U
Nickel	UG/L	10.6	100%	2	2	7.30E+02		100		2.8	4.2	10.6
Potassium	UG/L	21400	100%	2	2					7610	10900	21400
Selenium	UG/L	4.7 [4]	100%	2	2	1.82E+02		10		3.7 J	5.6 J	4.3

Table C-5A
EBS GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	Lowest GW Criteria Value [3]	Exceedances	Value	(Q)	Value	(Q)	Value	(Q)
Facility										SEAD-121C		SEAD-121C		SEAD-121C	
Location ID										MW121C-1		MW121C-1		MW121C-2	
Matrix										GW		GW		GW	
Sample ID										EB023		EB153		EB154	
Sample Depth to Top of Sample										2.1		2.1		1.6	
Sample Depth to Bottom of Sample										9.7		9.7		5.1	
Sample Date										3/17/1998		3/17/1998		3/17/1998	
QC Code										SA		SA		SA	
Study ID										EBS		EBS		EBS	
Silver	UG/L	0	0%	0	2	1.82E+02		50		1.3	U	1.3	U	1.3	U
Sodium	UG/L	95200	100%	2	2			20000	1	8920		11200		95200	
Thallium	UG/L	0	0%	0	2	2.41E+00		2		6.7	U	6.7	U	6.7	U
Vanadium	UG/L	6.5	100%	2	2	3.65E+01				1.5	U	2.4		6.5	J
Zinc	UG/L	16.4	100%	2	2	1.09E+04		5000		2.4		9.3		16.4	

NOTES:

1) Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.

2) The criteria value source is the Region IX Preliminary Remediation Goals for Tap Water (October 2004)

3) Lowest Groundwater Criteria Values came from the following:
   A) NYSDEC Class GA Groundwater Standard (TOGS 1.1.1, June 1998)
   B) Maximum Contaminant Level - Drinking Water Standards and Health Advisory (EPA 822-B-00-001)
   C) Secondary Drinking Water Regulations - Drinking Water Standards and Health Advisory (EPA 82-B-00-001)

4) The maximum detected concentration was obtained from the average of the sample-duplicate pair: EB153/EB023 at MW121C-1.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate

Table C-5B
RI GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										MW121C-3	MW121C-3	MW121C-4	MW121C-4
Matrix										GW	GW	GW	GW
Sample ID										121C-2000	121C-2009	121C-2002	121C-2004
Sample Depth to Top of Sample										7.75	7.75	4.5	4.5
Sample Depth to Bottom of Sample										9.5	9.5	10	10
Sample Date										2/3/2003	5/7/2003	2/3/2003	2/4/2003
QC Code										SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										2	3	2	2
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**Lowest GW Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0	0%	0	6	3.17E+03		5		5 U	0.4 U	5 U	5 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	0	6	5.53E-02		5		5 U	0.3 U	5 U	5 U
1,1,2-Trichloroethane	UG/L	0	0%	0	6	2.00E-01		1		5 U	0.3 U	5 U	5 U
1,1-Dichloroethane	UG/L	0	0%	0	6	8.11E+02		5		5 U	0.4 U	5 U	5 U
1,1-Dichloroethene	UG/L	0	0%	0	6	3.39E+02		5		5 U	0.3 UJ	5 U	5 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0	0	4.76E-02		0.04					
1,2-Dibromoethane	UG/L	0	0%	0	0	5.60E-03		0.0006					
1,2-Dichlorobenzene	UG/L	0	0%	0	0	3.70E+02		3					
1,2-Dichloroethane	UG/L	0	0%	0	6	1.23E-01		0.6		5 U	0.3 U	5 U	5 U
1,2-Dichloropropane	UG/L	0	0%	0	6	1.65E-01		1		5 U	0.4 U	5 U	5 U
1,3-Dichlorobenzene	UG/L	0	0%	0	0	1.83E+02		3					
1,4-Dichlorobenzene	UG/L	0	0%	0	0	5.02E-01		3					
Acetone	UG/L	0	0%	0	4	5.48E+03				5 UJ	5.8 R	5 UJ	5 UJ
Benzene	UG/L	0	0%	0	6	3.54E-01		1		5 U	0.3 U	5 U	5 U
Bromochloromethane	UG/L	0	0%	0	0			5					
Bromodichloromethane	UG/L	0	0%	0	6	1.81E-01		80		5 U	0.4 U	5 U	5 U
Bromoform	UG/L	0	0%	0	6	8.51E+00		80		5 U	0.3 U	5 U	5 U
Carbon disulfide	UG/L	0	0%	0	6	1.04E+03				5 UJ	0.3 UJ	5 UJ	5 UJ
Carbon tetrachloride	UG/L	0	0%	0	6	1.71E-01		5		5 U	0.4 U	5 U	5 U
Chlorobenzene	UG/L	0	0%	0	6	1.06E+02		5		5 U	0.4 U	5 U	5 U
Chlorodibromomethane	UG/L	0	0%	0	6	1.33E-01		80		5 U	0.4 U	5 U	5 U
Chloroethane	UG/L	0	0%	0	6	4.64E+00		5		5 U	0.4 UJ	5 U	5 U
Chloroform	UG/L	0	0%	0	6	1.66E-01		7		5 U	0.4 U	5 U	5 U
Cis-1,2-Dichloroethene	UG/L	0	0%	0	6	6.08E+01		5		5 U	0.3 U	5 U	5 U
Cis-1,3-Dichloropropene	UG/L	0	0%	0	6			0.4		5 U	0.3 UJ	5 U	5 U
Ethyl benzene	UG/L	0	0%	0	6	1.34E+03		5		5 U	0.4 U	5 U	5 U
Meta/Para Xylene	UG/L	0	0%	0	6					5 U	0.8 U	5 U	5 U
Methyl bromide	UG/L	0	0%	0	6	8.66E+00		5		5 U	0.4 U	5 U	5 U
Methyl butyl ketone	UG/L	0	0%	0	6					5 U	2.8 U	5 U	5 U
Methyl chloride	UG/L	0	0%	0	6	1.58E+02		5		5 UJ	0.4 U	5 UJ	5 UJ
Methyl ethyl ketone	UG/L	0	0%	0	3	6.97E+03				5 UJ	3.6 R	5 UJ	5 UJ
Methyl isobutyl ketone	UG/L	0	0%	0	6	1.99E+03				5 U	2.5 U	5 U	5 U
Methylene chloride	UG/L	0	0%	0	6	4.28E+00		5		5 U	0.7 UJ	5 U	5 U
Ortho Xylene	UG/L	0	0%	0	6			5		5 U	0.4 U	5 U	5 U
Styrene	UG/L	0	0%	0	6	1.64E+03		5		5 U	0.3 U	5 U	5 U
Tetrachloroethene	UG/L	0	0%	0	6	1.04E-01		5		5 U	0.5 U	5 U	5 U

Table C-5B
RI GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										MW121C-3	MW121C-3	MW121C-4	MW121C-4
Matrix										GW	GW	GW	GW
Sample ID										121C-2000	121C-2009	121C-2002	121C-2004
Sample Depth to Top of Sample										7.75	7.75	4.5	4.5
Sample Depth to Bottom of Sample										9.5	9.5	10	10
Sample Date										2/3/2003	5/7/2003	2/3/2003	2/4/2003
QC Code						**Region IX**				SA	SA	SA	SA
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**Lowest GW**		PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**		2	3	2	2
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses [1]**	**Value [2]**	**Exceedances**	**Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Toluene	UG/L	0	0%	0	6	7.23E+02		5		5 U	0.4 U	5 U	5 U
Total Xylenes	UG/L	0	0%	0	0	2.06E+02		5					
Trans-1,2-Dichloroethene	UG/L	0	0%	0	6	1.22E+02		5		5 U	0.4 U	5 U	5 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0	6			0.4		5 U	0.3 U	5 U	5 U
Trichloroethene	UG/L	0	0%	0	6	2.80E-02		5		5 U	0.4 U	5 U	5 U
Vinyl chloride	UG/L	0	0%	0	6	1.98E-02		2		5 U	0.3 U	5 U	5 U
Semivolatile Organic Compounds													
1,2,4-Trichlorobenzene	UG/L	0	0%	0	6	7.16E+00		5		1.2 U	1.2 U	1.2 U	1.3 UJ
1,2-Dichlorobenzene	UG/L	0	0%	0	6	3.70E+02		3		1 U	1 U	1 U	1.1 UJ
1,3-Dichlorobenzene	UG/L	0	0%	0	6	1.83E+02		3		1.2 U	1.2 U	1.2 U	1.3 UJ
1,4-Dichlorobenzene	UG/L	0	0%	0	6	5.02E-01		3		1 U	1 U	1 U	1.1 UJ
2,4,5-Trichlorophenol	UG/L	0	0%	0	6	3.65E+03		1		1 U	1 U	1 U	1.1 U
2,4,6-Trichlorophenol	UG/L	0	0%	0	6	3.65E+00		1		1 U	1 U	1 U	1.1 U
2,4-Dichlorophenol	UG/L	0	0%	0	6	1.09E+02		5		1.3 U	1.3 U	1.4 U	1.4 U
2,4-Dimethylphenol	UG/L	0	0%	0	6	7.30E+02				2.3 U	2.3 U	2.4 U	2.4 U
2,4-Dinitrophenol	UG/L	0	0%	0	3	7.30E+01					2 UJ		
2,4-Dinitrotoluene	UG/L	0	0%	0	6	7.30E+01		5		1.1 U	1.1 U	1.1 U	1.2 UJ
2,6-Dinitrotoluene	UG/L	0	0%	0	6	3.65E+01		5		1 U	1 U	1 U	1.1 UJ
2-Chloronaphthalene	UG/L	0	0%	0	6	4.87E+02				1.2 U	1.2 U	1.2 U	1.3 UJ
2-Chlorophenol	UG/L	0	0%	0	6	3.04E+01				1.1 U	1.1 U	1.1 U	1.2 U
2-Methylnaphthalene	UG/L	0	0%	0	6					1.2 U	1.2 U	1.2 U	1.3 UJ
2-Methylphenol	UG/L	0	0%	0	6	1.82E+03				1 U	1 U	1 U	1.1 U
2-Nitroaniline	UG/L	0	0%	0	6	1.09E+02		5		1 U	1 U	1 U	1.1 UJ
2-Nitrophenol	UG/L	0	0%	0	6			1		1.1 U	1.1 U	1.1 U	1.2 U
3 or 4-Methylphenol	UG/L	0	0%	0	3			1		1.8 U		1.9 U	1.9 U
3,3'-Dichlorobenzidine	UG/L	0	0%	0	6	1.49E-01		5		1 UJ	1 U	1 UJ	1.1 UJ
3-Nitroaniline	UG/L	0	0%	0	6	3.20E+00		5		1.2 U	1.2 UJ	1.2 U	1.3 UJ
4,6-Dinitro-2-methylphenol	UG/L	0	0%	0	6	3.65E+00		1		1.2 U	1.2 U	1.2 U	1.3 U
4-Bromophenyl phenyl ether	UG/L	0	0%	0	6					1.3 U	1.3 U	1.4 U	1.4 UJ
4-Chloro-3-methylphenol	UG/L	0	0%	0	6			1		1.1 U	1.1 U	1.1 U	1.2 U
4-Chloroaniline	UG/L	0	0%	0	6	1.46E+02		5		1.2 UJ	1.2 U	1.2 UJ	1.3 UJ
4-Chlorophenyl phenyl ether	UG/L	0	0%	0	6					1.2 U	1.2 U	1.2 U	1.3 UJ
4-Methylphenol	UG/L	0	0%	0	3	1.82E+02					1.8 U		
4-Nitroaniline	UG/L	0	0%	0	6	3.20E+00		5		2.4 U	2.4 U	2.5 U	2.5 UJ
4-Nitrophenol	UG/L	0	0%	0	6			1		1.1 U	1.1 U	1.1 U	1.2 U
Acenaphthene	UG/L	0	0%	0	6	3.65E+02				1 U	1 U	1 U	1.1 UJ
Acenaphthylene	UG/L	0	0%	0	6					1.2 U	1.2 U	1.2 U	1.3 UJ

Table C-5B
RI GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										MW121C-3	MW121C-3	MW121C-4	MW121C-4
Matrix										GW	GW	GW	GW
Sample ID										121C-2000	121C-2009	121C-2002	121C-2004
Sample Depth to Top of Sample										7.75	7.75	4.5	4.5
Sample Depth to Bottom of Sample										9.5	9.5	10	10
Sample Date										2/3/2003	5/7/2003	2/3/2003	2/4/2003
QC Code										SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										2	3	2	2
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses** [1]	**Region IX PRG Criteria Value** [2]	**Exceedances**	**Lowest GW Criteria Value** [3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Anthracene	UG/L	0	0%	0	6	1.83E+03				1.3 U	1.3 U	1.4 U	1.4 UJ
Benzo(a)anthracene	UG/L	0	0%	0	6	9.21E-02				1 U	1 U	1 U	1.1 UJ
Benzo(a)pyrene	UG/L	0	0%	0	6	9.21E-03				1.5 U	1.5 U	1.6 U	1.6 UJ
Benzo(b)fluoranthene	UG/L	0	0%	0	6	9.21E-02				1 U	1 U	1 U	1.1 UJ
Benzo(ghi)perylene	UG/L	0	0%	0	6					1.3 UJ	1.3 UJ	1.4 UJ	1.4 UJ
Benzo(k)fluoranthene	UG/L	0	0%	0	6	9.21E-01				2.6 U	2.6 U	2.7 U	2.7 UJ
Bis(2-Chloroethoxy)methane	UG/L	0	0%	0	6			5		1 U	1 U	1 U	1.1 UJ
Bis(2-Chloroethyl)ether	UG/L	0	0%	0	6	1.02E-02		1		1.2 U	1.2 U	1.2 U	1.3 UJ
Bis(2-Chloroisopropyl)ether	UG/L	0	0%	0	6	2.74E-01		5		1 U	1 U	1 U	1.1 UJ
Bis(2-Ethylhexyl)phthalate	UG/L	1.4	17%	1	6	4.80E+00		5		1 U	1 U	1 U	1.1 UJ
Butylbenzylphthalate	UG/L	0	0%	0	6	7.30E+03				1 U	1 U	1 U	1.1 UJ
Carbazole	UG/L	0	0%	0	6	3.36E+00				0.42 U	0.42 U	0.43 U	0.44 UJ
Chrysene	UG/L	0	0%	0	6	9.21E+00				1.6 U	1.6 U	1.7 U	1.7 UJ
Di-n-butylphthalate	UG/L	1.6	17%	1	6	3.65E+03		50		1.2 U	1.2 U	1.2 U	1.3 UJ
Di-n-octylphthalate	UG/L	0	0%	0	6	1.46E+03				1.5 U	1.5 U	1.6 U	1.6 UJ
Dibenz(a,h)anthracene	UG/L	0	0%	0	6	9.21E-03				1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ
Dibenzofuran	UG/L	0	0%	0	6	1.22E+01				1 U	1 U	1 U	1.1 UJ
Diethyl phthalate	UG/L	0	0%	0	6	2.92E+04				1 U	1 U	1 U	1.1 UJ
Dimethylphthalate	UG/L	0	0%	0	6	3.65E+05				1 U	1 U	1 U	1.1 UJ
Fluoranthene	UG/L	0	0%	0	6	1.46E+03				1 U	1 U	1 U	1.1 UJ
Fluorene	UG/L	0	0%	0	6	2.43E+02				1.1 U	1.1 U	1.1 U	1.2 UJ
Hexachlorobenzene	UG/L	0	0%	0	6	4.20E-02		0.04		1.1 U	1.1 U	1.1 U	1.2 UJ
Hexachlorobutadiene	UG/L	0	0%	0	6	8.62E-01		0.5		1.5 U	1.5 U	1.6 U	1.6 UJ
Hexachlorocyclopentadiene	UG/L	0	0%	0	4	2.19E+02		5		3.8 U	3.8 R	4 U	4 UJ
Hexachloroethane	UG/L	0	0%	0	6	4.80E+00		5		1.1 U	1.1 U	1.1 U	1.2 UJ
Indeno(1,2,3-cd)pyrene	UG/L	0	0%	0	6	9.21E-02				1.6 U	1.6 UJ	1.7 U	1.7 UJ
Isophorone	UG/L	0	0%	0	6	7.08E+01				1 U	1 U	1 U	1.1 UJ
N-Nitrosodiphenylamine	UG/L	0	0%	0	6	1.37E+01				2 U	2 U	2.1 U	2.1 UJ
N-Nitrosodipropylamine	UG/L	0	0%	0	6	9.60E-03				1 U	1 UJ	1 U	1.1 UJ
Naphthalene	UG/L	0	0%	0	6	6.20E+00				1.2 U	1.2 U	1.2 U	1.3 UJ
Nitrobenzene	UG/L	0	0%	0	6	3.40E+00		0.4		1 U	1 U	1 U	1.1 UJ
Pentachlorophenol	UG/L	0	0%	0	6	5.60E-01		1		1.9 U	1.9 U	2 U	2 U
Phenanthrene	UG/L	0	0%	0	6					1 U	1 U	1 U	1.1 UJ
Phenol	UG/L	0	0%	0	6	1.09E+04		1		1 U	1 U	1 U	1.1 U
Pyrene	UG/L	0	0%	0	6	1.83E+02				1 U	1 U	1 U	1.1 UJ
Pesticides/PCBs													
4,4'-DDD	UG/L	0	0%	0	2	2.80E-01		0.3		0.01 R	0.01 UJ	0.01 R	0.01 R

Table C-5B
RI GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	Lowest GW Criteria Value [3]	Exceedances	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Facility										SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID										MW121C-3		MW121C-3		MW121C-4		MW121C-4	
Matrix										GW		GW		GW		GW	
Sample ID										121C-2000		121C-2009		121C-2002		121C-2004	
Sample Depth to Top of Sample										7.75		7.75		4.5		4.5	
Sample Depth to Bottom of Sample										9.5		9.5		10		10	
Sample Date										2/3/2003		5/7/2003		2/3/2003		2/4/2003	
QC Code										SA		SA		SA		SA	
Study ID										PID-RI		PID-RI		PID-RI		PID-RI	
										2		3		2		2	
4,4'-DDE	UG/L	0	0%	0	5	1.98E-01		0.2		0.005	UJ	0.005	U	0.005	UJ	0.005	UJ
4,4'-DDT	UG/L	0	0%	0	2	1.98E-01		0.2		0.01	R	0.01	U	0.01	R	0.01	R
Aldrin	UG/L	0	0%	0	5	3.95E-03		0		0.02	U	0.02	UJ	0.02	U	0.02	U
Alpha-BHC	UG/L	0	0%	0	5	1.07E-02		0.01		0.01	U	0.01	UJ	0.01	U	0.01	U
Alpha-Chlordane	UG/L	0	0%	0	5					0.02	U	0.02	UJ	0.02	U	0.02	U
Beta-BHC	UG/L	0	0%	0	5	3.74E-02		0.04		0.01	U	0.01	U	0.01	U	0.01	U
Chlordane	UG/L	0	0%	0	3					0.14	U			0.14	U	0.14	U
Delta-BHC	UG/L	0	0%	0	5			0.04		0.004	UJ	0.004	UJ	0.004	UJ	0.004	UJ
Dieldrin	UG/L	0	0%	0	5	4.20E-03		0.004		0.009	U	0.009	U	0.009	U	0.009	U
Endosulfan I	UG/L	0	0%	0	5					0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ
Endosulfan II	UG/L	0	0%	0	5					0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ
Endosulfan sulfate	UG/L	0	0%	0	5					0.02	U	0.02	U	0.02	U	0.02	U
Endrin	UG/L	0	0%	0	5	1.09E+01		0		0.02	UJ	0.02	U	0.02	UJ	0.02	UJ
Endrin aldehyde	UG/L	0	0%	0	5			5		0.02	UJ	0.02	U	0.02	UJ	0.02	UJ
Endrin ketone	UG/L	0	0%	0	5			5		0.009	U	0.009	UJ	0.009	U	0.009	U
Gamma-BHC/Lindane	UG/L	0	0%	0	5	5.17E-02		0.05		0.009	U	0.009	UJ	0.009	U	0.009	U
Gamma-Chlordane	UG/L	0	0%	0	5					0.01	U	0.01	U	0.01	U	0.01	U
Heptachlor	UG/L	0	0%	0	5	1.49E-02		0.04		0.007	U	0.007	U	0.007	U	0.007	U
Heptachlor epoxide	UG/L	0	0%	0	5	7.39E-03		0.03		0.009	UJ	0.009	U	0.009	UJ	0.009	UJ
Methoxychlor	UG/L	0	0%	0	5	1.82E+02		35		0.008	UJ	0.008	U	0.008	UJ	0.008	UJ
Toxaphene	UG/L	0	0%	0	5	6.11E-02		0.06		0.12	U	0.12	U	0.12	U	0.12	U
Aroclor-1016	UG/L	0	0%	0	5	9.60E-01		0.09		0.24	U	0.24	UJ	0.24	U	0.24	U
Aroclor-1221	UG/L	0	0%	0	5			0.09		0.08	U	0.081	U	0.08	U	0.08	U
Aroclor-1232	UG/L	0	0%	0	5			0.09		0.09	U	0.091	UJ	0.09	U	0.09	U
Aroclor-1242	UG/L	0	0%	0	5			0.09		0.08	U	0.081	UJ	0.08	U	0.08	U
Aroclor-1248	UG/L	0	0%	0	5			0.09		0.12	U	0.12	U	0.12	U	0.12	U
Aroclor-1254	UG/L	0	0%	0	5	3.36E-02		0.09		0.05	U	0.051	U	0.05	U	0.05	U
Aroclor-1260	UG/L	0	0%	0	5			0.09		0.01	U	0.01	UJ	0.01	U	0.01	U
Metals and Cyanide																	
Aluminum	UG/L	588 [4]	100%	6	6	3.65E+04		50	4	401		239		146	J	1030	
Antimony	UG/L	8.4	33%	2	6	1.46E+01		3	2	7.5	U	3.8	U	7.5	U	10.9	J
Arsenic	UG/L	0	0%	0	6	4.48E-02		10		4.5	U	4.5	U	4.5	U	4.5	U
Barium	UG/L	73.7	100%	6	6	2.55E+03		1000		73.7		69.3	J	29.6		32.4	
Beryllium	UG/L	0.24	17%	1	6	7.30E+01		4		0.9	U	0.1	U	0.9	U	0.9	U
Cadmium	UG/L	1.1	17%	1	6	1.82E+01		5		0.8	U	0.8	U	0.8	U	0.8	U
Calcium	UG/L	558000	100%	6	6					115000		114000		420000		513000	
Chromium	UG/L	21.4	83%	5	6			50		1.4	U	3.1	J	1.4	U	5.8	

Table C-5B
RI GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C		SEAD-121C		SEAD-121C		SEAD-121C	
Location ID										MW121C-3		MW121C-3		MW121C-4		MW121C-4	
Matrix										GW		GW		GW		GW	
Sample ID										121C-2000		121C-2009		121C-2002		121C-2004	
Sample Depth to Top of Sample										7.75		7.75		4.5		4.5	
Sample Depth to Bottom of Sample										9.5		9.5		10		10	
Sample Date										2/3/2003		5/7/2003		2/3/2003		2/4/2003	
QC Code						**Region IX**				SA		SA		SA		SA	
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**Lowest GW**		PID-RI		PID-RI		PID-RI		PID-RI	
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**		2		3		2		2	
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses [1]**	**Value [2]**	**Exceedances**	**Value [3]**	**Exceedances**	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Cobalt	UG/L	3	50%	3	6	7.30E+02				2.3	U	0.7	U	2.3	U	4.8	J
Copper	UG/L	17.7	50%	3	6	1.46E+03		200		2	U	6.2	J	2	U	2	U
Cyanide	UG/L	0	50%	0	0	7.30E+02											
Cyanide, Amenable	MG/L	0	0%	0	6					0.01	U	0.01	U	0.01	U	0.01	U
Cyanide, Total	MG/L	0	0%	0	3					0.01	U			0.01	U	0.01	U
Iron	UG/L	868.725 [4]	50%	3	6	1.09E+04		300	3	540		516		34.9	U	1720	
Lead	UG/L	10.5	83%	5	6			15		4.1		3	U	5.6		4.8	
Magnesium	UG/L	109000	100%	6	6					27700		27800		73600		88000	
Manganese	UG/L	297	100%	6	6	8.76E+02		50	6	139		135		328		244	
Mercury	UG/L	0.2	33%	2	6	1.09E+01		0.7		0.2	U	0.2		0.2	U	0.2	U
Nickel	UG/L	2 [4]	17%	1	6	7.30E+02		100		2	U	2	U	2	U	3.2	J
Potassium	UG/L	9400	100%	6	6					2070		1790	J	9430		6320	
Selenium	UG/L	6.8	33%	2	6	1.82E+02		10		4.2	U	1.3	U	3	U	5	U
Silver	UG/L	0	0%	0	6	1.82E+02		50		3.7	U	3.7	U	3.7	U	3.7	U
Sodium	UG/L	58400 [4]	100%	6	6			20000	3	18300		17900		60100		56700	
Thallium	UG/L	0	0%	0	6	2.41E+00		2		4.2	U	5.3	U	4.2	U	4.2	U
Vanadium	UG/L	0	0%	0	6	3.65E+01				2.5	U	1.4	U	2.5	U	2.5	U
Zinc	UG/L	96.2	100%	6	6	1.09E+04		5000		12.8	J	38.2		9.2	J	24	
Other																	
Total Petroleum Hydrocarbons	MG/L	0	0%	0	6					0.04	U	1	U	0.041	U	0.04	U

NOTES:
1) Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Tap Water (October 2004)
3) Lowest Groundwater Criteria Values came from the following:
   A) NYSDEC Class GA Groundwater Standard (TOGS 1.1.1, June 1998)
   B) Maximum Contaminant Level - Drinking Water Standards and Health Advisory (EPA 822-B-00-001)
   C) Secondary Drinking Water Regulations - Drinking Water Standards and Health Advisory (EPA 82-B-00-001)
4) The maximum detected concentration was obtained from the average of the sample-duplicate pair: 121C-2004/121C-2002 at MW121C-4.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process

Table C-5B
RI GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C
Location ID										MW121C-4	MW121C-6	MW121C-6
Matrix										GW	GW	GW
Sample ID										121C-2010	121C-2003	121C-2012
Sample Depth to Top of Sample										4.5	6.9	6.9
Sample Depth to Bottom of Sample										10	10	10
Sample Date										5/7/2003	2/3/2003	5/7/2003
QC Code										SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI
										3	2	3
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**Lowest GW Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds												
1,1,1-Trichloroethane	UG/L	0	0%	0	6	3.17E+03		5		0.4 U	5 U	0.4 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	0	6	5.53E-02		5		0.3 U	5 U	0.3 U
1,1,2-Trichloroethane	UG/L	0	0%	0	6	2.00E-01		1		0.3 U	5 U	0.3 U
1,1-Dichloroethane	UG/L	0	0%	0	6	8.11E+02		5		0.4 U	5 U	0.4 U
1,1-Dichloroethene	UG/L	0	0%	0	6	3.39E+02		5		0.3 U	5 U	0.3 UJ
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0	0	4.76E-02		0.04				
1,2-Dibromoethane	UG/L	0	0%	0	0	5.60E-03		0.0006				
1,2-Dichlorobenzene	UG/L	0	0%	0	0	3.70E+02		3				
1,2-Dichloroethane	UG/L	0	0%	0	6	1.23E-01		0.6		0.3 U	5 U	0.3 U
1,2-Dichloropropane	UG/L	0	0%	0	6	1.65E-01		1		0.4 U	5 U	0.4 U
1,3-Dichlorobenzene	UG/L	0	0%	0	0	1.83E+02		3				
1,4-Dichlorobenzene	UG/L	0	0%	0	0	5.02E-01		3				
Acetone	UG/L	0	0%	0	4	5.48E+03				5.8 R	5 UJ	8.5 UJ
Benzene	UG/L	0	0%	0	6	3.54E-01		1		0.3 U	5 U	0.3 U
Bromochloromethane	UG/L	0	0%	0	0			5				
Bromodichloromethane	UG/L	0	0%	0	6	1.81E-01		80		0.4 U	5 U	0.4 U
Bromoform	UG/L	0	0%	0	6	8.51E+00		80		0.3 U	5 U	0.3 U
Carbon disulfide	UG/L	0	0%	0	6	1.04E+03				0.3 U	5 UJ	0.3 UJ
Carbon tetrachloride	UG/L	0	0%	0	6	1.71E-01		5		0.4 U	5 U	0.4 U
Chlorobenzene	UG/L	0	0%	0	6	1.06E+02		5		0.4 U	5 U	0.4 U
Chlorodibromomethane	UG/L	0	0%	0	6	1.33E-01		80		0.4 U	5 U	0.4 U
Chloroethane	UG/L	0	0%	0	6	4.64E+00		5		0.4 U	5 U	0.4 UJ
Chloroform	UG/L	0	0%	0	6	1.66E-01		7		0.4 U	5 U	0.4 U
Cis-1,2-Dichloroethene	UG/L	0	0%	0	6	6.08E+01		5		0.3 U	5 U	0.3 U
Cis-1,3-Dichloropropene	UG/L	0	0%	0	6			0.4		0.3 U	5 U	0.3 UJ
Ethyl benzene	UG/L	0	0%	0	6	1.34E+03		5		0.4 U	5 U	0.4 U
Meta/Para Xylene	UG/L	0	0%	0	6					0.8 U	5 U	0.8 U
Methyl bromide	UG/L	0	0%	0	6	8.66E+00		5		0.4 U	5 U	0.4 U
Methyl butyl ketone	UG/L	0	0%	0	6					2.8 U	5 U	2.8 U
Methyl chloride	UG/L	0	0%	0	6	1.58E+02		5		0.4 UJ	5 UJ	0.4 U
Methyl ethyl ketone	UG/L	0	0%	0	3	6.97E+03				3.6 R	5 UJ	3.6 R
Methyl isobutyl ketone	UG/L	0	0%	0	6	1.99E+03				2.5 U	5 U	2.5 U
Methylene chloride	UG/L	0	0%	0	6	4.28E+00		5		1.3 UJ	5 U	0.6 UJ
Ortho Xylene	UG/L	0	0%	0	6			5		0.4 U	5 U	0.4 U
Styrene	UG/L	0	0%	0	6	1.64E+03		5		0.3 U	5 U	0.3 U
Tetrachloroethene	UG/L	0	0%	0	6	1.04E-01		5		0.5 U	5 U	0.5 U

Table C-5B
RI GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	Lowest GW Criteria Value [3]	Exceedances			
Facility										SEAD-121C	SEAD-121C	SEAD-121C
Location ID										MW121C-4	MW121C-6	MW121C-6
Matrix										GW	GW	GW
Sample ID										121C-2010	121C-2003	121C-2012
Sample Depth to Top of Sample										4.5	6.9	6.9
Sample Depth to Bottom of Sample										10	10	10
Sample Date										5/7/2003	2/3/2003	5/7/2003
QC Code										SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI
										3	2	3
										Value (Q)	Value (Q)	Value (Q)
Toluene	UG/L	0	0%	0	6	7.23E+02		5		0.4 U	5 U	0.4 U
Total Xylenes	UG/L	0	0%	0	0	2.06E+02		5				
Trans-1,2-Dichloroethene	UG/L	0	0%	0	6	1.22E+02		5		0.4 U	5 U	0.4 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0	6			0.4		0.3 U	5 U	0.3 U
Trichloroethene	UG/L	0	0%	0	6	2.80E-02		5		0.4 U	5 U	0.4 U
Vinyl chloride	UG/L	0	0%	0	6	1.98E-02		2		0.3 U	5 U	0.3 U
Semivolatile Organic Compounds												
1,2,4-Trichlorobenzene	UG/L	0	0%	0	6	7.16E+00		5		1.2 U	1.2 U	1.2 U
1,2-Dichlorobenzene	UG/L	0	0%	0	6	3.70E+02		3		1 U	1 U	1 U
1,3-Dichlorobenzene	UG/L	0	0%	0	6	1.83E+02		3		1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/L	0	0%	0	6	5.02E-01		3		1 U	1 U	1 U
2,4,5-Trichlorophenol	UG/L	0	0%	0	6	3.65E+03		1		1 U	1 U	1 U
2,4,6-Trichlorophenol	UG/L	0	0%	0	6	3.65E+00		1		1 U	1 U	1 U
2,4-Dichlorophenol	UG/L	0	0%	0	6	1.09E+02		5		1.3 U	1.3 U	1.3 U
2,4-Dimethylphenol	UG/L	0	0%	0	6	7.30E+02				2.3 U	2.4 U	2.3 U
2,4-Dinitrophenol	UG/L	0	0%	0	3	7.30E+01				2 U		2 UJ
2,4-Dinitrotoluene	UG/L	0	0%	0	6	7.30E+01		5		1.1 U	1.1 U	1.1 U
2,6-Dinitrotoluene	UG/L	0	0%	0	6	3.65E+01		5		1 U	1 U	1 U
2-Chloronaphthalene	UG/L	0	0%	0	6	4.87E+02				1.2 U	1.2 U	1.2 U
2-Chlorophenol	UG/L	0	0%	0	6	3.04E+01				1.1 U	1.1 U	1.1 U
2-Methylnaphthalene	UG/L	0	0%	0	6					1.2 U	1.2 U	1.2 U
2-Methylphenol	UG/L	0	0%	0	6	1.82E+03				1 U	1 U	1 U
2-Nitroaniline	UG/L	0	0%	0	6	1.09E+02		5		1 U	1 U	1 U
2-Nitrophenol	UG/L	0	0%	0	6			1		1.1 U	1.1 U	1.1 U
3 or 4-Methylphenol	UG/L	0	0%	0	3			1			1.9 U	
3,3'-Dichlorobenzidine	UG/L	0	0%	0	6	1.49E-01		5		1 U	1 UJ	1 U
3-Nitroaniline	UG/L	0	0%	0	6	3.20E+00		5		1.2 U	1.2 U	1.2 UJ
4,6-Dinitro-2-methylphenol	UG/L	0	0%	0	6	3.65E+00		1		1.2 U	1.2 U	1.2 UJ
4-Bromophenyl phenyl ether	UG/L	0	0%	0	6					1.3 U	1.3 U	1.3 U
4-Chloro-3-methylphenol	UG/L	0	0%	0	6			1		1.1 U	1.1 U	1.1 U
4-Chloroaniline	UG/L	0	0%	0	6	1.46E+02		5		1.2 U	1.2 UJ	1.2 UJ
4-Chlorophenyl phenyl ether	UG/L	0	0%	0	6					1.2 U	1.2 U	1.2 U
4-Methylphenol	UG/L	0	0%	0	3	1.82E+02				1.8 U		1.8 U
4-Nitroaniline	UG/L	0	0%	0	6	3.20E+00		5		2.4 U	2.5 U	2.4 UJ
4-Nitrophenol	UG/L	0	0%	0	6			1		1.1 U	1.1 U	1.1 U
Acenaphthene	UG/L	0	0%	0	6	3.65E+02				1 U	1 U	1 U
Acenaphthylene	UG/L	0	0%	0	6					1.2 U	1.2 U	1.2 U

Table C-5B
RI GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C		SEAD-121C		SEAD-121C	
Location ID										MW121C-4		MW121C-6		MW121C-6	
Matrix										GW		GW		GW	
Sample ID										121C-2010		121C-2003		121C-2012	
Sample Depth to Top of Sample										4.5		6.9		6.9	
Sample Depth to Bottom of Sample										10		10		10	
Sample Date										5/7/2003		2/3/2003		5/7/2003	
QC Code										SA		SA		SA	
Study ID										PID-RI		PID-RI		PID-RI	
										3		2		3	
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**Lowest GW Criteria Value [3]**	**Exceedances**	Value	(Q)	Value	(Q)	Value	(Q)
Anthracene	UG/L	0	0%	0	6	1.83E+03				1.3	U	1.3	U	1.3	U
Benzo(a)anthracene	UG/L	0	0%	0	6	9.21E-02				1	U	1	U	1	U
Benzo(a)pyrene	UG/L	0	0%	0	6	9.21E-03				1.5	U	1.5	U	1.5	U
Benzo(b)fluoranthene	UG/L	0	0%	0	6	9.21E-02				1	U	1	U	1	U
Benzo(ghi)perylene	UG/L	0	0%	0	6					1.3	U	1.3	UJ	1.3	UJ
Benzo(k)fluoranthene	UG/L	0	0%	0	6	9.21E-01				2.7	U	2.7	U	2.6	U
Bis(2-Chloroethoxy)methane	UG/L	0	0%	0	6			5		1	U	1	U	1	U
Bis(2-Chloroethyl)ether	UG/L	0	0%	0	6	1.02E-02		1		1.2	U	1.2	U	1.2	U
Bis(2-Chloroisopropyl)ether	UG/L	0	0%	0	6	2.74E-01		5		1	U	1	U	1	U
Bis(2-Ethylhexyl)phthalate	UG/L	1.4	17%	1	6	4.80E+00		5		1.4	J	1	U	1	U
Butylbenzylphthalate	UG/L	0	0%	0	6	7.30E+03				1	U	1	U	1	U
Carbazole	UG/L	0	0%	0	6	3.36E+00				0.42	U	0.43	U	0.42	U
Chrysene	UG/L	0	0%	0	6	9.21E+00				1.6	U	1.6	U	1.6	U
Di-n-butylphthalate	UG/L	1.6	17%	1	6	3.65E+03		50		1.2	U	1.2	U	1.6	J
Di-n-octylphthalate	UG/L	0	0%	0	6	1.46E+03				1.5	U	1.5	U	1.5	U
Dibenz(a,h)anthracene	UG/L	0	0%	0	6	9.21E-03				1.5	U	1.5	UJ	1.5	UJ
Dibenzofuran	UG/L	0	0%	0	6	1.22E+01				1	U	1	U	1	U
Diethyl phthalate	UG/L	0	0%	0	6	2.92E+04				1	U	1	U	1	U
Dimethylphthalate	UG/L	0	0%	0	6	3.65E+05				1	U	1	U	1	U
Fluoranthene	UG/L	0	0%	0	6	1.46E+03				1	U	1	U	1	U
Fluorene	UG/L	0	0%	0	6	2.43E+02				1.1	U	1.1	U	1.1	U
Hexachlorobenzene	UG/L	0	0%	0	6	4.20E-02		0.04		1.1	U	1.1	U	1.1	U
Hexachlorobutadiene	UG/L	0	0%	0	6	8.62E-01		0.5		1.5	U	1.5	U	1.5	U
Hexachlorocyclopentadiene	UG/L	0	0%	0	4	2.19E+02		5		3.9	U	3.9	U	3.8	R
Hexachloroethane	UG/L	0	0%	0	6	4.80E+00		5		1.1	U	1.1	U	1.1	U
Indeno(1,2,3-cd)pyrene	UG/L	0	0%	0	6	9.21E-02				1.6	U	1.6	U	1.6	UJ
Isophorone	UG/L	0	0%	0	6	7.08E+01				1	U	1	U	1	U
N-Nitrosodiphenylamine	UG/L	0	0%	0	6	1.37E+01				2	U	2.1	U	2	U
N-Nitrosodipropylamine	UG/L	0	0%	0	6	9.60E-03				1	U	1	U	1	UJ
Naphthalene	UG/L	0	0%	0	6	6.20E+00				1.2	U	1.2	U	1.2	U
Nitrobenzene	UG/L	0	0%	0	6	3.40E+00		0.4		1	U	1	U	1	U
Pentachlorophenol	UG/L	0	0%	0	6	5.60E-01		1		1.9	U	2	U	1.9	U
Phenanthrene	UG/L	0	0%	0	6					1	U	1	U	1	U
Phenol	UG/L	0	0%	0	6	1.09E+04		1		1	U	1	U	1	U
Pyrene	UG/L	0	0%	0	6	1.83E+02				1	U	1	U	1	U
Pesticides/PCBs															
4,4'-DDD	UG/L	0	0%	0	2	2.80E-01		0.3		0.01	UJ	0.01	R		

Table C-5B
RI GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C		SEAD-121C		SEAD-121C	
Location ID										MW121C-4		MW121C-6		MW121C-6	
Matrix										GW		GW		GW	
Sample ID										121C-2010		121C-2003		121C-2012	
Sample Depth to Top of Sample										4.5		6.9		6.9	
Sample Depth to Bottom of Sample										10		10		10	
Sample Date										5/7/2003		2/3/2003		5/7/2003	
QC Code						Region IX				SA		SA		SA	
Study ID			Frequency	Number	Number	PRG		Lowest GW		PID-RI		PID-RI		PID-RI	
		Maximum	of	of Times	of	Criteria		Criteria		3		2		3	
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses [1]**	**Value [2]**	**Exceedances**	**Value [3]**	**Exceedances**	Value	(Q)	Value	(Q)	Value	(Q)
4,4'-DDE	UG/L	0	0%	0	5	1.98E-01		0.2		0.005	U	0.005	UJ		
4,4'-DDT	UG/L	0	0%	0	2	1.98E-01		0.2		0.01	UJ	0.01	R		
Aldrin	UG/L	0	0%	0	5	3.95E-03		0		0.02	U	0.02	U		
Alpha-BHC	UG/L	0	0%	0	5	1.07E-02		0.01		0.01	UJ	0.01	U		
Alpha-Chlordane	UG/L	0	0%	0	5					0.02	U	0.02	U		
Beta-BHC	UG/L	0	0%	0	5	3.74E-02		0.04		0.01	U	0.01	U		
Chlordane	UG/L	0	0%	0	3							0.14	U		
Delta-BHC	UG/L	0	0%	0	5			0.04		0.004	UJ	0.004	UJ		
Dieldrin	UG/L	0	0%	0	5	4.20E-03		0.004		0.009	U	0.009	U		
Endosulfan I	UG/L	0	0%	0	5					0.01	U	0.02	UJ		
Endosulfan II	UG/L	0	0%	0	5					0.01	UJ	0.01	UJ		
Endosulfan sulfate	UG/L	0	0%	0	5					0.02	UJ	0.02	U		
Endrin	UG/L	0	0%	0	5	1.09E+01		0		0.02	UJ	0.02	UJ		
Endrin aldehyde	UG/L	0	0%	0	5			5		0.02	U	0.02	UJ		
Endrin ketone	UG/L	0	0%	0	5			5		0.009	U	0.009	U		
Gamma-BHC/Lindane	UG/L	0	0%	0	5	5.17E-02		0.05		0.009	UJ	0.009	U		
Gamma-Chlordane	UG/L	0	0%	0	5					0.01	U	0.01	U		
Heptachlor	UG/L	0	0%	0	5	1.49E-02		0.04		0.007	U	0.007	U		
Heptachlor epoxide	UG/L	0	0%	0	5	7.39E-03		0.03		0.008	U	0.009	UJ		
Methoxychlor	UG/L	0	0%	0	5	1.82E+02		35		0.008	UJ	0.008	UJ		
Toxaphene	UG/L	0	0%	0	5	6.11E-02		0.06		0.12	U	0.12	U		
Aroclor-1016	UG/L	0	0%	0	5	9.60E-01		0.09		0.24	U	0.24	U		
Aroclor-1221	UG/L	0	0%	0	5			0.09		0.081	U	0.08	U		
Aroclor-1232	UG/L	0	0%	0	5			0.09		0.091	U	0.09	U		
Aroclor-1242	UG/L	0	0%	0	5			0.09		0.081	U	0.08	U		
Aroclor-1248	UG/L	0	0%	0	5			0.09		0.12	U	0.12	U		
Aroclor-1254	UG/L	0	0%	0	5	3.36E-02		0.09		0.051	U	0.05	U		
Aroclor-1260	UG/L	0	0%	0	5			0.09		0.01	U	0.01	U		
Metals and Cyanide															
Aluminum	UG/L	588 [4]	100%	6	6	3.65E+04		50	4	19.9	J	88.7	J	41.1	J
Antimony	UG/L	8.4	33%	2	6	1.46E+01		3	2	3.8	U	8.4	J	3.8	U
Arsenic	UG/L	0	0%	0	6	4.48E-02		10		4.5	U	4.5	U	4.5	U
Barium	UG/L	73.7	100%	6	6	2.55E+03		1000		21	J	19.4		18.2	J
Beryllium	UG/L	0.24	17%	1	6	7.30E+01		4		0.24	J	0.9	U	0.1	U
Cadmium	UG/L	1.1	17%	1	6	1.82E+01		5		0.8	U	0.8	U	1.1	J
Calcium	UG/L	558000	100%	6	6					338000	J	558000		418000	
Chromium	UG/L	21.4	83%	5	6			50		1.5	J	3.3		21.4	

Table C-5B
RI GROUNDWATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	Lowest GW Criteria Value [3]	Exceedances	Value	(Q)	Value	(Q)	Value	(Q)
Facility										SEAD-121C		SEAD-121C		SEAD-121C	
Location ID										MW121C-4		MW121C-6		MW121C-6	
Matrix										GW		GW		GW	
Sample ID										121C-2010		121C-2003		121C-2012	
Sample Depth to Top of Sample										4.5		6.9		6.9	
Sample Depth to Bottom of Sample										10		10		10	
Sample Date										5/7/2003		2/3/2003		5/7/2003	
QC Code										SA		SA		SA	
Study ID										PID-RI		PID-RI		PID-RI	
										3		2		3	
Cobalt	UG/L	3	50%	3	6	7.30E+02				1.5	J	3	J	0.7	U
Copper	UG/L	17.7	50%	3	6	1.46E+03		200		11.8	J	2	U	17.7	J
Cyanide	UG/L	0	50%	0	0	7.30E+02									
Cyanide, Amenable	MG/L	0	0%	0	6					0.01	U	0.01	U	0.01	U
Cyanide, Total	MG/L	0	0%	0	3							0.01	U		
Iron	UG/L	868.725 [4]	50%	3	6	1.09E+04		300	3	22.2	U	34.9	U	22.2	U
Lead	UG/L	10.5	83%	5	6			15		9		3.8		10.5	
Magnesium	UG/L	109000	100%	6	6					61800		109000		89000	
Manganese	UG/L	297	100%	6	6	8.76E+02		50	6	279		297		170	
Mercury	UG/L	0.2	33%	2	6	1.09E+01		0.7		0.2	U	0.2	U	0.2	
Nickel	UG/L	2 [4]	17%	1	6	7.30E+02		100		2	U	2	U	2	U
Potassium	UG/L	9400	100%	6	6					9400		3850		6320	J
Selenium	UG/L	6.8	33%	2	6	1.82E+02		10		1.9	J	6.8		1.3	U
Silver	UG/L	0	0%	0	6	1.82E+02		50		3.7	U	3.7	U	3.7	U
Sodium	UG/L	58400 [4]	100%	6	6			20000	3	54100		26400		17600	
Thallium	UG/L	0	0%	0	6	2.41E+00		2		5.3	U	4.2	U	5.3	U
Vanadium	UG/L	0	0%	0	6	3.65E+01				1.4	U	2.5	U	1.4	U
Zinc	UG/L	96.2	100%	6	6	1.09E+04		5000		24.8		12.6	J	96.2	
Other															
Total Petroleum Hydrocarbons	MG/L	0	0%	0	6					1	U	0.04	U	1	U

NOTES:
1) Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Tap Water (October 2004)
3) Lowest Groundwater Criteria Values came from the following:
  A) NYSDEC Class GA Groundwater Standard (TOGS 1.1.1, June 1998)
  B) Maximum Contaminant Level - Drinking Water Standards and Health Advisory (EPA 822-B-00-001)
  C) Secondary Drinking Water Regulations - Drinking Water Standards and Health Advisory (EPA 82-B-00-001)
4) The maximum detected concentration was obtained from the average of the sample-duplicate pair: 121C-2004/121C-2002 at MW121C-4.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process

Table C-6
GROUNDWATER SAMPLE RESULTS
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										Building 360	Building 360	Building 360	Building 360	Building 360
Location ID										MW-1	MW-1	MW-1	MW-1	MW-2
Matrix										GW	GW	GW	GW	GW
Sample ID										DRMO-2005	DRMO-2008	DRMO-2013	121C-2019	DRMO-2006
Sample Depth to Top of Sample										16.5	16.5	16.6	16.6	16.7
Sample Depth to Bottom of Sample										16.5	16.5	16.6	16.6	16.7
Sample Date										4/4/2003	4/4/2003	5/9/2003	5/9/2003	4/3/2003
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										2	2	3	3	2
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses** [1]	**Region IX PRG Criteria Value** [2]	**Exceedances**	**Lowest GW Criteria Value** [3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds														
1,1,1-Trichloroethane	UG/L	0	0%	0	6	3.17E+03		5		5 U	5 U	0.4 U	0.4 U	5 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	0	6	5.53E-02		5		5 U	5 U	0.3 U	0.3 U	5 U
1,1,2-Trichloroethane	UG/L	0	0%	0	6	2.00E-01		1		5 U	5 U	0.3 U	0.3 U	5 U
1,1-Dichloroethane	UG/L	4.3 [4]	67%	4	6	8.11E+02		5		5 UJ	4.4 J	4.3	4.3	5 UJ
1,1-Dichloroethene	UG/L	0	0%	0	6	3.39E+02		5		5 U	5 U	0.3 U	0.3 U	5 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0	0	4.76E-02		0.04						
1,2-Dibromoethane	UG/L	0	0%	0	0	5.60E-03		0.0006						
1,2-Dichlorobenzene	UG/L	0	0%	0	0	3.70E+02		3						
1,2-Dichloroethane	UG/L	0	0%	0	6	1.23E-01		0.6		5 U	5 U	0.3 U	0.3 U	5 U
1,2-Dichloropropane	UG/L	0.4 [4]	17%	1	6	1.65E-01	1	1		5 U	5 U	0.4 U	0.5 J	5 U
1,3-Dichlorobenzene	UG/L	0	17%	0	0	1.83E+02		3						
1,4-Dichlorobenzene	UG/L	0	17%	0	0	5.02E-01		3						
Acetone	UG/L	8.4 [4]	25%	1	4	5.48E+03				5 R	5 R	5.8 R	8.4 J	5 R
Benzene	UG/L	0	0%	0	6	3.54E-01		1		5 U	5 U	0.3 U	0.3 U	5 U
Bromochloromethane	UG/L	0	0%	0	0			5						
Bromodichloromethane	UG/L	0	0%	0	6	1.81E-01		80		5 U	5 U	0.4 U	0.4 U	5 U
Bromoform	UG/L	0	0%	0	6	8.51E+00		80		5 U	5 U	0.3 U	0.3 U	5 U
Carbon disulfide	UG/L	0.6	17%	1	6	1.04E+03				5 UJ	5 UJ	0.3 U	0.3 U	5 UJ
Carbon tetrachloride	UG/L	0	0%	0	6	1.71E-01		5		5 U	5 U	0.4 U	0.4 U	5 U
Chlorobenzene	UG/L	0	0%	0	6	1.06E+02		5		5 U	5 U	0.4 U	0.4 U	5 U
Chlorodibromomethane	UG/L	0	0%	0	6	1.33E-01		80		5 U	5 U	0.4 U	0.4 U	5 U
Chloroethane	UG/L	0	0%	0	6	4.64E+00		5		5 UJ	5 UJ	0.4 U	0.4 U	5 UJ
Chloroform	UG/L	0	0%	0	6	1.66E-01		7		5 U	5 U	0.4 U	0.4 U	5 U
Cis-1,2-Dichloroethene	UG/L	1	33%	2	6	6.08E+01		5		5 U	5 U	0.3 U	0.4 J	5 U
Cis-1,3-Dichloropropene	UG/L	0	0%	0	6			0.4		5 U	5 U	0.3 U	0.3 U	5 U
Ethyl benzene	UG/L	0	0%	0	6	1.34E+03		5		5 U	5 U	0.4 U	0.4 U	5 U
Meta/Para Xylene	UG/L	0	0%	0	6					5 U	5 U	0.8 U	0.8 U	5 U
Methyl bromide	UG/L	0	0%	0	6	8.66E+00		5		5 UJ	5 UJ	0.4 U	0.4 U	5 UJ
Methyl butyl ketone	UG/L	0	0%	0	6					5 U	5 U	2.8 U	2.8 U	5 U
Methyl chloride	UG/L	0	0%	0	6	1.58E+02		5		5 U	5 U	0.4 U	0.4 U	5 U
Methyl ethyl ketone	UG/L	0	0%	0	3	6.97E+03				5 UJ	5 UJ	3.6 R	3.6 R	5 UJ
Methyl isobutyl ketone	UG/L	0	0%	0	6	1.99E+03				5 U	5 U	2.5 U	2.5 U	5 U
Methylene chloride	UG/L	1 [4]	17%	1	6	4.28E+00		5		5 UJ	5 UJ	1 J	1 J	5 UJ
Ortho Xylene	UG/L	0	0%	0	6			5		5 U	5 U	0.4 U	0.4 U	5 U
Styrene	UG/L	0	0%	0	6	1.64E+03		5		5 U	5 U	0.3 U	0.3 U	5 U
Tetrachloroethene	UG/L	0	0%	0	6	1.04E-01		5		5 UJ	5 UJ	0.5 U	0.5 U	5 UJ
Toluene	UG/L	0	0%	0	6	7.23E+02		5		5 U	5 U	0.4 U	0.4 U	5 U
Total Xylenes	UG/L	0	0%	0	0	2.06E+02		5						
Trans-1,2-Dichloroethene	UG/L	0	0%	0	6	1.22E+02		5		5 U	5 U	0.4 U	0.4 U	5 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0	6			0.4		5 U	5 U	0.3 U	0.3 U	5 U
Trichloroethene	UG/L	0	0%	0	6	2.80E-02		5		5 U	5 U	0.4 U	0.4 U	5 U
Vinyl chloride	UG/L	2.3 [4]	67%	4	6	1.98E-02	4	2	1	2.2 J	2.4 J	1.4	1.3	5 U
Semivolatile Organic Compounds														
1,2,4-Trichlorobenzene	UG/L	0	0%	0	6	7.16E+00		5		1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ
1,2-Dichlorobenzene	UG/L	0	0%	0	6	3.70E+02		3		1 UJ	1 UJ	1 U	1 U	1 UJ

Table C-6
GROUNDWATER SAMPLE RESULTS
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	Lowest GW Criteria Value [3]	Exceedances					
Facility										Building 360	Building 360	Building 360	Building 360	Building 360
Location ID										MW-1	MW-1	MW-1	MW-1	MW-2
Matrix										GW	GW	GW	GW	GW
Sample ID										DRMO-2005	DRMO-2008	DRMO-2013	121C-2019	DRMO-2006
Sample Depth to Top of Sample										16.5	16.5	16.6	16.6	16.7
Sample Depth to Bottom of Sample										16.5	16.5	16.6	16.6	16.7
Sample Date										4/4/2003	4/4/2003	5/9/2003	5/9/2003	4/3/2003
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										2	2	3	3	2
										Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
1,3-Dichlorobenzene	UG/L	0	0%	0	6	1.83E+02		3		1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ
1,4-Dichlorobenzene	UG/L	0	0%	0	6	5.02E-01		3		1 UJ	1 UJ	1 U	1 U	1 UJ
2,4,5-Trichlorophenol	UG/L	0	0%	0	3	3.65E+03		1		1 R	1 R	1 U	1 U	1 R
2,4,6-Trichlorophenol	UG/L	0	0%	0	6	3.65E+00		1		1 U	1 U	1 U	1 U	1 U
2,4-Dichlorophenol	UG/L	0	0%	0	3	1.09E+02		5		1.4 R	1.3 R	1.3 U	1.3 U	1.3 R
2,4-Dimethylphenol	UG/L	0	0%	0	3	7.30E+02				2.4 R	2.3 R	2.3 U	2.3 U	2.3 R
2,4-Dinitrophenol	UG/L	0	0%	0	3	7.30E+01						2 UJ	2 UJ	
2,4-Dinitrotoluene	UG/L	0	0%	0	6	7.30E+01		5		1.1 UJ	1.1 UJ	1.1 U	1.1 U	1.1 UJ
2,6-Dinitrotoluene	UG/L	0	0%	0	6	3.65E+01		5		1 UJ	1 UJ	1 U	1 U	1 UJ
2-Chloronaphthalene	UG/L	0	0%	0	6	4.87E+02				1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ
2-Chlorophenol	UG/L	0	0%	0	3	3.04E+01				1.1 R	1.1 R	1.1 U	1.1 U	1.1 R
2-Methylnaphthalene	UG/L	0	0%	0	6					1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ
2-Methylphenol	UG/L	0	0%	0	3	1.82E+03				1 R	1 R	1 U	1 U	1 R
2-Nitroaniline	UG/L	0	0%	0	6	1.09E+02		5		1 UJ	1 UJ	1 U	1 U	1 UJ
2-Nitrophenol	UG/L	0	0%	0	3			1		1.1 R	1.1 R	1.1 U	1.1 U	1.1 R
3 or 4-Methylphenol	UG/L	0	0%	0	0			1						
3,3'-Dichlorobenzidine	UG/L	0	0%	0	6	1.49E-01		5		1 UJ	1 UJ	1 U	1 U	1 UJ
3-Nitroaniline	UG/L	0	0%	0	6	3.20E+00		5		1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ
4,6-Dinitro-2-methylphenol	UG/L	0	0%	0	3	3.65E+00		1		1.2 R	1.2 R	1.2 UJ	1.2 UJ	1.2 R
4-Bromophenyl phenyl ether	UG/L	0	0%	0	6					1.4 UJ	1.3 UJ	1.3 U	1.3 U	1.3 UJ
4-Chloro-3-methylphenol	UG/L	0	0%	0	3			1		1.1 R	1.1 R	1.1 U	1.1 U	1.1 R
4-Chloroaniline	UG/L	0	0%	0	3	1.46E+02		5		1.2 R	1.2 R	1.2 UJ	1.2 UJ	1.2 R
4-Chlorophenyl phenyl ether	UG/L	0	0%	0	6					1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ
4-Methylphenol	UG/L	0	0%	0	3	1.82E+02				1.9 R	1.8 R	1.8 U	1.8 U	1.8 R
4-Nitroaniline	UG/L	0	0%	0	6	3.20E+00		5		2.5 UJ	2.4 UJ	2.4 UJ	2.4 UJ	2.4 UJ
4-Nitrophenol	UG/L	0	0%	0	3			1		1.1 R	1.1 R	1.1 U	1.1 U	1.1 R
Acenaphthene	UG/L	0	0%	0	6	3.65E+02				1 UJ	1 UJ	1 U	1 U	1 UJ
Acenaphthylene	UG/L	0	0%	0	6					1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ
Anthracene	UG/L	0	0%	0	6	1.83E+03				1.4 UJ	1.3 UJ	1.3 U	1.3 U	1.3 UJ
Benzo(a)anthracene	UG/L	0	0%	0	6	9.21E-02				1 UJ	1 UJ	1 U	1 U	1 UJ
Benzo(a)pyrene	UG/L	0	0%	0	6	9.21E-03				1.6 UJ	1.5 UJ	1.5 U	1.5 U	1.5 UJ
Benzo(b)fluoranthene	UG/L	0	0%	0	6	9.21E-02				1 UJ	1 UJ	1 U	1 U	1 UJ
Benzo(ghi)perylene	UG/L	0	0%	0	6					1.4 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ
Benzo(k)fluoranthene	UG/L	0	0%	0	6	9.21E-01				2.7 UJ	2.7 UJ	2.6 U	2.7 U	2.7 UJ
Bis(2-Chloroethoxy)methane	UG/L	0	0%	0	6			5		1 U	1 U	1 U	1 U	1 U
Bis(2-Chloroethyl)ether	UG/L	0	0%	0	6	1.02E-02		1		1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Bis(2-Chloroisopropyl)ether	UG/L	0	0%	0	6	2.74E-01		5		1 UJ	1 UJ	1 U	1 U	1 UJ
Bis(2-Ethylhexyl)phthalate	UG/L	2.5	17%	1	6	4.80E+00		5		1 U	1 U	1 U	1 U	1 U
Butylbenzylphthalate	UG/L	0	0%	0	6	7.30E+03				1 UJ	1 UJ	1 U	1 U	1 UJ
Carbazole	UG/L	0	0%	0	6	3.36E+00				0.43 UJ	0.42 UJ	0.42 U	0.42 U	0.42 UJ
Chrysene	UG/L	0	0%	0	6	9.21E+00				1.7 UJ	1.6 UJ	1.6 U	1.6 U	1.6 UJ
Di-n-butylphthalate	UG/L	0	0%	0	6	3.65E+03		50		1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ
Di-n-octylphthalate	UG/L	0	0%	0	6	1.46E+03				1.6 UJ	1.5 UJ	1.5 U	1.5 U	1.5 UJ
Dibenz(a,h)anthracene	UG/L	0	0%	0	6	9.21E-03				1.6 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ
Dibenzofuran	UG/L	0	0%	0	6	1.22E+01				1 UJ	1 UJ	1 U	1 U	1 UJ
Diethyl phthalate	UG/L	0	0%	0	6	2.92E+04				1 UJ	1 UJ	1 U	1 U	1 UJ

Table C-6
GROUNDWATER SAMPLE RESULTS
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										Building 360	Building 360	Building 360	Building 360	Building 360
Location ID										MW-1	MW-1	MW-1	MW-1	MW-2
Matrix										GW	GW	GW	GW	GW
Sample ID										DRMO-2005	DRMO-2008	DRMO-2013	121C-2019	DRMO-2006
Sample Depth to Top of Sample										16.5	16.5	16.6	16.6	16.7
Sample Depth to Bottom of Sample										16.5	16.5	16.6	16.6	16.7
Sample Date										4/4/2003	4/4/2003	5/9/2003	5/9/2003	4/3/2003
QC Code						**Region IX**				SA	SA	SA	SA	SA
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**Lowest GW**		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**		2	2	3	3	2
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses [1]**	**Value [2]**	**Exceedances**	**Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Dimethylphthalate	UG/L	0	0%	0	6	3.65E+05				1 UJ	1 UJ	1 U	1 U	1 UJ
Fluoranthene	UG/L	0	0%	0	6	1.46E+03				1 UJ	1 UJ	1 U	1 U	1 UJ
Fluorene	UG/L	0	0%	0	6	2.43E+02				1.1 UJ	1.1 UJ	1.1 U	1.1 U	1.1 UJ
Hexachlorobenzene	UG/L	0	0%	0	6	4.20E-02		0.04		1.1 UJ	1.1 UJ	1.1 U	1.1 U	1.1 UJ
Hexachlorobutadiene	UG/L	0	0%	0	6	8.62E-01		0.5		1.6 UJ	1.5 UJ	1.5 U	1.5 U	1.5 UJ
Hexachlorocyclopentadiene	UG/L	0	0%	0	3	2.19E+02		5		4 UJ	3.9 UJ	3.8 R	3.9 R	3.9 UJ
Hexachloroethane	UG/L	0	0%	0	6	4.80E+00		5		1.1 UJ	1.1 UJ	1.1 U	1.1 U	1.1 UJ
Indeno(1,2,3-cd)pyrene	UG/L	0	0%	0	6	9.21E-02				1.7 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ
Isophorone	UG/L	0	0%	0	6	7.08E+01				1 UJ	1 UJ	1 U	1 U	1 UJ
N-Nitrosodiphenylamine	UG/L	0	0%	0	6	1.37E+01				2.1 UJ	2 UJ	2 U	2 U	2 UJ
N-Nitrosodipropylamine	UG/L	0	0%	0	6	9.60E-03				1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Naphthalene	UG/L	0	0%	0	6	6.20E+00				1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ
Nitrobenzene	UG/L	0	0%	0	6	3.40E+00		0.4		1 UJ	1 UJ	1 U	1 U	1 UJ
Pentachlorophenol	UG/L	0	0%	0	3	5.60E-01		1		2 R	1.9 R	1.9 U	1.9 U	1.9 R
Phenanthrene	UG/L	0	0%	0	6					1 UJ	1 UJ	1 U	1 U	1 UJ
Phenol	UG/L	0	0%	0	3	1.09E+04		1		1 R	1 R	1 U	1 U	1 R
Pyrene	UG/L	0	0%	0	6	1.83E+02				1 UJ	1 UJ	1 U	1 U	1 UJ
Pesticides/PCBs														
4,4'-DDD	UG/L	0	0%	0	6	2.80E-01		0.3		0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U
4,4'-DDE	UG/L	0	0%	0	6	1.98E-01		0.2		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
4,4'-DDT	UG/L	0	0%	0	6	1.98E-01		0.2		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Aldrin	UG/L	0	0%	0	6	3.95E-03		0		0.02 U	0.02 U	0.02 UJ	0.02 UJ	0.02 U
Alpha-BHC	UG/L	0	0%	0	6	1.07E-02		0.01		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Alpha-Chlordane	UG/L	0	0%	0	6					0.02 U	0.02 U	0.02 UJ	0.02 UJ	0.02 U
Beta-BHC	UG/L	0	0%	0	6	3.74E-02		0.04		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chlordane	UG/L	0	0%	0	3					0.14 U	0.14 U			0.14 U
Delta-BHC	UG/L	0	0%	0	6			0.04		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Dieldrin	UG/L	0	0%	0	6	4.20E-03		0.004		0.009 U	0.009 U	0.009 U	0.009 U	0.009 U
Endosulfan I	UG/L	0	0%	0	6					0.02 U	0.02 U	0.02 UJ	0.01 UJ	0.02 U
Endosulfan II	UG/L	0	0%	0	6					0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U
Endosulfan sulfate	UG/L	0	0%	0	6					0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin	UG/L	0	0%	0	6	1.09E+01		0		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin aldehyde	UG/L	0	0%	0	6			5		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin ketone	UG/L	0	0%	0	6			5		0.009 U	0.009 U	0.009 UJ	0.009 UJ	0.009 U
Gamma-BHC/Lindane	UG/L	0	0%	0	6	5.17E-02		0.05		0.009 U	0.009 U	0.009 UJ	0.009 UJ	0.009 U
Gamma-Chlordane	UG/L	0	0%	0	6					0.01 UJ	0.01 UJ	0.01 U	0.01 U	0.01 UJ
Heptachlor	UG/L	0	0%	0	6	1.49E-02		0.04		0.007 U	0.007 U	0.007 U	0.007 U	0.007 U
Heptachlor epoxide	UG/L	0	0%	0	6	7.39E-03		0.03		0.009 U	0.009 U	0.009 U	0.008 U	0.009 U
Methoxychlor	UG/L	0	0%	0	6	1.82E+02		35		0.008 UJ	0.008 UJ	0.008 U	0.008 U	0.008 UJ
Toxaphene	UG/L	0	0%	0	6	6.11E-02		0.06		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor-1016	UG/L	0	0%	0	6	9.60E-01		0.09		0.24 UJ	0.25 UJ	0.25 UJ	0.24 UJ	0.25 UJ
Aroclor-1221	UG/L	0	0%	0	6			0.09		0.082 U	0.082 U	0.083 U	0.081 U	0.082 U
Aroclor-1232	UG/L	0	0%	0	6			0.09		0.092 UJ	0.093 UJ	0.094 UJ	0.091 UJ	0.093 UJ
Aroclor-1242	UG/L	0	0%	0	6			0.09		0.082 UJ	0.082 UJ	0.083 UJ	0.081 UJ	0.082 UJ
Aroclor-1248	UG/L	0	0%	0	6			0.09		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U

Table C-6
GROUNDWATER SAMPLE RESULTS
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	Lowest GW Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										Building 360	Building 360	Building 360	Building 360	Building 360
Location ID										MW-1	MW-1	MW-1	MW-1	MW-2
Matrix										GW	GW	GW	GW	GW
Sample ID										DRMO-2005	DRMO-2008	DRMO-2013	121C-2019	DRMO-2006
Sample Depth to Top of Sample										16.5	16.5	16.6	16.6	16.7
Sample Depth to Bottom of Sample										16.5	16.5	16.6	16.6	16.7
Sample Date										4/4/2003	4/4/2003	5/9/2003	5/9/2003	4/3/2003
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										2	2	3	3	2
Aroclor-1254	UG/L	0	0%	0	6	3.36E-02		0.09		0.051 U	0.052 U	0.052 U	0.051 U	0.052 U
Aroclor-1260	UG/L	0	0%	0	6			0.09		0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U
Metals and Cyanide														
Aluminum	UG/L	105	57%	4	7	3.65E+04		50	4	150 U	28.3 J	32 U	32 U	65.4 J
Antimony	UG/L	0	0%	0	7	1.46E+01		3		3.8 U	3.8 U	7.5 U	7.5 U	3.8 U
Arsenic	UG/L	4.7[4]	14%	1	7	4.48E-02	1	10		4.5 U	4.5 U	7.1	4.5 U	4.5 U
Barium	UG/L	141[4]	100%	7	7	2.55E+03		1000		135	147	113	113	120
Beryllium	UG/L	0	0%	0	7	7.30E+01		4		0.1 U	0.1 U	0.9 U	0.9 U	0.1 U
Cadmium	UG/L	3.9	14%	1	7	1.82E+01		5		0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Calcium	UG/L	119149.8	100%	7	7					88700	96900	84200	87100	109000
Chromium	UG/L	84	71%	5	7			50	1	1.4 U	1.4 U	1.4 U	1.4 U	27.5
Cobalt	UG/L	7.4	43%	3	7	7.30E+02				0.7 U	0.7 U	2.3 U	2.3 U	0.85 J
Copper	UG/L	167	43%	3	7	1.46E+03		200		3.6 U	3.6 U	2 U	2 U	3.6 U
Cyanide	UG/L	0	43%	0	0	7.30E+02								
Cyanide, Amenable	MG/L	0	0%	0	6					0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Cyanide, Total	MG/L	0	0%	0	0									
Iron	UG/L	255000	100%	7	7	1.09E+04	2	300	4	3780 J	3290 J	3810	3510	251 J
Lead	UG/L	204	29%	2	7			15	2	3 U	3 U	3 U	3 U	3 U
Magnesium	UG/L	27400	100%	7	7					11400	12500	11000	11400	25300
Manganese	UG/L	1645[4]	100%	7	7	8.76E+02	4	50	7	1580	1710	1140	1180	347
Mercury	UG/L	0.28	29%	2	7	1.09E+01		0.7		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	UG/L	38.8	86%	6	7	7.30E+02		100		3 J	3.8 J	2 U	2 U	23.6
Potassium	UG/L	12300	100%	7	7					9450 J	10600 J	8820	9430	2460
Selenium	UG/L	7.5	57%	4	7	1.82E+02		10		4.2 J	3.3 J	1.3 U	3.2 J	3.4 J
Silver	UG/L	8.6	14%	1	7	1.82E+02		50		3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Sodium	UG/L	42850[4]	100%	7	7			20000	7	40400	45300	41100	44000	37700
Thallium	UG/L	3.3[4]	14%	1	7	2.41E+00	1	2	1	5.3 U	5.3 U	4.4 J	4.2 U	5.3 U
Vanadium	UG/L	4.4	14%	1	7	3.65E+01				1.4 U	1.4 U	2.5 U	2.5 U	1.4 U
Zinc	UG/L	5740	100%	7	7	1.09E+04		5000	2	7.1 J	7.1 J	14.4 J	17 J	10.4
Other														
Total Petroleum Hydrocarbons	MG/L	1.52	33%	2	6					1 U	1 U	1 U	1 U	1 U

NOTES:
1) Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Tap Water (October 2004)
3) Lowest Groundwater Criteria Values came from the following:
  A) NYSDEC Class GA Groundwater Standard (TOGS 1.1.1, June 1998)
  B) Maximum Contaminant Level - Drinking Water Standards and Health Advisory (EPA 822-B-00-001)
  C) Secondary Drinking Water Regulations - Drinking Water Standards and Health Advisory (EPA 82-B-00-001)
4) The maximum detected concentration was obtained from the average of the sample and its duplicate pairs:
  DRMO-2005/DRMO-2008 collected April 2003 from MW-1 and DRMO-2013/DRMO-2019 collected May 2003 from MW-1.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process

Table C-6
GROUNDWATER SAMPLE RESULTS
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										Building 360	Building 360	Building 360	Building 360
Location ID										MW-2	MW-2	T-SUMP	T-SUMP
Matrix										GW	GW	GW	GW
Sample ID										DRMO-2014D	DRMO-2014	DRMO-2007	DRMO-2015
Sample Depth to Top of Sample										16.7	16.7	3	0
Sample Depth to Bottom of Sample										16.7	16.7	3	0
Sample Date										5/8/2003	5/8/2003	4/3/2003	5/8/2003
QC Code										DU	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										3	3	2	3
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**Lowest GW Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0	0%	0	6	3.17E+03		5			0.4 U	5 U	0.4 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	0	6	5.53E-02		5			0.3 U	5 U	0.3 U
1,1,2-Trichloroethane	UG/L	0	0%	0	6	2.00E-01		1			0.3 U	5 U	0.3 U
1,1-Dichloroethane	UG/L	4.3 [4]	67%	4	6	8.11E+02		5			0.4 U	1.3 J	2.1
1,1-Dichloroethene	UG/L	0	0%	0	6	3.39E+02		5			0.3 UJ	5 U	0.3 UJ
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0	0	4.76E-02		0.04					
1,2-Dibromoethane	UG/L	0	0%	0	0	5.60E-03		0.0006					
1,2-Dichlorobenzene	UG/L	0	0%	0	0	3.70E+02		3					
1,2-Dichloroethane	UG/L	0	0%	0	6	1.23E-01		0.6			0.3 U	5 U	0.3 U
1,2-Dichloropropane	UG/L	0.4 [4]	17%	1	6	1.65E-01	1	1			0.4 U	5 U	0.4 U
1,3-Dichlorobenzene	UG/L	0	17%	0	0	1.83E+02		3					
1,4-Dichlorobenzene	UG/L	0	17%	0	0	5.02E-01		3					
Acetone	UG/L	8.4 [4]	25%	1	4	5.48E+03					5.9 UJ	10 UJ	9.1 UJ
Benzene	UG/L	0	0%	0	6	3.54E-01		1			0.3 U	5 U	0.3 U
Bromochloromethane	UG/L	0	0%	0	0			5					
Bromodichloromethane	UG/L	0	0%	0	6	1.81E-01		80			0.4 U	5 U	0.4 U
Bromoform	UG/L	0	0%	0	6	8.51E+00		80			0.3 U	5 U	0.3 U
Carbon disulfide	UG/L	0.6	17%	1	6	1.04E+03					0.3 UJ	5 UJ	0.6 J
Carbon tetrachloride	UG/L	0	0%	0	6	1.71E-01		5			0.4 U	5 U	0.4 U
Chlorobenzene	UG/L	0	0%	0	6	1.06E+02		5			0.4 U	5 U	0.4 U
Chlorodibromomethane	UG/L	0	0%	0	6	1.33E-01		80			0.4 U	5 U	0.4 U
Chloroethane	UG/L	0	0%	0	6	4.64E+00		5			0.4 UJ	5 UJ	0.4 UJ
Chloroform	UG/L	0	0%	0	6	1.66E-01		7			0.4 U	5 U	0.4 U
Cis-1,2-Dichloroethene	UG/L	1	33%	2	6	6.08E+01		5			0.3 U	5 U	1 J
Cis-1,3-Dichloropropene	UG/L	0	0%	0	6			0.4			0.3 UJ	5 U	0.3 UJ
Ethyl benzene	UG/L	0	0%	0	6	1.34E+03		5			0.4 U	5 U	0.4 U
Meta/Para Xylene	UG/L	0	0%	0	6						0.8 U	5 U	0.8 U
Methyl bromide	UG/L	0	0%	0	6	8.66E+00		5			0.4 U	5 UJ	0.4 U
Methyl butyl ketone	UG/L	0	0%	0	6						2.8 U	5 U	2.8 U
Methyl chloride	UG/L	0	0%	0	6	1.58E+02		5			0.4 U	5 U	0.4 U
Methyl ethyl ketone	UG/L	0	0%	0	3	6.97E+03					3.6 R	5 UJ	3.6 R
Methyl isobutyl ketone	UG/L	0	0%	0	6	1.99E+03					2.5 U	5 U	2.5 U
Methylene chloride	UG/L	1 [4]	17%	1	6	4.28E+00		5			0.7 UJ	5 UJ	1.3 UJ
Ortho Xylene	UG/L	0	0%	0	6			5			0.4 U	5 U	0.4 U
Styrene	UG/L	0	0%	0	6	1.64E+03		5			0.3 U	5 U	0.3 U
Tetrachloroethene	UG/L	0	0%	0	6	1.04E-01		5			0.5 U	5 UJ	0.5 U
Toluene	UG/L	0	0%	0	6	7.23E+02		5			0.4 U	5 U	0.4 U
Total Xylenes	UG/L	0	0%	0	0	2.06E+02		5					
Trans-1,2-Dichloroethene	UG/L	0	0%	0	6	1.22E+02		5			0.4 U	5 U	0.4 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0	6			0.4			0.3 U	5 U	0.3 U
Trichloroethene	UG/L	0	0%	0	6	2.80E-02		5			0.4 U	5 U	0.4 U
Vinyl chloride	UG/L	2.3 [4]	67%	4	6	1.98E-02	4	2	1		0.3 U	1.4 J	1.3
Semivolatile Organic Compounds													
1,2,4-Trichlorobenzene	UG/L	0	0%	0	6	7.16E+00		5			1.2 U	1.2 UJ	1.2 U
1,2-Dichlorobenzene	UG/L	0	0%	0	6	3.70E+02		3			1 U	1 UJ	1 U

Table C-6
GROUNDWATER SAMPLE RESULTS
BUILDING 360 (SEAD-27)
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Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	Lowest GW Criteria Value [3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										Building 360	Building 360	Building 360	Building 360
Location ID										MW-2	MW-2	T-SUMP	T-SUMP
Matrix										GW	GW	GW	GW
Sample ID										DRMO-2014D	DRMO-2014	DRMO-2007	DRMO-2015
Sample Depth to Top of Sample										16.7	16.7	3	0
Sample Depth to Bottom of Sample										16.7	16.7	3	0
Sample Date										5/8/2003	5/8/2003	4/3/2003	5/8/2003
QC Code										DU	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										3	3	2	3
1,3-Dichlorobenzene	UG/L	0	0%	0	6	1.83E+02		3			1.2 U	1.2 UJ	1.2 U
1,4-Dichlorobenzene	UG/L	0	0%	0	6	5.02E-01		3			1 U	1 UJ	1 U
2,4,5-Trichlorophenol	UG/L	0	0%	0	3	3.65E+03		1			1 U	1 R	1 U
2,4,6-Trichlorophenol	UG/L	0	0%	0	6	3.65E+00		1			1 U	1 U	1 U
2,4-Dichlorophenol	UG/L	0	0%	0	3	1.09E+02		5			1.4 U	1.3 R	1.3 U
2,4-Dimethylphenol	UG/L	0	0%	0	3	7.30E+02					2.4 U	2.4 R	2.3 U
2,4-Dinitrophenol	UG/L	0	0%	0	3	7.30E+01					2.1 UJ		2 UJ
2,4-Dinitrotoluene	UG/L	0	0%	0	6	7.30E+01		5			1.1 U	1.1 UJ	1.1 U
2,6-Dinitrotoluene	UG/L	0	0%	0	6	3.65E+01		5			1 U	1 UJ	1 U
2-Chloronaphthalene	UG/L	0	0%	0	6	4.87E+02					1.2 U	1.2 UJ	1.2 U
2-Chlorophenol	UG/L	0	0%	0	3	3.04E+01					1.1 U	1.1 R	1.1 U
2-Methylnaphthalene	UG/L	0	0%	0	6						1.2 U	1.2 UJ	1.2 U
2-Methylphenol	UG/L	0	0%	0	3	1.82E+03					1 U	1 R	1 U
2-Nitroaniline	UG/L	0	0%	0	6	1.09E+02		5			1 U	1 UJ	1 U
2-Nitrophenol	UG/L	0	0%	0	3			1			1.1 U	1.1 R	1.1 U
3 or 4-Methylphenol	UG/L	0	0%	0	0			1					
3,3'-Dichlorobenzidine	UG/L	0	0%	0	6	1.49E-01		5			1 U	1 UJ	1 U
3-Nitroaniline	UG/L	0	0%	0	6	3.20E+00		5			1.2 UJ	1.2 UJ	1.2 UJ
4,6-Dinitro-2-methylphenol	UG/L	0	0%	0	3	3.65E+00		1			1.2 U	1.2 R	1.2 U
4-Bromophenyl phenyl ether	UG/L	0	0%	0	6						1.4 U	1.3 UJ	1.3 U
4-Chloro-3-methylphenol	UG/L	0	0%	0	3			1			1.1 U	1.1 R	1.1 U
4-Chloroaniline	UG/L	0	0%	0	3	1.46E+02		5			1.2 U	1.2 R	1.2 U
4-Chlorophenyl phenyl ether	UG/L	0	0%	0	6						1.2 U	1.2 UJ	1.2 U
4-Methylphenol	UG/L	0	0%	0	3	1.82E+02					1.9 U	1.9 R	1.8 U
4-Nitroaniline	UG/L	0	0%	0	6	3.20E+00		5			2.5 U	2.5 UJ	2.4 U
4-Nitrophenol	UG/L	0	0%	0	3			1			1.1 U	1.1 R	1.1 U
Acenaphthene	UG/L	0	0%	0	6	3.65E+02					1 U	1 UJ	1 U
Acenaphthylene	UG/L	0	0%	0	6						1.2 U	1.2 UJ	1.2 U
Anthracene	UG/L	0	0%	0	6	1.83E+03					1.4 U	1.3 UJ	1.3 U
Benzo(a)anthracene	UG/L	0	0%	0	6	9.21E-02					1 U	1 UJ	1 U
Benzo(a)pyrene	UG/L	0	0%	0	6	9.21E-03					1.6 U	1.5 UJ	1.5 U
Benzo(b)fluoranthene	UG/L	0	0%	0	6	9.21E-02					1 U	1 UJ	1 U
Benzo(ghi)perylene	UG/L	0	0%	0	6						1.4 UJ	1.3 UJ	1.3 UJ
Benzo(k)fluoranthene	UG/L	0	0%	0	6	9.21E-01					2.7 U	2.7 UJ	2.7 U
Bis(2-Chloroethoxy)methane	UG/L	0	0%	0	6			5			1 U	1 U	1 U
Bis(2-Chloroethyl)ether	UG/L	0	0%	0	6	1.02E-02		1			1.2 U	1.2 U	1.2 U
Bis(2-Chloroisopropyl)ether	UG/L	0	0%	0	6	2.74E-01		5			1 U	1 UJ	1 U
Bis(2-Ethylhexyl)phthalate	UG/L	2.5	17%	1	6	4.80E+00		5			1 U	1 U	2.5 J
Butylbenzylphthalate	UG/L	0	0%	0	6	7.30E+03					1 U	1 UJ	1 U
Carbazole	UG/L	0	0%	0	6	3.36E+00					0.43 U	0.43 UJ	0.42 U
Chrysene	UG/L	0	0%	0	6	9.21E+00					1.7 U	1.6 UJ	1.6 U
Di-n-butylphthalate	UG/L	0	0%	0	6	3.65E+03		50			1.2 U	1.2 UJ	1.2 U
Di-n-octylphthalate	UG/L	0	0%	0	6	1.46E+03					1.6 U	1.5 UJ	1.5 U
Dibenz(a,h)anthracene	UG/L	0	0%	0	6	9.21E-03					1.6 UJ	1.5 UJ	1.5 UJ
Dibenzofuran	UG/L	0	0%	0	6	1.22E+01					1 U	1 UJ	1 U
Diethyl phthalate	UG/L	0	0%	0	6	2.92E+04					1 U	1 UJ	1 U

Table C-6
GROUNDWATER SAMPLE RESULTS
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										Building 360	Building 360	Building 360	Building 360
Location ID										MW-2	MW-2	T-SUMP	T-SUMP
Matrix										GW	GW	GW	GW
Sample ID										DRMO-2014D	DRMO-2014	DRMO-2007	DRMO-2015
Sample Depth to Top of Sample										16.7	16.7	3	0
Sample Depth to Bottom of Sample										16.7	16.7	3	0
Sample Date										5/8/2003	5/8/2003	4/3/2003	5/8/2003
QC Code										DU	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										3	3	2	3
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**Lowest GW Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Dimethylphthalate	UG/L	0	0%	0	6	3.65E+05					1 U	1 UJ	1 U
Fluoranthene	UG/L	0	0%	0	6	1.46E+03					1 U	1 UJ	1 U
Fluorene	UG/L	0	0%	0	6	2.43E+02					1.1 U	1.1 UJ	1.1 U
Hexachlorobenzene	UG/L	0	0%	0	6	4.20E-02		0.04			1.1 U	1.1 UJ	1.1 U
Hexachlorobutadiene	UG/L	0	0%	0	6	8.62E-01		0.5			1.6 U	1.5 UJ	1.5 U
Hexachlorocyclopentadiene	UG/L	0	0%	0	3	2.19E+02		5			4 R	3.9 UJ	3.9 R
Hexachloroethane	UG/L	0	0%	0	6	4.80E+00		5			1.1 U	1.1 UJ	1.1 U
Indeno(1,2,3-cd)pyrene	UG/L	0	0%	0	6	9.21E-02					1.7 UJ	1.6 UJ	1.6 UJ
Isophorone	UG/L	0	0%	0	6	7.08E+01					1 U	1 UJ	1 U
N-Nitrosodiphenylamine	UG/L	0	0%	0	6	1.37E+01					2.1 U	2.1 UJ	2 U
N-Nitrosodipropylamine	UG/L	0	0%	0	6	9.60E-03					1 UJ	1 UJ	1 UJ
Naphthalene	UG/L	0	0%	0	6	6.20E+00					1.2 U	1.2 UJ	1.2 U
Nitrobenzene	UG/L	0	0%	0	6	3.40E+00		0.4			1 U	1 UJ	1 U
Pentachlorophenol	UG/L	0	0%	0	3	5.60E-01		1			2 U	2 R	1.9 U
Phenanthrene	UG/L	0	0%	0	6						1 U	1 UJ	1 U
Phenol	UG/L	0	0%	0	3	1.09E+04		1			1 U	1 R	1 U
Pyrene	UG/L	0	0%	0	6	1.83E+02					1 U	1 UJ	1 U
Pesticides/PCBs													
4,4'-DDD	UG/L	0	0%	0	6	2.80E-01		0.3			0.01 U	0.01 U	0.01 UJ
4,4'-DDE	UG/L	0	0%	0	6	1.98E-01		0.2			0.005 U	0.005 U	0.005 U
4,4'-DDT	UG/L	0	0%	0	6	1.98E-01		0.2			0.01 UJ	0.01 UJ	0.01 U
Aldrin	UG/L	0	0%	0	6	3.95E-03		0			0.02 UJ	0.02 U	0.02 UJ
Alpha-BHC	UG/L	0	0%	0	6	1.07E-02		0.01			0.01 UJ	0.01 UJ	0.01 UJ
Alpha-Chlordane	UG/L	0	0%	0	6						0.02 UJ	0.02 U	0.02 UJ
Beta-BHC	UG/L	0	0%	0	6	3.74E-02		0.04			0.01 U	0.01 U	0.01 U
Chlordane	UG/L	0	0%	0	3							0.14 U	
Delta-BHC	UG/L	0	0%	0	6			0.04			0.004 U	0.004 UJ	0.004 UJ
Dieldrin	UG/L	0	0%	0	6	4.20E-03		0.004			0.009 U	0.009 U	0.009 U
Endosulfan I	UG/L	0	0%	0	6						0.02 UJ	0.02 U	0.02 UJ
Endosulfan II	UG/L	0	0%	0	6						0.01 U	0.01 U	0.01 UJ
Endosulfan sulfate	UG/L	0	0%	0	6						0.02 U	0.02 U	0.02 U
Endrin	UG/L	0	0%	0	6	1.09E+01		0			0.02 UJ	0.02 U	0.02 U
Endrin aldehyde	UG/L	0	0%	0	6			5			0.02 U	0.02 U	0.02 U
Endrin ketone	UG/L	0	0%	0	6			5			0.009 UJ	0.009 U	0.009 UJ
Gamma-BHC/Lindane	UG/L	0	0%	0	6	5.17E-02		0.05			0.009 UJ	0.009 U	0.009 UJ
Gamma-Chlordane	UG/L	0	0%	0	6						0.01 UJ	0.01 UJ	0.01 U
Heptachlor	UG/L	0	0%	0	6	1.49E-02		0.04			0.007 U	0.007 U	0.007 U
Heptachlor epoxide	UG/L	0	0%	0	6	7.39E-03		0.03			0.009 U	0.009 U	0.009 U
Methoxychlor	UG/L	0	0%	0	6	1.82E+02		35			0.008 U	0.008 UJ	0.008 U
Toxaphene	UG/L	0	0%	0	6	6.11E-02		0.06			0.12 U	0.12 U	0.12 U
Aroclor-1016	UG/L	0	0%	0	6	9.60E-01		0.09			0.24 UJ	0.25 UJ	0.24 UJ
Aroclor-1221	UG/L	0	0%	0	6			0.09			0.081 U	0.083 U	0.082 U
Aroclor-1232	UG/L	0	0%	0	6			0.09			0.091 UJ	0.094 UJ	0.092 UJ
Aroclor-1242	UG/L	0	0%	0	6			0.09			0.081 UJ	0.083 UJ	0.082 UJ
Aroclor-1248	UG/L	0	0%	0	6			0.09			0.12 U	0.12 U	0.12 U

Table C-6
GROUNDWATER SAMPLE RESULTS
BUILDING 360 (SEAD-27)
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										Building 360	Building 360	Building 360	Building 360
Location ID										MW-2	MW-2	T-SUMP	T-SUMP
Matrix										GW	GW	GW	GW
Sample ID										DRMO-2014D	DRMO-2014	DRMO-2007	DRMO-2015
Sample Depth to Top of Sample										16.7	16.7	3	0
Sample Depth to Bottom of Sample										16.7	16.7	3	0
Sample Date										5/8/2003	5/8/2003	4/3/2003	5/8/2003
QC Code										DU	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										3	3	2	3
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**Lowest GW Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aroclor-1254	UG/L	0	0%	0	6	3.36E-02		0.09			0.051 U	0.052 U	0.051 U
Aroclor-1260	UG/L	0	0%	0	6			0.09			0.01 UJ	0.01 U	0.01 UJ
Metals and Cyanide													
Aluminum	UG/L	105	57%	4	7	3.65E+04		50	4	18.4 U	18.4 U	83.7 J	105 J
Antimony	UG/L	0	0%	0	7	1.46E+01		3		3.8 U	3.8 U	3.8 U	3.8 U
Arsenic	UG/L	4.7 [4]	14%	1	7	4.48E-02	1	10		4.5 U	4.5 U	4.5 U	4.5 U
Barium	UG/L	141 [4]	100%	7	7	2.55E+03		1000		125.27 J	125 J	124	123 J
Beryllium	UG/L	0	0%	0	7	7.30E+01		4		0.1 U	0.1 U	0.1 U	0.1 U
Cadmium	UG/L	3.9	14%	1	7	1.82E+01		5		0.8 U	0.8 U	3.9 J	0.8 U
Calcium	UG/L	119149.8	100%	7	7					119149.8	119000	54700	62800
Chromium	UG/L	84	71%	5	7			50	1	10.99	11.3	30.3	84
Cobalt	UG/L	7.4	43%	3	7	7.30E+02				0.7 U	0.7 U	7.4 J	7 J
Copper	UG/L	167	43%	3	7	1.46E+03		200		3.6 U	3.6 J	145	167
Cyanide	UG/L	0	43%	0	0	7.30E+02							
Cyanide, Amenable	MG/L	0	0%	0	6						0.01 U	0.01 U	0.01 U
Cyanide, Total	MG/L	0	0%	0	0								
Iron	UG/L	255000	100%	7	7	1.09E+04	2	300	4	119.08	118	145000 J	255000
Lead	UG/L	204	29%	2	7			15	2	3 U	3 U	93.7	204
Magnesium	UG/L	27400	100%	7	7					27359.2598	27400	18900	20800
Manganese	UG/L	1645 [4]	100%	7	7	8.76E+02	4	50	7	528.01	527	1180	1250
Mercury	UG/L	0.28	29%	2	7	1.09E+01		0.7		0.2 U	0.2	0.2 U	0.28
Nickel	UG/L	38.8	86%	6	7	7.30E+02		100		24.8 J	24.3 J	31.4	38.8 J
Potassium	UG/L	12300	100%	7	7					2021.03 J	2040 J	11800 J	12300 J
Selenium	UG/L	7.5	57%	4	7	1.82E+02		10		1.3 U	1.3 U	7.5	1.3 U
Silver	UG/L	8.6	14%	1	7	1.82E+02		50		3.7 U	3.7 U	3.7 U	8.6 J
Sodium	UG/L	42850 [4]	100%	7	7			20000	7	37900.7383	37800	32300	35000
Thallium	UG/L	3.3 [4]	14%	1	7	2.41E+00	1	2	1	5.3 U	5.3 U	5.3 U	5.3 U
Vanadium	UG/L	4.4	14%	1	7	3.65E+01				1.4 U	1.4 U	1.4 U	4.4 J
Zinc	UG/L	5740	100%	7	7	1.09E+04		5000	2	18.32 J	17.9 J	5500	5740
Other													
Total Petroleum Hydrocarbons	MG/L	1.52	33%	2	6						1	1.52	1 U

NOTES:

1) Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.

2) The criteria value source is the Region IX Preliminary Remediation Goals for Tap Water (October 2004)

3) Lowest Groundwater Criteria Values came from the following:
   A) NYSDEC Class GA Groundwater Standard (TOGS 1.1.1, June 1998)
   B) Maximum Contaminant Level - Drinking Water Standards and Health Advisory (EPA 822-B-00-001)
   C) Secondary Drinking Water Regulations - Drinking Water Standards and Health Advisory (EPA 82-B-00-001)

4) The maximum detected concentration was obtained from the average of the sample and its duplicate pairs:
   DRMO-2005/DRMO-2008 collected April 2003 from MW-1 and DRMO-2013/DRMO-2019 collected May 2003 from MW-1.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process

Table C-7
SURFACE WATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SWDRMO-1	SWDRMO-10	SWDRMO-2	SWDRMO-3	SWDRMO-4	SWDRMO-5
Matrix										SW	SW	SW	SW	SW	SW
Sample ID										DRMO-3000	DRMO-3010	DRMO-3001	DRMO-3002	DRMO-3003	DRMO-3004
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A	N/A	N/A
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code						Region IX				SA	SA	SA	SA	SA	SA
Study ID			Frequency	Number	Number	PRG		NYSDEC		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	of	of Times	of	Criteria		Criteria		1		1	1	1	1
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses** [1]	**Value** [2]	**Exceedances**	**Value** [3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/L	0	0%	0	10	3.17E+03				0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	0	10	5.53E-02				0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
1,1,2-Trichloroethane	UG/L	0	0%	0	10	2.00E-01				0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U
1,1-Dichloroethane	UG/L	0	0%	0	10	8.11E+02				0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
1,1-Dichloroethene	UG/L	0	0%	0	10	3.39E+02				0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
1,2-Dichloroethane	UG/L	0	0%	0	10	1.23E-01				0.56 U	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U
1,2-Dichloropropane	UG/L	0	0%	0	10	1.65E-01				0.73 U	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U
Acetone	UG/L	0	0%	0	10	5.48E+03				3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ
Benzene	UG/L	0	0%	0	10	3.54E-01				0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
Bromodichloromethane	UG/L	0	0%	0	10	1.81E-01				0.73 U	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U
Bromoform	UG/L	0	0%	0	10	8.51E+00				0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Carbon disulfide	UG/L	0	0%	0	10	1.04E+03				0.72 UJ	0.72 U	0.72 UJ	0.72 UJ	0.72 UJ	0.72 UJ
Carbon tetrachloride	UG/L	0	0%	0	10	1.71E-01				0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U
Chlorobenzene	UG/L	0	0%	0	10	1.06E+02		5		0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U
Chlorodibromomethane	UG/L	0	0%	0	10	1.33E-01				0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Chloroethane	UG/L	0	0%	0	10	4.64E+00				2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Chloroform	UG/L	0	0%	0	10	1.66E-01				0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U
Cis-1,2-Dichloroethene	UG/L	0	0%	0	10	6.08E+01				0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U
Cis-1,3-Dichloropropene	UG/L	0	0%	0	10					0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Ethyl benzene	UG/L	0	0%	0	10	1.34E+03				0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
Meta/Para Xylene	UG/L	0	0%	0	10					1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Methyl bromide	UG/L	0	0%	0	10	8.66E+00				0.38 U	0.38 UJ	0.38 U	0.38 U	0.38 U	0.38 U
Methyl butyl ketone	UG/L	0	0%	0	10					0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Methyl chloride	UG/L	0	0%	0	10	1.58E+02				0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
Methyl ethyl ketone	UG/L	0	0%	0	10	6.97E+03				2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Methyl isobutyl ketone	UG/L	0	0%	0	10	1.99E+03				0.81 U	0.81 UJ	0.81 U	0.81 U	0.81 U	0.81 U
Methylene chloride	UG/L	0	0%	0	10	4.28E+00				1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Ortho Xylene	UG/L	0	0%	0	10					0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
Styrene	UG/L	0	0%	0	10	1.64E+03				0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
Tetrachloroethene	UG/L	0	0%	0	10	1.04E-01				0.7 UJ	0.7 UJ	0.7 UJ	0.7 UJ	0.7 UJ	0.7 UJ
Toluene	UG/L	0	0%	0	10	7.23E+02		6000		0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
Trans-1,2-Dichloroethene	UG/L	0	0%	0	10	1.22E+02				0.81 UJ	0.81 U	0.81 UJ	0.81 UJ	0.81 UJ	0.81 UJ
Trans-1,3-Dichloropropene	UG/L	0	0%	0	10					0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Trichloroethene	UG/L	0	0%	0	10	2.80E-02		40		0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
Vinyl chloride	UG/L	0	0%	0	10	1.98E-02				0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/L	0	0%	0	10	7.16E+00		5		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	UG/L	0	0%	0	10	3.70E+02		5		10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	UG/L	0	0%	0	10	1.83E+02		5		10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	UG/L	0	0%	0	10	5.02E-01		5		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	UG/L	0	0%	0	10	3.65E+03				10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	UG/L	0	0%	0	10	3.65E+00				10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	UG/L	0	0%	0	10	1.09E+02		1		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	UG/L	0	0%	0	10	7.30E+02		1000		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	UG/L	0	0%	0	10	7.30E+01		400		10 UJ	10 UJ	10 U	10 UJ	10 U	10 UJ
2,4-Dinitrotoluene	UG/L	0	0%	0	10	7.30E+01				10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	UG/L	0	0%	0	10	3.65E+01				10 U	10 U	10 U	10 U	10 U	10 U

Table C-7
SURFACE WATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SWDRMO-1	SWDRMO-10	SWDRMO-2	SWDRMO-3	SWDRMO-4	SWDRMO-5
Matrix										SW	SW	SW	SW	SW	SW
Sample ID										DRMO-3000	DRMO-3010	DRMO-3001	DRMO-3002	DRMO-3003	DRMO-3004
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A	N/A	N/A
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										1		1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2-Chloronaphthalene	UG/L	0	0%	0	10	4.87E+02				10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	UG/L	0	0%	0	10	3.04E+01				10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	UG/L	0	0%	0	10			4.7		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	UG/L	0	0%	0	10	1.82E+03				10 U	10 UJ	10 U	10 U	10 U	10 UJ
2-Nitroaniline	UG/L	0	0%	0	10	1.09E+02				10 UJ	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U	10 U
3 or 4-Methylphenol	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	UG/L	0	0%	0	10	1.49E-01				10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	UG/L	0	0%	0	10	3.20E+00				10 UJ	10 U	10 U	10 U	10 U	10 UJ
4,6-Dinitro-2-methylphenol	UG/L	0	0%	0	10	3.65E+00				10 UJ	10 UJ	10 U	10 U	10 UJ	10 UJ
4-Bromophenyl phenyl ether	UG/L	0	0%	0	10					10 UJ	10 UJ	10 U	10 U	10 UJ	10 UJ
4-Chloro-3-methylphenol	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	UG/L	0	0%	0	10	1.46E+02				10 UJ	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	UG/L	0	0%	0	10	3.20E+00				10 UJ	10 UJ	10 U	10 U	10 UJ	10 UJ
4-Nitrophenol	UG/L	0	0%	0	10					10 UJ	10 UJ	10 U	10 U	10 UJ	10 UJ
Acenaphthene	UG/L	0	0%	0	10	3.65E+02				10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	UG/L	0	0%	0	10	1.83E+03				10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	UG/L	0	0%	0	10	9.21E-02				10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	UG/L	0	0%	0	10	9.21E-03				10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	UG/L	0	0%	0	10	9.21E-02				10 U	10 U	10 UJ	10 U	10 U	10 UJ
Benzo(ghi)perylene	UG/L	0	0%	0	10					10 UJ	10 UJ	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	UG/L	0	0%	0	10	9.21E-01				10 U	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethoxy)methane	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl)ether	UG/L	0	0%	0	10	1.02E-02				10 U	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroisopropyl)ether	UG/L	0	0%	0	10	2.74E-01				10 U	10 U	10 U	10 U	10 U	10 U
Bis(2-Ethylhexyl)phthalate	UG/L	4.2	10%	1	10	4.80E+00		0.6	1	10 U	10 U	4.2 J	10 U	10 U	10 U
Butylbenzylphthalate	UG/L	0	0%	0	10	7.30E+03				10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	UG/L	0	0%	0	10	3.36E+00				10 UJ	10 U	10 U	10 U	10 U	10 U
Chrysene	UG/L	0	0%	0	10	9.21E+00				10 UJ	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	UG/L	0	0%	0	10	3.65E+03				10 UJ	10 UJ	10 U	10 U	10 UJ	10 UJ
Di-n-octylphthalate	UG/L	0	0%	0	10	1.46E+03				10 U	10 U	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	UG/L	0	0%	0	10	9.21E-03				10 UJ	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	UG/L	0	0%	0	10	1.22E+01				10 U	10 U	10 U	10 U	10 U	10 U
Diethyl phthalate	UG/L	0	0%	0	10	2.92E+04				10 UJ	10 U	10 U	10 U	10 U	10 U
Dimethylphthalate	UG/L	0	0%	0	10	3.65E+05				10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	UG/L	0	0%	0	10	1.46E+03				10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	UG/L	0	0%	0	10	2.43E+02				10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	UG/L	0	0%	0	10	4.20E-02		0.00003		10 UJ	10 UJ	10 U	10 U	10 UJ	10 UJ
Hexachlorobutadiene	UG/L	0	0%	0	10	8.62E-01		0.01		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	UG/L	0	0%	0	10	2.19E+02		0.45		10 UJ	10 U	10 UJ	10 UJ	10 U	10 UJ
Hexachloroethane	UG/L	0	0%	0	10	4.80E+00		0.6		10 U	10 U	10 U	10 U	10 U	10 UJ
Indeno(1,2,3-cd)pyrene	UG/L	0	0%	0	10	9.21E-02				10 UJ	10 UJ	10 U	10 U	10 UJ	10 U
Isophorone	UG/L	0	0%	0	10	7.08E+01				10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	UG/L	0	0%	0	10	1.37E+01				10 U	10 U	10 U	10 UJ	10 U	10 UJ
N-Nitrosodipropylamine	UG/L	0	0%	0	10	9.60E-03				10 U	10 U	10 UJ	10 U	10 U	10 U
Naphthalene	UG/L	0	0%	0	10	6.20E+00				10 U	10 U	10 U	10 U	10 U	10 U

Table C-7
SURFACE WATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SWDRMO-1	SWDRMO-10	SWDRMO-2	SWDRMO-3	SWDRMO-4	SWDRMO-5
Matrix										SW	SW	SW	SW	SW	SW
Sample ID										DRMO-3000	DRMO-3010	DRMO-3001	DRMO-3002	DRMO-3003	DRMO-3004
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A	N/A	N/A
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										1		1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**[1]	**Region IX PRG Criteria Value**[2]	**Exceedances**	**NYSDEC Criteria Value**[3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Nitrobenzene	UG/L	0	0%	0	10	3.40E+00				10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	UG/L	0	0%	0	10	5.60E-01		1		10 UJ	10 UJ	10 U	10 U	10 UJ	10 UJ
Phenanthrene	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U	10 U
Phenol	UG/L	0	0%	0	10	1.09E+04		5		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	UG/L	0	0%	0	10	1.83E+02				10 UJ	10 UJ	10 U	10 U	10 UJ	10 UJ
Pesticides/PCBs															
4,4'-DDD	UG/L	0	0%	0	10	2.80E-01		0.00008		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4,4'-DDE	UG/L	0	0%	0	10	1.98E-01		0.000007		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
4,4'-DDT	UG/L	0	0%	0	10	1.98E-01		0.00001		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Aldrin	UG/L	0	0%	0	10	3.95E-03		0.001		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Alpha-BHC	UG/L	0	0%	0	10	1.07E-02				0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Alpha-Chlordane	UG/L	0	0%	0	10					0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Beta-BHC	UG/L	0	0%	0	10	3.74E-02				0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chlordane	UG/L	0	0%	0	10					0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Delta-BHC	UG/L	0	0%	0	10					0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Dieldrin	UG/L	0	0%	0	10	4.20E-03		0.0000006		0.009 UJ	0.009 U	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ
Endosulfan I	UG/L	0	0%	0	10			0.009		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Endosulfan II	UG/L	0	0%	0	10			0.009		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Endosulfan sulfate	UG/L	0	0%	0	10					0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin	UG/L	0	0%	0	10	1.09E+01		0.002		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin aldehyde	UG/L	0	0%	0	10					0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin ketone	UG/L	0	0%	0	10					0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U
Gamma-BHC/Lindane	UG/L	0	0%	0	10	5.17E-02				0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U
Gamma-Chlordane	UG/L	0	0%	0	10					0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Heptachlor	UG/L	0	0%	0	10	1.49E-02		0.0002		0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U
Heptachlor epoxide	UG/L	0	0%	0	10	7.39E-03		0.0003		0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U
Methoxychlor	UG/L	0	0%	0	10	1.82E+02		0.03		0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U
Toxaphene	UG/L	0	0%	0	10	6.11E-02		0.000006		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor-1016	UG/L	0	0%	0	10	9.60E-01		0.000001		0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ
Aroclor-1221	UG/L	0	0%	0	10			0.000001		0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
Aroclor-1232	UG/L	0	0%	0	10			0.000001		0.09 UJ	0.09 UJ	0.09 UJ	0.09 UJ	0.09 UJ	0.09 UJ
Aroclor-1242	UG/L	0	0%	0	10					0.08 UJ	0.08 UJ	0.08 UJ	0.08 UJ	0.08 UJ	0.08 UJ
Aroclor-1248	UG/L	0	0%	0	10			0.000001		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor-1254	UG/L	0	0%	0	10	3.36E-02		0.000001		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor-1260	UG/L	0	0%	0	10			0.000001		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Metals and Cyanide															
Aluminum	UG/L	8760	100%	10	10	3.65E+04		100	5	146	219	8760	4500	39	524
Antimony	UG/L	0	0%	0	10	1.46E+01				4.7 U	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U
Arsenic	UG/L	50.3	10%	1	10	4.48E-02	1	150		2.8 U	2.8 U	50.3	2.8 U	2.8 U	2.8 U
Barium	UG/L	423	100%	10	10	2.55E+03				53.7	75.9	423	149	49.5	72.5
Beryllium	UG/L	0.86	90%	9	10	7.30E+01		1100		0.1 U	0.16 J	0.86 J	0.52 J	0.12 J	0.16
Cadmium	UG/L	19.5	40%	4	10	1.82E+01	1	3.84	2	0.4 U	0.4 U	19.5	4.3	0.4 U	1.4
Calcium	UG/L	166000	100%	10	10					73800	115000	150000	166000	66700	92600
Chromium	UG/L	129	80%	8	10			139.45		1.8	1.9	129	13.7	0.69	2.2
Cobalt	UG/L	47	70%	7	10	7.30E+02		5	2	2.2	0.6 U	47	9.7	0.6 U	3
Copper	UG/L	1160	100%	10	10	1.46E+03		17.32	2	4	3.8	1160	118	2.3	12.3
Cyanide, Amenable	MG/L	0	0%	0	10					0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Cyanide, Total	MG/L	0	0%	0	10					0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Table C-7
SURFACE WATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SWDRMO-1	SWDRMO-10	SWDRMO-2	SWDRMO-3	SWDRMO-4	SWDRMO-5
Matrix										SW	SW	SW	SW	SW	SW
Sample ID										DRMO-3000	DRMO-3010	DRMO-3001	DRMO-3002	DRMO-3003	DRMO-3004
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A	N/A	N/A
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										1		1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Iron	UG/L	110000	80%	8	10	1.09E+04	2	300	5	1460	421	110000	17200	105	2020
Lead	UG/L	839	100%	10	10			1.4624632	10	6.5 J	8 J	839	261	5.9 J	16.1
Magnesium	UG/L	26200	100%	10	10					12200	16100	26200	20000	11400	12300
Manganese	UG/L	2380	100%	10	10	8.76E+02	1			315	55.2	2380	828	37.4	235
Mercury	UG/L	2.1	20%	2	10	1.09E+01		0.0007	2	0.2 U	0.2 U	2.1	0.26	0.2 U	0.2 U
Nickel	UG/L	154	30%	3	10	7.30E+02		99.92	1	1.8 U	1.8 U	154	20.4	1.8 U	10.6
Potassium	UG/L	5350	100%	10	10					3420 J	2310 J	2580 J	5350 J	3440 J	3720 J
Selenium	UG/L	4.6	10%	1	10	1.82E+02		4.6		3 U	3 U	4.6 J	3 U	3 U	3 U
Silver	UG/L	8	20%	2	10	1.82E+02		0.1	2	1 U	1 U	8	1.7	1 U	1 U
Sodium	UG/L	123000	100%	10	10					123000 J	73900 J	71500 J	75200 J	117000 J	70400 J
Thallium	UG/L	6.3	20%	2	10	2.41E+00	2	8		5.5 J	5.4 U	5.4 U	5.4 U	6.3	5.4 U
Vanadium	UG/L	233	50%	5	10	3.65E+01	1	14	2	1.2	0.7 U	233	14.6	0.7 U	2.1
Zinc	UG/L	6910	100%	10	10	1.09E+04		159.25	2	19.6	19.7	6910	425	16.4	102
Other															
Total Petroleum Hydrocarbons	MG/L	8.08	11%	1	9					1 U	1 U	8.08	1 U	1 U	1 U

NOTES:
1) Sample-duplicate pair (DRMO-3008/DRMO-3005) collected from SWDRMO-8 was averaged and the average results were used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Tap Water (October 2004)
3) Action Levels are from the New York State Ambient Water Quality Standards, Class C for Surface Water.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate

Table C-7
SURFACE WATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SWDRMO-6	SWDRMO-7	SWDRMO-8	SWDRMO-8	SWDRMO-9
Matrix										SW	SW	SW	SW	SW
Sample ID										DRMO-3006	DRMO-3007	DRMO-3008	DRMO-3005	DRMO-3009
Sample Depth to Top of Sample										0	0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A	N/A
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1		
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds														
1,1,1-Trichloroethane	UG/L	0	0%	0	10	3.17E+03				0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	0	10	5.53E-02				0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
1,1,2-Trichloroethane	UG/L	0	0%	0	10	2.00E-01				0.62 U	0.62 U	0.62 U	0.62 U	0.62 U
1,1-Dichloroethane	UG/L	0	0%	0	10	8.11E+02				0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
1,1-Dichloroethene	UG/L	0	0%	0	10	3.39E+02				0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
1,2-Dichloroethane	UG/L	0	0%	0	10	1.23E-01				0.56 U	0.56 U	0.56 U	0.56 U	0.56 U
1,2-Dichloropropane	UG/L	0	0%	0	10	1.65E-01				0.73 U	0.73 U	0.73 U	0.73 U	0.73 U
Acetone	UG/L	0	0%	0	10	5.48E+03				3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ
Benzene	UG/L	0	0%	0	10	3.54E-01				0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
Bromodichloromethane	UG/L	0	0%	0	10	1.81E-01				0.73 U	0.73 U	0.73 U	0.73 U	0.73 U
Bromoform	UG/L	0	0%	0	10	8.51E+00				0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Carbon disulfide	UG/L	0	0%	0	10	1.04E+03				0.72 UJ	0.72 UJ	0.72 U	0.72 U	0.72 U
Carbon tetrachloride	UG/L	0	0%	0	10	1.71E-01				0.47 U	0.47 U	0.47 U	0.47 U	0.47 U
Chlorobenzene	UG/L	0	0%	0	10	1.06E+02		5		0.78 U	0.78 U	0.78 U	0.78 U	0.78 U
Chlorodibromomethane	UG/L	0	0%	0	10	1.33E-01				0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Chloroethane	UG/L	0	0%	0	10	4.64E+00				2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Chloroform	UG/L	0	0%	0	10	1.66E-01				0.61 U	0.61 U	0.61 U	0.61 U	0.61 U
Cis-1,2-Dichloroethene	UG/L	0	0%	0	10	6.08E+01				0.62 U	0.62 U	0.62 U	0.62 U	0.62 U
Cis-1,3-Dichloropropene	UG/L	0	0%	0	10					0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Ethyl benzene	UG/L	0	0%	0	10	1.34E+03				0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
Meta/Para Xylene	UG/L	0	0%	0	10					1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Methyl bromide	UG/L	0	0%	0	10	8.66E+00				0.38 U	0.38 U	0.38 UJ	0.38 UJ	0.38 UJ
Methyl butyl ketone	UG/L	0	0%	0	10					0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Methyl chloride	UG/L	0	0%	0	10	1.58E+02				0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
Methyl ethyl ketone	UG/L	0	0%	0	10	6.97E+03				2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Methyl isobutyl ketone	UG/L	0	0%	0	10	1.99E+03				0.81 U	0.81 U	0.81 UJ	0.81 UJ	0.81 UJ
Methylene chloride	UG/L	0	0%	0	10	4.28E+00				1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Ortho Xylene	UG/L	0	0%	0	10					0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
Styrene	UG/L	0	0%	0	10	1.64E+03				0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
Tetrachloroethene	UG/L	0	0%	0	10	1.04E-01				0.7 UJ	0.7 UJ	0.7 UJ	0.7 UJ	0.7 UJ
Toluene	UG/L	0	0%	0	10	7.23E+02		6000		0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
Trans-1,2-Dichloroethene	UG/L	0	0%	0	10	1.22E+02				0.81 UJ	0.81 UJ	0.81 U	0.81 U	0.81 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0	10					0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Trichloroethene	UG/L	0	0%	0	10	2.80E-02		40		0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
Vinyl chloride	UG/L	0	0%	0	10	1.98E-02				0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Semivolatile Organic Compounds														
1,2,4-Trichlorobenzene	UG/L	0	0%	0	10	7.16E+00		5		10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	UG/L	0	0%	0	10	3.70E+02		5		10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	UG/L	0	0%	0	10	1.83E+02		5		10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	UG/L	0	0%	0	10	5.02E-01		5		10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	UG/L	0	0%	0	10	3.65E+03				10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	UG/L	0	0%	0	10	3.65E+00				10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	UG/L	0	0%	0	10	1.09E+02		1		10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	UG/L	0	0%	0	10	7.30E+02		1000		10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	UG/L	0	0%	0	10	7.30E+01		400		10 UJ	10 UJ	10 U	10 U	10 UJ
2,4-Dinitrotoluene	UG/L	0	0%	0	10	7.30E+01				10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	UG/L	0	0%	0	10	3.65E+01				10 U	10 U	10 U	10 U	10 U

Table C-7
SURFACE WATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SWDRMO-6	SWDRMO-7	SWDRMO-8	SWDRMO-8	SWDRMO-9
Matrix										SW	SW	SW	SW	SW
Sample ID										DRMO-3006	DRMO-3007	DRMO-3008	DRMO-3005	DRMO-3009
Sample Depth to Top of Sample										0	0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A	N/A
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code						**Region IX**				SA	SA	SA	SA	SA
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**NYSDEC**		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**		1	1	1		
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses** [1]	**Value** [2]	**Exceedances**	**Value** [3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2-Chloronaphthalene	UG/L	0	0%	0	10	4.87E+02				10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	UG/L	0	0%	0	10	3.04E+01				10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	UG/L	0	0%	0	10			4.7		10 U	10 U	10 U	10 U	10 U
2-Methylphenol	UG/L	0	0%	0	10	1.82E+03				10 UJ	10 UJ	10 U	10 U	10 UJ
2-Nitroaniline	UG/L	0	0%	0	10	1.09E+02				10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U
3 or 4-Methylphenol	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	UG/L	0	0%	0	10	1.49E-01				10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	UG/L	0	0%	0	10	3.20E+00				10 UJ	10 U	10 U	10 U	10 U
4,6-Dinitro-2-methylphenol	UG/L	0	0%	0	10	3.65E+00				10 UJ	10 UJ	10 U	10 U	10 UJ
4-Bromophenyl phenyl ether	UG/L	0	0%	0	10					10 UJ	10 UJ	10 U	10 U	10 UJ
4-Chloro-3-methylphenol	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	UG/L	0	0%	0	10	1.46E+02				10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	UG/L	0	0%	0	10	3.20E+00				10 UJ	10 UJ	10 U	10 U	10 UJ
4-Nitrophenol	UG/L	0	0%	0	10					10 UJ	10 UJ	10 U	10 U	10 UJ
Acenaphthene	UG/L	0	0%	0	10	3.65E+02				10 U	10 U	10 U	10 U	10 U
Acenaphthylene	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U
Anthracene	UG/L	0	0%	0	10	1.83E+03				10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	UG/L	0	0%	0	10	9.21E-02				10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	UG/L	0	0%	0	10	9.21E-03				10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	UG/L	0	0%	0	10	9.21E-02				10 UJ	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	UG/L	0	0%	0	10	9.21E-01				10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethoxy)methane	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl)ether	UG/L	0	0%	0	10	1.02E-02				10 U	10 U	10 UJ	10 UJ	10 U
Bis(2-Chloroisopropyl)ether	UG/L	0	0%	0	10	2.74E-01				10 U	10 U	10 U	10 U	10 U
Bis(2-Ethylhexyl)phthalate	UG/L	4.2	10%	1	10	4.80E+00		0.6	1	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	UG/L	0	0%	0	10	7.30E+03				10 U	10 U	10 U	10 U	10 U
Carbazole	UG/L	0	0%	0	10	3.36E+00				10 U	10 U	10 U	10 U	10 U
Chrysene	UG/L	0	0%	0	10	9.21E+00				10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	UG/L	0	0%	0	10	3.65E+03				10 UJ	10 UJ	10 U	10 U	10 UJ
Di-n-octylphthalate	UG/L	0	0%	0	10	1.46E+03				10 U	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	UG/L	0	0%	0	10	9.21E-03				10 U	10 U	10 U	10 U	10 U
Dibenzofuran	UG/L	0	0%	0	10	1.22E+01				10 U	10 U	10 U	10 U	10 U
Diethyl phthalate	UG/L	0	0%	0	10	2.92E+04				10 U	10 U	10 U	10 U	10 U
Dimethylphthalate	UG/L	0	0%	0	10	3.65E+05				10 U	10 U	10 U	10 U	10 U
Fluoranthene	UG/L	0	0%	0	10	1.46E+03				10 U	10 U	10 U	10 U	10 U
Fluorene	UG/L	0	0%	0	10	2.43E+02				10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	UG/L	0	0%	0	10	4.20E-02		0.00003		10 UJ	10 UJ	10 U	10 U	10 UJ
Hexachlorobutadiene	UG/L	0	0%	0	10	8.62E-01		0.01		10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	UG/L	0	0%	0	10	2.19E+02		0.45		10 UJ	10 U	10 UJ	10 UJ	10 U
Hexachloroethane	UG/L	0	0%	0	10	4.80E+00		0.6		10 UJ	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	UG/L	0	0%	0	10	9.21E-02				10 U	10 UJ	10 U	10 U	10 UJ
Isophorone	UG/L	0	0%	0	10	7.08E+01				10 U	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	UG/L	0	0%	0	10	1.37E+01				10 UJ	10 U	10 U	10 U	10 U
N-Nitrosodipropylamine	UG/L	0	0%	0	10	9.60E-03				10 U	10 U	10 U	10 U	10 U
Naphthalene	UG/L	0	0%	0	10	6.20E+00				10 U	10 U	10 U	10 U	10 U

Table C-7
SURFACE WATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SWDRMO-6	SWDRMO-7	SWDRMO-8	SWDRMO-8	SWDRMO-9
Matrix										SW	SW	SW	SW	SW
Sample ID										DRMO-3006	DRMO-3007	DRMO-3008	DRMO-3005	DRMO-3009
Sample Depth to Top of Sample										0	0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A	N/A
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code										SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1		
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Nitrobenzene	UG/L	0	0%	0	10	3.40E+00				10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	UG/L	0	0%	0	10	5.60E-01		1		10 UJ	10 UJ	10 U	10 U	10 UJ
Phenanthrene	UG/L	0	0%	0	10					10 U	10 U	10 U	10 U	10 U
Phenol	UG/L	0	0%	0	10	1.09E+04		5		10 U	10 U	10 U	10 U	10 U
Pyrene	UG/L	0	0%	0	10	1.83E+02				10 UJ	10 UJ	10 U	10 U	10 UJ
Pesticides/PCBs														
4,4'-DDD	UG/L	0	0%	0	10	2.80E-01		0.00008		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4,4'-DDE	UG/L	0	0%	0	10	1.98E-01		0.000007		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
4,4'-DDT	UG/L	0	0%	0	10	1.98E-01		0.00001		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Aldrin	UG/L	0	0%	0	10	3.95E-03		0.001		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Alpha-BHC	UG/L	0	0%	0	10	1.07E-02				0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Alpha-Chlordane	UG/L	0	0%	0	10					0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Beta-BHC	UG/L	0	0%	0	10	3.74E-02				0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chlordane	UG/L	0	0%	0	10					0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Delta-BHC	UG/L	0	0%	0	10					0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Dieldrin	UG/L	0	0%	0	10	4.20E-03		0.0000006		0.009 UJ	0.009 UJ	0.009 UJ	0.009 U	0.009 U
Endosulfan I	UG/L	0	0%	0	10			0.009		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Endosulfan II	UG/L	0	0%	0	10			0.009		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Endosulfan sulfate	UG/L	0	0%	0	10					0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin	UG/L	0	0%	0	10	1.09E+01		0.002		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin aldehyde	UG/L	0	0%	0	10					0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin ketone	UG/L	0	0%	0	10					0.009 U	0.009 U	0.009 U	0.009 U	0.009 U
Gamma-BHC/Lindane	UG/L	0	0%	0	10	5.17E-02				0.009 U	0.009 U	0.009 U	0.009 U	0.009 U
Gamma-Chlordane	UG/L	0	0%	0	10					0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Heptachlor	UG/L	0	0%	0	10	1.49E-02		0.0002		0.007 U	0.007 U	0.007 U	0.007 U	0.007 U
Heptachlor epoxide	UG/L	0	0%	0	10	7.39E-03		0.0003		0.008 U	0.008 U	0.008 U	0.008 U	0.008 U
Methoxychlor	UG/L	0	0%	0	10	1.82E+02		0.03		0.008 U	0.008 U	0.008 U	0.008 U	0.008 U
Toxaphene	UG/L	0	0%	0	10	6.11E-02		0.000006		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor-1016	UG/L	0	0%	0	10	9.60E-01		0.000001		0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ
Aroclor-1221	UG/L	0	0%	0	10			0.000001		0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
Aroclor-1232	UG/L	0	0%	0	10			0.000001		0.09 UJ	0.09 UJ	0.09 UJ	0.09 UJ	0.09 UJ
Aroclor-1242	UG/L	0	0%	0	10					0.08 UJ	0.08 UJ	0.08 UJ	0.08 UJ	0.08 UJ
Aroclor-1248	UG/L	0	0%	0	10			0.000001		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor-1254	UG/L	0	0%	0	10	3.36E-02		0.000001		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor-1260	UG/L	0	0%	0	10			0.000001		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Metals and Cyanide														
Aluminum	UG/L	8760	100%	10	10	3.65E+04		100	5	27.5	14.4	23.9	23.4	19.4
Antimony	UG/L	0	0%	0	10	1.46E+01				4.7 U	4.7 U	4.7 U	4.7 U	4.7 U
Arsenic	UG/L	50.3	10%	1	10	4.48E-02	1	150		2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
Barium	UG/L	423	100%	10	10	2.55E+03				50.4	54	43.7	47.4	37.2
Beryllium	UG/L	0.86	90%	9	10	7.30E+01		1100		0.16	0.16	0.14	0.12	0.14
Cadmium	UG/L	19.5	40%	4	10	1.82E+01	1	3.84	2	0.4 U	0.4 U	0.4 U	0.4 U	0.46
Calcium	UG/L	166000	100%	10	10					72300	91700	67700	72200	84100
Chromium	UG/L	129	80%	8	10			139.45		0.6 U	0.89	0.6 U	0.6 U	1.9
Cobalt	UG/L	47	70%	7	10	7.30E+02		5	2	1.1	0.6 U	0.6	0.6	0.91
Copper	UG/L	1160	100%	10	10	1.46E+03		17.32	2	2.6	1.7	1.8	2.1	6.7
Cyanide, Amenable	MG/L	0	0%	0	10					0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Cyanide, Total	MG/L	0	0%	0	10					0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Table C-7
SURFACE WATER SAMPLE RESULTS
SEAD-121C
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C	SEAD-121C
Location ID										SWDRMO-6	SWDRMO-7	SWDRMO-8	SWDRMO-8	SWDRMO-9
Matrix										SW	SW	SW	SW	SW
Sample ID										DRMO-3006	DRMO-3007	DRMO-3008	DRMO-3005	DRMO-3009
Sample Depth to Top of Sample										0	0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A	N/A
Sample Date										11/5/2002	11/5/2002	11/5/2002	11/5/2002	11/5/2002
QC Code						**Region IX**				SA	SA	SA	SA	SA
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**NYSDEC**		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**		1	1	1		
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses** [1]	**Value** [2]	**Exceedances**	**Value** [3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Iron	UG/L	110000	80%	8	10	1.09E+04	2	300	5	109	17.3 U	19 J	34.2 J	17.3 U
Lead	UG/L	839	100%	10	10			1.4624632	10	6.8 J	7.7 J	3.7	5.1 J	5.7 J
Magnesium	UG/L	26200	100%	10	10					12000	12400	11600	12300	11100
Manganese	UG/L	2380	100%	10	10	8.76E+02	1			45.7	20.7	11.6	26.1	3.2
Mercury	UG/L	2.1	20%	2	10	1.09E+01		0.0007	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	UG/L	154	30%	3	10	7.30E+02		99.92	1	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Potassium	UG/L	5350	100%	10	10					3860 J	2070 J	3450 J	3660 J	4380 J
Selenium	UG/L	4.6	10%	1	10	1.82E+02		4.6		3 U	3 U	3 U	3 U	3 U
Silver	UG/L	8	20%	2	10	1.82E+02		0.1	2	1 U	1 U	1 U	1 U	1 U
Sodium	UG/L	123000	100%	10	10					113000 J	34800 J	102000 J	108000 J	4490
Thallium	UG/L	6.3	20%	2	10	2.41E+00	2	8		5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
Vanadium	UG/L	233	50%	5	10	3.65E+01	1	14	2	0.89	0.7 U	0.7 U	0.7 U	0.7 U
Zinc	UG/L	6910	100%	10	10	1.09E+04		159.25	2	17.8	15.9	13.9	16.8	42.7
Other														
Total Petroleum Hydrocarbons	MG/L	8.08	11%	1	9					1 U	1 U	1 U	1 U	

NOTES:

1) Sample-duplicate pair (DRMO-3008/DRMO-3005) collected from SWDRMO-8 was averaged and the average results were used in the summary statistic presented in this tabl

2) The criteria value source is the Region IX Preliminary Remediation Goals for Tap Water (October 2004)

3) Action Levels are from the New York State Ambient Water Quality Standards, Class C for Surface Water.

U = compound was not detected

J = the reported value is an estimated concentration

UJ = the compound was not detected; the associated reporting limit is approximate

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SB121I-1	SB121I-2	SB121I-2	SB121I-3	SB121I-4	SB121I-5	SS121I-1
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1040	121I-1043	121I-1044	121I-1047	121I-1050	121I-1053	EB147
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/24/2002	10/24/2002	10/24/2002	3/10/1998
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds																
1,1,1-Trichloroethane	UG/KG	0	0%	0	45	1.20E+06		800		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	45	4.08E+02		600		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
1,1,2-Trichloroethane	UG/KG	0	0%	0	45	7.29E+02				2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
1,1-Dichloroethane	UG/KG	0	0%	0	45	5.06E+05		200		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
1,1-Dichloroethene	UG/KG	0	0%	0	45	1.24E+05		400		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
1,2-Dichloroethane	UG/KG	0	0%	0	45	2.78E+02		100		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
1,2-Dichloropropane	UG/KG	0	0%	0	45	3.42E+02				2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Acetone	UG/KG	150	80%	36	45	1.41E+07		200		11 UJ	110 U	33 UJ	7.3 UJ	7.6 UJ	17 UJ	
Benzene	UG/KG	41[4]	20%	9	45	6.43E+02		60		2.9 UJ	6.6 J	10 J	2.9 UJ	3.1 UJ	3.2 UJ	
Bromodichloromethane	UG/KG	0	0%	0	45	8.24E+02				2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Bromoform	UG/KG	0	0%	0	45	6.16E+04				2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Carbon disulfide	UG/KG	0	0%	0	45	3.55E+05		2700		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Carbon tetrachloride	UG/KG	0	0%	0	45	2.51E+02		600		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Chlorobenzene	UG/KG	0	0%	0	45	1.51E+05		1700		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Chlorodibromomethane	UG/KG	0	0%	0	45	1.11E+03				2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Chloroethane	UG/KG	0	0%	0	45	3.03E+03		1900		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Chloroform	UG/KG	0	0%	0	45	2.21E+02		300		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	45	4.29E+04				2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	45					2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Ethyl benzene	UG/KG	7.8	13%	6	45	3.95E+05		5500		2.9 UJ	2 J	3.5 J	2.9 UJ	3.1 UJ	3.2 UJ	
Meta/Para Xylene	UG/KG	6.3[4]	13%	6	45					2.9 UJ	2.2 J	3.4 J	2.9 UJ	3.1 UJ	3.2 UJ	
Methyl bromide	UG/KG	0	0%	0	45	3.90E+03				2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Methyl butyl ketone	UG/KG	0	0%	0	45					2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Methyl chloride	UG/KG	0	0%	0	45	4.69E+04				2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Methyl ethyl ketone	UG/KG	78	24%	11	45	2.23E+07		300		2.9 UJ	55	27 J	2.9 UJ	3.1 UJ	3.2 UJ	
Methyl isobutyl ketone	UG/KG	0	0%	0	45	5.28E+06		1000		2.9 UJ	3.1 U	2.8 U	2.9 UJ	3.1 UJ	3.2 UJ	
Methylene chloride	UG/KG	2.8	20%	9	45	9.11E+03		100		1.8 J	3.1 U	2.7 J	1.6 J	2.8 J	2.4 J	
Ortho Xylene	UG/KG	3.6[4]	13%	6	45					2.9 UJ	1.1 J	2 J	2.9 UJ	3.1 UJ	3.2 UJ	
Styrene	UG/KG	0	0%	0	45	1.70E+06				2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Tetrachloroethene	UG/KG	0	0%	0	45	4.84E+02		1400		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Toluene	UG/KG	31[4]	18%	8	45	5.20E+05		1500		2.9 UJ	6.9	11 J	2.9 UJ	3.1 UJ	3.2 UJ	
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	45	6.95E+04		300		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	45					2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Trichloroethene	UG/KG	0	0%	0	45	5.30E+01		700		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Vinyl chloride	UG/KG	0	0%	0	45	7.91E+01		200		2.9 UJ	3.1 U	2.8 UJ	2.9 UJ	3.1 UJ	3.2 UJ	
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	51	6.22E+04		3400		390 U	390 U	390 U	360 U	380 U	390 U	470 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	51	6.00E+05		7900		390 U	390 U	390 U	360 U	380 U	390 U	470 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	51	5.31E+05		1600		390 U	390 U	390 U	360 U	380 U	390 U	470 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	51	3.45E+03		8500		390 U	390 U	390 U	360 U	380 U	390 U	470 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+06		100		970 U	970 U	980 U	900 U	950 U	990 U	1100 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+03				390 U	390 U	390 U	360 U	380 U	390 U	470 U
2,4-Dichlorophenol	UG/KG	0	0%	0	51	1.83E+05		400		390 U	390 U	390 U	360 U	380 U	390 U	470 U
2,4-Dimethylphenol	UG/KG	0	0%	0	51	1.22E+06				390 U	390 U	390 U	360 U	380 U	390 U	470 U
2,4-Dinitrophenol	UG/KG	0	0%	0	51	1.22E+05		200		970 U	970 U	980 U	900 U	950 U	990 U	1100 UJ

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SB121I-1	SB121I-2	SB121I-2	SB121I-3	SB121I-4	SB121I-5	SS121I-1
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1040	121I-1043	121I-1044	121I-1047	121I-1050	121I-1053	EB147
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/24/2002	10/24/2002	10/24/2002	3/10/1998
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dinitrotoluene	UG/KG	0	0%	0	51	1.22E+05				390 U	390 U	390 U	360 U	380 U	390 U	470 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	51	6.11E+04		1000		390 U	390 U	390 U	360 U	380 U	390 U	470 U
2-Chloronaphthalene	UG/KG	0	0%	0	51	4.94E+06				390 U	390 U	390 U	360 U	380 U	390 U	470 U
2-Chlorophenol	UG/KG	0	0%	0	51	6.34E+04		800		390 U	390 U	390 U	360 U	380 U	390 U	470 U
2-Methylnaphthalene	UG/KG	260	10%	5	51			36400		390 U	390 U	390 U	360 U	380 U	390 U	470 U
2-Methylphenol	UG/KG	0	0%	0	51	3.06E+06		100		390 U	390 U	390 U	360 U	380 U	390 U	470 U
2-Nitroaniline	UG/KG	0	0%	0	51	1.83E+05		430		970 U	970 U	980 U	900 U	950 U	990 U	1100 U
2-Nitrophenol	UG/KG	0	0%	0	51			330		390 U	390 U	390 U	360 U	380 U	390 U	470 U
3 or 4-Methylphenol	UG/KG	0	0%	0	45					390 U	390 U	390 U	360 U	380 U	390 U	
3,3'-Dichlorobenzidine	UG/KG	315 [4]	2%	1	47	1.08E+03				390 U	390 UJ	390 U	360 U	380 U	390 U	470 U
3-Nitroaniline	UG/KG	0	0%	0	51	1.83E+04		500		970 U	970 U	980 U	900 U	950 U	990 U	1100 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	50	6.11E+03				970 U	970 U	980 UJ	900 UJ	950 U	990 UJ	1100 UJ
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	50					390 U	390 U	390 U	360 U	380 U	390 U	470 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	51			240		390 U	390 U	390 U	360 U	380 U	390 U	470 U
4-Chloroaniline	UG/KG	0	0%	0	51	2.44E+05		220		390 U	390 U	390 U	360 U	380 U	390 U	470 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	51					390 U	390 U	390 U	360 U	380 U	390 U	470 U
4-Methylphenol	UG/KG	0	0%	0	6	3.06E+05		900								470 U
4-Nitroaniline	UG/KG	0	0%	0	51	2.32E+04				970 U	970 U	980 U	900 U	950 U	990 U	1100 UJ
4-Nitrophenol	UG/KG	0	0%	0	51			100		970 U	970 U	980 U	900 U	950 U	990 U	1100 U
Acenaphthene	UG/KG	6100	51%	26	51	3.68E+06		50000		390 U	390 U	390 U	360 U	380 U	390 U	170 J
Acenaphthylene	UG/KG	560	12%	6	51			41000		390 U	390 U	390 U	360 U	380 U	390 U	470 U
Anthracene	UG/KG	12000	58%	29	50	2.19E+07		50000		390 U	89 J	74 J	360 U	380 U	390 U	170 J
Benzo(a)anthracene	UG/KG	28000	90%	46	51	6.21E+02	18	224	28	67 J	350 J	350 J	100 J	380 U	43 J	1400
Benzo(a)pyrene	UG/KG	23000	88%	45	51	6.21E+01	44	61	44	97 J	390 J	450 J	150 J	380 UJ	390 U	1300
Benzo(b)fluoranthene	UG/KG	29000	94%	48	51	6.21E+02	21	1100	14	140 J	600 J	620 J	160 J	380 UJ	66 J	1500
Benzo(ghi)perylene	UG/KG	29000	82%	42	51			50000		390 U	220 J	140 J	73 J	380 UJ	390 U	820
Benzo(k)fluoranthene	UG/KG	23000	74%	37	50	6.21E+03	4	1100	14	390 UJ	300 J	360 J	100 J	380 UJ	390 UJ	1500
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	51					390 U	390 U	390 U	360 U	380 U	390 U	470 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	51	2.18E+02				390 U	390 U	390 U	360 U	380 UJ	390 U	470 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	51	2.88E+03				390 U	390 U	390 U	360 U	380 U	390 U	470 U
Bis(2-Ethylhexyl)phthalate	UG/KG	1600	33%	17	51	3.47E+04		50000		58 J	78 J	390 U	38 J	380 U	390 U	51 J
Butylbenzylphthalate	UG/KG	420 [4]	6%	3	48	1.22E+07		50000		130 J	390 UJ	390 U	360 U	380 U	390 U	470 U
Carbazole	UG/KG	6800	57%	29	51	2.43E+04				390 U	56 J	67 J	360 U	380 U	390 U	230 J
Chrysene	UG/KG	32000	86%	44	51	6.21E+04		400	25	89 J	380 J	400	100 J	380 U	390 U	1700
Di-n-butylphthalate	UG/KG	45	2%	1	50	6.11E+06		8100		390 U	390 U	390 U	360 U	380 U	390 U	45 J
Di-n-octylphthalate	UG/KG	420 [4]	2%	1	47	2.44E+06		50000		390 U	390 UJ	390 U	360 U	380 U	390 U	470 UJ
Dibenz(a,h)anthracene	UG/KG	5000	34%	15	44	6.21E+01	15	14	15	390 U	390 UJ	390 U	360 U	380 UJ	390 U	350 J
Dibenzofuran	UG/KG	2000	27%	14	51	1.45E+05		6200		390 U	390 U	390 U	360 U	380 U	390 U	29 J
Diethyl phthalate	UG/KG	640 [4]	2%	1	51	4.89E+07		7100		390 U	390 U	390 U	360 U	380 U	390 U	470 U
Dimethylphthalate	UG/KG	0	0%	0	51	1.00E+08		2000		390 U	390 U	390 U	360 U	380 U	390 U	470 U
Fluoranthene	UG/KG	62000	94%	48	51	2.29E+06		50000	1	170 J	720	920	210 J	380 U	120 J	3200
Fluorene	UG/KG	4200	43%	22	51	2.75E+06		50000		390 U	390 U	390 U	360 U	380 U	390 U	83 J
Hexachlorobenzene	UG/KG	0	0%	0	50	3.04E+02		410		390 U	390 U	390 U	360 U	380 U	390 U	470 U
Hexachlorobutadiene	UG/KG	0	0%	0	51	6.24E+03				390 UJ	390 UJ	390 UJ	360 U	380 U	390 UJ	470 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	51	3.65E+05				390 U	390 U	390 U	360 U	380 U	390 U	470 U
Hexachloroethane	UG/KG	0	0%	0	51	3.47E+04				390 U	390 U	390 U	360 U	380 U	390 U	470 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SB121I-1	SB121I-2	SB121I-2	SB121I-3	SB121I-4	SB121I-5	SS121I-1
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1040	121I-1043	121I-1044	121I-1047	121I-1050	121I-1053	EB147
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/24/2002	10/24/2002	10/24/2002	3/10/1998
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Indeno(1,2,3-cd)pyrene	UG/KG	12000	71%	35	49	6.21E+02	13	3200	3	390 UJ	63 J	79 J	360 UJ	380 U	390 UJ	760
Isophorone	UG/KG	315[4]	2%	1	51	5.12E+05		4400		390 UJ	390 UJ	390 UJ	360 UJ	380 UJ	390 UJ	470 U
N-Nitrosodiphenylamine	UG/KG	0	0%	0	50	9.93E+04				390 U	390 U	390 U	360 U	380 U	390 U	470 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	51	6.95E+01				390 U	390 U	390 U	360 U	380 U	390 U	470 U
Naphthalene	UG/KG	630	14%	7	51	5.59E+04		13000		390 U	390 U	390 U	360 U	380 U	390 U	470 U
Nitrobenzene	UG/KG	315[4]	2%	1	51	1.96E+04		200	1	390 UJ	390 UJ	390 UJ	360 UJ	380 UJ	390 UJ	470 U
Pentachlorophenol	UG/KG	0	0%	0	50	2.98E+03		1000		970 U	970 U	980 U	900 U	950 U	990 U	1100 U
Phenanthrene	UG/KG	52000	94%	48	51			50000	1	69 J	450	440	110 J	380 U	53 J	1200
Phenol	UG/KG	315[4]	2%	1	51	1.83E+07		30	1	390 U	390 U	390 U	360 U	380 UJ	390 U	470 U
Pyrene	UG/KG	64000	94%	48	51	2.32E+06		50000	1	120 J	1200 J	660	160 J	380 U	72 J	2700
Pesticides/PCBs																
4,4'-DDD	UG/KG	0	0%	0	45	2.44E+03		2900		2 UJ	2 UJ	2 UJ	1.8 UJ	1.9 UJ	2 UJ	
4,4'-DDE	UG/KG	34	11%	5	45	1.72E+03		2100		2 U	2 U	2 U	1.8 U	1.9 U	2 U	
4,4'-DDT	UG/KG	39	5%	2	44	1.72E+03		2100		2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Aldrin	UG/KG	12	9%	4	45	2.86E+01		41		2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Alpha-BHC	UG/KG	0	0%	0	45	9.02E+01		110		2 UJ	2 UJ	2 U	1.8 UJ	1.9 UJ	2 UJ	
Alpha-Chlordane	UG/KG	0	0%	0	41					2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Beta-BHC	UG/KG	0	0%	0	45	3.16E+02		200		2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Chlordane	UG/KG	0	0%	0	45					20 U	20 U	20 U	18 U	19 U	20 U	
Delta-BHC	UG/KG	0	0%	0	45			300		2 UJ	2 UJ	2 UJ	1.8 UJ	1.9 UJ	2 UJ	
Dieldrin	UG/KG	34	4%	2	45	3.04E+01	1	44		2 UJ	2 UJ	2 UJ	1.8 UJ	1.9 UJ	2 UJ	
Endosulfan I	UG/KG	95	59%	24	41			900		2 U	11 J	6.9 J	1.8 U	1.9 U	2 U	
Endosulfan II	UG/KG	0	0%	0	45			900		2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Endosulfan sulfate	UG/KG	0	0%	0	45			1000		2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Endrin	UG/KG	30	4%	2	45	1.83E+04		100		2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Endrin aldehyde	UG/KG	0	0%	0	45					2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Endrin ketone	UG/KG	0	0%	0	45					2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Gamma-BHC/Lindane	UG/KG	0	0%	0	45	4.37E+02		60		2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Gamma-Chlordane	UG/KG	0	0%	0	45			540		2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Heptachlor	UG/KG	0	0%	0	45	1.08E+02		100		2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Heptachlor epoxide	UG/KG	55	21%	8	39	5.34E+01	1	20	3	2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Methoxychlor	UG/KG	0	0%	0	45	3.06E+05				2 U	2 U	2 U	1.8 U	1.9 U	2 U	
Toxaphene	UG/KG	0	0%	0	45	4.42E+02				20 U	20 U	20 U	18 U	19 U	20 U	
Aroclor-1016	UG/KG	0	0%	0	45	3.93E+03				20 U	20 U	20 U	18 U	19 U	20 U	
Aroclor-1221	UG/KG	0	0%	0	45					20 U	20 U	20 U	18 U	19 U	20 U	
Aroclor-1232	UG/KG	0	0%	0	45					20 U	20 U	20 U	18 U	19 U	20 U	
Aroclor-1242	UG/KG	0	0%	0	45					20 U	20 U	20 U	18 U	19 U	20 U	
Aroclor-1248	UG/KG	0	0%	0	45					20 U	20 U	20 U	18 U	19 U	20 U	
Aroclor-1254	UG/KG	67	4%	2	45	2.22E+02		10000		20 UJ	20 UJ	20 UJ	18 UJ	19 UJ	20 UJ	
Aroclor-1260	UG/KG	46	7%	3	45			10000		20 UJ	20 UJ	20 UJ	18 UJ	19 UJ	20 UJ	
Metals and Cyanide																
Aluminum	MG/KG	13200	100%	45	45	7.61E+04		19300		4400	9700	9020	5510	13000	13200	
Antimony	MG/KG	7.5	31%	14	45	3.13E+01		5.9	1	3.8 J	1.8	8.6	1.7	1 U	1.1 U	
Arsenic	MG/KG	104	100%	34	34	3.90E-01	34	8.2	8	4.5 J	21.2 J	43 J	5.4 J	7.3 J	11.5 J	
Barium	MG/KG	207	100%	45	45	5.37E+03		300		105 J	74.3 J	83.6 J	67.3 J	102 J	91.3 J	
Beryllium	MG/KG	0.68	98%	44	45	1.54E+02		1.1		0.27	0.49	0.46	0.31	0.67	0.68	

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SB121I-1	SB121I-2	SB121I-2	SB121I-3	SB121I-4	SB121I-5	SS121I-1
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1040	121I-1043	121I-1044	121I-1047	121I-1050	121I-1053	EB147
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2	0.2
Sample Date										10/24/2002	10/24/2002	10/24/2002	10/24/2002	10/24/2002	10/24/2002	3/10/1998
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	EBS
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Cadmium	MG/KG	6.6	31%	14	45	3.70E+01		2.3	3	0.53	0.14 U	0.14 U	6.6	0.14 U	0.14 U	
Calcium	MG/KG	298000	100%	45	45			121000	18	171000	30900	27800	121000	10300	18800	
Chromium	MG/KG	439 [4]	100%	45	45			29.6	6	11.2 J	25.9 J	50 J	14.1 J	22 J	22.6 J	
Cobalt	MG/KG	206 [4]	100%	45	45	9.03E+02		30	4	6.9 J	23.9 J	40.6 J	12.4 J	18 J	13.7 J	
Copper	MG/KG	209 [4]	100%	40	40	3.13E+03		33	10	21 R	37.5 R	66.1 R	20.6 R	24.4 R	27.6 R	
Cyanide, Amenable	MG/KG	0	0%	0	45					0.59 U	0.59 U	0.6 U	0.55 U	0.58 U	0.6 U	
Cyanide, Total	MG/KG	2.00 [4]	7%	3	45					0.592 U	0.592 U	0.595 U	0.552 U	0.575 U	0.602 U	
Iron	MG/KG	58400 [4]	100%	45	45	2.35E+04	12	36500	2	11500	27100	31500	15400	30400	30200	
Lead	MG/KG	122	100%	45	45	4.00E+02		24.8	22	15.7	31.3	42.1	20.3	13.7	12.8	
Magnesium	MG/KG	22300	100%	45	45			21500	1	18800	6110	4240	12000	5240	5980	
Manganese	MG/KG	310500 [4]	100%	45	45	1.76E+03	11	1060	15	474 J	33200 J	57800 J	534 J	1420 J	1010 J	
Mercury	MG/KG	0.18	98%	44	45	2.35E+01		0.1	1	0.07	0.04	0.05	0.03	0.05	0.05	
Nickel	MG/KG	342 [4]	100%	45	45	1.56E+03		49	7	53.6 J	38.9 J	46.3 J	26.7 J	37.4 J	33.3 J	
Potassium	MG/KG	1450	100%	45	45			2380		1080 J	859 J	929 J	950 J	1090 J	949 J	
Selenium	MG/KG	146 [4]	47%	21	45	3.91E+02		2	5	0.65 J	5.1 J	17.9 J	0.46 UJ	1.4 J	1.4 J	
Silver	MG/KG	10.5	18%	6	34	3.91E+02		0.75	4	0.31 UJ	1.9 J	4.2 J	0.29	0.3 UJ	0.32 UJ	
Sodium	MG/KG	372	82%	37	45			172	24	372	118 U	115 U	207	113 U	118 U	
Thallium	MG/KG	163 [4]	20%	9	45	5.16E+00	5	0.7	5	0.36 U	3	14.4	0.34 U	0.35 U	0.5 J	
Vanadium	MG/KG	182 [4]	100%	45	45	7.82E+01	1	150	1	8.3 J	22.6 J	31.6 J	11.4 J	24.3 J	21 J	
Zinc	MG/KG	532	100%	45	45	2.35E+04		110	14	176 J	85.1 J	82 J	70.7 J	92.1 J	93.9 J	
Other																
Total Organic Carbon	MG/KG	8900	100%	45	45					5400	5600	6800	6500	7100	6700	
Total Petroleum Hydrocarbons	MG/KG	2200	33%	15	45					47 U	47 U	48 U	44 U	46 U	48 U	

NOTES:

1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.

2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)

3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.

4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected

J = the reported value is an estimated concentration

UJ = the compound was not detected; the associated reporting limit is approximate

R = the data was rejected in the data validating process

NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-10	SS121I-10	SS121I-11	SS121I-12	SS121I-13	SS121I-14	SS121I-15
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1006	121I-1031	121I-1007	121I-1008	121I-1009	121I-1010	121I-1011
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds																
1,1,1-Trichloroethane	UG/KG	0	0%	0	45	1.20E+06		800		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	45	4.08E+02		600		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
1,1,2-Trichloroethane	UG/KG	0	0%	0	45	7.29E+02				2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
1,1-Dichloroethane	UG/KG	0	0%	0	45	5.06E+05		200		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
1,1-Dichloroethene	UG/KG	0	0%	0	45	1.24E+05		400		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
1,2-Dichloroethane	UG/KG	0	0%	0	45	2.78E+02		100		2.5 UJ	2.2 U	3.1 UJ	2.8 UJ	2.6 UJ	3 UJ	2.9 UJ
1,2-Dichloropropane	UG/KG	0	0%	0	45	3.42E+02				2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Acetone	UG/KG	150	80%	36	45	1.41E+07		200		4.5 J	2.2 U	15 J	12 J	30 J	37	110
Benzene	UG/KG	41[4]	20%	9	45	6.43E+02		60		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	29
Bromodichloromethane	UG/KG	0	0%	0	45	8.24E+02				2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Bromoform	UG/KG	0	0%	0	45	6.16E+04				2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Carbon disulfide	UG/KG	0	0%	0	45	3.55E+05		2700		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Carbon tetrachloride	UG/KG	0	0%	0	45	2.51E+02		600		2.5 UJ	2.2 U	3.1 UJ	2.8 UJ	2.6 UJ	3 UJ	2.9 UJ
Chlorobenzene	UG/KG	0	0%	0	45	1.51E+05		1700		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Chlorodibromomethane	UG/KG	0	0%	0	45	1.11E+03				2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Chloroethane	UG/KG	0	0%	0	45	3.03E+03		1900		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 UJ	2.9 UJ
Chloroform	UG/KG	0	0%	0	45	2.21E+02		300		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	45	4.29E+04				2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	45					2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Ethyl benzene	UG/KG	7.8	13%	6	45	3.95E+05		5500		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	7.8
Meta/Para Xylene	UG/KG	6.3[4]	13%	6	45					2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	5.9
Methyl bromide	UG/KG	0	0%	0	45	3.90E+03				2.5 UJ	2.2 U	3.1 UJ	2.8 UJ	2.6 UJ	3 UJ	2.9 UJ
Methyl butyl ketone	UG/KG	0	0%	0	45					2.5 UJ	2.2 U	3.1 UJ	2.8 UJ	2.6 UJ	3 UJ	2.9 UJ
Methyl chloride	UG/KG	0	0%	0	45	4.69E+04				2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Methyl ethyl ketone	UG/KG	78	24%	11	45	2.23E+07		300		2.5 U	2.2 U	3.1 U	2.8 U	5	14	70
Methyl isobutyl ketone	UG/KG	0	0%	0	45	5.28E+06		1000		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Methylene chloride	UG/KG	2.8	20%	9	45	9.11E+03		100		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	2.1 J	2.9 U
Ortho Xylene	UG/KG	3.6[4]	13%	6	45					2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	3.4
Styrene	UG/KG	0	0%	0	45	1.70E+06				2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Tetrachloroethene	UG/KG	0	0%	0	45	4.84E+02		1400		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 UJ	2.9 UJ
Toluene	UG/KG	31[4]	18%	8	45	5.20E+05		1500		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	25
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	45	6.95E+04		300		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	45					2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Trichloroethene	UG/KG	0	0%	0	45	5.30E+01		700		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Vinyl chloride	UG/KG	0	0%	0	45	7.91E+01		200		2.5 U	2.2 U	3.1 U	2.8 U	2.6 U	3 U	2.9 U
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	51	6.22E+04		3400		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	51	6.00E+05		7900		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	51	5.31E+05		1600		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	51	3.45E+03		8500		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+06		100		910 U	910 U	930 U	920 U	4500 U	980 U	970 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+03				360 U	360 U	370 U	370 U	1800 U	390 U	390 U
2,4-Dichlorophenol	UG/KG	0	0%	0	51	1.83E+05		400		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
2,4-Dimethylphenol	UG/KG	0	0%	0	51	1.22E+06				360 U	360 U	370 U	370 U	1800 U	390 U	390 U
2,4-Dinitrophenol	UG/KG	0	0%	0	51	1.22E+05		200		910 UJ	910 UJ	930 U	920 UJ	4500 UJ	980 U	970 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-10	SS121I-10	SS121I-11	SS121I-12	SS121I-13	SS121I-14	SS121I-15
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1006	121I-1031	121I-1007	121I-1008	121I-1009	121I-1010	121I-1011
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dinitrotoluene	UG/KG	0	0%	0	51	1.22E+05				360 U	360 U	370 U	370 U	1800 U	390 U	390 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	51	6.11E+04		1000		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
2-Chloronaphthalene	UG/KG	0	0%	0	51	4.94E+06				360 U	360 U	370 U	370 U	1800 U	390 U	390 U
2-Chlorophenol	UG/KG	0	0%	0	51	6.34E+04		800		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
2-Methylnaphthalene	UG/KG	260	10%	5	51			36400		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
2-Methylphenol	UG/KG	0	0%	0	51	3.06E+06		100		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
2-Nitroaniline	UG/KG	0	0%	0	51	1.83E+05		430		910 U	910 UJ	930 UJ	920 U	4500 UJ	980 UJ	970 UJ
2-Nitrophenol	UG/KG	0	0%	0	51			330		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
3 or 4-Methylphenol	UG/KG	0	0%	0	45					360 U	360 U	370 U	370 U	1800 U	390 U	390 U
3,3'-Dichlorobenzidine	UG/KG	315[4]	2%	1	47	1.08E+03				360 U	360 U	370 UJ	370 UJ	1800 U	390 UJ	390 UJ
3-Nitroaniline	UG/KG	0	0%	0	51	1.83E+04		500		910 U	910 U	930 U	920 U	4500 U	980 U	970 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	50	6.11E+03				910 UJ	910 UJ	930 U	920 UJ	4500 UJ	980 U	970 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	50					360 U	360 U	370 U	370 U	1800 U	390 U	390 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	51			240		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
4-Chloroaniline	UG/KG	0	0%	0	51	2.44E+05		220		360 UJ	360 U	370 U	370 UJ	1800 U	390 U	390 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	51					360 U	360 U	370 U	370 U	1800 U	390 U	390 U
4-Methylphenol	UG/KG	0	0%	0	6	3.06E+05		900								
4-Nitroaniline	UG/KG	0	0%	0	51	2.32E+04				910 U	910 U	930 U	920 U	4500 U	980 U	970 U
4-Nitrophenol	UG/KG	0	0%	0	51			100		910 U	910 U	930 U	920 U	4500 U	980 U	970 U
Acenaphthene	UG/KG	6100	51%	26	51	3.68E+06		50000		360 U	360 U	370 U	370 U	1800 U	53 J	57 J
Acenaphthylene	UG/KG	560	12%	6	51			41000		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Anthracene	UG/KG	12000	58%	29	50	2.19E+07		50000		360 U	360 U	370 U	370 U	1800 U	79 J	110 J
Benzo(a)anthracene	UG/KG	28000	90%	46	51	6.21E+02	18	224	28	48 J	47 J	63 J	120 J	660 J	270 J	180 J
Benzo(a)pyrene	UG/KG	23000	88%	45	51	6.21E+01	44	61	44	66 J	60 J	75 J	180 J	1100 J	290 J	190 J
Benzo(b)fluoranthene	UG/KG	29000	94%	48	51	6.21E+02	21	1100	14	53 J	51 J	100 J	160 J	920 J	280 J	140 J
Benzo(ghi)perylene	UG/KG	29000	82%	42	51			50000		67 J	63 J	70 J	160 J	840 J	290 J	160 J
Benzo(k)fluoranthene	UG/KG	23000	74%	37	50	6.21E+03	4	1100	14	360 U	360 U	110 J	150 J	980 J	280 J	220 J
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	51					360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	51	2.18E+02				360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	51	2.88E+03				360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Bis(2-Ethylhexyl)phthalate	UG/KG	1600	33%	17	51	3.47E+04		50000		360 UJ	360 U	370 UJ	370 UJ	1800 U	390 UJ	390 UJ
Butylbenzylphthalate	UG/KG	420[4]	6%	3	48	1.22E+07		50000		360 U	360 U	370 UJ	370 UJ	1800 U	390 UJ	390 UJ
Carbazole	UG/KG	6800	57%	29	51	2.43E+04				360 U	360 U	370 U	370 U	1800 U	65 J	78 J
Chrysene	UG/KG	32000	86%	44	51	6.21E+04		400	25	62 J	63 J	100 J	210 J	800 J	300 J	190 J
Di-n-butylphthalate	UG/KG	45	2%	1	50	6.11E+06		8100		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Di-n-octylphthalate	UG/KG	420[4]	2%	1	47	2.44E+06		50000		360 U	360 U	370 UJ	370 UJ	1800 U	390 UJ	390 UJ
Dibenz(a,h)anthracene	UG/KG	5000	34%	15	44	6.21E+01	15	14	15	360 U	360 UJ	370 R	370 UJ	1800 UJ	390 U	390 UJ
Dibenzofuran	UG/KG	2000	27%	14	51	1.45E+05		6200		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Diethyl phthalate	UG/KG	640[4]	2%	1	51	4.89E+07		7100		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Dimethylphthalate	UG/KG	0	0%	0	51	1.00E+08		2000		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Fluoranthene	UG/KG	62000	94%	48	51	2.29E+06		50000	1	100 J	78 J	130 J	220 J	1200 J	570	430
Fluorene	UG/KG	4200	43%	22	51	2.75E+06		50000		360 U	360 U	370 U	370 U	1800 U	390 U	46 J
Hexachlorobenzene	UG/KG	0	0%	0	50	3.04E+02		410		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Hexachlorobutadiene	UG/KG	0	0%	0	51	6.24E+03				360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	51	3.65E+05				360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Hexachloroethane	UG/KG	0	0%	0	51	3.47E+04				360 U	360 U	370 U	370 U	1800 U	390 U	390 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-10	SS121I-10	SS121I-11	SS121I-12	SS121I-13	SS121I-14	SS121I-15
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1006	121I-1031	121I-1007	121I-1008	121I-1009	121I-1010	121I-1011
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**[1]	**Region IX PRG Criteria Value**[2]	**Exceedances**	**NYSDEC Criteria Value**[3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Indeno(1,2,3-cd)pyrene	UG/KG	12000	71%	35	49	6.21E+02	13	3200	3	83 J	74 J	370 UJ	250 J	440 J	290 J	91 J
Isophorone	UG/KG	315[4]	2%	1	51	5.12E+05		4400		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
N-Nitrosodiphenylamine	UG/KG	0	0%	0	50	9.93E+04				360 U	360 U	370 U	370 U	1800 U	390 U	390 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	51	6.95E+01				360 U	360 UJ	370 UJ	370 U	1800 UJ	390 UJ	390 UJ
Naphthalene	UG/KG	630	14%	7	51	5.59E+04		13000		360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Nitrobenzene	UG/KG	315[4]	2%	1	51	1.96E+04		200	1	360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Pentachlorophenol	UG/KG	0	0%	0	50	2.98E+03		1000		910 U	910 U	930 U	920 U	4500 U	980 U	970 U
Phenanthrene	UG/KG	52000	94%	48	51			50000	1	60 J	56 J	70 J	170 J	760 J	400	430
Phenol	UG/KG	315[4]	2%	1	51	1.83E+07		30	1	360 U	360 U	370 U	370 U	1800 U	390 U	390 U
Pyrene	UG/KG	64000	94%	48	51	2.32E+06		50000	1	79 J	98 J	160 J	270 J	1500 J	610 J	590 J
Pesticides/PCBs																
4,4'-DDD	UG/KG	0	0%	0	45	2.44E+03		2900		1.9 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	2 UJ
4,4'-DDE	UG/KG	34	11%	5	45	1.72E+03		2100		1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	2 U	2 U
4,4'-DDT	UG/KG	39	5%	2	44	1.72E+03		2100		1.9 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	2 UJ
Aldrin	UG/KG	12	9%	4	45	2.86E+01		41		1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	2 U	2 U
Alpha-BHC	UG/KG	0	0%	0	45	9.02E+01		110		1.9 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	2 UJ
Alpha-Chlordane	UG/KG	0	0%	0	41					1.9 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	2 UJ
Beta-BHC	UG/KG	0	0%	0	45	3.16E+02		200		1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	2 U	2 U
Chlordane	UG/KG	0	0%	0	45					19 U	18 U	19 U	19 U	18 U	20 U	20 U
Delta-BHC	UG/KG	0	0%	0	45			300		1.9 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	2 UJ
Dieldrin	UG/KG	34	4%	2	45	3.04E+01	1	44		1.9 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.8 UJ	16 J	2 UJ
Endosulfan I	UG/KG	95	59%	24	41			900		3.7 J	4.2 J	4.9	5.4	12	7.4 J	2 U
Endosulfan II	UG/KG	0	0%	0	45			900		1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	2 U	2 U
Endosulfan sulfate	UG/KG	0	0%	0	45			1000		1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	2 U	2 U
Endrin	UG/KG	30	4%	2	45	1.83E+04		100		1.9 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 U	2 U
Endrin aldehyde	UG/KG	0	0%	0	45					1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	2 U	2 U
Endrin ketone	UG/KG	0	0%	0	45					1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	2 U	2 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	45	4.37E+02		60		1.9 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 U	2 U
Gamma-Chlordane	UG/KG	0	0%	0	45			540		1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	2 U	2 U
Heptachlor	UG/KG	0	0%	0	45	1.08E+02		100		1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	2 U	2 U
Heptachlor epoxide	UG/KG	55	21%	8	39	5.34E+01	1	20	3	1.9 U	1.8 U	1.9 U	1.9 U	6.1	4.1 R	2 U
Methoxychlor	UG/KG	0	0%	0	45	3.06E+05				1.9 U	1.8 U	1.9 U	1.9 U	1.8 U	2 UJ	2 UJ
Toxaphene	UG/KG	0	0%	0	45	4.42E+02				19 U	18 U	19 U	19 U	18 U	20 U	20 U
Aroclor-1016	UG/KG	0	0%	0	45	3.93E+03				19 UJ	19 UJ	19 U	19 UJ	18 UJ	20 UJ	20 UJ
Aroclor-1221	UG/KG	0	0%	0	45					19 U	19 U	19 U	19 U	18 U	20 UJ	20 UJ
Aroclor-1232	UG/KG	0	0%	0	45					19 UJ	19 UJ	19 U	19 UJ	18 UJ	20 UJ	20 UJ
Aroclor-1242	UG/KG	0	0%	0	45					19 UJ	19 UJ	19 U	19 UJ	18 UJ	20 UJ	20 UJ
Aroclor-1248	UG/KG	0	0%	0	45					19 U	19 U	19 U	19 U	18 U	20 UJ	20 UJ
Aroclor-1254	UG/KG	67	4%	2	45	2.22E+02		10000		19 U	19 U	19 UJ	19 U	18 U	20 UJ	20 UJ
Aroclor-1260	UG/KG	46	7%	3	45			10000		19 U	19 U	19 UJ	19 U	8.3 J	46 J	20 UJ
Metals and Cyanide																
Aluminum	MG/KG	13200	100%	45	45	7.61E+04		19300		6480	7510	4290	5050	3380	10700	10600
Antimony	MG/KG	7.5	31%	14	45	3.13E+01		5.9	1	3.4	2.5	1.3	1.8	6.5 U	1.1 U	1.1 U
Arsenic	MG/KG	104	100%	34	34	3.90E-01	34	8.2	8	5.2	5.2	5.9	5.6	6.4	8.4 R	67.4 R
Barium	MG/KG	207	100%	45	45	5.37E+03		300		116	119	142	81.8	167	81.4 J	80 J
Beryllium	MG/KG	0.68	98%	44	45	1.54E+02		1.1		0.38 J	0.43 J	0.36 J	0.32	0.27	0.61	0.51

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-10	SS121I-10	SS121I-11	SS121I-12	SS121I-13	SS121I-14	SS121I-15
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1006	121I-1031	121I-1007	121I-1008	121I-1009	121I-1010	121I-1011
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/23/2002	10/23/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Cadmium	MG/KG	6.6	31%	14	45	3.70E+01		2.3	3	5	4.1	0.55 U	0.17 J	0.54 U	0.2	0.14 U
Calcium	MG/KG	298000	100%	45	45			121000	18	166000	143000	223000	205000	220000	7700 J	24700 J
Chromium	MG/KG	439 [4]	100%	45	45			29.6	6	14.3	14.7	8.7	12.3	15.8	39.7	24.1
Cobalt	MG/KG	206 [4]	100%	45	45	9.03E+02		30	4	8.4	8.9	6.8	7.4	7.9	12.5 J	66.1 J
Copper	MG/KG	209 [4]	100%	40	40	3.13E+03		33	10	24.5 J	22.6 J	18.9 J	19.4 J	21.4 J	25	108
Cyanide, Amenable	MG/KG	0	0%	0	45					0.56 UJ	0.55 UJ	0.56 UJ	0.56 UJ	0.55 UJ	0.59 U	0.59 U
Cyanide, Total	MG/KG	2.00 [4]	7%	3	45					0.556 UJ	0.551 UJ	0.56 UJ	0.559 UJ	0.546 UJ	0.595 U	0.585 U
Iron	MG/KG	58400 [4]	100%	45	45	2.35E+04	12	36500	2	17100	17600	12600	13900	12500	26100	39800
Lead	MG/KG	122	100%	45	45	4.00E+02		24.8	22	19	16.3	22.5	21.9	22.3	45.8 J	27.9 J
Magnesium	MG/KG	22300	100%	45	45			21500	1	13500	9040	5410	16200	16300	4980 J	5100 J
Manganese	MG/KG	310500 [4]	100%	45	45	1.76E+03	11	1060	15	786	822	1120	709	2650 J	2340	93100
Mercury	MG/KG	0.18	98%	44	45	2.35E+01		0.1	1	0.03	0.03	0.02	0.02	0.02	0.04	0.04
Nickel	MG/KG	342 [4]	100%	45	45	1.56E+03		49	7	26.7	26.9	18.1	21.1	23	66.1 J	125 J
Potassium	MG/KG	1450	100%	45	45			2380		786	1150	819	956	908	1040 J	995
Selenium	MG/KG	146 [4]	47%	21	45	3.91E+02		2	5	0.87	0.8	0.55 U	1.1	0.54 U	1.4 J	37.6 J
Silver	MG/KG	10.5	18%	6	34	3.91E+02		0.75	4	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.32 R	6.4 R
Sodium	MG/KG	372	82%	37	45			172	24	210	188	263	238	309	145	143
Thallium	MG/KG	163 [4]	20%	9	45	5.16E+00	5	0.7	5	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.37 UJ	37.8 J
Vanadium	MG/KG	182 [4]	100%	45	45	7.82E+01	1	150	1	11.6	13.2	10.7	9.9	10.8	20.5 J	62 J
Zinc	MG/KG	532	100%	45	45	2.35E+04		110	14	84 J	67.9 J	55.5 J	57.7 J	88.1 J	109 J	140
Other																
Total Organic Carbon	MG/KG	8900	100%	45	45					5600	4500	5400	4400	3700	4800	5000
Total Petroleum Hydrocarbons	MG/KG	2200	33%	15	45					44 UJ	44 UJ	45 UJ	45 UJ	1200 J	48 U	47 U

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-16	SS121I-17	SS121I-18	SS121I-19	SS121I-2	SS121I-20	SS121I-21
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1012	121I-1013	121I-1014	121I-1015	EB150	121I-1016	121I-1017
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/23/2002	10/22/2002	10/22/2002	3/10/1998	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	EBS	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds																
1,1,1-Trichloroethane	UG/KG	0	0%	0	45	1.20E+06		800		2.6 U	3 U	2.7 UJ	2.9 UJ		3 UJ	2.7 U
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	45	4.08E+02		600		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
1,1,2-Trichloroethane	UG/KG	0	0%	0	45	7.29E+02				2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
1,1-Dichloroethane	UG/KG	0	0%	0	45	5.06E+05		200		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
1,1-Dichloroethene	UG/KG	0	0%	0	45	1.24E+05		400		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
1,2-Dichloroethane	UG/KG	0	0%	0	45	2.78E+02		100		2.6 UJ	3 UJ	2.7 UJ	2.9 UJ		3 UJ	2.7 UJ
1,2-Dichloropropane	UG/KG	0	0%	0	45	3.42E+02				2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Acetone	UG/KG	150	80%	36	45	1.41E+07		200		18	9.2	3.7	7		15 J	10
Benzene	UG/KG	41 [4]	20%	9	45	6.43E+02		60		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Bromodichloromethane	UG/KG	0	0%	0	45	8.24E+02				2.6 U	3 U	2.7 U	2.9 UJ		3 UJ	2.7 U
Bromoform	UG/KG	0	0%	0	45	6.16E+04				2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Carbon disulfide	UG/KG	0	0%	0	45	3.55E+05		2700		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Carbon tetrachloride	UG/KG	0	0%	0	45	2.51E+02		600		2.6 UJ	3 UJ	2.7 UJ	2.9 UJ		3 UJ	2.7 UJ
Chlorobenzene	UG/KG	0	0%	0	45	1.51E+05		1700		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Chlorodibromomethane	UG/KG	0	0%	0	45	1.11E+03				2.6 U	3 U	2.7 UJ	2.9 UJ		3 UJ	2.7 U
Chloroethane	UG/KG	0	0%	0	45	3.03E+03		1900		2.6 UJ	3 UJ	2.7 UJ	2.9 UJ		3 UJ	2.7 U
Chloroform	UG/KG	0	0%	0	45	2.21E+02		300		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	45	4.29E+04				2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	45					2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Ethyl benzene	UG/KG	7.8	13%	6	45	3.95E+05		5500		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Meta/Para Xylene	UG/KG	6.3 [4]	13%	6	45					2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Methyl bromide	UG/KG	0	0%	0	45	3.90E+03				2.6 UJ	3 UJ	2.7 UJ	2.9 UJ		3 UJ	2.7 UJ
Methyl butyl ketone	UG/KG	0	0%	0	45					2.6 UJ	3 UJ	2.7 UJ	2.9 UJ		3 UJ	2.7 UJ
Methyl chloride	UG/KG	0	0%	0	45	4.69E+04				2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Methyl ethyl ketone	UG/KG	78	24%	11	45	2.23E+07		300		2.6 U	3.6	2.7 U	2.9 U		3 UJ	2.7 U
Methyl isobutyl ketone	UG/KG	0	0%	0	45	5.28E+06		1000		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Methylene chloride	UG/KG	2.8	20%	9	45	9.11E+03		100		2.8	2.2 J	2.7 U	2.9 U		3 UJ	2.7 U
Ortho Xylene	UG/KG	3.6 [4]	13%	6	45					2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Styrene	UG/KG	0	0%	0	45	1.70E+06				2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Tetrachloroethene	UG/KG	0	0%	0	45	4.84E+02		1400		2.6 UJ	3 UJ	2.7 U	2.9 U		3 UJ	2.7 U
Toluene	UG/KG	31 [4]	18%	8	45	5.20E+05		1500		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	45	6.95E+04		300		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	45					2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Trichloroethene	UG/KG	0	0%	0	45	5.30E+01		700		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Vinyl chloride	UG/KG	0	0%	0	45	7.91E+01		200		2.6 U	3 U	2.7 U	2.9 U		3 UJ	2.7 U
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	51	6.22E+04		3400		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	51	6.00E+05		7900		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	51	5.31E+05		1600		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	51	3.45E+03		8500		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+06		100		890 U	950 U	900 U	920 U	18000 UJ	4600 U	4400 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+03				360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
2,4-Dichlorophenol	UG/KG	0	0%	0	51	1.83E+05		400		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
2,4-Dimethylphenol	UG/KG	0	0%	0	51	1.22E+06				360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
2,4-Dinitrophenol	UG/KG	0	0%	0	51	1.22E+05		200		890 UJ	950 UJ	900 U	920 U	18000 UJ	4600 U	4400 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-16	SS121I-17	SS121I-18	SS121I-19	SS121I-2	SS121I-20	SS121I-21
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1012	121I-1013	121I-1014	121I-1015	EB150	121I-1016	121I-1017
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/23/2002	10/22/2002	10/22/2002	3/10/1998	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	EBS	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses** [1]	**Region IX PRG Criteria Value** [2]	**Exceedances**	**NYSDEC Criteria Value** [3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dinitrotoluene	UG/KG	0	0%	0	51	1.22E+05				360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	51	6.11E+04		1000		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
2-Chloronaphthalene	UG/KG	0	0%	0	51	4.94E+06				360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
2-Chlorophenol	UG/KG	0	0%	0	51	6.34E+04		800		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
2-Methylnaphthalene	UG/KG	260	10%	5	51			36400		360 U	380 U	360 U	370 U	7400 UJ	260 J	1800 U
2-Methylphenol	UG/KG	0	0%	0	51	3.06E+06		100		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
2-Nitroaniline	UG/KG	0	0%	0	51	1.83E+05		430		890 UJ	950 UJ	900 U	920 UJ	18000 UJ	4600 U	4400 U
2-Nitrophenol	UG/KG	0	0%	0	51			330		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
3 or 4-Methylphenol	UG/KG	0	0%	0	45					360 U	380 U	360 U	370 U		1800 U	1800 U
3,3'-Dichlorobenzidine	UG/KG	315 [4]	2%	1	47	1.08E+03				360 U	380 U	360 UJ	370 UJ	7400 U	1800 UJ	8800 U
3-Nitroaniline	UG/KG	0	0%	0	51	1.83E+04		500		890 UJ	950 UJ	900 U	920 U	18000 UJ	4600 U	4400 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	50	6.11E+03				890 UJ	950 UJ	900 U	920 U	18000 UJ	4600 U	4400 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	50					360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	51			240		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
4-Chloroaniline	UG/KG	0	0%	0	51	2.44E+05		220		360 U	380 U	360 UJ	370 U	7400 UJ	1800 UJ	1800 UJ
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	51					360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
4-Methylphenol	UG/KG	0	0%	0	6	3.06E+05		900						7400 UJ		
4-Nitroaniline	UG/KG	0	0%	0	51	2.32E+04				890 UJ	950 UJ	900 U	920 U	18000 U	4600 U	4400 U
4-Nitrophenol	UG/KG	0	0%	0	51			100		890 U	950 U	900 U	920 U	18000 UJ	4600 U	4400 U
Acenaphthene	UG/KG	6100	51%	26	51	3.68E+06		50000		360 U	380 U	54 J	90 J	1900 J	6100	1400 J
Acenaphthylene	UG/KG	560	12%	6	51			41000		360 U	380 U	360 U	370 U	7400 U	1800 U	560 J
Anthracene	UG/KG	12000	58%	29	50	2.19E+07		50000		360 U	380 U	94 J	150 J	2600 J	12000	2200
Benzo(a)anthracene	UG/KG	28000	90%	46	51	6.21E+02	18	224	28	58 J	110 J	470 J	600 J	13000 J	28000 J	6100 J
Benzo(a)pyrene	UG/KG	23000	88%	45	51	6.21E+01	44	61	44	74 J	120 J	610 J	620 J	13000 J	23000	5800 J
Benzo(b)fluoranthene	UG/KG	29000	94%	48	51	6.21E+02	21	1100	14	74 J	110 J	580 J	660 J	12000 J	29000	5700 J
Benzo(ghi)perylene	UG/KG	29000	82%	42	51			50000		360 UJ	56 J	300 J	490 J	8100 J	29000 J	5000 J
Benzo(k)fluoranthene	UG/KG	23000	74%	37	50	6.21E+03	4	1100	14	360 U	140 J	760 J	540 J	15000 J	21000 J	7100 J
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	51					360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	51	2.18E+02				360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	51	2.88E+03				360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Bis(2-Ethylhexyl)phthalate	UG/KG	1600	33%	17	51	3.47E+04		50000		360 UJ	380 UJ	360 UJ	370 UJ	7400 UJ	1800 UJ	8800 U
Butylbenzylphthalate	UG/KG	420 [4]	6%	3	48	1.22E+07		50000		360 UJ	380 UJ	360 UJ	370 UJ	7400 UJ	1800 UJ	8800 U
Carbazole	UG/KG	6800	57%	29	51	2.43E+04				360 UJ	380 UJ	120 J	140 J	3100 J	6800	1900
Chrysene	UG/KG	32000	86%	44	51	6.21E+04		400	25	83 J	120 J	740 J	740 J	16000 J	32000 J	8500 J
Di-n-butylphthalate	UG/KG	45	2%	1	50	6.11E+06		8100		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Di-n-octylphthalate	UG/KG	420 [4]	2%	1	47	2.44E+06		50000		360 U	380 U	360 UJ	370 UJ	7400 UJ	1800 UJ	8800 U
Dibenz(a,h)anthracene	UG/KG	5000	34%	15	44	6.21E+01	15	14	15	360 U	380 U	360 R	370 UJ	4600 J	2200 J	710 J
Dibenzofuran	UG/KG	2000	27%	14	51	1.45E+05		6200		360 U	380 U	360 U	370 U	440 J	2000	700 J
Diethyl phthalate	UG/KG	640 [4]	2%	1	51	4.89E+07		7100		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Dimethylphthalate	UG/KG	0	0%	0	51	1.00E+08		2000		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Fluoranthene	UG/KG	62000	94%	48	51	2.29E+06		50000	1	170 J	240 J	1100	1400	35000 J	62000	13000
Fluorene	UG/KG	4200	43%	22	51	2.75E+06		50000		360 U	380 U	360 U	55 J	1100 J	4200	1000 J
Hexachlorobenzene	UG/KG	0	0%	0	50	3.04E+02		410		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Hexachlorobutadiene	UG/KG	0	0%	0	51	6.24E+03				360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	51	3.65E+05				360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Hexachloroethane	UG/KG	0	0%	0	51	3.47E+04				360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-16	SS121I-17	SS121I-18	SS121I-19	SS121I-2	SS121I-20	SS121I-21
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1012	121I-1013	121I-1014	121I-1015	EB150	121I-1016	121I-1017
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/23/2002	10/22/2002	10/22/2002	3/10/1998	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	EBS	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Indeno(1,2,3-cd)pyrene	UG/KG	12000	71%	35	49	6.21E+02	13	3200	3	360 UJ	61 J	170 J	390 J	8000 J	8100 J	2300 J
Isophorone	UG/KG	315 [4]	2%	1	51	5.12E+05		4400		360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
N-Nitrosodiphenylamine	UG/KG	0	0%	0	50	9.93E+04				360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	51	6.95E+01				360 UJ	380 UJ	360 UJ	370 UJ	7400 UJ	1800 UJ	1800 UJ
Naphthalene	UG/KG	630	14%	7	51	5.59E+04		13000		360 U	380 U	360 U	370 U	7400 UJ	480 J	630 J
Nitrobenzene	UG/KG	315 [4]	2%	1	51	1.96E+04		200	1	360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Pentachlorophenol	UG/KG	0	0%	0	50	2.98E+03		1000		890 U	950 U	900 U	920 U	18000 UJ	4600 U	4400 U
Phenanthrene	UG/KG	52000	94%	48	51			50000	1	140 J	170 J	650	900	15000 J	52000	14000
Phenol	UG/KG	315 [4]	2%	1	51	1.83E+07		30	1	360 U	380 U	360 U	370 U	7400 UJ	1800 U	1800 U
Pyrene	UG/KG	64000	94%	48	51	2.32E+06		50000	1	140 J	250 J	1600	2000 J	23000	44000 J	13000
Pesticides/PCBs																
4,4'-DDD	UG/KG	0	0%	0	45	2.44E+03		2900		1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ		1.9 UJ	1.8 UJ
4,4'-DDE	UG/KG	34	11%	5	45	1.72E+03		2100		1.8 U	1.9 U	1.9 U	1.9 U		1.9 U	26 J
4,4'-DDT	UG/KG	39	5%	2	44	1.72E+03		2100		1.8 UJ	1.9 UJ	1.9 U	1.9 U		1.9 UJ	39 J
Aldrin	UG/KG	12	9%	4	45	2.86E+01		41		1.8 U	1.9 U	1.9 UJ	1.9 UJ		12	1.8 U
Alpha-BHC	UG/KG	0	0%	0	45	9.02E+01		110		1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ		1.9 UJ	1.8 UJ
Alpha-Chlordane	UG/KG	0	0%	0	41					1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ		1.9 UJ	1.8 UJ
Beta-BHC	UG/KG	0	0%	0	45	3.16E+02		200		1.8 U	1.9 U	1.9 U	1.9 U		1.9 U	1.8 U
Chlordane	UG/KG	0	0%	0	45					18 U	19 U	19 U	19 U		19 U	18 U
Delta-BHC	UG/KG	0	0%	0	45			300		1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ		1.9 UJ	1.8 UJ
Dieldrin	UG/KG	34	4%	2	45	3.04E+01	1	44		1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ		1.9 UJ	34 J
Endosulfan I	UG/KG	95	59%	24	41			900		1.8 U	1.9 U	18	13		95 J	20 J
Endosulfan II	UG/KG	0	0%	0	45			900		1.8 U	1.9 U	1.9 U	1.9 U		1.9 U	1.8 U
Endosulfan sulfate	UG/KG	0	0%	0	45			1000		1.8 U	1.9 U	1.9 U	1.9 U		1.9 U	1.8 U
Endrin	UG/KG	30	4%	2	45	1.83E+04		100		1.8 U	1.9 U	1.9 U	1.9 U		1.9 UJ	30 J
Endrin aldehyde	UG/KG	0	0%	0	45					1.8 U	1.9 U	1.9 U	1.9 U		1.9 U	1.8 U
Endrin ketone	UG/KG	0	0%	0	45					1.8 U	1.9 U	1.9 U	1.9 U		1.9 U	1.8 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	45	4.37E+02		60		1.8 U	1.9 U	1.9 UJ	1.9 UJ		1.9 UJ	1.8 UJ
Gamma-Chlordane	UG/KG	0	0%	0	45			540		1.8 U	1.9 U	1.9 U	1.9 U		1.9 U	1.8 U
Heptachlor	UG/KG	0	0%	0	45	1.08E+02		100		1.8 U	1.9 U	1.9 U	1.9 U		1.9 U	1.8 U
Heptachlor epoxide	UG/KG	55	21%	8	39	5.34E+01	1	20	3	1.8 U	1.9 U	13	6.5		1.9 U	55 J
Methoxychlor	UG/KG	0	0%	0	45	3.06E+05				1.8 UJ	1.9 UJ	1.9 U	1.9 U		1.9 U	1.8 U
Toxaphene	UG/KG	0	0%	0	45	4.42E+02				18 U	19 U	19 U	19 U		19 U	18 U
Aroclor-1016	UG/KG	0	0%	0	45	3.93E+03				18 UJ	19 UJ	18 U	19 U		19 U	18 UJ
Aroclor-1221	UG/KG	0	0%	0	45					18 UJ	19 UJ	18 U	19 U		19 U	18 U
Aroclor-1232	UG/KG	0	0%	0	45					18 UJ	19 UJ	18 U	19 U		19 U	18 UJ
Aroclor-1242	UG/KG	0	0%	0	45					18 UJ	19 UJ	18 U	19 U		19 U	18 UJ
Aroclor-1248	UG/KG	0	0%	0	45					18 UJ	19 UJ	18 U	19 U		19 U	18 U
Aroclor-1254	UG/KG	67	4%	2	45	2.22E+02		10000		18 UJ	19 UJ	18 UJ	19 UJ		19 UJ	18 U
Aroclor-1260	UG/KG	46	7%	3	45			10000		18 UJ	19 UJ	18 UJ	19 UJ		19 UJ	18 U
Metals and Cyanide																
Aluminum	MG/KG	13200	100%	45	45	7.61E+04		19300		10900	10300	5810	7410		7590	2870
Antimony	MG/KG	7.5	31%	14	45	3.13E+01		5.9	1	0.96 U	1 U	6.5 U	6.7 U		6.6 U	0.99
Arsenic	MG/KG	104	100%	34	34	3.90E-01	34	8.2	8	6 R	10.4 R	4.5	5.9		8.9	7.3
Barium	MG/KG	207	100%	45	45	5.37E+03		300		61.8 J	75 J	74.4	92		111	168
Beryllium	MG/KG	0.68	98%	44	45	1.54E+02		1.1		0.55	0.54	0.35	0.46 J		0.56	0.28 J

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-16	SS121I-17	SS121I-18	SS121I-19	SS121I-2	SS121I-20	SS121I-21
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1012	121I-1013	121I-1014	121I-1015	EB150	121I-1016	121I-1017
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/23/2002	10/22/2002	10/22/2002	3/10/1998	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	EBS	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Cadmium	MG/KG	6.6	31%	14	45	3.70E+01		2.3	3	0.13 U	0.14 U	0.54 U	0.56 U		0.55 U	1.4
Calcium	MG/KG	298000	100%	45	45			121000	18	5370 J	15800 J	143000	132000		67500	202000
Chromium	MG/KG	439[4]	100%	45	45			29.6	6	19.6	17.9	10.7	11.9		16.4	12.4
Cobalt	MG/KG	206[4]	100%	45	45	9.03E+02		30	4	11.2 J	14.1 J	6.1	9.9		12.3	8
Copper	MG/KG	209[4]	100%	40	40	3.13E+03		33	10	17.6	32.2	12.8 J	14.3 J		44.1 J	29.6 J
Cyanide, Amenable	MG/KG	0	0%	0	45					0.54 U	0.58 U	0.55 UJ	0.56 UJ		0.56 UJ	0.54 UJ
Cyanide, Total	MG/KG	2.00[4]	7%	3	45					0.543 U	0.578 U	1.1 J	0.565 UJ		0.558 UJ	0.536 UJ
Iron	MG/KG	58400[4]	100%	45	45	2.35E+04	12	36500	2	24400	23900	14000	16900		19400	14100
Lead	MG/KG	122	100%	45	45	4.00E+02		24.8	22	8.6 J	15.3 J	21.5	14.8		48.8	90.9
Magnesium	MG/KG	22300	100%	45	45			21500	1	4630 J	6270 J	7180	5810		6470	10900
Manganese	MG/KG	310500[4]	100%	45	45	1.76E+03	11	1060	15	442	6560	648	854		779	909
Mercury	MG/KG	0.18	98%	44	45	2.35E+01		0.1	1	0.03	0.04	0.02	0.03		0.03	0.04
Nickel	MG/KG	342[4]	100%	45	45	1.56E+03		49	7	29.9 J	31.8 J	16.4	21		30.7	17.1
Potassium	MG/KG	1450	100%	45	45			2380		807	965	882	960		830	767
Selenium	MG/KG	146[4]	47%	21	45	3.91E+02		2	5	1.3 J	1.5 J	0.54 U	0.56 U		0.7	0.48 J
Silver	MG/KG	10.5	18%	6	34	3.91E+02		0.75	4	0.29 R	0.38 R	1.1 U	1.1 U		1.1 U	1.1 U
Sodium	MG/KG	372	82%	37	45			172	24	106 U	122	209	154		161	286
Thallium	MG/KG	163[4]	20%	9	45	5.16E+00	5	0.7	5	0.33 UJ	0.35 UJ	1.1 U	1.1 U		1.1 U	1.1 U
Vanadium	MG/KG	182[4]	100%	45	45	7.82E+01	1	150	1	17.4 J	20.4 J	10.5	13.2		17.1	14.6
Zinc	MG/KG	532	100%	45	45	2.35E+04		110	14	70.8 J	75.4 J	53.5 J	55.1 J		145 J	157 J
Other																
Total Organic Carbon	MG/KG	8900	100%	45	45					6000	8100	3300	5700		6200	3000
Total Petroleum Hydrocarbons	MG/KG	2200	33%	15	45					43 U	46 U	100 J	45 UJ		810 J	850 J

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses ^{1}	Region IX PRG Criteria Value ^{2}	Exceedances	NYSDEC Criteria Value ^{3}	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-22	SS121I-23	SS121I-24	SS121I-25	SS121I-26	SS121I-27	SS121I-28
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1018	121I-1019	121I-1020	121I-1021	121I-1022	121I-1023	121I-1024
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/22/2002	10/22/2002	10/22/2002	10/23/2002	10/23/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Volatile Organic Compounds																
1,1,1-Trichloroethane	UG/KG	0	0%	0	45	1.20E+06		800		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	45	4.08E+02		600		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
1,1,2-Trichloroethane	UG/KG	0	0%	0	45	7.29E+02				2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
1,1-Dichloroethane	UG/KG	0	0%	0	45	5.06E+05		200		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
1,1-Dichloroethene	UG/KG	0	0%	0	45	1.24E+05		400		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
1,2-Dichloroethane	UG/KG	0	0%	0	45	2.78E+02		100		2.7 UJ	2.5 UJ	2.3 UJ	2.6 UJ	2.7 UJ	2.9 UJ	2.7 UJ
1,2-Dichloropropane	UG/KG	0	0%	0	45	3.42E+02				2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Acetone	UG/KG	150	80%	36	45	1.41E+07		200		4.4	3.8 UJ	2.2 J	5.1 J	5.6 J	45 UJ	16 J
Benzene	UG/KG	41 ^{4}	20%	9	45	6.43E+02		60		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	4.6 J	2.7 U
Bromodichloromethane	UG/KG	0	0%	0	45	8.24E+02				2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Bromoform	UG/KG	0	0%	0	45	6.16E+04				2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Carbon disulfide	UG/KG	0	0%	0	45	3.55E+05		2700		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Carbon tetrachloride	UG/KG	0	0%	0	45	2.51E+02		600		2.7 UJ	2.5 UJ	2.3 UJ	2.6 UJ	2.7 UJ	2.9 UJ	2.7 UJ
Chlorobenzene	UG/KG	0	0%	0	45	1.51E+05		1700		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Chlorodibromomethane	UG/KG	0	0%	0	45	1.11E+03				2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Chloroethane	UG/KG	0	0%	0	45	3.03E+03		1900		2.7 UJ	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Chloroform	UG/KG	0	0%	0	45	2.21E+02		300		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	45	4.29E+04				2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	45					2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Ethyl benzene	UG/KG	7.8	13%	6	45	3.95E+05		5500		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Meta/Para Xylene	UG/KG	6.3 ^{4}	13%	6	45					2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Methyl bromide	UG/KG	0	0%	0	45	3.90E+03				2.7 UJ	2.5 UJ	2.3 UJ	2.6 UJ	2.7 UJ	2.9 UJ	2.7 UJ
Methyl butyl ketone	UG/KG	0	0%	0	45					2.7 UJ	2.5 UJ	2.3 UJ	2.6 UJ	2.7 UJ	2.9 UJ	2.7 UJ
Methyl chloride	UG/KG	0	0%	0	45	4.69E+04				2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Methyl ethyl ketone	UG/KG	78	24%	11	45	2.23E+07		300		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	28 J	2.7 U
Methyl isobutyl ketone	UG/KG	0	0%	0	45	5.28E+06		1000		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Methylene chloride	UG/KG	2.8	20%	9	45	9.11E+03		100		2 J	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Ortho Xylene	UG/KG	3.6 ^{4}	13%	6	45					2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Styrene	UG/KG	0	0%	0	45	1.70E+06				2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Tetrachloroethene	UG/KG	0	0%	0	45	4.84E+02		1400		2.7 UJ	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Toluene	UG/KG	31 ^{4}	18%	8	45	5.20E+05		1500		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.8 J	2.7 U
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	45	6.95E+04		300		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	45					2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Trichloroethene	UG/KG	0	0%	0	45	5.30E+01		700		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Vinyl chloride	UG/KG	0	0%	0	45	7.91E+01		200		2.7 U	2.5 UJ	2.3 U	2.6 U	2.7 UJ	2.9 UJ	2.7 U
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	51	6.22E+04		3400		360 U	340 U	350 U	350 U	370 U	390 U	360 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	51	6.00E+05		7900		360 U	340 U	350 U	350 U	370 U	390 U	360 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	51	5.31E+05		1600		360 U	340 U	350 U	350 U	370 U	390 U	360 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	51	3.45E+03		8500		360 U	340 U	350 U	350 U	370 U	390 U	360 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+06		100		910 U	870 U	880 U	890 U	940 U	970 UJ	890 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+03				360 U	340 U	350 U	350 U	370 U	390 UJ	360 U
2,4-Dichlorophenol	UG/KG	0	0%	0	51	1.83E+05		400		360 U	340 U	350 U	350 U	370 U	390 U	360 U
2,4-Dimethylphenol	UG/KG	0	0%	0	51	1.22E+06				360 U	340 U	350 U	350 U	370 U	390 U	360 U
2,4-Dinitrophenol	UG/KG	0	0%	0	51	1.22E+05		200		910 UJ	870 UJ	880 UJ	890 U	940 U	970 UJ	890 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-22	SS121I-23	SS121I-24	SS121I-25	SS121I-26	SS121I-27	SS121I-28
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1018	121I-1019	121I-1020	121I-1021	121I-1022	121I-1023	121I-1024
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/22/2002	10/22/2002	10/22/2002	10/23/2002	10/23/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dinitrotoluene	UG/KG	0	0%	0	51	1.22E+05				360 U	340 U	350 U	350 U	370 U	390 UJ	360 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	51	6.11E+04		1000		360 U	340 U	350 U	350 U	370 U	390 UJ	360 U
2-Chloronaphthalene	UG/KG	0	0%	0	51	4.94E+06				360 U	340 U	350 U	350 U	370 U	390 U	360 U
2-Chlorophenol	UG/KG	0	0%	0	51	6.34E+04		800		360 U	340 U	350 U	350 U	370 U	390 U	360 U
2-Methylnaphthalene	UG/KG	260	10%	5	51			36400		360 U	58 J	350 U	350 U	370 U	390 U	360 U
2-Methylphenol	UG/KG	0	0%	0	51	3.06E+06		100		360 U	340 U	350 U	350 U	370 U	390 U	360 U
2-Nitroaniline	UG/KG	0	0%	0	51	1.83E+05		430		910 UJ	870 UJ	880 UJ	890 U	940 UJ	970 UJ	890 UJ
2-Nitrophenol	UG/KG	0	0%	0	51			330		360 U	340 U	350 U	350 U	370 U	390 U	360 U
3 or 4-Methylphenol	UG/KG	0	0%	0	45					360 U	340 U	350 U	350 U	370 U	390 U	360 U
3,3'-Dichlorobenzidine	UG/KG	315 [4]	2%	1	47	1.08E+03				360 R	340 R	350 UJ	350 UJ	370 UJ	390 UJ	360 R
3-Nitroaniline	UG/KG	0	0%	0	51	1.83E+04		500		910 UJ	870 UJ	880 UJ	890 U	940 U	970 UJ	890 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	50	6.11E+03				910 UJ	870 UJ	880 U	890 UJ	940 U	970 R	890 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	50					360 UJ	340 UJ	350 U	350 UJ	370 U	390 R	360 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	51			240		360 U	340 U	350 U	350 U	370 U	390 U	360 U
4-Chloroaniline	UG/KG	0	0%	0	51	2.44E+05		220		360 U	340 U	350 U	350 UJ	370 U	390 U	360 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	51					360 U	340 U	350 U	350 U	370 U	390 UJ	360 U
4-Methylphenol	UG/KG	0	0%	0	6	3.06E+05		900								
4-Nitroaniline	UG/KG	0	0%	0	51	2.32E+04				910 UJ	870 UJ	880 U	890 U	940 U	970 UJ	890 U
4-Nitrophenol	UG/KG	0	0%	0	51			100		910 U	870 U	880 U	890 U	940 U	970 UJ	890 U
Acenaphthene	UG/KG	6100	51%	26	51	3.68E+06		50000		230 J	1300	84 J	760	66 J	390 UJ	360 U
Acenaphthylene	UG/KG	560	12%	6	51			41000		360 U	340 U	350 U	350 U	370 U	390 UJ	360 U
Anthracene	UG/KG	12000	58%	29	50	2.19E+07		50000		400 J	2100 J	120 J	900 J	110 J	390 R	360 U
Benzo(a)anthracene	UG/KG	28000	90%	46	51	6.21E+02	18	224	28	1300 J	9000 J	910 J	5500	660 J	120 J	56 J
Benzo(a)pyrene	UG/KG	23000	88%	45	51	6.21E+01	44	61	44	1400 J	5600 J	880 J	5500	740 J	240 J	86 J
Benzo(b)fluoranthene	UG/KG	29000	94%	48	51	6.21E+02	21	1100	14	1300 J	6300 J	970 J	7000	820 J	140 J	72 J
Benzo(ghi)perylene	UG/KG	29000	82%	42	51			50000		1500 J	8300 J	900 J	5000	470 J	65 J	70 J
Benzo(k)fluoranthene	UG/KG	23000	74%	37	50	6.21E+03	4	1100	14	1600 J	6100 J	650 J	4500	820 J	260 J	360 R
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	51					360 U	340 U	350 U	350 U	370 U	390 U	360 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	51	2.18E+02				360 U	340 U	350 U	350 U	370 U	390 U	360 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	51	2.88E+03				360 U	340 U	350 U	350 U	370 U	390 U	360 U
Bis(2-Ethylhexyl)phthalate	UG/KG	1600	33%	17	51	3.47E+04		50000		130 UJ	63 J	39 J	350 UJ	74 J	110 J	66 J
Butylbenzylphthalate	UG/KG	420 [4]	6%	3	48	1.22E+07		50000		360 R	340 R	350 UJ	350 UJ	370 UJ	390 UJ	55 J
Carbazole	UG/KG	6800	57%	29	51	2.43E+04				310 J	830 J	89 J	1000	110 J	390 UJ	360 U
Chrysene	UG/KG	32000	86%	44	51	6.21E+04		400	25	1700 J	14000 J	1200 J	6300	1100 J	220 J	100 J
Di-n-butylphthalate	UG/KG	45	2%	1	50	6.11E+06		8100		360 UJ	340 UJ	350 U	350 UJ	370 U	390 R	360 U
Di-n-octylphthalate	UG/KG	420 [4]	2%	1	47	2.44E+06		50000		360 R	340 R	350 UJ	350 UJ	370 UJ	390 UJ	360 R
Dibenz(a,h)anthracene	UG/KG	5000	34%	15	44	6.21E+01	15	14	15	160 J	660 J	72 J	300 J	370 UJ	390 R	360 R
Dibenzofuran	UG/KG	2000	27%	14	51	1.45E+05		6200		92 J	220 J	350 U	120 J	370 U	390 UJ	360 U
Diethyl phthalate	UG/KG	640 [4]	2%	1	51	4.89E+07		7100		360 U	340 U	350 U	350 U	370 U	390 UJ	360 U
Dimethylphthalate	UG/KG	0	0%	0	51	1.00E+08		2000		360 U	340 U	350 U	350 U	370 U	390 UJ	360 U
Fluoranthene	UG/KG	62000	94%	48	51	2.29E+06		50000	1	2600 J	27000 J	1500	11000	1500	130 J	86 J
Fluorene	UG/KG	4200	43%	22	51	2.75E+06		50000		160 J	520	350 U	310 J	370 U	390 UJ	360 U
Hexachlorobenzene	UG/KG	0	0%	0	50	3.04E+02		410		360 UJ	340 UJ	350 U	350 UJ	370 U	390 R	360 U
Hexachlorobutadiene	UG/KG	0	0%	0	51	6.24E+03				360 U	340 U	350 U	350 U	370 U	390 U	360 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	51	3.65E+05				360 U	340 U	350 U	350 U	370 U	390 UJ	360 U
Hexachloroethane	UG/KG	0	0%	0	51	3.47E+04				360 U	340 U	350 U	350 U	370 U	390 U	360 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-22	SS121I-23	SS121I-24	SS121I-25	SS121I-26	SS121I-27	SS121I-28
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1018	121I-1019	121I-1020	121I-1021	121I-1022	121I-1023	121I-1024
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/22/2002	10/22/2002	10/22/2002	10/23/2002	10/23/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Indeno(1,2,3-cd)pyrene	UG/KG	12000	71%	35	49	6.21E+02	13	3200	3	520 J	2200 J	890 J	1400 J	470 J	390 UJ	360 R
Isophorone	UG/KG	315[4]	2%	1	51	5.12E+05		4400		360 U	340 U	350 U	350 U	370 U	390 U	360 U
N-Nitrosodiphenylamine	UG/KG	0	0%	0	50	9.93E+04				360 UJ	340 UJ	350 U	350 UJ	370 U	390 R	360 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	51	6.95E+01				360 UJ	340 UJ	350 UJ	350 UJ	370 UJ	390 UJ	360 UJ
Naphthalene	UG/KG	630	14%	7	51	5.59E+04		13000		67 J	120 J	350 U	350 U	370 U	390 U	360 U
Nitrobenzene	UG/KG	315[4]	2%	1	51	1.96E+04		200	1	360 U	340 U	350 U	350 U	370 U	390 U	360 UJ
Pentachlorophenol	UG/KG	0	0%	0	50	2.98E+03		1000		910 UJ	870 UJ	880 U	890 UJ	940 U	970 R	890 U
Phenanthrene	UG/KG	52000	94%	48	51			50000	1	2400 J	12000 J	520	5200	640	150 J	74 J
Phenol	UG/KG	315[4]	2%	1	51	1.83E+07		30	1	360 U	340 U	350 U	350 U	370 U	390 U	360 U
Pyrene	UG/KG	64000	94%	48	51	2.32E+06		50000	1	6300 J	64000 J	2500 J	13000	2500 J	500 J	120 J
Pesticides/PCBs																
4,4'-DDD	UG/KG	0	0%	0	45	2.44E+03		2900		1.9 U	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	2 UJ	1.8 UJ
4,4'-DDE	UG/KG	34	11%	5	45	1.72E+03		2100		11 NJ	34 NJ	1.8 U	1.8 U	24	2 U	1.8 U
4,4'-DDT	UG/KG	39	5%	2	44	1.72E+03		2100		6.3 R	24 NJ	1.8 UJ	1.8 UJ	1.9 UJ	2 UJ	1.8 UJ
Aldrin	UG/KG	12	9%	4	45	2.86E+01		41		4.5 UJ	10 J	1.8 U	12 J	1.9 U	2 U	1.8 U
Alpha-BHC	UG/KG	0	0%	0	45	9.02E+01		110		1.9 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	2 UJ	1.8 UJ
Alpha-Chlordane	UG/KG	0	0%	0	41					1.9 U	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	2 UJ	1.8 UJ
Beta-BHC	UG/KG	0	0%	0	45	3.16E+02		200		1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U	1.8 U
Chlordane	UG/KG	0	0%	0	45					19 U	18 U	18 U	18 U	19 U	20 U	18 U
Delta-BHC	UG/KG	0	0%	0	45			300		1.9 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	2 UJ	1.8 UJ
Dieldrin	UG/KG	34	4%	2	45	3.04E+01	1	44		1.9 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	2 UJ	1.8 UJ
Endosulfan I	UG/KG	95	59%	24	41			900		28	63 J	24	47 J	20	2 U	1.8 U
Endosulfan II	UG/KG	0	0%	0	45			900		1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U	1.8 U
Endosulfan sulfate	UG/KG	0	0%	0	45			1000		1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U	1.8 U
Endrin	UG/KG	30	4%	2	45	1.83E+04		100		1.9 U	1.8 U	1.8 UJ	6.5 J	1.9 U	2 U	1.8 UJ
Endrin aldehyde	UG/KG	0	0%	0	45					1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U	1.8 U
Endrin ketone	UG/KG	0	0%	0	45					1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U	1.8 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	45	4.37E+02		60		1.9 U	1.8 U	1.8 UJ	1.8 UJ	1.9 U	2 U	1.8 UJ
Gamma-Chlordane	UG/KG	0	0%	0	45			540		1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U	1.8 U
Heptachlor	UG/KG	0	0%	0	45	1.08E+02		100		1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U	1.8 U
Heptachlor epoxide	UG/KG	55	21%	8	39	5.34E+01	1	20	3	21	1.8 U	1.8 U	1.8 U	11 R	2 U	1.8 U
Methoxychlor	UG/KG	0	0%	0	45	3.06E+05				1.9 UJ	1.8 UJ	1.8 U	1.8 U	1.9 UJ	2 UJ	1.8 U
Toxaphene	UG/KG	0	0%	0	45	4.42E+02				19 U	18 U	18 U	18 U	19 U	20 U	18 U
Aroclor-1016	UG/KG	0	0%	0	45	3.93E+03				19 UJ	18 UJ	18 UJ	18 UJ	19 UJ	20 UJ	18 UJ
Aroclor-1221	UG/KG	0	0%	0	45					19 UJ	18 UJ	18 U	18 U	19 UJ	20 UJ	18 U
Aroclor-1232	UG/KG	0	0%	0	45					19 UJ	18 UJ	18 UJ	18 UJ	19 UJ	20 UJ	18 UJ
Aroclor-1242	UG/KG	0	0%	0	45					19 UJ	18 UJ	18 UJ	18 UJ	19 UJ	20 UJ	18 UJ
Aroclor-1248	UG/KG	0	0%	0	45					19 UJ	18 UJ	18 U	18 U	19 UJ	20 UJ	18 U
Aroclor-1254	UG/KG	67	4%	2	45	2.22E+02		10000		30 J	18 UJ	18 U	18 U	19 UJ	20 UJ	18 U
Aroclor-1260	UG/KG	46	7%	3	45			10000		19 UJ	18 UJ	18 U	18 U	19 UJ	20 UJ	18 U
Metals and Cyanide																
Aluminum	MG/KG	13200	100%	45	45	7.61E+04		19300		4430	1530	1510	1560	1950	4110	2310
Antimony	MG/KG	7.5	31%	14	45	3.13E+01		5.9	1	0.98 U	1.7	1.3	6.3 U	1 U	1.1 U	7.5
Arsenic	MG/KG	104	100%	34	34	3.90E-01	34	8.2	8	7.7 R	4.4 R	5.7	3.5	5.8 R	9.1 R	3.9
Barium	MG/KG	207	100%	45	45	5.37E+03		300		71 J	73.5 J	88.7	74.8	207	97.4 J	112
Beryllium	MG/KG	0.68	98%	44	45	1.54E+02		1.1		0.32	0.2	0.19 J	0.16	0.25	0.32	0.19 J

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-22	SS121I-23	SS121I-24	SS121I-25	SS121I-26	SS121I-27	SS121I-28
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1018	121I-1019	121I-1020	121I-1021	121I-1022	121I-1023	121I-1024
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/22/2002	10/22/2002	10/22/2002	10/23/2002	10/23/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Cadmium	MG/KG	6.6	31%	14	45	3.70E+01		2.3	3	0.27	0.33	0.19 J	0.52 U	0.13 U	0.14 U	3.4
Calcium	MG/KG	298000	100%	45	45			121000	18	177000 J	269000 J	225000	232000	298000 J	180000 J	230000
Chromium	MG/KG	439[4]	100%	45	45			29.6	6	10.7	6.1	4.1	3.9	4.6	10.7	10.3
Cobalt	MG/KG	206[4]	100%	45	45	9.03E+02		30	4	7.3	4.6	6.3	5	5.3	10.8 J	5.5
Copper	MG/KG	209[4]	100%	40	40	3.13E+03		33	10	31.9	13	15 J	10.4 J	14.9	17.9	19.1 J
Cyanide, Amenable	MG/KG	0	0%	0	45					0.56 U	0.53 U	0.53 UJ	0.54 UJ	0.57 U	0.59 U	0.55 UJ
Cyanide, Total	MG/KG	2.00[4]	7%	3	45					0.557 U	0.526 U	0.534 UJ	0.538 UJ	0.569 U	0.588 U	0.546 UJ
Iron	MG/KG	58400[4]	100%	45	45	2.35E+04	12	36500	2	11800	6130	6100	5720	8350	15400	8250
Lead	MG/KG	122	100%	45	45	4.00E+02		24.8	22	34 J	31 J	19.1	122	16.3 J	11.1 J	32.8
Magnesium	MG/KG	22300	100%	45	45			21500	1	12500 J	12600 J	15100	16800	5470 J	22300 J	12900
Manganese	MG/KG	310500[4]	100%	45	45	1.76E+03	11	1060	15	557	594	406	593	1230	9720	699
Mercury	MG/KG	0.18	98%	44	45	2.35E+01		0.1	1	0.01	0.02	0.02	0.02	0.01	0.04	0.02
Nickel	MG/KG	342[4]	100%	45	45	1.56E+03		49	7	19 J	11.9 J	17.2	11.1	12.8 J	25.5 J	14.3
Potassium	MG/KG	1450	100%	45	45			2380		941	871	1100	846	747	903	861
Selenium	MG/KG	146[4]	47%	21	45	3.91E+02		2	5	0.66 J	0.43 UJ	0.53 U	0.52 U	0.47 UJ	0.86 J	0.54 U
Silver	MG/KG	10.5	18%	6	34	3.91E+02		0.75	4	0.29 R	0.28 R	1.1 U	1 U	0.3 R	0.6 R	1.1 U
Sodium	MG/KG	372	82%	37	45			172	24	302	324	256	232	365	240	284
Thallium	MG/KG	163[4]	20%	9	45	5.16E+00	5	0.7	5	0.34 UJ	0.32 UJ	1.1 U	1 U	0.35 UJ	0.36 UJ	1.1 U
Vanadium	MG/KG	182[4]	100%	45	45	7.82E+01	1	150	1	11.1 J	5.9	7.2	6.3	9.1	29 J	6.7
Zinc	MG/KG	532	100%	45	45	2.35E+04		110	14	71.3 J	80.5 J	44.9 J	47.2 J	49.9 J	116	162 J
Other																
Total Organic Carbon	MG/KG	8900	100%	45	45					3600	5000	3900	3500	5600	4600	6900
Total Petroleum Hydrocarbons	MG/KG	2200	33%	15	45					370	470	43 UJ	43 UJ	46 U	2200	44 UJ

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	NYSDEC Criteria Value [3]	Exceedances							
Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-29	SS121I-29	SS121I-3	SS121I-30	SS121I-31	SS121I-32	SS121I-33
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1025	121I-1030	EB149	121I-1026	121I-1027	121I-1028	121I-1029
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/23/2002	3/10/1998	10/22/2002	10/22/2002	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	EBS	PID-RI	PID-RI	PID-RI	PID-RI
										Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds																
1,1,1-Trichloroethane	UG/KG	0	0%	0	45	1.20E+06		800		3.1 U	3.6 UJ		2.8 U	3.4 UJ	2.7 U	2.7 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	45	4.08E+02		600		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	45	7.29E+02				3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	45	5.06E+05		200		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	45	1.24E+05		400		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	45	2.78E+02		100		3.1 UJ	3.6 UJ		2.8 UJ	3.4 UJ	2.7 UJ	2.7 UJ
1,2-Dichloropropane	UG/KG	0	0%	0	45	3.42E+02				3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Acetone	UG/KG	150	80%	36	45	1.41E+07		200		3.1 U	3.6 UJ		9.8	11	5.1	7.6 J
Benzene	UG/KG	41 [4]	20%	9	45	6.43E+02		60		24	57 J		2.8 U	3.4 U	2.7 U	2.7 UJ
Bromodichloromethane	UG/KG	0	0%	0	45	8.24E+02				3.1 U	3.6 UJ		2.8 U	3.4 UJ	2.7 U	2.7 UJ
Bromoform	UG/KG	0	0%	0	45	6.16E+04				3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Carbon disulfide	UG/KG	0	0%	0	45	3.55E+05		2700		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Carbon tetrachloride	UG/KG	0	0%	0	45	2.51E+02		600		3.1 UJ	3.6 UJ		2.8 UJ	3.4 UJ	2.7 UJ	2.7 UJ
Chlorobenzene	UG/KG	0	0%	0	45	1.51E+05		1700		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Chlorodibromomethane	UG/KG	0	0%	0	45	1.11E+03				3.1 U	3.6 UJ		2.8 U	3.4 UJ	2.7 U	2.7 UJ
Chloroethane	UG/KG	0	0%	0	45	3.03E+03		1900		3.1 UJ	3.6 UJ		2.8 U	3.4 UJ	2.7 U	2.7 UJ
Chloroform	UG/KG	0	0%	0	45	2.21E+02		300		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	45	4.29E+04				3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	45					3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Ethyl benzene	UG/KG	7.8	13%	6	45	3.95E+05		5500		4.4	9.5 J		2.8 U	3.4 U	2.7 U	2.7 UJ
Meta/Para Xylene	UG/KG	6.3 [4]	13%	6	45					3.9	8.7 J		2.8 U	3.4 U	2.7 U	2.7 UJ
Methyl bromide	UG/KG	0	0%	0	45	3.90E+03				3.1 UJ	3.6 UJ		2.8 UJ	3.4 UJ	2.7 UJ	2.7 UJ
Methyl butyl ketone	UG/KG	0	0%	0	45					3.1 UJ	3.6 UJ		2.8 UJ	3.4 UJ	2.7 UJ	2.7 UJ
Methyl chloride	UG/KG	0	0%	0	45	4.69E+04				3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Methyl ethyl ketone	UG/KG	78	24%	11	45	2.23E+07		300		3.1 U	67 J		2.8 U	3.4 U	2.7 U	2.7 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	45	5.28E+06		1000		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Methylene chloride	UG/KG	2.8	20%	9	45	9.11E+03		100		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Ortho Xylene	UG/KG	3.6 [4]	13%	6	45					2.1 J	5.1 J		2.8 U	3.4 U	2.7 U	2.7 UJ
Styrene	UG/KG	0	0%	0	45	1.70E+06				3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Tetrachloroethene	UG/KG	0	0%	0	45	4.84E+02		1400		3.1 UJ	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Toluene	UG/KG	31 [4]	18%	8	45	5.20E+05		1500		18	43 J		2.8 U	3.4 U	2.7 U	2.7 UJ
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	45	6.95E+04		300		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	45					3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Trichloroethene	UG/KG	0	0%	0	45	5.30E+01		700		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Vinyl chloride	UG/KG	0	0%	0	45	7.91E+01		200		3.1 U	3.6 UJ		2.8 U	3.4 U	2.7 U	2.7 UJ
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	51	6.22E+04		3400		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	51	6.00E+05		7900		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	51	5.31E+05		1600		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	51	3.45E+03		8500		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+06		100		5200 U	5700 U	1900 U	920 U	890 U	940 U	900 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+03				2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
2,4-Dichlorophenol	UG/KG	0	0%	0	51	1.83E+05		400		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
2,4-Dimethylphenol	UG/KG	0	0%	0	51	1.22E+06				2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
2,4-Dinitrophenol	UG/KG	0	0%	0	51	1.22E+05		200		5200 R	5700 UJ	1900 U	920 UJ	890 U	940 U	900 UJ

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	NYSDEC Criteria Value [3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-29	SS121I-29	SS121I-3	SS121I-30	SS121I-31	SS121I-32	SS121I-33
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1025	121I-1030	EB149	121I-1026	121I-1027	121I-1028	121I-1029
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/23/2002	3/10/1998	10/22/2002	10/22/2002	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	EBS	PID-RI	PID-RI	PID-RI	PID-RI
2,4-Dinitrotoluene	UG/KG	0	0%	0	51	1.22E+05				2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	51	6.11E+04		1000		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
2-Chloronaphthalene	UG/KG	0	0%	0	51	4.94E+06				2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
2-Chlorophenol	UG/KG	0	0%	0	51	6.34E+04		800		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
2-Methylnaphthalene	UG/KG	260	10%	5	51			36400		2100 U	2300 U	54 J	370 U	360 U	380 U	360 U
2-Methylphenol	UG/KG	0	0%	0	51	3.06E+06		100		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
2-Nitroaniline	UG/KG	0	0%	0	51	1.83E+05		430		5200 UJ	5700 UJ	1900 U	920 U	890 U	940 U	900 UJ
2-Nitrophenol	UG/KG	0	0%	0	51			330		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
3 or 4-Methylphenol	UG/KG	0	0%	0	45					2100 U	2300 U		370 U	360 U	380 U	360 U
3,3'-Dichlorobenzidine	UG/KG	315 [4]	2%	1	47	1.08E+03				2100 UJ	2300 R	770 U	370 UJ	360 UJ	380 UJ	360 UJ
3-Nitroaniline	UG/KG	0	0%	0	51	1.83E+04		500		5200 U	5700 UJ	1900 U	920 U	890 U	940 U	900 UJ
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	50	6.11E+03				5200 R	5700 UJ	1900 U	920 UJ	890 U	940 U	900 UJ
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	50					2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	51			240		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
4-Chloroaniline	UG/KG	0	0%	0	51	2.44E+05		220		2100 U	2300 U	770 U	370 UJ	360 UJ	380 UJ	360 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	51					2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
4-Methylphenol	UG/KG	0	0%	0	6	3.06E+05		900				770 U				
4-Nitroaniline	UG/KG	0	0%	0	51	2.32E+04				5200 U	5700 UJ	1900 U	920 U	890 U	940 U	900 UJ
4-Nitrophenol	UG/KG	0	0%	0	51			100		5200 U	5700 U	1900 U	920 U	890 U	940 U	900 U
Acenaphthene	UG/KG	6100	51%	26	51	3.68E+06		50000		2100 U	2300 U	140 J	370 U	360 U	380 U	360 U
Acenaphthylene	UG/KG	560	12%	6	51			41000		2100 U	2300 U	770 U	370 U	360 U	64 J	360 U
Anthracene	UG/KG	12000	58%	29	50	2.19E+07		50000		330 J	2300 U	220 J	370 U	360 U	69 J	360 U
Benzo(a)anthracene	UG/KG	28000	90%	46	51	6.21E+02	18	224	28	700 J	260 J	1600	370 UJ	43 J	190 J	80 J
Benzo(a)pyrene	UG/KG	23000	88%	45	51	6.21E+01	44	61	44	700 J	2300 R	1800	370 U	61 J	290 J	110 J
Benzo(b)fluoranthene	UG/KG	29000	94%	48	51	6.21E+02	21	1100	14	720 J	2300 R	2100	370 U	67 J	360 J	110 J
Benzo(ghi)perylene	UG/KG	29000	82%	42	51			50000		430 J	2300 R	1600	370 UJ	50 J	320 J	110 J
Benzo(k)fluoranthene	UG/KG	23000	74%	37	50	6.21E+03	4	1100	14	720 J	2300 R	2500	370 U	360 UJ	340 J	95 J
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	51					2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	51	2.18E+02				2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	51	2.88E+03				2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
Bis(2-Ethylhexyl)phthalate	UG/KG	1600	33%	17	51	3.47E+04		50000		2100 U	260 J	230 J	370 UJ	1600	380 UJ	360 UJ
Butylbenzylphthalate	UG/KG	420 [4]	6%	3	48	1.22E+07		50000		2100 U	2300 R	770 U	370 UJ	360 UJ	380 UJ	360 UJ
Carbazole	UG/KG	6800	57%	29	51	2.43E+04				340 J	2300 UJ	320 J	370 U	360 U	60 J	360 UJ
Chrysene	UG/KG	32000	86%	44	51	6.21E+04		400	25	790 J	2300 R	2000	370 UJ	68 J	350 J	130 J
Di-n-butylphthalate	UG/KG	45	2%	1	50	6.11E+06		8100		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
Di-n-octylphthalate	UG/KG	420 [4]	2%	1	47	2.44E+06		50000		2100 U	2300 R	770 U	370 UJ	360 UJ	380 UJ	360 UJ
Dibenz(a,h)anthracene	UG/KG	5000	34%	15	44	6.21E+01	15	14	15	2100 UJ	2300 R	720 J	370 U	360 UJ	380 UJ	360 UJ
Dibenzofuran	UG/KG	2000	27%	14	51	1.45E+05		6200		2100 U	2300 U	42 J	370 U	360 U	380 U	360 U
Diethyl phthalate	UG/KG	640 [4]	2%	1	51	4.89E+07		7100		2100 U	230 J	770 U	370 U	360 U	380 U	360 U
Dimethylphthalate	UG/KG	0	0%	0	51	1.00E+08		2000		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
Fluoranthene	UG/KG	62000	94%	48	51	2.29E+06		50000	1	2500	490 J	4000	370 U	80 J	500	120 J
Fluorene	UG/KG	4200	43%	22	51	2.75E+06		50000		2100 U	2300 U	98 J	370 U	360 U	380 U	360 U
Hexachlorobenzene	UG/KG	0	0%	0	50	3.04E+02		410		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
Hexachlorobutadiene	UG/KG	0	0%	0	51	6.24E+03				2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	51	3.65E+05				2100 UJ	2300 U	770 U	370 U	360 U	380 U	360 U
Hexachloroethane	UG/KG	0	0%	0	51	3.47E+04				2100 U	2300 U	770 U	370 U	360 U	380 U	360 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-29	SS121I-29	SS121I-3	SS121I-30	SS121I-31	SS121I-32	SS121I-33
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1025	121I-1030	EB149	121I-1026	121I-1027	121I-1028	121I-1029
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/23/2002	3/10/1998	10/22/2002	10/22/2002	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	EBS	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses**[1]	**Region IX PRG Criteria Value**[2]	**Exceedances**	**NYSDEC Criteria Value**[3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Indeno(1,2,3-cd)pyrene	UG/KG	12000	71%	35	49	6.21E+02	13	3200	3	2100 UJ	2300 R	1600	370 UJ	360 UJ	220 J	76 J
Isophorone	UG/KG	315[4]	2%	1	51	5.12E+05		4400		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
N-Nitrosodiphenylamine	UG/KG	0	0%	0	50	9.93E+04				2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	51	6.95E+01				2100 U	2300 UJ	770 U	370 U	360 UJ	380 UJ	360 UJ
Naphthalene	UG/KG	630	14%	7	51	5.59E+04		13000		2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
Nitrobenzene	UG/KG	315[4]	2%	1	51	1.96E+04		200	1	2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
Pentachlorophenol	UG/KG	0	0%	0	50	2.98E+03		1000		5200 UJ	5700 U	1900 U	920 U	890 U	940 U	900 U
Phenanthrene	UG/KG	52000	94%	48	51			50000	1	2200	530 J	1400	370 U	52 J	290 J	95 J
Phenol	UG/KG	315[4]	2%	1	51	1.83E+07		30	1	2100 U	2300 U	770 U	370 U	360 U	380 U	360 U
Pyrene	UG/KG	64000	94%	48	51	2.32E+06		50000	1	2300	1600 J	3000	370 UJ	110 J	640 J	300 J
Pesticides/PCBs																
4,4'-DDD	UG/KG	0	0%	0	45	2.44E+03		2900		2.2 UJ	2.3 UJ		1.9 UJ	1.8 UJ	2 UJ	1.8 UJ
4,4'-DDE	UG/KG	34	11%	5	45	1.72E+03		2100		2.2 U	2.3 U		1.9 U	1.8 U	2 U	1.8 U
4,4'-DDT	UG/KG	39	5%	2	44	1.72E+03		2100		2.2 UJ	2.3 UJ		1.9 U	1.8 U	2 U	1.8 UJ
Aldrin	UG/KG	12	9%	4	45	2.86E+01		41		2.2 U	2.3 U		1.9 UJ	1.8 UJ	2 UJ	1.8 U
Alpha-BHC	UG/KG	0	0%	0	45	9.02E+01		110		2.2 UJ	2.3 UJ		1.9 UJ	1.8 UJ	2 UJ	1.8 UJ
Alpha-Chlordane	UG/KG	0	0%	0	41					2.2 UJ	2.3 UJ		1.9 UJ	1.8 UJ	2 UJ	1.8 UJ
Beta-BHC	UG/KG	0	0%	0	45	3.16E+02		200		2.2 U	2.3 U		1.9 U	1.8 U	2 U	1.8 U
Chlordane	UG/KG	0	0%	0	45					22 U	23 U		19 U	18 U	20 U	18 U
Delta-BHC	UG/KG	0	0%	0	45			300		2.2 UJ	2.3 UJ		1.9 UJ	1.8 UJ	2 UJ	1.8 UJ
Dieldrin	UG/KG	34	4%	2	45	3.04E+01	1	44		2.2 UJ	2.3 UJ		1.9 UJ	1.8 UJ	2 U	1.8 UJ
Endosulfan I	UG/KG	95	59%	24	41			900		23	2.3 U		1.9 U	1.8 U	15	7.2 J
Endosulfan II	UG/KG	0	0%	0	45			900		2.2 U	2.3 U		1.9 U	1.8 U	2 U	1.8 U
Endosulfan sulfate	UG/KG	0	0%	0	45			1000		2.2 U	2.3 U		1.9 U	1.8 U	2 U	1.8 U
Endrin	UG/KG	30	4%	2	45	1.83E+04		100		2.2 U	2.3 U		1.9 U	1.8 U	2 U	1.8 U
Endrin aldehyde	UG/KG	0	0%	0	45					2.2 U	2.3 U		1.9 U	1.8 U	2 U	1.8 U
Endrin ketone	UG/KG	0	0%	0	45					2.2 U	2.3 U		1.9 U	1.8 U	2 U	1.8 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	45	4.37E+02		60		2.2 U	2.3 U		1.9 UJ	1.8 UJ	2 UJ	1.8 U
Gamma-Chlordane	UG/KG	0	0%	0	45			540		2.2 U	2.3 U		1.9 U	1.8 U	2 U	1.8 U
Heptachlor	UG/KG	0	0%	0	45	1.08E+02		100		2.2 U	2.3 U		1.9 U	1.8 U	2 U	1.8 U
Heptachlor epoxide	UG/KG	55	21%	8	39	5.34E+01	1	20	3	17 R	2.3 U		1.9 U	1.8 U	8	1.8 U
Methoxychlor	UG/KG	0	0%	0	45	3.06E+05				2.2 UJ	2.3 UJ		1.9 U	1.8 U	2 U	1.8 UJ
Toxaphene	UG/KG	0	0%	0	45	4.42E+02				22 U	23 U		19 U	18 U	20 U	18 U
Aroclor-1016	UG/KG	0	0%	0	45	3.93E+03				21 UJ	23 UJ		19 U	18 U	19 U	18 UJ
Aroclor-1221	UG/KG	0	0%	0	45					21 UJ	23 UJ		19 U	18 U	19 U	18 UJ
Aroclor-1232	UG/KG	0	0%	0	45					21 UJ	23 UJ		19 U	18 U	19 U	18 UJ
Aroclor-1242	UG/KG	0	0%	0	45					21 UJ	23 UJ		19 U	18 U	19 U	18 UJ
Aroclor-1248	UG/KG	0	0%	0	45					21 UJ	23 UJ		19 U	18 U	19 U	18 UJ
Aroclor-1254	UG/KG	67	4%	2	45	2.22E+02		10000		21 UJ	23 UJ		19 UJ	18 UJ	19 UJ	18 UJ
Aroclor-1260	UG/KG	46	7%	3	45			10000		21 UJ	23 UJ		19 UJ	18 UJ	19 UJ	18 UJ
Metals and Cyanide																
Aluminum	MG/KG	13200	100%	45	45	7.61E+04		19300		3730	2200		7610	4750	7030	2410
Antimony	MG/KG	7.5	31%	14	45	3.13E+01		5.9	1	1.1 U	1.2 U		6.5 U	4.5	6.7 U	3.2
Arsenic	MG/KG	104	100%	34	34	3.90E-01	34	8.2	8	349 R	239 R		5.1	6.4	5.8	7.5 R
Barium	MG/KG	207	100%	45	45	5.37E+03		300		87.4 J	84.9 J		48.3	38.2	48.9	188
Beryllium	MG/KG	0.68	98%	44	45	1.54E+02		1.1		0.16 U	0.18 U		0.42	0.27	0.43	0.22

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-29	SS121I-29	SS121I-3	SS121I-30	SS121I-31	SS121I-32	SS121I-33
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1025	121I-1030	EB149	121I-1026	121I-1027	121I-1028	121I-1029
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/23/2002	10/23/2002	3/10/1998	10/22/2002	10/22/2002	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	EBS	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Cadmium	MG/KG	6.6	31%	14	45	3.70E+01		2.3	3	0.15 U	0.16 U		0.54 U	0.53 U	0.56 U	0.45
Calcium	MG/KG	298000	100%	45	45			121000	18	29900 J	46500 J		50600	52400	40900	253000 J
Chromium	MG/KG	439 [4]	100%	45	45			29.6	6	516	362		14.6	10.5	15.2	10.8
Cobalt	MG/KG	206 [4]	100%	45	45	9.03E+02		30	4	237 J	174 J		9.6	9.5	8.9	7.2
Copper	MG/KG	209 [4]	100%	40	40	3.13E+03		33	10	243	175		20.7 J	14.2 J	21.3 J	23.9
Cyanide, Amenable	MG/KG	0	0%	0	45					0.63 U	0.68 U		0.56 UJ	0.54 UJ	0.58 UJ	0.55 U
Cyanide, Total	MG/KG	2.00 [4]	7%	3	45					1.26	2.73		0.557 UJ	0.545 UJ	0.577 UJ	0.546 U
Iron	MG/KG	58400 [4]	100%	45	45	2.35E+04	12	36500	2	69400	47400		18100	14500	16900	10300
Lead	MG/KG	122	100%	45	45	4.00E+02		24.8	22	47.8 J	45.9 J		13.5	21	31.2	40 J
Magnesium	MG/KG	22300	100%	45	45			21500	1	2770 J	6090 J		12800	4770	5330	18800 J
Manganese	MG/KG	310500 [4]	100%	45	45	1.76E+03	11	1060	15	349000	272000		412	377	428	847
Mercury	MG/KG	0.18	98%	44	45	2.35E+01		0.1	1	0.02	0.02		0.02	0.02	0.03	0.02
Nickel	MG/KG	342 [4]	100%	45	45	1.56E+03		49	7	394 J	289 J		25.4	22.3	27.2	342 J
Potassium	MG/KG	1450	100%	45	45			2380		656	612		1300	653	835	1000 J
Selenium	MG/KG	146 [4]	47%	21	45	3.91E+02		2	5	160 J	131 J		0.54 U	0.53 U	0.56 U	0.62 J
Silver	MG/KG	10.5	18%	6	34	3.91E+02		0.75	4	24.1 R	18.6 R		1.1 U	1.1 U	1.1 U	0.29 R
Sodium	MG/KG	372	82%	37	45			172	24	126 U	135 U		129	138	117	326
Thallium	MG/KG	163 [4]	20%	9	45	5.16E+00	5	0.7	5	173 J	152 J		1.1 U	1.1 U	1.1 U	0.33 UJ
Vanadium	MG/KG	182 [4]	100%	45	45	7.82E+01	1	150	1	217 J	147 J		13.6	8.9	13.6	7.7
Zinc	MG/KG	532	100%	45	45	2.35E+04		110	14	47.7 J	37.8 J		70.9 J	71.1 J	92.6 J	329
Other																
Total Organic Carbon	MG/KG	8900	100%	45	45					7300	4900		6600	4300	6600	3600
Total Petroleum Hydrocarbons	MG/KG	2200	33%	15	45					240	1600		45 UJ	44 UJ	140 J	44 U

NOTES:

1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-34	SS121I-4	SS121I-5	SS121I-6	SS121I-7	SS121I-8	SS121I-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1032	EB148	121I-1000	121I-1001	121I-1002	121I-1004	121I-1005
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/22/2002	3/10/1998	10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	EBS	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds																
1,1,1-Trichloroethane	UG/KG	0	0%	0	45	1.20E+06		800		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	45	4.08E+02		600		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
1,1,2-Trichloroethane	UG/KG	0	0%	0	45	7.29E+02				3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
1,1-Dichloroethane	UG/KG	0	0%	0	45	5.06E+05		200		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
1,1-Dichloroethene	UG/KG	0	0%	0	45	1.24E+05		400		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
1,2-Dichloroethane	UG/KG	0	0%	0	45	2.78E+02		100		3 UJ		3 UJ	2.8 UJ	2.8 UJ	3.3 UJ	2.9 UJ
1,2-Dichloropropane	UG/KG	0	0%	0	45	3.42E+02				3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Acetone	UG/KG	150	80%	36	45	1.41E+07		200		9.8 J		3 UJ	7.7	51	11 J	20 J
Benzene	UG/KG	41 [4]	20%	9	45	6.43E+02		60		3 UJ		3 UJ	2.8 U	16	3.3 U	4.8
Bromodichloromethane	UG/KG	0	0%	0	45	8.24E+02				3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Bromoform	UG/KG	0	0%	0	45	6.16E+04				3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Carbon disulfide	UG/KG	0	0%	0	45	3.55E+05		2700		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Carbon tetrachloride	UG/KG	0	0%	0	45	2.51E+02		600		3 UJ		3 UJ	2.8 UJ	2.8 UJ	3.3 UJ	2.9 UJ
Chlorobenzene	UG/KG	0	0%	0	45	1.51E+05		1700		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Chlorodibromomethane	UG/KG	0	0%	0	45	1.11E+03				3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Chloroethane	UG/KG	0	0%	0	45	3.03E+03		1900		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Chloroform	UG/KG	0	0%	0	45	2.21E+02		300		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	45	4.29E+04				3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	45					3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Ethyl benzene	UG/KG	7.8	13%	6	45	3.95E+05		5500		3 UJ		3 UJ	2.8 U	2.3 J	3.3 U	2.1 J
Meta/Para Xylene	UG/KG	6.3 [4]	13%	6	45					3 UJ		3 UJ	2.8 U	2.3 J	3.3 U	2.1 J
Methyl bromide	UG/KG	0	0%	0	45	3.90E+03				3 UJ		3 UJ	2.8 UJ	2.8 UJ	3.3 UJ	2.9 UJ
Methyl butyl ketone	UG/KG	0	0%	0	45					3 UJ		3 UJ	2.8 UJ	2.8 UJ	3.3 UJ	2.9 UJ
Methyl chloride	UG/KG	0	0%	0	45	4.69E+04				3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Methyl ethyl ketone	UG/KG	78	24%	11	45	2.23E+07		300		3 UJ		3 UJ	2.8 U	31	3.3 U	9.8
Methyl isobutyl ketone	UG/KG	0	0%	0	45	5.28E+06		1000		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Methylene chloride	UG/KG	2.8	20%	9	45	9.11E+03		100		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Ortho Xylene	UG/KG	3.6 [4]	13%	6	45					3 UJ		3 UJ	2.8 U	1.4 J	3.3 U	1.3 J
Styrene	UG/KG	0	0%	0	45	1.70E+06				3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Tetrachloroethene	UG/KG	0	0%	0	45	4.84E+02		1400		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Toluene	UG/KG	31 [4]	18%	8	45	5.20E+05		1500		3 UJ		3 UJ	2.8 U	12	3.3 U	6.1
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	45	6.95E+04		300		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	45					3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Trichloroethene	UG/KG	0	0%	0	45	5.30E+01		700		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Vinyl chloride	UG/KG	0	0%	0	45	7.91E+01		200		3 UJ		3 UJ	2.8 U	2.8 U	3.3 U	2.9 U
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	51	6.22E+04		3400		360 U	550 U	400 U	370 U	390 U	390 U	380 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	51	6.00E+05		7900		360 U	550 U	400 U	370 U	390 U	390 U	380 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	51	5.31E+05		1600		360 U	550 U	400 U	370 U	390 U	390 U	380 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	51	3.45E+03		8500		360 U	550 U	400 U	370 U	390 U	390 U	380 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+06		100		910 U	1300 U	1000 U	920 U	980 U	980 U	970 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+03				360 U	550 U	400 U	370 U	390 U	390 U	380 U
2,4-Dichlorophenol	UG/KG	0	0%	0	51	1.83E+05		400		360 U	550 U	400 U	370 U	390 U	390 U	380 U
2,4-Dimethylphenol	UG/KG	0	0%	0	51	1.22E+06				360 U	550 U	400 U	370 U	390 U	390 U	380 U
2,4-Dinitrophenol	UG/KG	0	0%	0	51	1.22E+05		200		910 U	1300 UJ	1000 UJ	920 U	980 U	980 UJ	970 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-34	SS121I-4	SS121I-5	SS121I-6	SS121I-7	SS121I-8	SS121I-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1032	EB148	121I-1000	121I-1001	121I-1002	121I-1004	121I-1005
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/22/2002	3/10/1998	10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	EBS	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dinitrotoluene	UG/KG	0	0%	0	51	1.22E+05				360 U	550 U	400 U	370 U	390 U	390 U	380 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	51	6.11E+04		1000		360 U	550 U	400 U	370 U	390 U	390 U	380 U
2-Chloronaphthalene	UG/KG	0	0%	0	51	4.94E+06				360 U	550 U	400 U	370 U	390 U	390 U	380 U
2-Chlorophenol	UG/KG	0	0%	0	51	6.34E+04		800		360 U	550 U	400 U	370 U	390 U	390 U	380 U
2-Methylnaphthalene	UG/KG	260	10%	5	51			36400		360 U	550 U	400 U	370 U	390 U	390 U	380 U
2-Methylphenol	UG/KG	0	0%	0	51	3.06E+06		100		360 U	550 U	400 U	370 U	390 U	390 U	380 U
2-Nitroaniline	UG/KG	0	0%	0	51	1.83E+05		430		910 UJ	1300 U	1000 UJ	920 U	980 UJ	980 U	970 UJ
2-Nitrophenol	UG/KG	0	0%	0	51			330		360 U	550 U	400 U	370 U	390 U	390 U	380 U
3 or 4-Methylphenol	UG/KG	0	0%	0	45					360 U		400 U	370 U	390 U	390 U	380 U
3,3'-Dichlorobenzidine	UG/KG	315 [4]	2%	1	47	1.08E+03				360 UJ	550 U	400 U	370 U	390 UJ	390 U	380 R
3-Nitroaniline	UG/KG	0	0%	0	51	1.83E+04		500		910 U	1300 U	1000 U	920 U	980 U	980 U	970 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	50	6.11E+03				910 U	1300 U	1000 UJ	920 U	980 U	980 UJ	970 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	50					360 U	550 U	400 U	370 U	390 U	390 U	380 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	51			240		360 U	550 U	400 U	370 U	390 U	390 U	380 U
4-Chloroaniline	UG/KG	0	0%	0	51	2.44E+05		220		360 U	550 U	400 U	370 U	390 U	390 U	380 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	51					360 U	550 U	400 U	370 U	390 U	390 U	380 U
4-Methylphenol	UG/KG	0	0%	0	6	3.06E+05		900			550 U					
4-Nitroaniline	UG/KG	0	0%	0	51	2.32E+04				910 U	1300 UJ	1000 U	920 U	980 U	980 U	970 U
4-Nitrophenol	UG/KG	0	0%	0	51			100		910 U	1300 U	1000 U	920 U	980 U	980 U	970 U
Acenaphthene	UG/KG	6100	51%	26	51	3.68E+06		50000		360 U	320 J	400 U	370 U	65 J	390 U	84 J
Acenaphthylene	UG/KG	560	12%	6	51			41000		360 U	550 U	400 U	370 U	390 U	390 U	380 U
Anthracene	UG/KG	12000	58%	29	50	2.19E+07		50000		360 U	230 J	400 U	370 U	94 J	390 U	130 J
Benzo(a)anthracene	UG/KG	28000	90%	46	51	6.21E+02	18	224	28	99 J	1700	69 J	370 U	360 J	52 J	620 J
Benzo(a)pyrene	UG/KG	23000	88%	45	51	6.21E+01	44	61	44	130 J	1600	95 J	75 J	370 J	71 J	610 J
Benzo(b)fluoranthene	UG/KG	29000	94%	48	51	6.21E+02	21	1100	14	130 J	1700	82 J	61 J	360 J	55 J	690 J
Benzo(ghi)perylene	UG/KG	29000	82%	42	51			50000		90 J	940	85 J	370 U	270 J	78 J	510 J
Benzo(k)fluoranthene	UG/KG	23000	74%	37	50	6.21E+03	4	1100	14	120 J	1800	400 U	370 U	470 J	390 U	530 J
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	51					360 U	550 U	400 U	370 U	390 U	390 U	380 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	51	2.18E+02				360 U	550 U	400 U	370 U	390 U	390 U	380 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	51	2.88E+03				360 U	550 U	400 U	370 U	390 U	390 U	380 U
Bis(2-Ethylhexyl)phthalate	UG/KG	1600	33%	17	51	3.47E+04		50000		360 UJ	47 J	400 U	370 U	390 UJ	390 U	63 J
Butylbenzylphthalate	UG/KG	420 [4]	6%	3	48	1.22E+07		50000		360 UJ	550 U	400 U	370 U	390 UJ	390 U	380 R
Carbazole	UG/KG	6800	57%	29	51	2.43E+04				360 U	380 J	400 U	370 U	110 J	390 U	130 J
Chrysene	UG/KG	32000	86%	44	51	6.21E+04		400	25	170 J	1900	94 J	370 U	480 J	66 J	890 J
Di-n-butylphthalate	UG/KG	45	2%	1	50	6.11E+06		8100		360 U	550 U	400 U	370 U	390 U	390 U	380 U
Di-n-octylphthalate	UG/KG	420 [4]	2%	1	47	2.44E+06		50000		360 UJ	550 UJ	400 U	370 U	390 UJ	390 U	380 R
Dibenz(a,h)anthracene	UG/KG	5000	34%	15	44	6.21E+01	15	14	15	360 R	420 J	400 UJ	370 U	390 R	390 U	380 R
Dibenzofuran	UG/KG	2000	27%	14	51	1.45E+05		6200		360 U	63 J	400 U	370 U	390 U	390 U	380 U
Diethyl phthalate	UG/KG	640 [4]	2%	1	51	4.89E+07		7100		360 U	550 U	400 U	370 U	390 U	390 U	380 U
Dimethylphthalate	UG/KG	0	0%	0	51	1.00E+08		2000		360 U	550 U	400 U	370 U	390 U	390 U	380 U
Fluoranthene	UG/KG	62000	94%	48	51	2.29E+06		50000	1	180 J	4100	150 J	120 J	910	140 J	1400
Fluorene	UG/KG	4200	43%	22	51	2.75E+06		50000		360 U	160 J	400 U	370 U	43 J	390 U	54 J
Hexachlorobenzene	UG/KG	0	0%	0	50	3.04E+02		410		360 U	550 U	400 U	370 U	390 U	390 U	380 U
Hexachlorobutadiene	UG/KG	0	0%	0	51	6.24E+03				360 U	550 U	400 U	370 U	390 U	390 U	380 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	51	3.65E+05				360 U	550 U	400 U	370 U	390 U	390 U	380 U
Hexachloroethane	UG/KG	0	0%	0	51	3.47E+04				360 U	550 U	400 U	370 U	390 U	390 U	380 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-34	SS121I-4	SS121I-5	SS121I-6	SS121I-7	SS121I-8	SS121I-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1032	EB148	121I-1000	121I-1001	121I-1002	121I-1004	121I-1005
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/22/2002	3/10/1998	10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	EBS	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Indeno(1,2,3-cd)pyrene	UG/KG	12000	71%	35	49	6.21E+02	13	3200	3	65 J	950	72 J	370 U	180 J	100 J	480 R
Isophorone	UG/KG	315 [4]	2%	1	51	5.12E+05		4400		360 U	550 U	400 U	370 U	390 U	390 U	380 U
N-Nitrosodiphenylamine	UG/KG	0	0%	0	50	9.93E+04				360 U	550 U	400 U	370 U	390 U	390 U	380 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	51	6.95E+01				360 UJ	550 U	400 UJ	370 U	390 UJ	390 U	380 UJ
Naphthalene	UG/KG	630	14%	7	51	5.59E+04		13000		360 U	51 J	400 U	370 U	390 U	390 U	380 U
Nitrobenzene	UG/KG	315 [4]	2%	1	51	1.96E+04		200	1	360 U	550 U	400 U	370 U	390 U	390 U	380 U
Pentachlorophenol	UG/KG	0	0%	0	50	2.98E+03		1000		910 U	1300 U	1000 U	920 U	980 U	980 U	970 U
Phenanthrene	UG/KG	52000	94%	48	51			50000	1	130 J	1800	66 J	76 J	650	73 J	930
Phenol	UG/KG	315 [4]	2%	1	51	1.83E+07		30	1	360 U	550 U	400 U	370 U	390 U	390 U	380 U
Pyrene	UG/KG	64000	94%	48	51	2.32E+06		50000	1	260 J	3200	140 J	120 J	1100 J	97 J	3000 J
Pesticides/PCBs																
4,4'-DDD	UG/KG	0	0%	0	45	2.44E+03		2900		1.9 UJ		2.1 UJ	1.9 UJ	2 UJ	2 UJ	2 UJ
4,4'-DDE	UG/KG	34	11%	5	45	1.72E+03		2100		1.9 U		2.1 U	1.9 U	2 U	2 U	2 U
4,4'-DDT	UG/KG	39	5%	2	44	1.72E+03		2100		1.9 UJ		2.1 U	1.9 UJ	2 U	2 UJ	2 UJ
Aldrin	UG/KG	12	9%	4	45	2.86E+01		41		1.9 U		2.1 UJ	1.9 U	2 UJ	2 U	3.2 J
Alpha-BHC	UG/KG	0	0%	0	45	9.02E+01		110		1.9 UJ		2.1 UJ	1.9 UJ	2 UJ	2 UJ	2 UJ
Alpha-Chlordane	UG/KG	0	0%	0	41					1.9 UJ		2.1 UJ	1.9 UJ	2 UJ	2 UJ	2 UJ
Beta-BHC	UG/KG	0	0%	0	45	3.16E+02		200		1.9 U		2.1 U	1.9 U	2 U	2 U	2 U
Chlordane	UG/KG	0	0%	0	45					19 U		21 U	19 U	20 U	20 U	20 U
Delta-BHC	UG/KG	0	0%	0	45			300		1.9 UJ		2.1 UJ	1.9 UJ	2 UJ	2 UJ	2 UJ
Dieldrin	UG/KG	34	4%	2	45	3.04E+01	1	44		1.9 UJ		2.1 UJ	1.9 UJ	2 UJ	2 UJ	2 UJ
Endosulfan I	UG/KG	95	59%	24	41			900		4.9 J		4.2	2.6	8.7	4	36 J
Endosulfan II	UG/KG	0	0%	0	45			900		1.9 U		2.1 U	1.9 U	2 U	2 U	2 U
Endosulfan sulfate	UG/KG	0	0%	0	45			1000		1.9 U		2.1 U	1.9 U	2 U	2 U	2 U
Endrin	UG/KG	30	4%	2	45	1.83E+04		100		1.9 U		2.1 U	1.9 UJ	2 U	2 UJ	2 UJ
Endrin aldehyde	UG/KG	0	0%	0	45					1.9 U		2.1 U	1.9 U	2 U	2 U	2 U
Endrin ketone	UG/KG	0	0%	0	45					1.9 U		2.1 U	1.9 U	2 U	2 U	2 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	45	4.37E+02		60		1.9 U		2.1 UJ	1.9 UJ	2 UJ	2 UJ	2 UJ
Gamma-Chlordane	UG/KG	0	0%	0	45			540		1.9 U		2.1 U	1.9 U	2 U	2 U	2 U
Heptachlor	UG/KG	0	0%	0	45	1.08E+02		100		1.9 U		2.1 U	1.9 U	2 U	2 U	2 U
Heptachlor epoxide	UG/KG	55	21%	8	39	5.34E+01	1	20	3	1.9 U		2.1 U	1.9 U	6.4	2 U	25
Methoxychlor	UG/KG	0	0%	0	45	3.06E+05				1.9 UJ		2.1 U	1.9 U	2 U	2 U	2 U
Toxaphene	UG/KG	0	0%	0	45	4.42E+02				19 U		21 U	19 U	20 U	20 U	20 U
Aroclor-1016	UG/KG	0	0%	0	45	3.93E+03				19 UJ		21 U	19 UJ	20 U	20 UJ	20 U
Aroclor-1221	UG/KG	0	0%	0	45					19 UJ		21 U	19 U	20 U	20 U	20 U
Aroclor-1232	UG/KG	0	0%	0	45					19 UJ		21 U	19 UJ	20 U	20 UJ	20 U
Aroclor-1242	UG/KG	0	0%	0	45					19 UJ		21 U	19 UJ	20 U	20 UJ	20 U
Aroclor-1248	UG/KG	0	0%	0	45					19 UJ		21 U	19 U	20 U	20 U	20 U
Aroclor-1254	UG/KG	67	4%	2	45	2.22E+02		10000		19 UJ		21 UJ	19 U	20 UJ	20 U	20 UJ
Aroclor-1260	UG/KG	46	7%	3	45			10000		19 UJ		21 UJ	19 U	20 UJ	20 U	20 UJ
Metals and Cyanide																
Aluminum	MG/KG	13200	100%	45	45	7.61E+04		19300		5670		6960	10600	7880	7750	7210
Antimony	MG/KG	7.5	31%	14	45	3.13E+01		5.9	1	4.1		7.3 U	6.7 U	7.1 U	3.6	6.9 U
Arsenic	MG/KG	104	100%	34	34	3.90E-01	34	8.2	8	5.7 R		3.7	7.2	30	4.1	14
Barium	MG/KG	207	100%	45	45	5.37E+03		300		97.2 J		41.4	61.9	79.2	83.5	87.5
Beryllium	MG/KG	0.68	98%	44	45	1.54E+02		1.1		0.38		0.39 J	0.53 J	0.41 J	0.38 J	0.45

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SS121I-34	SS121I-4	SS121I-5	SS121I-6	SS121I-7	SS121I-8	SS121I-9
Matrix										SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID										121I-1032	EB148	121I-1000	121I-1001	121I-1002	121I-1004	121I-1005
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sample Date										10/22/2002	3/10/1998	10/22/2002	10/22/2002	10/22/2002	10/22/2002	10/22/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										PID-RI	EBS	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Cadmium	MG/KG	6.6	31%	14	45	3.70E+01		2.3	3	0.17		0.61 U	0.56 U	0.6 U	0.57 U	0.15
Calcium	MG/KG	298000	100%	45	45			121000	18	160000 J		37300	36000	30600	62600	39800
Chromium	MG/KG	439 [4]	100%	45	45			29.6	6	14.2		14.7	19.8	77.1	11.8	35
Cobalt	MG/KG	206 [4]	100%	45	45	9.03E+02		30	4	8.3		11	11.7	26.5	8.1	15
Copper	MG/KG	209 [4]	100%	40	40	3.13E+03		33	10	21		24.1 J	23.1 J	41.8 J	31 J	37 J
Cyanide, Amenable	MG/KG	0	0%	0	45					0.55 U		0.61 UJ	0.56 UJ	0.6 UJ	0.59 UJ	0.58 UJ
Cyanide, Total	MG/KG	2.00 [4]	7%	3	45					0.551 U		0.61 UJ	0.559 J	0.595 UJ	0.588 UJ	0.581 UJ
Iron	MG/KG	58400 [4]	100%	45	45	2.35E+04	12	36500	2	14600		15900	24500	25200	15100	22900
Lead	MG/KG	122	100%	45	45	4.00E+02		24.8	22	25.9 J		21.4	16	35.6	15.2	51
Magnesium	MG/KG	22300	100%	45	45			21500	1	11800 J		6310	11500	9420	14200	7110
Manganese	MG/KG	310500 [4]	100%	45	45	1.76E+03	11	1060	15	634		404	880	28100	567	9500
Mercury	MG/KG	0.18	98%	44	45	2.35E+01		0.1	1	0.03		0.04	0.03	0.04	0.03	0.03
Nickel	MG/KG	342 [4]	100%	45	45	1.56E+03		49	7	30.8 J		30.9	30.3	74.8	25.9	34.3
Potassium	MG/KG	1450	100%	45	45			2380		867		1140	1140	969	889	723
Selenium	MG/KG	146 [4]	47%	21	45	3.91E+02		2	5	0.76 J		0.61 U	1.3	5.5	0.57 U	1.3
Silver	MG/KG	10.5	18%	6	34	3.91E+02		0.75	4	0.29 R		1.2 U	1.1 U	1.8	1.1 U	0.51 J
Sodium	MG/KG	372	82%	37	45			172	24	218		132	132	595 U	134	123
Thallium	MG/KG	163 [4]	20%	9	45	5.16E+00	5	0.7	5	0.34 UJ		1.2 U	0.38	6.7	1.1 U	0.5 J
Vanadium	MG/KG	182 [4]	100%	45	45	7.82E+01	1	150	1	11.3 J		11.9	17.3	34.5	13.8	18.7
Zinc	MG/KG	532	100%	45	45	2.35E+04		110	14	78.8 J		59.7 J	82.6 J	123 J	56.8 J	132 J
Other																
Total Organic Carbon	MG/KG	8900	100%	45	45					4900		4200	8900	6100	4900	5000
Total Petroleum Hydrocarbons	MG/KG	2200	33%	15	45					44 U		410 J	45 UJ	48 UJ	47 UJ	47 UJ

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SD121I-1EBS	SD121I-2EBS	SD121I-4	SD121I-5	SD121I-7	SD121I-6	SD121I-7
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										EB151	EB152	121I-4003	121I-4004	121I-4005	121I-4006	121I-4007
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	2	2	2	2	2
Sample Date										3/10/1998	3/10/1998	11/6/2002	11/6/2002	10/26/2002	11/6/2002	10/26/2002
QC Code						**Region IX**				SA	SA	SA	SA	SA	SA	SA
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**NYSDEC**		EBS	EBS	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**				1	1	1	1	1
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses [1]**	**Value [2]**	**Exceedances**	**Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds																
1,1,1-Trichloroethane	UG/KG	0	0%	0	45	1.20E+06		800				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	45	4.08E+02		600				2.7 UJ	3.1 UJ	3.1 UJ	4.4 UJ	3.2 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	45	7.29E+02						2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
1,1-Dichloroethane	UG/KG	0	0%	0	45	5.06E+05		200				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
1,1-Dichloroethene	UG/KG	0	0%	0	45	1.24E+05		400				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
1,2-Dichloroethane	UG/KG	0	0%	0	45	2.78E+02		100				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
1,2-Dichloropropane	UG/KG	0	0%	0	45	3.42E+02						2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Acetone	UG/KG	150	80%	36	45	1.41E+07		200				28	16	25 J	16	10 J
Benzene	UG/KG	41 [4]	20%	9	45	6.43E+02		60				2.3 J	3.1 U	3.1 UJ	1.2 J	3.2 UJ
Bromodichloromethane	UG/KG	0	0%	0	45	8.24E+02						2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Bromoform	UG/KG	0	0%	0	45	6.16E+04						2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Carbon disulfide	UG/KG	0	0%	0	45	3.55E+05		2700				2.7 UJ	3.1 UJ	3.1 UJ	4.4 UJ	3.2 UJ
Carbon tetrachloride	UG/KG	0	0%	0	45	2.51E+02		600				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Chlorobenzene	UG/KG	0	0%	0	45	1.51E+05		1700				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Chlorodibromomethane	UG/KG	0	0%	0	45	1.11E+03						2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Chloroethane	UG/KG	0	0%	0	45	3.03E+03		1900				2.7 UJ	3.1 UJ	3.1 UJ	4.4 UJ	3.2 UJ
Chloroform	UG/KG	0	0%	0	45	2.21E+02		300				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	45	4.29E+04						2.7 UJ	3.1 UJ	3.1 UJ	4.4 UJ	3.2 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	45							2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Ethyl benzene	UG/KG	7.8	13%	6	45	3.95E+05		5500				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Meta/Para Xylene	UG/KG	6.3 [4]	13%	6	45							2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Methyl bromide	UG/KG	0	0%	0	45	3.90E+03						2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Methyl butyl ketone	UG/KG	0	0%	0	45							2.7 UJ	3.1 UJ	3.1 UJ	4.4 UJ	3.2 UJ
Methyl chloride	UG/KG	0	0%	0	45	4.69E+04						2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Methyl ethyl ketone	UG/KG	78	24%	11	45	2.23E+07		300				7.2	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Methyl isobutyl ketone	UG/KG	0	0%	0	45	5.28E+06		1000				2.7 UJ	3.1 UJ	3.1 UJ	4.4 UJ	3.2 UJ
Methylene chloride	UG/KG	2.8	20%	9	45	9.11E+03		100				2.7 UJ	3.1 UJ	2.5 U	4.4 UJ	1.9 U
Ortho Xylene	UG/KG	3.6 [4]	13%	6	45							2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Styrene	UG/KG	0	0%	0	45	1.70E+06						2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Tetrachloroethene	UG/KG	0	0%	0	45	4.84E+02		1400				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Toluene	UG/KG	31 [4]	18%	8	45	5.20E+05		1500				1.7 J	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	45	6.95E+04		300				2.7 UJ	3.1 UJ	3.1 UJ	4.4 UJ	3.2 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	45							2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Trichloroethene	UG/KG	0	0%	0	45	5.30E+01		700				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Vinyl chloride	UG/KG	0	0%	0	45	7.91E+01		200				2.7 U	3.1 U	3.1 UJ	4.4 U	3.2 UJ
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	51	6.22E+04		3400		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	51	6.00E+05		7900		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	51	5.31E+05		1600		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	51	3.45E+03		8500		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+06		100		1200 U	11000 U	970 U	1000 U	1100 U	1300 U	1100 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+03				480 U	4400 U	390 U	410 U	420 U	530 U	420 U
2,4-Dichlorophenol	UG/KG	0	0%	0	51	1.83E+05		400		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
2,4-Dimethylphenol	UG/KG	0	0%	0	51	1.22E+06				480 U	4400 U	390 U	410 U	420 U	530 U	420 U
2,4-Dinitrophenol	UG/KG	0	0%	0	51	1.22E+05		200		1200 U	11000 U	970 U	1000 U	1100 U	1300 U	1100 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SD121I-1EBS	SD121I-2EBS	SD121I-4	SD121I-5	SD121I-7	SD121I-6	SD121I-7
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										EB151	EB152	121I-4003	121I-4004	121I-4005	121I-4006	121I-4007
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	2	2	2	2	2
Sample Date										3/10/1998	3/10/1998	11/6/2002	11/6/2002	10/26/2002	11/6/2002	10/26/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
												1	1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dinitrotoluene	UG/KG	0	0%	0	51	1.22E+05				480 U	4400 U	390 U	410 U	420 U	530 U	420 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	51	6.11E+04		1000		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
2-Chloronaphthalene	UG/KG	0	0%	0	51	4.94E+06				480 U	4400 U	390 U	410 U	420 U	530 U	420 U
2-Chlorophenol	UG/KG	0	0%	0	51	6.34E+04		800		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
2-Methylnaphthalene	UG/KG	260	10%	5	51			36400		33 J	4400 U	390 U	410 U	420 U	530 U	130 J
2-Methylphenol	UG/KG	0	0%	0	51	3.06E+06		100		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
2-Nitroaniline	UG/KG	0	0%	0	51	1.83E+05		430		1200 U	11000 U	970 U	1000 U	1100 U	1300 U	1100 U
2-Nitrophenol	UG/KG	0	0%	0	51			330		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
3 or 4-Methylphenol	UG/KG	0	0%	0	45							390 U	410 U	420 U	530 U	420 U
3,3'-Dichlorobenzidine	UG/KG	315 [4]	2%	1	47	1.08E+03				480 U	4400 U	390 U	410 U	420 UJ	530 U	420 J
3-Nitroaniline	UG/KG	0	0%	0	51	1.83E+04		500		1200 U	11000 U	970 U	1000 U	1100 U	1300 U	1100 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	50	6.11E+03				1200 U	11000 U	970 U	1000 U	1100 U	1300 U	1100 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	50					480 U	4400 U	390 U	410 U	420 U	530 U	420 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	51			240		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
4-Chloroaniline	UG/KG	0	0%	0	51	2.44E+05		220		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	51					480 U	4400 U	390 U	410 UJ	420 U	530 U	420 U
4-Methylphenol	UG/KG	0	0%	0	6	3.06E+05		900		480 U	4400 U					
4-Nitroaniline	UG/KG	0	0%	0	51	2.32E+04				1200 U	11000 U	970 U	1000 U	1100 U	1300 U	1100 U
4-Nitrophenol	UG/KG	0	0%	0	51			100		1200 U	11000 U	970 U	1000 U	1100 U	1300 U	1100 U
Acenaphthene	UG/KG	6100	51%	26	51	3.68E+06		50000		140 J	390 J	300 J	140 J	280 J	80 J	1200
Acenaphthylene	UG/KG	560	12%	6	51			41000		480 U	420 J	83 J	410 U	70 J	530 U	420 U
Anthracene	UG/KG	12000	58%	29	50	2.19E+07		50000		260 J	1800 J	650	140 J	420 J	110 J	1900
Benzo(a)anthracene	UG/KG	28000	90%	46	51	6.21E+02	18	224	28	1300	14000	2900	770	2200 J	270 J	5000 J
Benzo(a)pyrene	UG/KG	23000	88%	45	51	6.21E+01	44	61	44	1300	16000	2800 J	750 J	2800 J	290 J	5900 J
Benzo(b)fluoranthene	UG/KG	29000	94%	48	51	6.21E+02	21	1100	14	2100	22000	3600 J	1100 J	3600 J	380 J	8100 J
Benzo(ghi)perylene	UG/KG	29000	82%	42	51			50000		840	12000	810 J	250 J	1400 J	110 J	3200 J
Benzo(k)fluoranthene	UG/KG	23000	74%	37	50	6.21E+03	4	1100	14	1600	23000	2400 J	710 J	2500 J	140 J	4900 J
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	51					480 U	4400 U	390 U	410 U	420 U	530 U	420 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	51	2.18E+02				480 U	4400 U	390 U	410 U	420 UJ	530 U	420 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	51	2.88E+03				480 U	4400 U	390 U	410 U	420 U	530 U	420 U
Bis(2-Ethylhexyl)phthalate	UG/KG	1600	33%	17	51	3.47E+04		50000		25 J	4400 U	390 U	410 U	75 J	530 U	110 J
Butylbenzylphthalate	UG/KG	420 [4]	6%	3	48	1.22E+07		50000		480 U	4400 U	390 U	410 U	420 J	530 U	420 J
Carbazole	UG/KG	6800	57%	29	51	2.43E+04				410 J	1600 J	510	150 J	440	110 J	1700
Chrysene	UG/KG	32000	86%	44	51	6.21E+04		400	25	1700	25000	3400 J	910	2400 J	340 J	5400 J
Di-n-butylphthalate	UG/KG	45	2%	1	50	6.11E+06		8100		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
Di-n-octylphthalate	UG/KG	420 [4]	2%	1	47	2.44E+06		50000		480 U	4400 U	390 U	410 U	420 J	530 U	420 J
Dibenz(a,h)anthracene	UG/KG	5000	34%	15	44	6.21E+01	15	14	15	400 J	5000 J	86 J	410 UJ	130 J	530 U	350 J
Dibenzofuran	UG/KG	2000	27%	14	51	1.45E+05		6200		58 J	4400 U	160 J	410 UJ	71 J	530 U	640
Diethyl phthalate	UG/KG	640 [4]	2%	1	51	4.89E+07		7100		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
Dimethylphthalate	UG/KG	0	0%	0	51	1.00E+08		2000		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
Fluoranthene	UG/KG	62000	94%	48	51	2.29E+06		50000	1	3400	24000	5800	1600	4400	680	13000
Fluorene	UG/KG	4200	43%	22	51	2.75E+06		50000		130 J	360 J	270 J	72 J	190 J	70 J	1100
Hexachlorobenzene	UG/KG	0	0%	0	50	3.04E+02		410		480 U	4400 U	390 U	410 U	420 U	530 U	420 U
Hexachlorobutadiene	UG/KG	0	0%	0	51	6.24E+03				480 U	4400 U	390 U	410 U	420 U	530 U	420 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	51	3.65E+05				480 U	4400 U	390 U	410 UJ	420 U	530 U	420 U
Hexachloroethane	UG/KG	0	0%	0	51	3.47E+04				480 U	4400 U	390 U	410 U	420 U	530 U	420 U

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SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SD121I-1EBS	SD121I-2EBS	SD121I-4	SD121I-5	SD121I-7	SD121I-6	SD121I-7
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										EB151	EB152	121I-4003	121I-4004	121I-4005	121I-4006	121I-4007
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	2	2	2	2	2
Sample Date										3/10/1998	3/10/1998	11/6/2002	11/6/2002	10/26/2002	11/6/2002	10/26/2002
QC Code						Region IX				SA	SA	SA	SA	SA	SA	SA
Study ID			Frequency	Number	Number	PRG		NYSDEC		EBS	EBS	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	of	of Times	of	Criteria		Criteria				1	1	1	1	1
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses [1]**	**Value [2]**	**Exceedances**	**Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Indeno(1,2,3-cd)pyrene	UG/KG	12000	71%	35	49	6.21E+02	13	3200	3	850 J	12000 J	350 J	140 J	400 J	98 J	1300 J
Isophorone	UG/KG	315 [4]	2%	1	51	5.12E+05		4400		480 U	4400 U	390 U	410 U	420 J	530 U	420 U
N-Nitrosodiphenylamine	UG/KG	0	0%	0	50	9.93E+04				480 U	4400 U	390 U	410 U	420 U	530 U	420 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	51	6.95E+01				480 U	4400 U	390 U	410 UJ	420 U	530 U	420 U
Naphthalene	UG/KG	630	14%	7	51	5.59E+04		13000		480 U	4400 U	390 U	410 U	420 U	530 U	490
Nitrobenzene	UG/KG	315 [4]	2%	1	51	1.96E+04		200	1	480 U	4400 U	390 U	410 U	420 J	530 U	420 U
Pentachlorophenol	UG/KG	0	0%	0	50	2.98E+03		1000		1200 U	11000 U	970 U	1000 U	1100 U	1300 U	1100 U
Phenanthrene	UG/KG	52000	94%	48	51			50000	1	1600	4400 J	4200	870	2500	620	10000
Phenol	UG/KG	315 [4]	2%	1	51	1.83E+07		30	1	480 U	4400 U	390 U	410 U	420 J	530 U	420 U
Pyrene	UG/KG	64000	94%	48	51	2.32E+06		50000	1	2700	17000	8800 J	1500	6500 J	560	17000 J
Pesticides/PCBs																
4,4'-DDD	UG/KG	0	0%	0	45	2.44E+03		2900				0.24 U	0.25 U	2.2 U	0.33 U	2.2 U
4,4'-DDE	UG/KG	34	11%	5	45	1.72E+03		2100				0.24 U	0.25 U	14 J	0.33 U	2.2 UJ
4,4'-DDT	UG/KG	39	5%	2	44	1.72E+03		2100				0.24 UJ	0.25 UJ	2.2 UJ	0.33 UJ	2.2 UJ
Aldrin	UG/KG	12	9%	4	45	2.86E+01		41				0.12 U	0.12 U	2.2 U	0.16 U	2.2 U
Alpha-BHC	UG/KG	0	0%	0	45	9.02E+01		110				1.4 UJ	1.5 UJ	2.2 U	2 UJ	2.2 U
Alpha-Chlordane	UG/KG	0	0%	0	41							0.35 R	0.38 UJ	2.2 U	0.49 UJ	2.2 U
Beta-BHC	UG/KG	0	0%	0	45	3.16E+02		200				0.12 U	0.12 U	2.2 U	0.16 U	2.2 U
Chlordane	UG/KG	0	0%	0	45							2.2 U	2.4 U	22 U	3.1 U	22 U
Delta-BHC	UG/KG	0	0%	0	45			300				0.24 UJ	0.25 UJ	2.2 UJ	0.33 UJ	2.2 UJ
Dieldrin	UG/KG	34	4%	2	45	3.04E+01	1	44				0.12 UJ	0.12 UJ	2.2 UJ	0.16 UJ	2.2 UJ
Endosulfan I	UG/KG	95	59%	24	41			900				0.59 R	0.62 UJ	2.2 U	0.82 UJ	56 R
Endosulfan II	UG/KG	0	0%	0	45			900				0.35 U	0.38 U	2.2 U	0.49 U	2.2 U
Endosulfan sulfate	UG/KG	0	0%	0	45			1000				0.71 U	0.75 U	2.2 U	0.98 U	2.2 U
Endrin	UG/KG	30	4%	2	45	1.83E+04		100				0.94 U	1 U	2.2 UJ	1.3 U	2.2 UJ
Endrin aldehyde	UG/KG	0	0%	0	45							0.94 UJ	1 UJ	2.2 UJ	1.3 UJ	2.2 UJ
Endrin ketone	UG/KG	0	0%	0	45							0.12 U	0.12 U	2.2 U	0.16 U	2.2 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	45	4.37E+02		60				0.12 UJ	0.12 UJ	2.2 U	0.16 UJ	2.2 U
Gamma-Chlordane	UG/KG	0	0%	0	45			540				0.35 UJ	0.38 UJ	2.2 U	0.49 UJ	2.2 U
Heptachlor	UG/KG	0	0%	0	45	1.08E+02		100				1.2 U	1.2 U	2.2 U	1.6 U	2.2 U
Heptachlor epoxide	UG/KG	55	21%	8	39	5.34E+01	1	20	3			0.35 R	0.38 U	2.2 U	0.49 U	2.2 U
Methoxychlor	UG/KG	0	0%	0	45	3.06E+05						0.12 U	0.12 U	2.2 UJ	0.16 U	2.2 UJ
Toxaphene	UG/KG	0	0%	0	45	4.42E+02						3.8 U	4 U	22 U	5.2 U	22 U
Aroclor-1016	UG/KG	0	0%	0	45	3.93E+03						6 U	6.3 U	22 U	8.5 U	22 U
Aroclor-1221	UG/KG	0	0%	0	45							1.5 U	1.6 U	22 U	2.1 U	22 U
Aroclor-1232	UG/KG	0	0%	0	45							9.2 U	9.7 U	22 U	13 U	22 U
Aroclor-1242	UG/KG	0	0%	0	45							2.5 U	2.7 U	22 U	3.6 U	22 U
Aroclor-1248	UG/KG	0	0%	0	45							6.3 U	6.7 U	22 U	9 U	22 U
Aroclor-1254	UG/KG	67	4%	2	45	2.22E+02		10000				12 U	67	22 U	17 U	22 U
Aroclor-1260	UG/KG	46	7%	3	45			10000				2.3 U	2.4 U	22 U	3.3 U	17 NJ
Metals and Cyanide																
Aluminum	MG/KG	13200	100%	45	45	7.61E+04		19300				6270	4740	6950	10300	6170
Antimony	MG/KG	7.5	31%	14	45	3.13E+01		5.9	1			1.1 UJ	1.1 UJ	1.1 U	1.5 UJ	0.99 U
Arsenic	MG/KG	104	100%	34	34	3.90E-01	34	8.2	8			27.4	4.6	7.8	8.8	6.9
Barium	MG/KG	207	100%	45	45	5.37E+03		300				80.5 J	57.7 J	72.2	65 J	58.9
Beryllium	MG/KG	0.68	98%	44	45	1.54E+02		1.1				0.37	0.33	0.48 J	0.66	0.43 J

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses ^{1}	Region IX PRG Criteria Value ^{2}	Exceedances	NYSDEC Criteria Value ^{3}	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SD121I-1EBS	SD121I-2EBS	SD121I-4	SD121I-5	SD121I-7	SD121I-6	SD121I-7
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										EB151	EB152	121I-4003	121I-4004	121I-4005	121I-4006	121I-4007
Sample Depth to Top of Sample										0	0	0	0	0	0	0
Sample Depth to Bottom of Sample										0.2	0.2	2	2	2	2	2
Sample Date										3/10/1998	3/10/1998	11/6/2002	11/6/2002	10/26/2002	11/6/2002	10/26/2002
QC Code										SA	SA	SA	SA	SA	SA	SA
Study ID										EBS	EBS	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
												1	1	1	1	1
Cadmium	MG/KG	6.6	31%	14	45	3.70E+01		2.3	3			0.14 U	0.15 U	0.83	0.19 U	0.77
Calcium	MG/KG	298000	100%	45	45			121000	18			30100	72300	145000	39000	110000
Chromium	MG/KG	439 ^{4}	100%	45	45			29.6	6			9.9	10.1	14.5	25.5	13.5
Cobalt	MG/KG	206 ^{4}	100%	45	45	9.03E+02		30	4			25.1	6.8	11	12.3	10.5
Copper	MG/KG	209 ^{4}	100%	40	40	3.13E+03		33	10			130	20	33.8 J	45.4	34.7 J
Cyanide, Amenable	MG/KG	0	0%	0	45							0.59 U	0.62 U	0.64 U	0.82 U	0.65 U
Cyanide, Total	MG/KG	2.00 ^{4}	7%	3	45							0.59 U	0.62 U	0.644 U	0.82 U	0.648 U
Iron	MG/KG	58400 ^{4}	100%	45	45	2.35E+04	12	36500	2			21200	11300	15200 J	23800	13900 J
Lead	MG/KG	122	100%	45	45	4.00E+02		24.8	22			82.4	42.9	71.2 J	93.3	77.4 J
Magnesium	MG/KG	22300	100%	45	45			21500	1			5240	11300	11700 J	8050	9890 J
Manganese	MG/KG	310500 ^{4}	100%	45	45	1.76E+03	11	1060	15			12300	471	588 J	1290	541 J
Mercury	MG/KG	0.18	98%	44	45	2.35E+01		0.1	1			0.03	0.03	0.12 UJ	0.06	0.11 UJ
Nickel	MG/KG	342 ^{4}	100%	45	45	1.56E+03		49	7			29.8	16.7	27.9 J	33.7	26.9 J
Potassium	MG/KG	1450	100%	45	45			2380				671	886	1340 J	1450	1230 J
Selenium	MG/KG	146 ^{4}	47%	21	45	3.91E+02		2	5			0.49 U	0.52 U	0.53 U	0.68 U	0.46 U
Silver	MG/KG	10.5	18%	6	34	3.91E+02		0.75	4			2.5	0.34 U	0.34 U	0.44 U	0.3 U
Sodium	MG/KG	372	82%	37	45			172	24			118 U	264	288	185	211
Thallium	MG/KG	163 ^{4}	20%	9	45	5.16E+00	5	0.7	5			0.36 U	0.39 U	0.71 J	0.5 U	0.34 U
Vanadium	MG/KG	182 ^{4}	100%	45	45	7.82E+01	1	150	1			25.8	11.4	20.2 J	22.1	18.4 J
Zinc	MG/KG	532	100%	45	45	2.35E+04		110	14			78.6 J	100 J	124 J	532	125 J
Other																
Total Organic Carbon	MG/KG	8900	100%	45	45							3500	6700	5300	5400	4500
Total Petroleum Hydrocarbons	MG/KG	2200	33%	15	45							350	760	1000 J	66 U	630 J

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SD121I-8	SD121I-9	SD121I-10	SD121I-1	SD121I-2	SD121I-3
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										121I-4008	121I-4009	121I-4010	121I-4000	121I-4001	121I-4002
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										11/6/2002	11/6/2002	11/6/2002	11/6/2002	11/6/2002	11/6/2002
QC Code						**Region IX**				SA	SA	SA	SA	SA	SA
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**NYSDEC**		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**		1	1	1	1		1
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses [1]**	**Value [2]**	**Exceedances**	**Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds															
1,1,1-Trichloroethane	UG/KG	0	0%	0	45	1.20E+06		800		2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
1,1,2,2-Tetrachloroethane	UG/KG	0	0%	0	45	4.08E+02		600		2.9 UJ	3.7 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.3 UJ
1,1,2-Trichloroethane	UG/KG	0	0%	0	45	7.29E+02				2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
1,1-Dichloroethane	UG/KG	0	0%	0	45	5.06E+05		200		2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
1,1-Dichloroethene	UG/KG	0	0%	0	45	1.24E+05		400		2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
1,2-Dichloroethane	UG/KG	0	0%	0	45	2.78E+02		100		2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
1,2-Dichloropropane	UG/KG	0	0%	0	45	3.42E+02				2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Acetone	UG/KG	150	80%	36	45	1.41E+07		200		150	22 J	13 J	30	8	9.9
Benzene	UG/KG	41 [4]	20%	9	45	6.43E+02		60		39	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Bromodichloromethane	UG/KG	0	0%	0	45	8.24E+02				2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Bromoform	UG/KG	0	0%	0	45	6.16E+04				2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Carbon disulfide	UG/KG	0	0%	0	45	3.55E+05		2700		2.9 UJ	3.7 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.3 UJ
Carbon tetrachloride	UG/KG	0	0%	0	45	2.51E+02		600		2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Chlorobenzene	UG/KG	0	0%	0	45	1.51E+05		1700		2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 UJ	3.3 U
Chlorodibromomethane	UG/KG	0	0%	0	45	1.11E+03				2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Chloroethane	UG/KG	0	0%	0	45	3.03E+03		1900		2.9 UJ	3.7 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.3 UJ
Chloroform	UG/KG	0	0%	0	45	2.21E+02		300		2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Cis-1,2-Dichloroethene	UG/KG	0	0%	0	45	4.29E+04				2.9 UJ	3.7 UJ	3.2 UJ	3.8 U	3.2 UJ	3.3 UJ
Cis-1,3-Dichloropropene	UG/KG	0	0%	0	45					2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Ethyl benzene	UG/KG	7.8	13%	6	45	3.95E+05		5500		5.2	3.7 UJ	3.2 UJ	3.8 U	3.2 UJ	3.3 U
Meta/Para Xylene	UG/KG	6.3 [4]	13%	6	45					4.8	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Methyl bromide	UG/KG	0	0%	0	45	3.90E+03				2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Methyl butyl ketone	UG/KG	0	0%	0	45					2.9 UJ	3.7 UJ	3.2 UJ	3.8 UJ	3.2 U	3.3 UJ
Methyl chloride	UG/KG	0	0%	0	45	4.69E+04				2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Methyl ethyl ketone	UG/KG	78	24%	11	45	2.23E+07		300		78	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Methyl isobutyl ketone	UG/KG	0	0%	0	45	5.28E+06		1000		2.9 UJ	3.7 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.3 UJ
Methylene chloride	UG/KG	2.8	20%	9	45	9.11E+03		100		2.9 UJ	3.7 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.3 UJ
Ortho Xylene	UG/KG	3.6 [4]	13%	6	45					3	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Styrene	UG/KG	0	0%	0	45	1.70E+06				2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 UJ	3.3 U
Tetrachloroethene	UG/KG	0	0%	0	45	4.84E+02		1400		2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 UJ	3.3 U
Toluene	UG/KG	31 [4]	18%	8	45	5.20E+05		1500		26	3.7 UJ	3.2 UJ	3.8 U	3.2 UJ	3.3 U
Trans-1,2-Dichloroethene	UG/KG	0	0%	0	45	6.95E+04		300		2.9 UJ	3.7 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.3 UJ
Trans-1,3-Dichloropropene	UG/KG	0	0%	0	45					2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Trichloroethene	UG/KG	0	0%	0	45	5.30E+01		700		2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Vinyl chloride	UG/KG	0	0%	0	45	7.91E+01		200		2.9 U	3.7 UJ	3.2 UJ	3.8 U	3.2 U	3.3 U
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	UG/KG	0	0%	0	51	6.22E+04		3400		440 U	450 U	480 U	460 U	380 U	430 U
1,2-Dichlorobenzene	UG/KG	0	0%	0	51	6.00E+05		7900		440 U	450 U	480 U	460 U	380 U	430 U
1,3-Dichlorobenzene	UG/KG	0	0%	0	51	5.31E+05		1600		440 U	450 U	480 U	460 U	380 U	430 U
1,4-Dichlorobenzene	UG/KG	0	0%	0	51	3.45E+03		8500		440 U	450 U	480 U	460 U	380 U	430 U
2,4,5-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+06		100		1100 U	1100 U	1200 U	1100 U	960 U	1100 U
2,4,6-Trichlorophenol	UG/KG	0	0%	0	51	6.11E+03				440 U	450 U	480 U	460 U	380 U	430 U
2,4-Dichlorophenol	UG/KG	0	0%	0	51	1.83E+05		400		440 U	450 U	480 U	460 U	380 U	430 U
2,4-Dimethylphenol	UG/KG	0	0%	0	51	1.22E+06				440 U	450 U	480 U	460 U	380 U	430 U
2,4-Dinitrophenol	UG/KG	0	0%	0	51	1.22E+05		200		1100 U	1100 U	1200 U	1100 U	960 U	1100 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SD121I-8	SD121I-9	SD121I-10	SD121I-1	SD121I-2	SD121I-3
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										121I-4008	121I-4009	121I-4010	121I-4000	121I-4001	121I-4002
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										11/6/2002	11/6/2002	11/6/2002	11/6/2002	11/6/2002	11/6/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1		1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
2,4-Dinitrotoluene	UG/KG	0	0%	0	51	1.22E+05				440 U	450 U	480 U	460 U	380 U	430 U
2,6-Dinitrotoluene	UG/KG	0	0%	0	51	6.11E+04		1000		440 U	450 U	480 U	460 U	380 U	430 U
2-Chloronaphthalene	UG/KG	0	0%	0	51	4.94E+06				440 U	450 U	480 U	460 U	380 U	430 U
2-Chlorophenol	UG/KG	0	0%	0	51	6.34E+04		800		440 U	450 U	480 U	460 U	380 U	430 U
2-Methylnaphthalene	UG/KG	260	10%	5	51			36400		440 U	450 U	480 U	460 U	380 U	430 U
2-Methylphenol	UG/KG	0	0%	0	51	3.06E+06		100		440 U	450 U	480 U	460 U	380 U	430 U
2-Nitroaniline	UG/KG	0	0%	0	51	1.83E+05		430		1100 U	1100 U	1200 U	1100 U	960 U	1100 U
2-Nitrophenol	UG/KG	0	0%	0	51			330		440 U	450 U	480 U	460 U	380 U	430 U
3 or 4-Methylphenol	UG/KG	0	0%	0	45					440 U	450 U	480 U	460 U	380 U	430 U
3,3'-Dichlorobenzidine	UG/KG	315 [4]	2%	1	47	1.08E+03				440 U	450 UJ	480 U	460 U	380 U	430 U
3-Nitroaniline	UG/KG	0	0%	0	51	1.83E+04		500		1100 U	1100 U	1200 U	1100 U	960 U	1100 U
4,6-Dinitro-2-methylphenol	UG/KG	0	0%	0	50	6.11E+03				1100 U	1100 U	1200 U	1100 U	960 U	1100 U
4-Bromophenyl phenyl ether	UG/KG	0	0%	0	50					440 U	450 U	480 U	460 U	380 U	430 U
4-Chloro-3-methylphenol	UG/KG	0	0%	0	51			240		440 U	450 U	480 U	460 U	380 U	430 U
4-Chloroaniline	UG/KG	0	0%	0	51	2.44E+05		220		440 U	450 U	480 U	460 U	380 U	430 U
4-Chlorophenyl phenyl ether	UG/KG	0	0%	0	51					440 UJ	450 U	480 U	460 UJ	380 U	430 U
4-Methylphenol	UG/KG	0	0%	0	6	3.06E+05		900							
4-Nitroaniline	UG/KG	0	0%	0	51	2.32E+04				1100 U	1100 U	1200 U	1100 U	960 U	1100 U
4-Nitrophenol	UG/KG	0	0%	0	51			100		1100 U	1100 U	1200 U	1100 U	960 U	1100 U
Acenaphthene	UG/KG	6100	51%	26	51	3.68E+06		50000		66 J	640	130 J	460 U	380 U	430 U
Acenaphthylene	UG/KG	560	12%	6	51			41000		440 U	76 J	480 U	460 U	380 U	430 U
Anthracene	UG/KG	12000	58%	29	50	2.19E+07		50000		120 J	980	210 J	460 U	380 U	430 U
Benzo(a)anthracene	UG/KG	28000	90%	46	51	6.21E+02	18	224	28	450	5800 J	510	460 U	380 U	49 J
Benzo(a)pyrene	UG/KG	23000	88%	45	51	6.21E+01	44	61	44	420 J	5500 J	390 J	460 U	380 U	430 U
Benzo(b)fluoranthene	UG/KG	29000	94%	48	51	6.21E+02	21	1100	14	610 J	8500 J	550	460 U	45 J	44 J
Benzo(ghi)perylene	UG/KG	29000	82%	42	51			50000		140 J	2100 J	150 J	460 U	380 U	430 U
Benzo(k)fluoranthene	UG/KG	23000	74%	37	50	6.21E+03	4	1100	14	260 J	3300 J	250 J	460 UJ	380 U	430 U
Bis(2-Chloroethoxy)methane	UG/KG	0	0%	0	51					440 U	450 U	480 U	460 U	380 U	430 U
Bis(2-Chloroethyl)ether	UG/KG	0	0%	0	51	2.18E+02				440 U	450 U	480 U	460 U	380 U	430 U
Bis(2-Chloroisopropyl)ether	UG/KG	0	0%	0	51	2.88E+03				440 U	450 U	480 U	460 U	380 U	430 U
Bis(2-Ethylhexyl)phthalate	UG/KG	1600	33%	17	51	3.47E+04		50000		440 U	78 J	480 U	460 U	380 U	430 U
Butylbenzylphthalate	UG/KG	420 [4]	6%	3	48	1.22E+07		50000		440 U	450 UJ	480 U	460 U	380 U	430 U
Carbazole	UG/KG	6800	57%	29	51	2.43E+04				100 J	920	200 J	460 U	380 U	430 U
Chrysene	UG/KG	32000	86%	44	51	6.21E+04		400	25	500	5800 J	540	460 U	380 U	430 U
Di-n-butylphthalate	UG/KG	45	2%	1	50	6.11E+06		8100		440 U	450 U	480 U	460 U	380 U	430 U
Di-n-octylphthalate	UG/KG	420 [4]	2%	1	47	2.44E+06		50000		440 U	450 UJ	480 U	460 U	380 U	430 U
Dibenz(a,h)anthracene	UG/KG	5000	34%	15	44	6.21E+01	15	14	15	440 UJ	160 J	480 U	460 U	380 U	430 U
Dibenzofuran	UG/KG	2000	27%	14	51	1.45E+05		6200		440 UJ	130 J	94 J	460 UJ	380 U	430 U
Diethyl phthalate	UG/KG	640 [4]	2%	1	51	4.89E+07		7100		440 U	450 U	480 U	460 U	380 U	430 U
Dimethylphthalate	UG/KG	0	0%	0	51	1.00E+08		2000		440 U	450 U	480 U	460 U	380 U	430 U
Fluoranthene	UG/KG	62000	94%	48	51	2.29E+06		50000	1	1100	9400	1300	460 U	99 J	130 J
Fluorene	UG/KG	4200	43%	22	51	2.75E+06		50000		53 J	390 J	140 J	460 U	380 U	430 U
Hexachlorobenzene	UG/KG	0	0%	0	50	3.04E+02		410		440 U	450 U	480 U	460 U	380 U	430 U
Hexachlorobutadiene	UG/KG	0	0%	0	51	6.24E+03				440 U	450 U	480 U	460 U	380 U	430 U
Hexachlorocyclopentadiene	UG/KG	0	0%	0	51	3.65E+05				440 UJ	450 U	480 U	460 UJ	380 U	430 U
Hexachloroethane	UG/KG	0	0%	0	51	3.47E+04				440 U	450 U	480 U	460 U	380 U	430 U

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SD121I-8	SD121I-9	SD121I-10	SD121I-1	SD121I-2	SD121I-3
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										121I-4008	121I-4009	121I-4010	121I-4000	121I-4001	121I-4002
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										11/6/2002	11/6/2002	11/6/2002	11/6/2002	11/6/2002	11/6/2002
QC Code						**Region IX**				SA	SA	SA	SA	SA	SA
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**NYSDEC**		PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**		1	1	1	1		1
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses [1]**	**Value [2]**	**Exceedances**	**Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Indeno(1,2,3-cd)pyrene	UG/KG	12000	71%	35	49	6.21E+02	13	3200	3	110 J	750 J	150 J	460 U	380 U	430 U
Isophorone	UG/KG	315 [4]	2%	1	51	5.12E+05		4400		440 U	450 U	480 U	460 U	380 U	430 U
N-Nitrosodiphenylamine	UG/KG	0	0%	0	50	9.93E+04				440 U	450 U	480 U	460 U	380 U	430 U
N-Nitrosodipropylamine	UG/KG	0	0%	0	51	6.95E+01				440 UJ	450 U	480 U	460 UJ	380 U	430 U
Naphthalene	UG/KG	630	14%	7	51	5.59E+04		13000		440 U	450 U	65 J	460 U	380 U	430 U
Nitrobenzene	UG/KG	315 [4]	2%	1	51	1.96E+04		200	1	440 U	450 U	480 U	460 U	380 U	430 U
Pentachlorophenol	UG/KG	0	0%	0	50	2.98E+03		1000		1100 U	1100 U	1200 U	1100 U	960 U	1100 U
Phenanthrene	UG/KG	52000	94%	48	51			50000	1	650	4900	1200	460 U	50 J	93 J
Phenol	UG/KG	315 [4]	2%	1	51	1.83E+07		30	1	440 U	450 U	480 U	460 U	380 U	430 U
Pyrene	UG/KG	64000	94%	48	51	2.32E+06		50000	1	840	17000 J	940	460 U	78 J	93 J
Pesticides/PCBs															
4,4'-DDD	UG/KG	0	0%	0	45	2.44E+03		2900		0.27 U	0.27 U	0.29 U	0.28 UJ	0.24 U	0.26 U
4,4'-DDE	UG/KG	34	11%	5	45	1.72E+03		2100		0.27 U	0.27 U	0.29 U	0.28 U	0.24 U	0.26 U
4,4'-DDT	UG/KG	39	5%	2	44	1.72E+03		2100		0.27 UJ	0.27 UJ	0.29 UJ	0.28 UJ	0.24 UJ	0.26 UJ
Aldrin	UG/KG	12	9%	4	45	2.86E+01		41		0.14 U	0.14 U	0.14 U	0.14 UJ	0.12 U	0.13 U
Alpha-BHC	UG/KG	0	0%	0	45	9.02E+01		110		1.6 UJ	1.6 UJ	1.7 UJ	1.7 UJ	1.4 UJ	1.6 UJ
Alpha-Chlordane	UG/KG	0	0%	0	41					0.41 R	0.41 R	0.43 UJ	0.42 UJ	0.35 R	0.39 UJ
Beta-BHC	UG/KG	0	0%	0	45	3.16E+02		200		0.14 U	0.14 U	0.14 U	0.14 U	0.12 U	0.13 U
Chlordane	UG/KG	0	0%	0	45					2.6 U	2.6 U	2.8 U	2.6 U	2.2 U	2.5 U
Delta-BHC	UG/KG	0	0%	0	45			300		0.27 UJ	0.27 UJ	0.29 UJ	0.28 UJ	0.24 UJ	0.26 UJ
Dieldrin	UG/KG	34	4%	2	45	3.04E+01	1	44		0.14 UJ	0.14 UJ	0.14 UJ	0.14 UJ	0.12 UJ	0.13 UJ
Endosulfan I	UG/KG	95	59%	24	41			900		0.68 R	0.68 R	0.72 UJ	0.69 UJ	0.59 R	0.66 UJ
Endosulfan II	UG/KG	0	0%	0	45			900		0.41 U	0.41 U	0.43 U	0.42 UJ	0.35 U	0.39 U
Endosulfan sulfate	UG/KG	0	0%	0	45			1000		0.81 U	0.82 U	0.87 U	0.83 UJ	0.71 U	0.79 U
Endrin	UG/KG	30	4%	2	45	1.83E+04		100		1.1 U	1.1 U	1.2 U	1.1 UJ	0.94 U	1.1 U
Endrin aldehyde	UG/KG	0	0%	0	45					1.1 UJ	1.1 UJ	1.2 UJ	1.1 UJ	0.94 UJ	1.1 UJ
Endrin ketone	UG/KG	0	0%	0	45					0.14 U	0.14 U	0.14 U	0.14 UJ	0.12 U	0.13 U
Gamma-BHC/Lindane	UG/KG	0	0%	0	45	4.37E+02		60		0.14 UJ	0.14 UJ	0.14 UJ	0.14 UJ	0.12 UJ	0.13 UJ
Gamma-Chlordane	UG/KG	0	0%	0	45			540		0.41 UJ	0.41 UJ	0.43 UJ	0.42 UJ	0.35 UJ	0.39 UJ
Heptachlor	UG/KG	0	0%	0	45	1.08E+02		100		1.4 U	1.4 U	1.4 U	1.4 U	1.2 U	1.3 U
Heptachlor epoxide	UG/KG	55	21%	8	39	5.34E+01	1	20	3	0.41 R	0.41 R	0.43 U	0.42 U	0.35 R	0.39 U
Methoxychlor	UG/KG	0	0%	0	45	3.06E+05				0.14 U	0.14 U	0.14 U	0.14 U	0.12 U	0.13 U
Toxaphene	UG/KG	0	0%	0	45	4.42E+02				4.3 U	4.4 U	4.6 U	4.4 U	3.8 U	4.2 U
Aroclor-1016	UG/KG	0	0%	0	45	3.93E+03				6.9 U	7.1 UJ	7.5 UJ	7.2 U	6.1 U	6.8 U
Aroclor-1221	UG/KG	0	0%	0	45					1.7 U	1.8 U	1.9 U	1.8 U	1.5 U	1.7 U
Aroclor-1232	UG/KG	0	0%	0	45					11 U	11 UJ	12 UJ	11 U	9.4 U	10 U
Aroclor-1242	UG/KG	0	0%	0	45					2.9 U	3 UJ	3.2 UJ	3 U	2.6 U	2.9 U
Aroclor-1248	UG/KG	0	0%	0	45					7.3 U	7.5 U	8 U	7.6 U	6.4 U	7.2 U
Aroclor-1254	UG/KG	67	4%	2	45	2.22E+02		10000		14 U	14 U	15 U	15 U	12 U	14 U
Aroclor-1260	UG/KG	46	7%	3	45			10000		2.6 U	2.7 UJ	2.9 UJ	2.8 U	2.3 U	2.6 U
Metals and Cyanide															
Aluminum	MG/KG	13200	100%	45	45	7.61E+04		19300		5040	6140	5330	8790	4180	6930
Antimony	MG/KG	7.5	31%	14	45	3.13E+01		5.9	1	1.2 UJ	1.2 UJ	1.3 UJ	1.2 UJ	1 UJ	1.2 UJ
Arsenic	MG/KG	104	100%	34	34	3.90E-01	34	8.2	8	104	6.6	3.8	7.7	2.6	4
Barium	MG/KG	207	100%	45	45	5.37E+03		300		91.1 J	75.6 J	74.4 J	47.8 J	44.1 J	53.7 J
Beryllium	MG/KG	0.68	98%	44	45	1.54E+02		1.1		0.3	0.5	0.43	0.52	0.31	0.42

Table C-8
SURFACE SOIL AND DITCH SOIL SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SD121I-8	SD121I-9	SD121I-10	SD121I-1	SD121I-2	SD121I-3
Matrix										DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL	DITCHSOIL
Sample ID										121I-4008	121I-4009	121I-4010	121I-4000	121I-4001	121I-4002
Sample Depth to Top of Sample										0	0	0	0	0	0
Sample Depth to Bottom of Sample										2	2	2	2	2	2
Sample Date										11/6/2002	11/6/2002	11/6/2002	11/6/2002	11/6/2002	11/6/2002
QC Code										SA	SA	SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1		1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses[1]**	**Region IX PRG Criteria Value[2]**	**Exceedances**	**NYSDEC Criteria Value[3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Cadmium	MG/KG	6.6	31%	14	45	3.70E+01		2.3	3	0.16 U	0.16 U	0.17 U	0.16 U	0.14 U	0.16 U
Calcium	MG/KG	298000	100%	45	45			121000	18	8990	65800	54300	17000	36500	33200
Chromium	MG/KG	439[4]	100%	45	45			29.6	6	83.9	12.2	10.1	15.6	8.6	11.7
Cobalt	MG/KG	206[4]	100%	45	45	9.03E+02		30	4	91.9	8.8	7.4	10.3	5.9	9.3
Copper	MG/KG	209[4]	100%	40	40	3.13E+03		33	10	117	33.2	20.4	17.1 J	23.1	22.9
Cyanide, Amenable	MG/KG	0	0%	0	45					0.67 U	0.68 U	0.72 U	0.69 UJ	0.59 U	0.66 U
Cyanide, Total	MG/KG	2.00[4]	7%	3	45					0.67 U	0.68 U	0.72 U	0.69 UJ	0.59 U	0.66 U
Iron	MG/KG	58400[4]	100%	45	45	2.35E+04	12	36500	2	30400	13900	12500	19800 J	10100	16600
Lead	MG/KG	122	100%	45	45	4.00E+02		24.8	22	67.2	86.9	39.6	11.2 J	22.4	17.8
Magnesium	MG/KG	22300	100%	45	45			21500	1	2150	7380	7450	4480 J	3530	7540
Manganese	MG/KG	310500[4]	100%	45	45	1.76E+03	11	1060	15	14900	767	477	478 J	303	399
Mercury	MG/KG	0.18	98%	44	45	2.35E+01		0.1	1	0.05	0.1	0.05	0.04 J	0.02	0.18
Nickel	MG/KG	342[4]	100%	45	45	1.56E+03		49	7	153	20.4	17	24.3 J	16.4	24.4
Potassium	MG/KG	1450	100%	45	45			2380		874	958	837	723 J	541	818
Selenium	MG/KG	146[4]	47%	21	45	3.91E+02		2	5	18	0.56 U	0.6 U	0.57 UJ	0.48 U	0.55 U
Silver	MG/KG	10.5	18%	6	34	3.91E+02		0.75	4	10.5	0.36 U	0.39 U	0.37 UJ	0.31 U	0.36 U
Sodium	MG/KG	372	82%	37	45			172	24	132 U	162	266	184 J	186	209
Thallium	MG/KG	163[4]	20%	9	45	5.16E+00	5	0.7	5	21.5	0.41 U	0.44 U	0.42 UJ	0.36 U	0.41 U
Vanadium	MG/KG	182[4]	100%	45	45	7.82E+01	1	150	1	69.4	17	11.6	13.4 J	8.1	12.4
Zinc	MG/KG	532	100%	45	45	2.35E+04		110	14	121 J	129 J	89.2 J	57.3 J	59.3 J	132 J
Other															
Total Organic Carbon	MG/KG	8900	100%	45	45					5400	7000	6200	7200 J	4400	2800
Total Petroleum Hydrocarbons	MG/KG	2200	33%	15	45					54 U	910	58 U	55 UJ	150	52 U

NOTES:
1) Sample-duplicate pairs were averaged and the average results was used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Residential Soil (October 2004)
3) The criteria value source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046, Revised January 24, 1994.
4) The maximum detected concentration was obtained from the average of the sample and its duplicate.

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process
NJ = compound was "tentatively identified" and the associated numerical value is approximate

Table C-9
SURFACE WATER SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SW121I-1	SW121I-10	SW121I-2	SW121I-3
Matrix										SW	SW	SW	SW
Sample ID										121I-3000	121I-3010	121I-3001	121I-3002
Sample Depth to Top of Sample										0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A
Sample Date										11/6/2002	11/6/2002	11/6/2002	11/6/2002
QC Code										SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0	0%	0	7	3.17E+03				0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	0	7	5.53E-02				0.7 U	0.7 U	0.7 U	0.7 U
1,1,2-Trichloroethane	UG/L	0	0%	0	7	2.00E-01				0.62 U	0.62 U	0.62 U	0.62 U
1,1-Dichloroethane	UG/L	0	0%	0	7	8.11E+02				0.66 U	0.66 U	0.66 U	0.66 U
1,1-Dichloroethene	UG/L	0	0%	0	7	3.39E+02				0.69 U	0.69 U	0.69 U	0.69 U
1,2-Dichloroethane	UG/L	0	0%	0	7	1.23E-01				0.56 U	0.56 U	0.56 U	0.56 U
1,2-Dichloropropane	UG/L	0	0%	0	7	1.65E-01				0.73 U	0.73 U	0.73 U	0.73 U
Acetone	UG/L	0	0%	0	7	5.48E+03				3.5 UJ	3.5 U	3.5 U	3.5 U
Benzene	UG/L	0	0%	0	7	3.54E-01				0.71 U	0.71 U	0.71 U	0.71 U
Bromodichloromethane	UG/L	0	0%	0	7	1.81E-01				0.73 U	0.73 U	0.73 U	0.73 U
Bromoform	UG/L	0	0%	0	7	8.51E+00				0.49 U	0.49 U	0.49 U	0.49 U
Carbon disulfide	UG/L	0	0%	0	7	1.04E+03				0.72 U	0.72 U	0.72 U	0.72 U
Carbon tetrachloride	UG/L	0	0%	0	7	1.71E-01				0.47 U	0.47 U	0.47 U	0.47 U
Chlorobenzene	UG/L	0	0%	0	7	1.06E+02		5		0.78 U	0.78 U	0.78 U	0.78 U
Chlorodibromomethane	UG/L	0	0%	0	7	1.33E-01				0.66 U	0.66 U	0.66 U	0.66 U
Chloroethane	UG/L	0	0%	0	7	4.64E+00				2.4 U	2.4 U	2.4 U	2.4 U
Chloroform	UG/L	0	0%	0	7	1.66E-01				0.61 U	0.61 U	0.61 U	0.61 U
Cis-1,2-Dichloroethene	UG/L	0	0%	0	7	6.08E+01				0.62 U	0.62 U	0.62 U	0.62 U
Cis-1,3-Dichloropropene	UG/L	0	0%	0	7					0.66 U	0.66 U	0.66 U	0.66 U
Ethyl benzene	UG/L	0	0%	0	7	1.34E+03				0.76 U	0.76 U	0.76 U	0.76 U
Meta/Para Xylene	UG/L	0	0%	0	7					1.5 U	1.5 U	1.5 U	1.5 U
Methyl bromide	UG/L	0	0%	0	7	8.66E+00				0.38 UJ	0.38 U	0.38 U	0.38 U
Methyl butyl ketone	UG/L	0	0%	0	7					0.6 U	0.6 U	0.6 U	0.6 U
Methyl chloride	UG/L	0	0%	0	7	1.58E+02				0.51 U	0.51 U	0.51 U	0.51 U
Methyl ethyl ketone	UG/L	0	0%	0	7	6.97E+03				2.3 U	2.3 U	2.3 U	2.3 U
Methyl isobutyl ketone	UG/L	0	0%	0	7	1.99E+03				0.81 UJ	0.81 U	0.81 U	0.81 U
Methylene chloride	UG/L	0	0%	0	7	4.28E+00				1.8 U	1.8 U	1.8 U	1.8 U
Ortho Xylene	UG/L	0	0%	0	7					0.72 U	0.72 U	0.72 U	0.72 U
Styrene	UG/L	0	0%	0	7	1.64E+03				0.92 U	0.92 U	0.92 U	0.92 U
Tetrachloroethene	UG/L	0	0%	0	7	1.04E-01				0.7 UJ	0.7 U	0.7 U	0.7 U
Toluene	UG/L	0	0%	0	7	7.23E+02		6000		0.71 U	0.71 U	0.71 U	0.71 U
Trans-1,2-Dichloroethene	UG/L	0	0%	0	7	1.22E+02				0.81 U	0.81 U	0.81 U	0.81 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0	7					0.66 U	0.66 U	0.66 U	0.66 U
Trichloroethene	UG/L	0	0%	0	7	2.80E-02		40		0.72 U	0.72 U	0.72 U	0.72 U
Vinyl chloride	UG/L	0	0%	0	7	1.98E-02				0.79 U	0.79 U	0.79 U	0.79 U

Table C-9
SURFACE WATER SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	NYSDEC Criteria Value [3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SW121I-1	SW121I-10	SW121I-2	SW121I-3
Matrix										SW	SW	SW	SW
Sample ID										121I-3000	121I-3010	121I-3001	121I-3002
Sample Depth to Top of Sample										0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A
Sample Date										11/6/2002	11/6/2002	11/6/2002	11/6/2002
QC Code										SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1
Semivolatile Organic Compounds													
1,2,4-Trichlorobenzene	UG/L	0	0%	0	7	7.16E+00		5		10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	UG/L	0	0%	0	7	3.70E+02		5		10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	UG/L	0	0%	0	7	1.83E+02		5		10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	UG/L	0	0%	0	7	5.02E-01		5		10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	UG/L	0	0%	0	4	3.65E+03				10 U	10 U	10 R	10 R
2,4,6-Trichlorophenol	UG/L	0	0%	0	4	3.65E+00				10 U	10 U	10 R	10 R
2,4-Dichlorophenol	UG/L	0	0%	0	4	1.09E+02		1		10 U	10 U	10 R	10 R
2,4-Dimethylphenol	UG/L	0	0%	0	4	7.30E+02		1000		10 U	10 U	10 R	10 R
2,4-Dinitrophenol	UG/L	0	0%	0	4	7.30E+01		400		10 UJ	10 UJ	10 R	10 R
2,4-Dinitrotoluene	UG/L	0	0%	0	7	7.30E+01				10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	UG/L	0	0%	0	7	3.65E+01				10 U	10 U	10 U	10 U
2-Chloronaphthalene	UG/L	0	0%	0	7	4.87E+02				10 U	10 U	10 U	10 U
2-Chlorophenol	UG/L	0	0%	0	4	3.04E+01				10 U	10 U	10 R	10 R
2-Methylnaphthalene	UG/L	0	0%	0	7			4.7		10 U	10 U	10 U	10 U
2-Methylphenol	UG/L	0	0%	0	4	1.82E+03				10 UJ	10 U	10 R	10 R
2-Nitroaniline	UG/L	0	0%	0	7	1.09E+02				10 U	10 UJ	10 U	10 U
2-Nitrophenol	UG/L	0	0%	0	4					10 U	10 U	10 R	10 R
3 or 4-Methylphenol	UG/L	0	0%	0	7					10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	UG/L	0	0%	0	7	1.49E-01				10 U	10 U	10 U	10 U
3-Nitroaniline	UG/L	0	0%	0	7	3.20E+00				10 U	10 U	10 U	10 UJ
4,6-Dinitro-2-methylphenol	UG/L	0	0%	0	4	3.65E+00				10 UJ	10 UJ	10 R	10 R
4-Bromophenyl phenyl ether	UG/L	0	0%	0	7					10 UJ	10 UJ	10 UJ	10 UJ
4-Chloro-3-methylphenol	UG/L	0	0%	0	4					10 U	10 U	10 R	10 R
4-Chloroaniline	UG/L	0	0%	0	7	1.46E+02				10 U	10 UJ	10 U	10 U
4-Chlorophenyl phenyl ether	UG/L	0	0%	0	7					10 U	10 U	10 U	10 U
4-Nitroaniline	UG/L	0	0%	0	7	3.20E+00				10 UJ	10 UJ	10 UJ	10 UJ
4-Nitrophenol	UG/L	0	0%	0	4					10 UJ	10 UJ	10 R	10 R
Acenaphthene	UG/L	0	0%	0	7	3.65E+02				10 U	10 U	10 U	10 U
Acenaphthylene	UG/L	0	0%	0	7					10 U	10 U	10 U	10 U
Anthracene	UG/L	0	0%	0	7	1.83E+03				10 U	10 U	10 U	10 U
Benzo(a)anthracene	UG/L	0	0%	0	7	9.21E-02				10 U	10 U	10 U	10 U
Benzo(a)pyrene	UG/L	0	0%	0	7	9.21E-03				10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	UG/L	0	0%	0	7	9.21E-02				10 U	10 U	10 U	10 U
Benzo(ghi)perylene	UG/L	0	0%	0	7					10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	UG/L	0	0%	0	7	9.21E-01				10 U	10 U	10 U	10 U
Bis(2-Chloroethoxy)methane	UG/L	0	0%	0	7					10 U	10 U	10 U	10 U

Table C-9
SURFACE WATER SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SW121I-1	SW121I-10	SW121I-2	SW121I-3
Matrix										SW	SW	SW	SW
Sample ID										121I-3000	121I-3010	121I-3001	121I-3002
Sample Depth to Top of Sample										0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A
Sample Date										11/6/2002	11/6/2002	11/6/2002	11/6/2002
QC Code										SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Bis(2-Chloroethyl)ether	UG/L	0	0%	0	7	1.02E-02				10 U	10 U	10 U	10 U
Bis(2-Chloroisopropyl)ether	UG/L	0	0%	0	7	2.74E-01				10 U	10 U	10 U	10 U
Bis(2-Ethylhexyl)phthalate	UG/L	0	0%	0	7	4.80E+00		0.6		10 U	10 U	10 U	10 U
Butylbenzylphthalate	UG/L	1.1	14%	1	7	7.30E+03				10 U	1.1 J	10 U	10 U
Carbazole	UG/L	0	0%	0	7	3.36E+00				10 U	10 UJ	10 U	10 U
Chrysene	UG/L	0	0%	0	7	9.21E+00				10 U	10 UJ	10 U	10 U
Di-n-butylphthalate	UG/L	0	0%	0	7	3.65E+03				10 UJ	10 UJ	10 UJ	10 UJ
Di-n-octylphthalate	UG/L	0	0%	0	7	1.46E+03				10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	UG/L	0	0%	0	7	9.21E-03				10 U	10 UJ	10 U	10 U
Dibenzofuran	UG/L	0	0%	0	7	1.22E+01				10 U	10 U	10 U	10 U
Diethyl phthalate	UG/L	0	0%	0	7	2.92E+04				10 U	10 UJ	10 U	10 U
Dimethylphthalate	UG/L	0	0%	0	7	3.65E+05				10 U	10 U	10 U	10 U
Fluoranthene	UG/L	1.1	14%	1	7	1.46E+03				10 U	10 U	10 U	10 U
Fluorene	UG/L	0	0%	0	7	2.43E+02				10 U	10 U	10 U	10 U
Hexachlorobenzene	UG/L	0	0%	0	7	4.20E-02		0.00003		10 UJ	10 UJ	10 UJ	10 UJ
Hexachlorobutadiene	UG/L	0	0%	0	7	8.62E-01		0.01		10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	UG/L	0	0%	0	7	2.19E+02		0.45		10 U	10 UJ	10 U	10 UJ
Hexachloroethane	UG/L	0	0%	0	7	4.80E+00		0.6		10 U	10 U	10 U	10 UJ
Indeno(1,2,3-cd)pyrene	UG/L	0	0%	0	7	9.21E-02				10 UJ	10 UJ	10 UJ	10 U
Isophorone	UG/L	0	0%	0	7	7.08E+01				10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	UG/L	0	0%	0	7	1.37E+01				10 U	10 U	10 U	10 UJ
N-Nitrosodipropylamine	UG/L	0	0%	0	7	9.60E-03				10 U	10 U	10 U	10 U
Naphthalene	UG/L	0	0%	0	7	6.20E+00				10 U	10 U	10 U	10 U
Nitrobenzene	UG/L	0	0%	0	7	3.40E+00				10 U	10 U	10 U	10 U
Pentachlorophenol	UG/L	0	0%	0	4	5.60E-01		1		10 UJ	10 UJ	10 R	10 R
Phenanthrene	UG/L	0	0%	0	7					10 U	10 U	10 U	10 U
Phenol	UG/L	0	0%	0	4	1.09E+04		5		10 U	10 U	10 R	10 R
Pyrene	UG/L	0	0%	0	7	1.83E+02				10 UJ	10 UJ	10 UJ	10 UJ
Pesticides/PCBs													
4,4'-DDD	UG/L	0	0%	0	7	2.80E-01		0.00008		0.01 U	0.01 U	0.01 U	0.01 U
4,4'-DDE	UG/L	0	0%	0	7	1.98E-01		0.000007		0.005 U	0.005 U	0.005 U	0.005 U
4,4'-DDT	UG/L	0	0%	0	7	1.98E-01		0.00001		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Aldrin	UG/L	0	0%	0	7	3.95E-03		0.001		0.02 U	0.02 U	0.02 U	0.02 U
Alpha-BHC	UG/L	0	0%	0	7	1.07E-02				0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Alpha-Chlordane	UG/L	0	0%	0	7					0.02 U	0.02 U	0.02 U	0.02 U
Beta-BHC	UG/L	0	0%	0	7	3.74E-02				0.01 U	0.01 U	0.01 U	0.01 U
Chlordane	UG/L	0	0%	0	7					0.13 U	0.13 U	0.13 U	0.13 U

Table C-9
SURFACE WATER SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SW121I-1	SW121I-10	SW121I-2	SW121I-3
Matrix										SW	SW	SW	SW
Sample ID										121I-3000	121I-3010	121I-3001	121I-3002
Sample Depth to Top of Sample										0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A
Sample Date										11/6/2002	11/6/2002	11/6/2002	11/6/2002
QC Code										SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses** [1]	**Region IX PRG Criteria Value** [2]	**Exceedances**	**NYSDEC Criteria Value** [3]	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Delta-BHC	UG/L	0	0%	0	7					0.004 U	0.004 U	0.004 U	0.004 U
Dieldrin	UG/L	0	0%	0	7	4.20E-03		0.0000006		0.009 U	0.009 U	0.009 U	0.009 U
Endosulfan I	UG/L	0	0%	0	7			0.009		0.01 U	0.01 U	0.01 U	0.01 U
Endosulfan II	UG/L	0	0%	0	7			0.009		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Endosulfan sulfate	UG/L	0	0%	0	7					0.02 U	0.02 U	0.02 U	0.02 U
Endrin	UG/L	0	0%	0	7	1.09E+01		0.002		0.02 U	0.02 U	0.02 U	0.02 U
Endrin aldehyde	UG/L	0	0%	0	7					0.02 U	0.02 U	0.02 U	0.02 U
Endrin ketone	UG/L	0	0%	0	7					0.009 U	0.009 U	0.009 U	0.009 U
Gamma-BHC/Lindane	UG/L	0	0%	0	7	5.17E-02				0.009 U	0.009 U	0.009 U	0.009 U
Gamma-Chlordane	UG/L	0	0%	0	7					0.01 U	0.01 U	0.01 U	0.01 U
Heptachlor	UG/L	0	0%	0	7	1.49E-02		0.0002		0.007 U	0.007 U	0.007 U	0.007 U
Heptachlor epoxide	UG/L	0	0%	0	7	7.39E-03		0.0003		0.008 U	0.008 U	0.008 U	0.008 U
Methoxychlor	UG/L	0	0%	0	7	1.82E+02		0.03		0.008 U	0.008 U	0.008 U	0.008 U
Toxaphene	UG/L	0	0%	0	7	6.11E-02		0.000006		0.12 U	0.12 U	0.12 U	0.12 U
Aroclor-1016	UG/L	0	0%	0	7	9.60E-01		0.000001		0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ
Aroclor-1221	UG/L	0	0%	0	7			0.000001		0.08 U	0.08 U	0.08 U	0.08 U
Aroclor-1232	UG/L	0	0%	0	7			0.000001		0.09 UJ	0.09 UJ	0.09 UJ	0.09 UJ
Aroclor-1242	UG/L	0	0%	0	7					0.08 UJ	0.08 UJ	0.08 UJ	0.08 UJ
Aroclor-1248	UG/L	0	0%	0	7			0.000001		0.12 U	0.12 U	0.12 U	0.12 U
Aroclor-1254	UG/L	0	0%	0	7	3.36E-02		0.000001		0.05 U	0.05 U	0.05 U	0.05 U
Aroclor-1260	UG/L	0	0%	0	7			0.000001		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Metals and Cyanide													
Aluminum	UG/L	2050	100%	7	7	3.65E+04		100	3	37.6	1490	23.9	43.5
Antimony	UG/L	0	0%	0	7	1.46E+01				4.7 U	4.7 U	4.7 U	4.7 U
Arsenic	UG/L	0	0%	0	7	4.48E-02		150		2.8 U	2.8 U	2.8 U	2.8 U
Barium	UG/L	49.2	86%	6	7	2.55E+03				49.2	48.9	33.8	33.2
Beryllium	UG/L	0.28	86%	6	7	7.30E+01		1100		0.21	0.26	0.16	0.16
Cadmium	UG/L	0.54	14%	1	7	1.82E+01		3.84		0.4 U	0.54	0.4 U	0.4 U
Calcium	UG/L	74200	100%	7	7					74200	56600	60900	61100
Chromium	UG/L	6	71%	5	7			139.45		1.9	4.3	1.1	0.6 U
Cobalt	UG/L	3	29%	2	7	7.30E+02		5		0.6 U	2.8	0.6 U	0.6 U
Copper	UG/L	11.2	86%	6	7	1.46E+03		17.32		1.4	7.2	1.2	2
Cyanide, Amenable	MG/L	0	0%	0	7					0.01 U	0.01 U	0.01 U	0.01 U
Cyanide, Total	MG/L	0	0%	0	7					0.01 U	0.01 U	0.01 U	0.01 U
Iron	UG/L	3410	71%	5	7	1.09E+04		300	2	32.3 J	3080	17.3 U	17.3 U
Lead	UG/L	26.3	57%	4	7			1.4624632	4	2.1 U	21	4.3 J	2.1 U
Magnesium	UG/L	11100	100%	7	7					11100	7240	7790	9700

Table C-9
SURFACE WATER SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses[1]	Region IX PRG Criteria Value[2]	Exceedances	NYSDEC Criteria Value[3]	Exceedances	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Facility										SEAD-121I		SEAD-121I		SEAD-121I		SEAD-121I	
Location ID										SW121I-1		SW121I-10		SW121I-2		SW121I-3	
Matrix										SW		SW		SW		SW	
Sample ID										121I-3000		121I-3010		121I-3001		121I-3002	
Sample Depth to Top of Sample										0		0		0		0	
Sample Depth to Bottom of Sample										N/A		N/A		N/A		N/A	
Sample Date										11/6/2002		11/6/2002		11/6/2002		11/6/2002	
QC Code										SA		SA		SA		SA	
Study ID										PID-RI		PID-RI		PID-RI		PID-RI	
										1		1		1		1	
Manganese	UG/L	206	100%	7	7	8.76E+02				18		139		0.8		1.7	
Mercury	UG/L	0	0%	0	7	1.09E+01		0.0007		0.2	U	0.2	U	0.2	U	0.2	U
Nickel	UG/L	3.6	29%	2	7	7.30E+02		99.92		1.8	U	3.5		1.8	U	1.8	U
Potassium	UG/L	4640	100%	7	7					2400	J	3200	J	1700	J	1290	J
Selenium	UG/L	2.5[4]	14%	1	7	1.82E+02		4.6		3	U	3	U	3	U	3	U
Silver	UG/L	0	0%	0	7	1.82E+02		0.1		1	U	1	U	1	U	1	U
Sodium	UG/L	38500	100%	7	7					18700	J	38500	J	14900	J	30900	J
Thallium	UG/L	0	0%	0	7	2.41E+00		8		5.4	U	5.4	U	5.4	U	5.4	U
Vanadium	UG/L	3.9	43%	3	7	3.65E+01		14		2.1		3.3		0.7	U	0.7	U
Zinc	UG/L	190	100%	7	7	1.09E+04		159.25	1	15.9		54.1		12.5		16.4	
Other																	
Total Petroleum Hydrocarbons	MG/L	0	0%	0	7					1	U	1	U	1	U	1	U

NOTES:
1) Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Tap Water (October 2004)
3) Action Levels are from the New York State Ambient Water Quality Standards, Class C for Surface Water.
4) The maximum detected concentration was obtained from the average of the sample (121I-3007) and its duplicate (121I-3005).

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process

Table C-9
SURFACE WATER SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I		SEAD-121I		SEAD-121I		SEAD-121I	
Location ID										SW121I-5		SW121I-6		SW121I-7		SW121I-7	
Matrix										SW		SW		SW		SW	
Sample ID										121I-3004		121I-3006		121I-3007		121I-3005	
Sample Depth to Top of Sample										0		0		0		0	
Sample Depth to Bottom of Sample										N/A		N/A		N/A		N/A	
Sample Date										11/6/2002		11/6/2002		10/26/2002		10/26/2002	
QC Code						**Region IX**				SA		SA		SA		SA	
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**NYSDEC**		PID-RI		PID-RI		PID-RI		PID-RI	
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**		1		1		1		1	
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses** [1]	**Value** [2]	**Exceedances**	**Value** [3]	**Exceedances**	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Volatile Organic Compounds																	
1,1,1-Trichloroethane	UG/L	0	0%	0	7	3.17E+03				0.75	U	0.75	U	5	U	5	U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	0	7	5.53E-02				0.7	U	0.7	U	5	U	5	U
1,1,2-Trichloroethane	UG/L	0	0%	0	7	2.00E-01				0.62	U	0.62	U	5	U	5	U
1,1-Dichloroethane	UG/L	0	0%	0	7	8.11E+02				0.66	U	0.66	U	5	U	5	U
1,1-Dichloroethene	UG/L	0	0%	0	7	3.39E+02				0.69	U	0.69	U	5	U	5	U
1,2-Dichloroethane	UG/L	0	0%	0	7	1.23E-01				0.56	U	0.56	U	5	U	5	U
1,2-Dichloropropane	UG/L	0	0%	0	7	1.65E-01				0.73	U	0.73	U	5	U	5	U
Acetone	UG/L	0	0%	0	7	5.48E+03				3.5	U	3.5	U	5	UJ	5	UJ
Benzene	UG/L	0	0%	0	7	3.54E-01				0.71	U	0.71	U	5	U	5	U
Bromodichloromethane	UG/L	0	0%	0	7	1.81E-01				0.73	U	0.73	U	5	U	5	U
Bromoform	UG/L	0	0%	0	7	8.51E+00				0.49	U	0.49	U	5	U	5	U
Carbon disulfide	UG/L	0	0%	0	7	1.04E+03				0.72	U	0.72	U	5	U	5	U
Carbon tetrachloride	UG/L	0	0%	0	7	1.71E-01				0.47	U	0.47	U	5	U	5	U
Chlorobenzene	UG/L	0	0%	0	7	1.06E+02		5		0.78	U	0.78	U	5	U	5	U
Chlorodibromomethane	UG/L	0	0%	0	7	1.33E-01				0.66	U	0.66	U	5	UJ	5	UJ
Chloroethane	UG/L	0	0%	0	7	4.64E+00				2.4	U	2.4	U	5	UJ	5	UJ
Chloroform	UG/L	0	0%	0	7	1.66E-01				0.61	U	0.61	U	5	U	5	U
Cis-1,2-Dichloroethene	UG/L	0	0%	0	7	6.08E+01				0.62	U	0.62	U	5	U	5	U
Cis-1,3-Dichloropropene	UG/L	0	0%	0	7					0.66	U	0.66	U	5	U	5	U
Ethyl benzene	UG/L	0	0%	0	7	1.34E+03				0.76	U	0.76	U	5	U	5	U
Meta/Para Xylene	UG/L	0	0%	0	7					1.5	U	1.5	U	5	U	5	U
Methyl bromide	UG/L	0	0%	0	7	8.66E+00				0.38	U	0.38	U	5	U	5	U
Methyl butyl ketone	UG/L	0	0%	0	7					0.6	U	0.6	U	5	U	5	U
Methyl chloride	UG/L	0	0%	0	7	1.58E+02				0.51	U	0.51	U	5	U	5	U
Methyl ethyl ketone	UG/L	0	0%	0	7	6.97E+03				2.3	U	2.3	U	5	UJ	5	UJ
Methyl isobutyl ketone	UG/L	0	0%	0	7	1.99E+03				0.81	U	0.81	U	5	U	5	U
Methylene chloride	UG/L	0	0%	0	7	4.28E+00				1.8	U	1.8	U	5	U	5	U
Ortho Xylene	UG/L	0	0%	0	7					0.72	U	0.72	U	5	U	5	U
Styrene	UG/L	0	0%	0	7	1.64E+03				0.92	U	0.92	U	5	U	5	U
Tetrachloroethene	UG/L	0	0%	0	7	1.04E-01				0.7	U	0.7	U	5	U	5	U
Toluene	UG/L	0	0%	0	7	7.23E+02		6000		0.71	U	0.71	U	5	U	5	U
Trans-1,2-Dichloroethene	UG/L	0	0%	0	7	1.22E+02				0.81	U	0.81	U	5	U	5	U
Trans-1,3-Dichloropropene	UG/L	0	0%	0	7					0.66	U	0.66	U	5	UJ	5	UJ
Trichloroethene	UG/L	0	0%	0	7	2.80E-02		40		0.72	U	0.72	U	5	U	5	U
Vinyl chloride	UG/L	0	0%	0	7	1.98E-02				0.79	U	0.79	U	5	UJ	5	UJ

Table C-9
SURFACE WATER SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SW121I-5	SW121I-6	SW121I-7	SW121I-7
Matrix										SW	SW	SW	SW
Sample ID										121I-3004	121I-3006	121I-3007	121I-3005
Sample Depth to Top of Sample										0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A
Sample Date										11/6/2002	11/6/2002	10/26/2002	10/26/2002
QC Code						**Region IX**				SA	SA	SA	SA
Study ID			**Frequency**	**Number**	**Number**	**PRG**		**NYSDEC**		PID-RI	PID-RI	PID-RI	PID-RI
		Maximum	**of**	**of Times**	**of**	**Criteria**		**Criteria**		1	1	1	1
Parameter	**Units**	**Value**	**Detection**	**Detected**	**Analyses [1]**	**Value [2]**	**Exceedances**	**Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Semivolatile Organic Compounds													
1,2,4-Trichlorobenzene	UG/L	0	0%	0	7	7.16E+00		5		10 U	10 U	10 U	10 UJ
1,2-Dichlorobenzene	UG/L	0	0%	0	7	3.70E+02		5		10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	UG/L	0	0%	0	7	1.83E+02		5		10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	UG/L	0	0%	0	7	5.02E-01		5		10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	UG/L	0	0%	0	4	3.65E+03				10 R	10 U	10 U	10 R
2,4,6-Trichlorophenol	UG/L	0	0%	0	4	3.65E+00				10 R	10 U	10 U	10 R
2,4-Dichlorophenol	UG/L	0	0%	0	4	1.09E+02		1		10 R	10 U	10 U	10 R
2,4-Dimethylphenol	UG/L	0	0%	0	4	7.30E+02		1000		10 R	10 U	10 U	10 R
2,4-Dinitrophenol	UG/L	0	0%	0	4	7.30E+01		400		10 R	10 UJ	10 UJ	10 R
2,4-Dinitrotoluene	UG/L	0	0%	0	7	7.30E+01				10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	UG/L	0	0%	0	7	3.65E+01				10 U	10 U	10 U	10 U
2-Chloronaphthalene	UG/L	0	0%	0	7	4.87E+02				10 U	10 U	10 U	10 U
2-Chlorophenol	UG/L	0	0%	0	4	3.04E+01				10 R	10 U	10 U	10 R
2-Methylnaphthalene	UG/L	0	0%	0	7			4.7		10 U	10 U	10 U	10 U
2-Methylphenol	UG/L	0	0%	0	4	1.82E+03				10 R	10 U	10 U	10 U
2-Nitroaniline	UG/L	0	0%	0	7	1.09E+02				10 UJ	10 UJ	10 UJ	10 U
2-Nitrophenol	UG/L	0	0%	0	4					10 R	10 U	10 U	10 R
3 or 4-Methylphenol	UG/L	0	0%	0	7					10 U	10 U	10 U	10 UJ
3,3'-Dichlorobenzidine	UG/L	0	0%	0	7	1.49E-01				10 U	10 U	10 U	10 R
3-Nitroaniline	UG/L	0	0%	0	7	3.20E+00				10 UJ	10 UJ	10 U	10 U
4,6-Dinitro-2-methylphenol	UG/L	0	0%	0	4	3.65E+00				10 R	10 UJ	10 U	10 R
4-Bromophenyl phenyl ether	UG/L	0	0%	0	7					10 UJ	10 UJ	10 U	10 U
4-Chloro-3-methylphenol	UG/L	0	0%	0	4					10 R	10 U	10 U	10 R
4-Chloroaniline	UG/L	0	0%	0	7	1.46E+02				10 UJ	10 UJ	10 U	10 U
4-Chlorophenyl phenyl ether	UG/L	0	0%	0	7					10 U	10 U	10 U	10 U
4-Nitroaniline	UG/L	0	0%	0	7	3.20E+00				10 UJ	10 UJ	10 U	10 U
4-Nitrophenol	UG/L	0	0%	0	4					10 R	10 UJ	10 U	10 R
Acenaphthene	UG/L	0	0%	0	7	3.65E+02				10 U	10 U	10 U	10 U
Acenaphthylene	UG/L	0	0%	0	7					10 U	10 U	10 U	10 U
Anthracene	UG/L	0	0%	0	7	1.83E+03				10 U	10 U	10 U	10 U
Benzo(a)anthracene	UG/L	0	0%	0	7	9.21E-02				10 U	10 U	10 U	10 U
Benzo(a)pyrene	UG/L	0	0%	0	7	9.21E-03				10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	UG/L	0	0%	0	7	9.21E-02				10 U	10 U	10 U	10 U
Benzo(ghi)perylene	UG/L	0	0%	0	7					10 UJ	10 UJ	10 U	10 U
Benzo(k)fluoranthene	UG/L	0	0%	0	7	9.21E-01				10 U	10 U	10 U	10 U
Bis(2-Chloroethoxy)methane	UG/L	0	0%	0	7					10 U	10 U	10 U	10 U

Table C-9
SURFACE WATER SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SW121I-5	SW121I-6	SW121I-7	SW121I-7
Matrix										SW	SW	SW	SW
Sample ID										121I-3004	121I-3006	121I-3007	121I-3005
Sample Depth to Top of Sample										0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A
Sample Date										11/6/2002	11/6/2002	10/26/2002	10/26/2002
QC Code										SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Bis(2-Chloroethyl)ether	UG/L	0	0%	0	7	1.02E-02				10 U	10 U	10 UJ	10 UJ
Bis(2-Chloroisopropyl)ether	UG/L	0	0%	0	7	2.74E-01				10 U	10 U	10 U	10 U
Bis(2-Ethylhexyl)phthalate	UG/L	0	0%	0	7	4.80E+00		0.6		10 U	10 U	10 U	10 U
Butylbenzylphthalate	UG/L	1.1	14%	1	7	7.30E+03				10 U	10 U	10 U	10 U
Carbazole	UG/L	0	0%	0	7	3.36E+00				10 UJ	10 UJ	10 U	10 U
Chrysene	UG/L	0	0%	0	7	9.21E+00				10 UJ	10 UJ	10 U	10 U
Di-n-butylphthalate	UG/L	0	0%	0	7	3.65E+03				10 UJ	10 UJ	10 U	10 U
Di-n-octylphthalate	UG/L	0	0%	0	7	1.46E+03				10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	UG/L	0	0%	0	7	9.21E-03				10 UJ	10 UJ	10 U	10 U
Dibenzofuran	UG/L	0	0%	0	7	1.22E+01				10 U	10 U	10 U	10 U
Diethyl phthalate	UG/L	0	0%	0	7	2.92E+04				10 UJ	10 UJ	10 U	10 U
Dimethylphthalate	UG/L	0	0%	0	7	3.65E+05				10 U	10 U	10 U	10 U
Fluoranthene	UG/L	1.1	14%	1	7	1.46E+03				10 U	1.1 J	10 U	10 U
Fluorene	UG/L	0	0%	0	7	2.43E+02				10 U	10 U	10 U	10 U
Hexachlorobenzene	UG/L	0	0%	0	7	4.20E-02		0.00003		10 UJ	10 UJ	10 U	10 U
Hexachlorobutadiene	UG/L	0	0%	0	7	8.62E-01		0.01		10 U	10 U	10 UJ	10 UJ
Hexachlorocyclopentadiene	UG/L	0	0%	0	7	2.19E+02		0.45		10 UJ	10 UJ	10 UJ	10 UJ
Hexachloroethane	UG/L	0	0%	0	7	4.80E+00		0.6		10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	UG/L	0	0%	0	7	9.21E-02				10 UJ	10 UJ	10 U	10 UJ
Isophorone	UG/L	0	0%	0	7	7.08E+01				10 U	10 U	10 UJ	10 U
N-Nitrosodiphenylamine	UG/L	0	0%	0	7	1.37E+01				10 U	10 U	10 UJ	10 UJ
N-Nitrosodipropylamine	UG/L	0	0%	0	7	9.60E-03				10 U	10 U	10 U	10 U
Naphthalene	UG/L	0	0%	0	7	6.20E+00				10 U	10 U	10 U	10 U
Nitrobenzene	UG/L	0	0%	0	7	3.40E+00				10 U	10 U	10 U	10 U
Pentachlorophenol	UG/L	0	0%	0	4	5.60E-01		1		10 R	10 UJ	10 U	10 R
Phenanthrene	UG/L	0	0%	0	7					10 U	10 U	10 U	10 U
Phenol	UG/L	0	0%	0	4	1.09E+04		5		10 R	10 U	10 U	10 R
Pyrene	UG/L	0	0%	0	7	1.83E+02				10 UJ	10 UJ	10 U	10 U
Pesticides/PCBs													
4,4'-DDD	UG/L	0	0%	0	7	2.80E-01		0.00008		0.01 U	0.01 U	0.01 UJ	0.01 UJ
4,4'-DDE	UG/L	0	0%	0	7	1.98E-01		0.000007		0.005 U	0.005 U	0.005 UJ	0.005 UJ
4,4'-DDT	UG/L	0	0%	0	7	1.98E-01		0.00001		0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Aldrin	UG/L	0	0%	0	7	3.95E-03		0.001		0.02 U	0.02 U	0.02 UJ	0.02 UJ
Alpha-BHC	UG/L	0	0%	0	7	1.07E-02				0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Alpha-Chlordane	UG/L	0	0%	0	7					0.02 U	0.02 U	0.02 UJ	0.02 UJ
Beta-BHC	UG/L	0	0%	0	7	3.74E-02				0.01 U	0.01 U	0.01 UJ	0.01 UJ
Chlordane	UG/L	0	0%	0	7					0.13 U	0.13 U	0.13 U	0.13 U

Table C-9
SURFACE WATER SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Number of Times Detected	Number of Analyses [1]	Region IX PRG Criteria Value [2]	Exceedances	NYSDEC Criteria Value [3]	Exceedances	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility										SEAD-121I	SEAD-121I	SEAD-121I	SEAD-121I
Location ID										SW121I-5	SW121I-6	SW121I-7	SW121I-7
Matrix										SW	SW	SW	SW
Sample ID										121I-3004	121I-3006	121I-3007	121I-3005
Sample Depth to Top of Sample										0	0	0	0
Sample Depth to Bottom of Sample										N/A	N/A	N/A	N/A
Sample Date										11/6/2002	11/6/2002	10/26/2002	10/26/2002
QC Code										SA	SA	SA	SA
Study ID										PID-RI	PID-RI	PID-RI	PID-RI
										1	1	1	1
Delta-BHC	UG/L	0	0%	0	7					0.004 U	0.004 U	0.004 UJ	0.004 UJ
Dieldrin	UG/L	0	0%	0	7	4.20E-03		0.0000006		0.009 U	0.009 U	0.009 UJ	0.009 UJ
Endosulfan I	UG/L	0	0%	0	7			0.009		0.01 U	0.01 U	0.01 UJ	0.01 UJ
Endosulfan II	UG/L	0	0%	0	7			0.009		0.01 UJ	0.01 UJ	0.01 U	0.01 U
Endosulfan sulfate	UG/L	0	0%	0	7					0.02 U	0.02 U	0.02 U	0.02 U
Endrin	UG/L	0	0%	0	7	1.09E+01		0.002		0.02 U	0.02 U	0.02 UJ	0.02 UJ
Endrin aldehyde	UG/L	0	0%	0	7					0.02 U	0.02 U	0.02 U	0.02 U
Endrin ketone	UG/L	0	0%	0	7					0.009 U	0.009 U	0.009 U	0.009 U
Gamma-BHC/Lindane	UG/L	0	0%	0	7	5.17E-02				0.009 U	0.009 U	0.009 UJ	0.009 UJ
Gamma-Chlordane	UG/L	0	0%	0	7					0.01 U	0.01 U	0.01 UJ	0.01 UJ
Heptachlor	UG/L	0	0%	0	7	1.49E-02		0.0002		0.007 U	0.007 U	0.007 UJ	0.007 UJ
Heptachlor epoxide	UG/L	0	0%	0	7	7.39E-03		0.0003		0.008 U	0.008 U	0.008 UJ	0.008 UJ
Methoxychlor	UG/L	0	0%	0	7	1.82E+02		0.03		0.008 U	0.008 U	0.008 U	0.008 U
Toxaphene	UG/L	0	0%	0	7	6.11E-02		0.000006		0.12 U	0.12 U	0.12 U	0.12 U
Aroclor-1016	UG/L	0	0%	0	7	9.60E-01		0.000001		0.24 UJ	0.24 UJ	0.5 UJ	0.5 UJ
Aroclor-1221	UG/L	0	0%	0	7			0.000001		0.08 U	0.08 U	0.5 U	0.5 U
Aroclor-1232	UG/L	0	0%	0	7			0.000001		0.09 UJ	0.09 UJ	0.5 UJ	0.5 UJ
Aroclor-1242	UG/L	0	0%	0	7					0.08 UJ	0.08 UJ	0.5 U	0.5 U
Aroclor-1248	UG/L	0	0%	0	7			0.000001		0.12 U	0.12 U	0.5 U	0.5 U
Aroclor-1254	UG/L	0	0%	0	7	3.36E-02		0.000001		0.05 U	0.05 U	0.5 U	0.5 U
Aroclor-1260	UG/L	0	0%	0	7			0.000001		0.01 UJ	0.01 UJ	0.5 UJ	0.5 UJ
Metals and Cyanide													
Aluminum	UG/L	2050	100%	7	7	3.65E+04		100	3	119	2050	45.8	46.3
Antimony	UG/L	0	0%	0	7	1.46E+01				4.7 U	4.7 U	3.8 U	3.8 U
Arsenic	UG/L	0	0%	0	7	4.48E-02		150		2.8 U	2.8 U	4.5 U	4.5 U
Barium	UG/L	49.2	86%	6	7	2.55E+03				29.3	22.5	9.9 U	9.9 U
Beryllium	UG/L	0.28	86%	6	7	7.30E+01		1100		0.14	0.28	0.1 U	0.1 U
Cadmium	UG/L	0.54	14%	1	7	1.82E+01		3.84		0.4 U	0.4 U	0.8 U	0.8 U
Calcium	UG/L	74200	100%	7	7					33500	67200	18300	17700
Chromium	UG/L	6	71%	5	7			139.45		1.5	6	1.4 U	1.4 U
Cobalt	UG/L	3	29%	2	7	7.30E+02		5		0.6 U	3	0.7 U	0.7 U
Copper	UG/L	11.2	86%	6	7	1.46E+03		17.32		5	11.2	3.6 U	3.6 U
Cyanide, Amenable	MG/L	0	0%	0	7					0.01 U	0.01 U	0.01 U	0.01 U
Cyanide, Total	MG/L	0	0%	0	7					0.01 U	0.01 U	0.01 U	0.01 U
Iron	UG/L	3410	71%	5	7	1.09E+04		300	2	90.1 J	3410	41.8 J	41.8 J
Lead	UG/L	26.3	57%	4	7			1.4624632	4	6.6 J	26.3	3 U	3 U
Magnesium	UG/L	11100	100%	7	7					4130	7290	3660	3610

Table C-9
SURFACE WATER SAMPLE RESULTS
SEAD-121I
SEAD-121C and SEAD-121I RI REPORT
Seneca Army Depot Activity

Facility										SEAD-121I		SEAD-121I		SEAD-121I		SEAD-121I	
Location ID										SW121I-5		SW121I-6		SW121I-7		SW121I-7	
Matrix										SW		SW		SW		SW	
Sample ID										121I-3004		121I-3006		121I-3007		121I-3005	
Sample Depth to Top of Sample										0		0		0		0	
Sample Depth to Bottom of Sample										N/A		N/A		N/A		N/A	
Sample Date										11/6/2002		11/6/2002		10/26/2002		10/26/2002	
QC Code										SA		SA		SA		SA	
Study ID										PID-RI		PID-RI		PID-RI		PID-RI	
										1		1		1		1	
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Number of Times Detected**	**Number of Analyses [1]**	**Region IX PRG Criteria Value [2]**	**Exceedances**	**NYSDEC Criteria Value [3]**	**Exceedances**	Value	(Q)	Value	(Q)	Value	(Q)	Value	(Q)
Manganese	UG/L	206	100%	7	7	8.76E+02				43		206		5.3		3	
Mercury	UG/L	0	0%	0	7	1.09E+01		0.0007		0.2	U	0.2	U	0.2	U	0.2	U
Nickel	UG/L	3.6	29%	2	7	7.30E+02		99.92		1.8	U	3.6		2	U	2	U
Potassium	UG/L	4640	100%	7	7					3050	J	4640	J	630		660	
Selenium	UG/L	2.5 [4]	14%	1	7	1.82E+02		4.6		3	U	3	U	3.1	J	1.8	J
Silver	UG/L	0	0%	0	7	1.82E+02		0.1		1	U	1	U	3.7	U	3.7	U
Sodium	UG/L	38500	100%	7	7					3400		4810		2180		2300	
Thallium	UG/L	0	0%	0	7	2.41E+00		8		5.4	U	5.4	U	5.3	U	5.3	U
Vanadium	UG/L	3.9	43%	3	7	3.65E+01		14		0.7	U	3.9		1.4	UJ	1.4	UJ
Zinc	UG/L	190	100%	7	7	1.09E+04		159.25	1	32.9		190		14.7	J	13.8	J
Other																	
Total Petroleum Hydrocarbons	MG/L	0	0%	0	7					1	U	1	U	0.412	UJ	0.408	UJ

NOTES:
1) Sample-duplicate pair was averaged and the average results were used in the summary statistic presented in this table.
2) The criteria value source is the Region IX Preliminary Remediation Goals for Tap Water (October 2004)
3) Action Levels are from the New York State Ambient Water Quality Standards, Class C for Surface Water.
4) The maximum detected concentration was obtained from the average of the sample (121I-3007) and its duplicate (121I-3005).

U = compound was not detected
J = the reported value is an estimated concentration
UJ = the compound was not detected; the associated reporting limit is approximate
R = the data was rejected in the data validating process

APPENDIX D

SENECA SITE-WIDE BACKGROUND DATA

D-1	Background Soil Data
D-2	Background Groundwater Data

TABLE D-1
SOIL BACKGROUND DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

LOC_ID:	B-8-91		B-8-91		B-8-91		B-8-91		B-9-91		B-9-91		B-9-91		BK-1		BK-2	
QC CODE:	SA		SA		SA		SA		SA		SA		SA		SA		SA	
STUDY ID:	RI PHASE1		RI PHASE1		RI PHASE1		RI PHASE1		RI PHASE1		RI PHASE1		RI PHASE1		RI PHASE1		RI PHASE1	
TOP:																		
BOTTOM:																		
MATRIX:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE DATE:	11/05/91		11/05/91		11/05/91		11/05/91		11/05/91		11/05/91		11/05/91		12/16/92		12/16/92	
SAMP ID:	S1105-24SOIL1		S1105-25SOIL1		S1105-26(1)SOIL1		S1105-27SOIL1		S1105-28SOIL1		S1105-29SOIL1		S1105-30RESOIL1		BK-1SOIL3		BK-2RESOIL3	
METALs	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)
Aluminum	19200		20500		17700		12700		14800		8880		7160		19400		14400	
Antimony	10.3	UJ	8.8	UJ	8.2	UJ	8.4	UJ	9.9	UJ	9.9	UJ	7	UJ	7.9	U	7.2	U
Arsenic	5.1	J	6.1	J	6	J	4.2	J	4.3	J	3.8	J	4.4	J	3		2.7	
Barium	136	J	98.9	J	86.7	J	56.2	J	101	J	110	J	39.9	J	159		106	
Beryllium	1.4		1.2		1		0.78	J	1.1		0.76		0.52	J	1.1		0.81	
Cadmium	2.6		2.9		2.4		1.9		2.3		1.7		1.5		0.45	U	0.41	U
Calcium	5390		4870		3560		85900		45600		104000		101000		4590		22500	
Chromium	27.4	J	30.1	J	26.9	J	19.8	J	22.5	J	13.8	J	11.2	J	30		22.3	
Cobalt	13.8		18.4		14		14.2		13.7		10.7		8.1		14.4		12.3	
Copper	22.3		27.6		26		16.2		22.6		21.6		19.3		26.9		18.8	
Cyanide	0.6	U	0.63	U	0.67	U	0.58	U	0.7	U	0.63	U	0.62	U	0.57	U	0.61	U
Iron	37200		36100		32500		27400		31000		19600		17300		38600		26600	
Lead	14.5		11.4		13.6		10.1		10.8		10.1		7.8		15.8		18.9	
Magnesium	5850		7300		6490		6720		8860		17000		12600		5980		7910	
Manganese	1130		956		832		926		903		532		514		2380		800	
Mercury	0.09		0.06	J	0.06	J	0.05	J	0.08	J	0.04	J	0.05	J	0.13	J	0.11	
Nickel	42.3		48.7		44.4		30.4		38.4		23.8		19		47.7		31	
Potassium	1910		2110		1760		1430		1320		1080		1050		1720		1210	
Selenium	0.17	UJ	0.21	UJ	0.2	UJ	0.61	UJ	0.21	UJ	0.65	UJ	0.21	UJ	0.73	J	0.94	
Silver	1.6	U	1.3	U	1.2	U	1.3	U	1.5	U	1.5	U	1.1	U	0.47	U	0.43	U
Sodium	79.2	U	67.5	U	62.6	U	75.3	J	84.2	J	112	J	116	J	49.1	J	61.1	J
Thallium	0.47	U	0.58	U	0.57	U	0.34	U	0.59	U	0.36	U	0.6	U	0.42	U	0.38	U
Vanadium	32.2		25.4		26.4		15.7		19.7		19.5		12.9		28		22.4	
Zinc	85.1	J	94.2	J	85	J	75	J	126	J	84.3	J	74.8	J	98.6		63.7	

U = compound was not detected

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UJ = the compound was not detected; the associated reporting limit is approximate

R = the data was rejected in the data validating process

NJ = compound was "tentatively identified" and the associated numerical value is approximate

TABLE D-1
SOIL BACKGROUND DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

LOC_ID:	GB35		GB35		GB35		GB36		GB36		MW-36		MW-34		SB24-5		SB24-5	
QC CODE:	SA		SA		DU		SA		SA		SA		SA		SA		SA	
STUDY ID:	RI PHASE1		RI PHASE1		RI PHASE1		RI PHASE1		RI PHASE1		RI Phase 1 Step 1		RI PHASE1		ESI		ESI	
TOP:											-1				-1		-1	
BOTTOM:											-1				-1		-1	
MATRIX:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE DATE:	01/20/93		01/20/93		01/20/93		01/20/93		01/20/93		01/11/93		11/20/91		12/02/93		12/02/93	
SAMP ID:	GB35-1GRID		GB35-2GRID		GB35-6DUGRID		GB36-1GRID		GB36-2GRID		MW36-3GRID		S2011121MW34GRID		SB24-5-1		SB24-5-3	
METALs	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)
Aluminum	18000		17600		16200		18100		16200		12700		16100		16200		10100	
Antimony	5.8	UJ	6.8	J	6.3	J	5.9	J	5.8	UJ	5.7	UJ	5.7	J	12.5	UJ	5.8	UJ
Arsenic	6.2		7.7		5.3		4.6		9.7		2.9	J	6.3	U	4.2		3.3	
Barium	93.6		61.7		61.7		74.8		50.8		46.9	J	67.5		117		58.3	
Beryllium	0.85		0.74		0.77		0.77		0.65		0.59		0.86		0.98	J	0.48	J
Cadmium	0.33	U	0.31	U	0.35	U	0.3	U	0.33	U	0.33	U	2.3		0.78	U	0.36	U
Calcium	1590		17700		1370		1660		22900		4170		28600		4540		74200	
Chromium	23.5		29.3		25.1		24.8		27.4		23.3	J	26.6		24.5		16.9	
Cobalt	9.4		16.3		10.3		20.4		13.2		18.6		17		16		8.2	
Copper	17.5		24.5		17.2		17.7		17.5		19.2	J	32.7		28.4		20.9	
Cyanide	0.78	U	0.71	U	0.82	U	0.7	U	0.68	U	0.56	U	0.54	U	0.6	U	0.51	U
Iron	25200		34200		30800		26100		30700		27500		35000		33600		21300	
Lead	14.4		5.4		19.1		12.7		6.2		20.2		11.9		45.5	J	8.7	J
Magnesium	3850		7790		4490		4490		7150		5750		6850		5150		12100	
Manganese	701		646		775		426		507		540		803		1080		400	
Mercury	0.06	J	0.03	U	0.07	J	0.02	J	0.02	J	0.02	J	0.07	R	0.07	JR	0.06	JR
Nickel	26.3		48.7		28.3		28.3		42.8		43.3	J	49.3	J	37.3		26.4	
Potassium	1110		1110		975		1400		1100		754		1290		1170	J	993	
Selenium	0.23	UJ	0.23	UJ	0.21	UJ	0.2	UJ	0.18	UJ	0.19	UJ	0.18	UJ	0.15	UJ	0.23	UJ
Silver	0.34	U	0.32	U	0.36	U	0.31	U	0.34	U	0.34	U	0.87	J	1.6	U	0.73	U
Sodium	35.6	J	77.5	J	34.6	J	46.6	J	97.6	J	31.6	U	55.2	J	50.9	J	153	J
Thallium	0.55	U	0.54	U	0.5	U	0.46	U	0.43	U	0.45	U	0.51	U	0.16	U	0.25	U
Vanadium	27.1		22.3		26.1		27.8		19.7		16.2	J	22.3		29.9		14.4	
Zinc	55		83.4		53.1		59.2		74.1		34.7	J	95.7		85.7		62.8	

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TABLE D-1
SOIL BACKGROUND DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

LOC_ID:	SB24-5		MW25-1		MW25-1		MW25-6		MW25-6		MW25-6		MW25-6		MW64A-1		MW64A-1	
QC CODE:	SA		SA		SA		SA		SA		SA		DU		SA		SA	
STUDY ID:	ESI		ESI		ESI		RI ROUND1		RI ROUND1		RI ROUND1		RI ROUND1		ESI		ESI	
TOP:	-1		0		2		0		4		6		0		0		2	
BOTTOM:	-1		2		4		0.17		6		8		0.17		0.2		4	
MATRIX:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE DATE:	12/02/93		12/03/93		12/03/93		09/25/95		09/25/95		09/25/95		09/25/95		04/02/94		04/02/94	
SAMP ID:	SB24-5-5		SB25-6-01		SB25-6-02		SB25-7-00		SB25-7-03		SB25-7-04		SB25-7-10		MW64A-1-1		MW64A-1-2	
METALs	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)
Aluminum	13700		10600		7070		12500		8020		7550		12500		16100		19800	
Antimony	11.3	UJ	4.2	U	3	U	0.4		0.42	UJ	0.44	U	0.4	UJ	0.23	J	0.2	UJ
Arsenic	5		8.3		4.8		4.3		4.1		3.4		4.3		7.1		8.2	
Barium	67.2		59.1		35		71.3		58		52		71.3		83.7		91.2	
Beryllium	0.62	J	0.48	J	0.35	J	0.56		0.43		0.39		0.56		0.68	J	0.74	J
Cadmium	0.7	U	0.41	U	0.29	U	0.05	U	0.06	U	0.06	U	0.05	U	0.11	J	0.02	U
Calcium	49000		82500		122000		47400	J	120000	J	133000	J	47400	J	7210		4300	
Chromium	23.1		16.9		11.3		16.9	J	13.7	J	12.4	J	16.9	J	23		25	
Cobalt	12		11.2		6.6	J	8		8.2		6.9		8		11.8		11.3	
Copper	22.2		20.2	J	12	J	15.7		17.7		16.4		15.7		25.5		21	
Cyanide	0.57	U	0.58	U	0.64	U	0.44	U	0.57	U	0.51	U	0.444	U	0.66	U	0.56	U
Iron	26700		21400		15800		20500		18900		15400		20500		28500		28000	
Lead	7.9	J	9.5		13.8		11.1		7		6.5		11.1		21.6		13.6	
Magnesium	11400		19600		22800		11700		17400		20700		11700		5480		5010	
Manganese	450		722	J	610	J	452		735		402		452		558		604	
Mercury	0.04	JR	0.03	J	0.04	U	0.03		0.02		0.01		0.03		0.05	J	0.03	J
Nickel	35.2		26.8		18		22.3		26.4		22.4		22.3		32.2		28.6	
Potassium	1660		1480		1060		1110		1280		1430		1110		2590	J	2260	J
Selenium	0.22	UJ	0.97	J	0.63	J	0.63	U	0.7	U	0.74	U	0.66	U	0.96		1.7	
Silver	1.4	U	0.82	U	0.59	U	0.89	U	0.98	U	1	U	0.92	U	0.12	U	0.14	U
Sodium	139	J	269	J	186	J	59.9		89.1		110		57.5		27.5	U	31.8	U
Thallium	0.24	U	0.24	UJ	0.21	UJ	1.2		1.1		0.6	U	1.2		0.42	J	0.32	U
Vanadium	19.5		18.5		12		21		13.4		13.7		21		27.6		32.2	
Zinc	63.2		71.6	J	40.6	J	54.1		64.9		65.1		54.1		104		87.1	
U = compound was not detected																		
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TABLE D-1
SOIL BACKGROUND DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

LOC_ID:	MW64A-1		MW64B-1		MW64B-1		MW64B-1		MW64B-1		MW67-2		MW67-2		MW67-2		MW70-1	
QC CODE:	SA		SA		SA		SA		SA		SA		SA		SA		SA	
STUDY ID:	ESI		ESI		ESI		ESI		ESI		ESI		ESI		ESI		ESI	
TOP:	4		0		4		6		6		0		2		4		0	
BOTTOM:	6		0.2		6		8		8		0.2		4		5		0.2	
MATRIX:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE DATE:	04/02/94		05/13/94		05/13/94		05/13/94		05/13/94		03/30/94		03/30/94		03/30/94		05/11/94	
SAMP ID:	MW64A-1-3		MW64B-1-1		MW64B-1-2		MW64B-1-3		MW64B-1-04		MW67-2-1		MW67-2-2		MW67-2-3		MW70-1-1	
METALs	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)
Aluminum	12600		13400		8870		7620		7620		16700		14900		9460		12200	
Antimony	0.2	UJ	0.3	J	0.15	UJ	0.15	UJ	0.15	UJ	0.27	J	0.22	J	0.2	UJ	0.23	UJ
Arsenic	5		5.5		4.3		5.5		5.5		4.4		4.5		4.2		5.4	
Barium	62.3		75.5		70.8		76.7		76.7		114		105		80.8		67.5	
Beryllium	0.53	J	0.56	J	0.43	J	0.37	J	0.37	J	0.67	J	0.61	J	0.4	J	0.44	J
Cadmium	0.12	J	0.63	J	0.64	J	0.54	J	0.54	J	0.2	J	0.11	J	0.12	J	0.57	J
Calcium	72400		5530		70000		75900		75900		3580		79000		77800		3600	
Chromium	19		17.5		14.1		13.5		13.5		19.5		22.5		14.8		13.7	
Cobalt	9.1	J	7.2	J	10		7.4	J	7.4	J	7.5	J	10.4	J	9.7	J	5.5	J
Copper	23.7		18.9		20.2		17.6		17.6		16.5		20.3		20.5		12.4	
Cyanide	0.55	U	0.6	U	0.5	U	0.48	U	0.48	U	0.64	U	0.5	U	0.54	U		
Iron	22600		20900		18400		17100		17100		20500		24400		18700		17700	
Lead	15.4		21.4		8.8		8.3		8.3		17.5		9.3		8.5		20.7	
Magnesium	14800		3720		18900		21500		21500								2830	
Manganese	402		207		434		389		389		438		528		411		233	
Mercury	0.02	J	0.05	J	0.02	J	0.01	U	0.01	U	0.04		0.01	J	0.02	J	0.1	J
Nickel	26.7		19.8		28.2		22.6		22.6		18.7		32.3		25.9		12.3	
Potassium	2700	J	1700		1630		1650		1650		1780	J	3160	J	1970	J	982	J
Selenium	0.34	U	0.99	J	0.26	U	0.57	J	0.57	J	0.81		0.36	U	0.34	U	1	J
Silver	0.14	U	0.16	UJ	0.11	UJ	0.11	UJ	0.11	UJ	0.11	U	0.15	U	0.14	U		
Sodium	92.1	J	35.9	U	96.8	J	79.6	J	79.6	J	25.1	U	112	J	107	J	36.4	U
Thallium	0.32	U	0.41	J	0.24	U	0.24	U	0.24	U	0.48	J	0.34	U	0.32	U		
Vanadium	22.8		23.3		14.8		14.2		14.2		28.2		24.8		16.5		23.3	
Zinc	64.9		72.2		59		45.6		45.600		64.8		62		60.1		55.4	
U = compound was not detected																		
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SOIL BACKGROUND DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

LOC_ID:	MW70-1		MW70-1		SB11-3		SB11-3		SB11-3		SB13-1		SB13-1		SB13-1		MW13-6	
QC CODE:	SA		SA		SA		SA		SA		SA		SA		SA		SA	
STUDY ID:	ESI		ESI		ESI		ESI		ESI		ESI		ESI		ESI		ESI	
TOP:	2		4		0		2		10		0				6		0	
BOTTOM:	4		6		2		4		12		2				8		2	
MATRIX:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE DATE:	05/11/94		05/11/94		11/02/93		11/02/93		11/03/93		12/08/93				12/08/93		12/15/93	
SAMP ID:	MW70-1-2		MW70-1-3		SB11-3-1		SB11-3-2		SB11-3-6		SB13-1-1		SB13-1-2		SB13-1-3		SB13-6-1	
METALs	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)
Aluminum	9480		11000		17600		6330		10900		18300		8250		11700		16000	
Antimony	0.21	UJ	0.19	UJ	10.8	UJ	8	UJ	7.6	UJ	5.1	J	3.7	UJ	2.8	UJ	3.2	UJ
Arsenic	4.1		5.7		5.6	R	3.4	R	6	R	7		6.2		5.7		4.6	
Barium	56.6		79.9		113		57.4		62.7		106		88.1		33.9		103	
Beryllium	0.41	J	0.54	J	0.85	J	0.34	J	0.47	J	0.92	J	0.42	J	0.54	J	0.92	
Cadmium	0.43	J	0.8	J	0.67	U	0.5	U	0.48	U	0.45	U	0.36	U	0.27	U	0.31	U
Calcium	51600		48600		4950		91300		48600		3570		87700		50300		5140	
Chromium	14.7		17.8		24		11.1		18.6		29.4		13.3		19.6		21.5	
Cobalt	7.1	J	21		11.3		6.5	J	10.1		12		7.2	J	11.1		10.6	
Copper	19.7		33.5		20		12.2		21.7		11.6		18.4		17.6		16	
Cyanide					0.57	U	0.47	U	0.53	U	0.61	U	0.5	U	0.53	U	0.6	U
Iron	16000		26400		27200		13200		28300		32500		17400		24700		25300	
Lead	9.1		13.6		27.9		11.4		10.1		15	R	9	R	11.7	R	13.8	
Magnesium	13600		7980		4160		12900		10100		5890		20800		12600		3750	
Manganese	470		1040		674		356		434		451		517		404		934	
Mercury	0.03	J	0.02	J	0.05	J	0.04	U	0.03	U	0.03	J	0.07	J	0.02	U	0.03	J
Nickel	17.6		52.4		28.3		16.7		29.5		34.9		24		33.1		22.7	
Potassium	1590		1350		2110		1110		1230		2190		1390		1270		1330	
Selenium	0.64	J	0.32	U	0.24	J	0.13	UJ	0.21	UJ	0.26	J	0.56	J	0.51	J	1.2	
Silver					1.4	UJ	1	UJ	0.97	UJ	0.9	U	0.71	U	0.54	U	0.62	U
Sodium	126	J	165	J	66.3	J	136	J	146	J	80.6	J	155	J	134	J	61.9	J
Thallium					0.19	U	1.5	U	0.23	U	0.43	J	0.43	J	0.64	J	0.18	U
Vanadium	17.2		17.6		31.8		13.3		17		32.7		13.3		16.3		29.9	
Zinc	42.4		116		83.2	R	65	R	77.3	R	81.9		56.2		45.8		62.5	

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TABLE D-1
SOIL BACKGROUND DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

LOC_ID:	MW13-6		MW13-6		SB17-1		SB17-1		SB17-1		SB26-1		SB26-1		SB4-1		SB4-1	
QC CODE:	SA		SA		SA		SA		SA		SA		SA		SA		DU	
STUDY ID:	ESI		ESI		ESI		ESI		ESI		ESI		ESI		ESI		ESI	
TOP:	4		6		0		2		4		0		2		0		0	
BOTTOM:	6		8		2		4		6		2		4		2		2	
MATRIX:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE DATE:	12/15/93		12/15/93		12/01/93		12/01/93		12/01/93		11/17/93		11/17/93		12/06/93		12/06/93	
SAMP ID:	SB13-6-3		SB13-6-4		SB17-1-1		SB17-1-2		SB17-1-3		SB26-1-1		SB26-1-2		SB4-1-1		SB4-1-10	
METALs	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)
Aluminum	13500		10200		13700		18100		8700		5560		9040		14800		21000	
Antimony	2.5	UJ	2.9	UJ	11.7	UJ	11.8	UJ	9	UJ	7.3	UJ	6.7	UJ	4.8	UJ	3.8	UJ
Arsenic	2.7		2.3		4.3		5.2		3.4		3.2		5.3		6.2		4.2	
Barium	60.4		56.8		107		114		59.4		73.2		43.7		72		97.7	
Beryllium	0.71		0.58	J	0.7	J	0.9	J	0.42	J	0.35	J	0.41	J	0.73	J	0.64	J
Cadmium	0.25	U	0.28	U	0.73	U	0.74	U	0.56	U	0.46	U	0.42	U	0.47	U	0.37	U
Calcium	31800		45200		2870		20900		72800		293000		47300		4280		2460	
Chromium	23.5		17.8		17.6		25.1		13.9		10.3		15.7		23.2		27.9	
Cobalt	15		11.3		9.9	J	13.3		8.8		5.9	J	9.5		11.3		5.9	J
Copper	27.4		14.5		46.4		26.9		20		9.7		14.3		14.1		15.1	
Cyanide	0.53	U	0.51	U	0	NA	0	NA	0	NA	0.48	U	0.57	U	0.52	U	0.53	U
Iron	26900		20700		25100		29900		18800		8770		19100		27500		19500	
Lead	11.6		11.7		266		11.4	J	7.5	J	6.33		8.5		17.7	J	9.8	J
Magnesium	6640		5220		3330		8490		18100		29100		9160		4270		4460	
Manganese	508		556		547		487		391		309		551		615	JR	119	JR
Mercury	0.01	U	0.01	U	0.05	J	0.06	J	0.03	UJ	0.02	U	0.02	U	0.05	J	0.04	J
Nickel	41.9		33		19.1		42		25.2		31.6	R	23.9		27.8		25.1	
Potassium	1120		1000		628	J	1560		1090		1710		901		1250		2490	
Selenium	0.11	J	0.24	J	0.25	UJ	0.24	UJ	0.14	UJ	0.13	UJ	0.26	J	0.4	J	0.23	J
Silver	0.49	U	0.56	U	1.5	U	1.5	U	1.1	U	0.92	UJ	0.85	UJ	0.93	U	0.74	U
Sodium	116	J	141	J	46.2	J	74.6	J	137	J	192	J	108	J	43.8	U	39.2	J
Thallium	0.14	U	0.23	U	0.28	UJ	0.26	UJ	0.15	UJ	0.73	U	0.17	U	0.23	U	0.23	U
Vanadium	18.5		13.8		23.1		27		13.9		12.7		14.4		28.6		31	
Zinc	64.7		39.3		93.4		80.2		57.1		283	R	90.6		79.6		72.1	

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TABLE D-1
SOIL BACKGROUND DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

LOC_ID:	SB4-1		SB4-1		TP57-11	
QC CODE:	SA		SA		SA	
STUDY ID:	ESI		ESI		ESI	
TOP:	4		8		3	
BOTTOM:	6		10		3	
MATRIX:	SOIL		SOIL		SOIL	
SAMPLE DATE:	12/06/93		12/06/93		11/08/93	
SAMP ID:	SB4-1-2		SB4-1-3		TP57-11	
METALs	VALUE	(Q)	VALUE	(Q)	VALUE	(Q)
Aluminum	15300		19200		14600	
Antimony	5	UJ	2.8	UJ	11.3	UJ
Arsenic	3.9		21.5		5.9	
Barium	40.4	J	81.2		120	
Beryllium	0.74	J	1		0.81	J
Cadmium	0.49	U	0.27	U	0.71	U
Calcium	30900		14400		22300	
Chromium	27.6		32.7		20.1	
Cobalt	16.5		29.1		8.8	J
Copper	62.8		21.6		21.7	
Cyanide	0.53	U	0.47	U	0.54	U
Iron	34300		37900		24900	
Lead	7.5	J	9.1	J	11.3	
Magnesium	7130		8040		5360	
Manganese	337	R	795	R	329	
Mercury	0.04	J	0.04	J	0.04	J
Nickel	47.6		62.3		25.7	
Potassium	1300		2030		1430	
Selenium	0.09	U	0.14	U	0.46	J
Silver	0.98	U	0.64	J	1.4	UJ
Sodium	105	J	91.6	J	93	J
Thallium	0.16	U	0.24	U	0.17	U
Vanadium	22.2		29.3		27.8	
Zinc	102		115		57.9	
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TABLE D-2
BACKGROUND GROUNDWATER DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

STUDY ID:		RI PHASE1		3Q93		RI PHASE1		ESI		ESI	
LOC ID:		MW-21		MW-35		MW-35		MW11-1		MW13-1	
QC CODE:		SA		SA		SA		SA		SA	
SAMP. DETH TOP:		NONE		NONE		NONE		NONE		NONE	
SAMP. DEPTH BOT:		NONE		NONE		NONE		NONE		NONE	
MATRIX:		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER	
SAMP. DATE:		8-Jan-92		NONE		8-Jan-92		18-Jan-94		3-Feb-94	
SAMP ID:		MW-21GW		MW35OB3Q93M		MW-35GW		MW11-1-1		MW13-1-1	
PARAMETER	UNIT	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
METALS											
Aluminum	UG/L	1880	J	207		7550	J	53.7	J	42400	
Antimony	UG/L	55.9	U	16.8	U	55.5	U	21.4	U	33.9	J
Arsenic	UG/L	3.5	U	1	B	3.5	U	0.8	U	9.3	J
Barium	UG/L	47.5	J	97.3	B	103	J	25.2	J	337	
Beryllium	UG/L	1.6	R	0.3	U	1.8	R	0.4	U	2.2	J
Cadmium	UG/L	2.9	U	2.4	U	2.9	U	2.1	U	2.1	U
Calcium	UG/L	94100		108000		94700		97500		181000	
Chromium	UG/L	6.2	U	3.3	U	15.3	R	2.6	U	69.4	
Cobalt	UG/L	20	U	2.7	U	19.9	J	4.4	U	34.6	J
Copper	UG/L	14.5	U	2.1	U	14.4	U	3.1	U	23.3	J
Cyanide	UG/L	10	UJ	2.8	B	10	UJ	5	U	5	U
Iron	UG/L	2720		321		10500		41.4	J	69400	
Lead	UG/L	1.8	J	2.8	B	3.3		1.1	J	34.8	
Magnesium	UG/L	12200		15600		14600		29700		50300	
Manganese	UG/L	232	J	23.4		557	J	278		1120	
Mercury	UG/L	0.15	R	0.1	U	0.18	R	0.04	U	0.05	J
Nickel	UG/L	16	U	8.3	U	15.9	U	4	U	99.8	
Potassium	UG/L	3050	J	1400	B	4180	J	7100		10100	
Selenium	UG/L	1	U	1.2	B	1.1	J	0.7	U	3.6	J
Silver	UG/L	9.1	U	2.6	U	9	U	4.2	U	4.2	U
Sodium	UG/L	18400		13400		44100		4860	J	9350	
Thallium	UG/L	3.2	U	1.2	U	3.2	U	1.2	U	1.2	U
Vanadium	UG/L	30.6	U	3	U	30.3	U	3.7	U	70.8	
Zinc	UG/L	15.1	R	72.7		58.2		21.4		143	

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TABLE D-2
BACKGROUND GROUNDWATER DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

STUDY ID:		ESI		RI ROUND1		RI ROUND2		RI ROUND1		RI ROUND2	
LOC ID:		MW13-4		MW16-1		MW16-1		MW17-1		MW17-1	
QC CODE:		SA		SA		SA		SA		SA	
SAMP. DETH TOP:		NONE		3.3		731.5		3.4		731.1	
SAMP. DEPTH BOT:		NONE		5.3		728.4		7.4		727.1	
MATRIX:		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER	
SAMP. DATE:		4-Feb-94		27-Aug-96		7-Dec-96		29-Aug-96		11-Dec-96	
SAMP ID:		MW13-4-1		16101		16152		16108		16171	
PARAMETER	UNIT	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
METALS											
Aluminum	UG/L	5540		1850		143	U	90.4		386	
Antimony	UG/L	31.5	J	2	U	3	U	2	U	3	U
Arsenic	UG/L	1.4	U	2.7	U	4.4	U	2.7	U	4.4	U
Barium	UG/L	71.2	J	74.2		48.2	U	85		90.4	U
Beryllium	UG/L	0.4	U	0.23		0.2	U	0.26		0.2	U
Cadmium	UG/L	2.1	U	0.3	U	0.6	U	0.3	U	0.6	U
Calcium	UG/L	182000		157000		116000		108000		104000	
Chromium	UG/L	9.9	J	2.7		1	U	1	U	1	U
Cobalt	UG/L	6.7	J	2.1		1.3	U	1.2	U	2	U
Copper	UG/L	3.3	J	4.9		1.9	U	3.1		1.1	U
Cyanide	UG/L	5	U	5	U	5	UJ	5	U	5	UJ
Iron	UG/L	8010		2400	J	296		119		572	J
Lead	UG/L	3.1		1.7	U	1.5	U	1.7	U	1.5	U
Magnesium	UG/L	44900		23300		17600		22600		22900	
Manganese	UG/L	299		210		64.2		21.3		9.7	U
Mercury	UG/L	0.04	U	0.1	U	0.1	U	0.1	U	0.1	U
Nickel	UG/L	17.5	J	4.7		2.5	U	1.8		2.5	U
Potassium	UG/L	4460	J	1670		998	U	472		843	U
Selenium	UG/L	1.2	J	2.4	U	4.7	UJ	2.4	U	4.7	UJ
Silver	UG/L	4.2	U	1.3	U	1.5	U	1.3	U	1.5	U
Sodium	UG/L	9340		8750		3870	U	9290		8190	
Thallium	UG/L	1.2	U	4.2	U	5.9	U	4.4		4.1	U
Vanadium	UG/L	8.8	J	3.3		1.6	U	1.2	U	1.6	U
Zinc	UG/L	138		15.6	R	5.8	U	2.5	R	14.4	U
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TABLE D-2
BACKGROUND GROUNDWATER DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

STUDY ID:		RI ROUND1		RI ROUND2		RI ROUND1		RI ROUND2		ESI		RI ROUND1	
LOC ID:		MW25-1		MW25-1		MW25-6		MW25-6		MW26-1		MW26-1	
QC CODE:		SA		SA		SA		SA		SA		SA	
SAMP. DETH TOP:		NONE		NONE		NONE		NONE		NONE		NONE	
SAMP. DEPTH BOT:		NONE		NONE		NONE		NONE		NONE		NONE	
MATRIX:		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER	
SAMP. DATE:		22-Nov-95		10-Apr-96		21-Nov-95		31-Mar-96		21-Jan-94		13-Nov-95	
SAMP ID:		MW25-1		25001		MW25-6		25008		MW26-1-1		MW26-1	
PARAMETER	UNIT	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
METALS													
Aluminum	UG/L	18		34.5	U	162		529		188	J	457	
Antimony	UG/L	2.2	U	1.4		2.2	U	2.3	U	21.5	U	2.2	U
Arsenic	UG/L	2.1	U	4	U	2.1	U	3.5	U	0.8	U	2.1	U
Barium	UG/L	77.1		71.2		85.6		72.3		31.9	J	33.2	
Beryllium	UG/L	0.27	U	0.1	U	0.27	U	0.13	U	0.4	U	0.27	U
Cadmium	UG/L	0.3	U	0.3	U	0.3	U	0.32	U	2.1	U	0.3	U
Calcium	UG/L	128000		122000		133000		118000		115000		121000	
Chromium	UG/L	0.68		0.7	U	2.2		1.3	U	2.6	U	4.7	
Cobalt	UG/L	0.99	U	0.9	U	1.3		1.1	U	4.4	U	1.1	
Copper	UG/L	2		1	U	0.99		1.1		3.1	U	5.7	
Cyanide	UG/L	5	U	5	U	5	U	5	UJ	5	U	5	U
Iron	UG/L	27.3		21.7	U	308		623		286		867	
Lead	UG/L	3.4		1.9	U	4.4		1.1	U	0.5	U	7.8	
Magnesium	UG/L	23100		22800		35900		32900		16700		16600	
Manganese	UG/L	31.2		21.8		56		22		529		27.5	
Mercury	UG/L	0.02	U	0.2	U	0.02	U	0.1	U	0.05	J	0.02	U
Nickel	UG/L	0.99	U	1.6	U	2.6		1.7	U	4	U	6.2	
Potassium	UG/L	1030		861	J	1840	J	1420		10200		3620	
Selenium	UG/L	3.7	U	3.4	U	3.7	U	3.4	U	0.7	U	3.7	U
Silver	UG/L	0.8	U	1.3	U	0.8	U	1.1	U	4.2	U	0.8	U
Sodium	UG/L	64700	J	53100		20400	J	16500		30300		24600	
Thallium	UG/L	3	U	4.7	U	3	U	3.5	U	1.2	U	4.3	
Vanadium	UG/L	1.1	U	1.1	U	1.4		1.2	U	3.7	U	1.3	J
Zinc	UG/L	6.3		1.7		7.5		2.2		26.7		20.5	

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TABLE D-2
BACKGROUND GROUNDWATER DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

STUDY ID:		RI ROUND2		ESI		ESI		ESI		ESI		ESI	
LOC ID:		MW26-1		MW4-1		MW44A-1		MW44B-1		MW5-1		MW57-1	
QC CODE:		SA		SA		SA		SA		SA		SA	
SAMP. DETH TOP:		NONE		NONE		NONE		NONE		NONE		NONE	
SAMP. DEPTH BOT:		NONE		NONE		NONE		NONE		NONE		NONE	
MATRIX:		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER	
SAMP. DATE:		11-Apr-96		21-Jan-94		12-Jul-94		12-Jul-94		11-Jul-94		3-Feb-94	
SAMP ID:		26001		MW4-1-1		MW44A-1-1		MW44B-1-1		MW5-1-1		MW57-1-1	
PARAMETER	UNIT	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
METALS													
Aluminum	UG/L	38.7		41.9	U	69	J	288	J	1310		4200	
Antimony	UG/L	1.4		21.6	U	1.3	U	1.3	U	1.3	U	44.7	J
Arsenic	UG/L	4	U	2.2	J	2	U	2	U	2	U	1.4	U
Barium	UG/L	29.9		19.6	J	102	J	72.6	J	42.2	J	36.5	J
Beryllium	UG/L	0.1	U	0.4	U	0.1	U	0.1	U	0.1	U	0.4	U
Cadmium	UG/L	0.3	U	2.1	U	0.2	U	0.2	U	0.2	U	2.1	U
Calcium	UG/L	110000		137000		92200		120000		240000		82000	
Chromium	UG/L	0.73		2.6	U	0.4	U	0.4	U	2.5	J	7.7	J
Cobalt	UG/L	0.9	U	4.6	J	0.5	U	0.91	J	2.8	J	4.4	U
Copper	UG/L	1	U	3.1	U	0.5	U	0.5	U	2.2	J	3.1	U
Cyanide	UG/L	5	U	5	U	5	U	5	U	5	U	5	U
Iron	UG/L	58.4	J	332		114	J	666		2670		6360	
Lead	UG/L	1.9	U	0.5	U	0.9	U	0.9	U	0.89	U	2.1	J
Magnesium	UG/L	15500		57600		19000		31800		43200		11400	
Manganese	UG/L	2.5		346		18.2		219		450		245	
Mercury	UG/L	0.2	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
Nickel	UG/L	1.6	U	4	U	0.7	U	0.73	J	5.3	J	8.2	J
Potassium	UG/L	3860	J	7380		1050	J	2150	J	4650	J	3860	J
Selenium	UG/L	3.4	U	2.1	J	2.7	U	2.7	U	2.7	U	0.69	U
Silver	UG/L	1.3	U	4.2	U	0.5	U	0.68	J	0.5	U	4.2	U
Sodium	UG/L	34800		11700		2310	J	7190		73500		4080	J
Thallium	UG/L	4.7	U	1.2	U	1.9	U	4.7	J	1.9	U	1.2	U
Vanadium	UG/L	1.1	U	3.7	U	0.5	U	0.5	U	2.6	J	7.6	J
Zinc	UG/L	3.1	J	19.1	J	3.8	J	2.2	U	11.5	J	57.4	

U = compound was not detected

J = the reported value is an estimated concentration

UJ = the compound was not detected; the associated reporting limit is approximate

R = the data was rejected in the data validating process

NJ = compound was "tentatively identified" and the associated numerical value is approximate

TABLE D-2
BACKGROUND GROUNDWATER DATA
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

STUDY ID:		ESI		ESI		ESI		ESI		ESI		RI PHASE2	
LOC ID:		MW58-1		MW64A-1		MW64B-1		MW64C-9		MW64D-1		PT-10	
QC CODE:		SA		SA		SA		SA		SA		SA	
SAMP. DETH TOP:		NONE		NONE		NONE		NONE		NONE		NONE	
SAMP. DEPTH BOT:		NONE		NONE		NONE		NONE		NONE		NONE	
MATRIX:		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER		GROUNDWATER	
SAMP. DATE:		11-Jul-94		19-Jul-94		10-Jul-94		10-Jul-94		8-Jul-94		23-Jun-93	
SAMP ID:		MW58-1-1		MW64A-1-1G		MW64B-1-1G		MW64C-9-1		MW64D-1-1		PT10GW1	
PARAMETER	UNIT	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
METALS													
Aluminum	UG/L	440		398		198	J	38.2	J	177	J	72	U
Antimony	UG/L	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	49.5	UJ
Arsenic	UG/L	2	U	2	U	2	U	2	U	2	U	1.4	UJ
Barium	UG/L	71.9	J	42	J	104	J	20.4	J	88.6	J	193	J
Beryllium	UG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.89	U
Cadmium	UG/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2.8	U
Calcium	UG/L	113000		109000		138000		121000		142000		79100	
Chromium	UG/L	0.82	J	0.49	J	0.41	J	0.4	U	0.4	U	2.7	UJ
Cobalt	UG/L	0.64	J	0.5	U	1.1	J	0.5	U	0.69	J	5.4	U
Copper	UG/L	1.5	J	0.61	J	1	J	0.55	J	0.5	U	4.7	U
Cyanide	UG/L	5	U	5	U	5	U	5	U	5	U	10	UJ
Iron	UG/L	678		773	J	400		681		440		85.6	J
Lead	UG/L	0.89	U	0.89	U	0.9	U	0.9	U	0.9	U	0.79	U
Magnesium	UG/L	17300		16800		45600		49400		14800		34200	
Manganese	UG/L	84		28.3		98.9		96		223		124	
Mercury	UG/L	0.04	U	0.04	J	0.04	U	0.04	U	0.04	U	0.09	UJ
Nickel	UG/L	1.6	J	1	J	1.4	J	1.2	J	1.4	J	7.4	UJ
Potassium	UG/L	1460	J	1790	J	4780	J	1670	J	3340	J	2870	J
Selenium	UG/L	2.7	U	2.7	U	2.7	U	2.7	U	2.7	U	0.99	UJ
Silver	UG/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5.4	U
Sodium	UG/L	4180	J	2180	J	8140		6420		12300		41100	
Thallium	UG/L	1.9	U	1.9	U	1.9	U	1.9	U	2.2	J		
Vanadium	UG/L	0.81	J	1.3	J	0.73	J	0.61	J	0.69	J	6.7	UJ
Zinc	UG/L	7.1	J	3.9	J	3.9	J	3.9	J	3.8	J	8.8	J
U = compound was not detected													
J = the reported value is an estimated concentration													
UJ = the compound was not detected; the associated reporting limit is approximate													
R = the data was rejected in the data validating process													
NJ = compound was "tentatively identified" and the associated numerical value is approximate													

APPENDIX E

SEAD-121C HUMAN HEALTH RISK ASSESSMENT CALCULATION TABLES

TABLE E-1A
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Surface Soil	EPC Total Soils	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Volatile Organic Compounds																
Benzene	4E-03	5.5E-02	N/A	1.9E-01					6.27E-07	8.96E-09	2E-04	5E-10				
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	3.1E+00	1.8E+00		1.08E-06		8E-07		8.09E-08		6E-08		1.69E-08		1E-08
Benzo(a)pyrene	N/A	7.3E+00	3.4E+00	1.8E+00		1.20E-06		9E-06		8.36E-08		6E-07		1.88E-08		1E-07
Benzo(b)fluoranthene	N/A	7.3E-01	4.5E+00	2.4E+00		1.58E-06		1E-06		1.09E-07		8E-08		2.48E-08		2E-08
Benzo(k)fluoranthene	N/A	7.3E-02	2.4E+00	1.3E+00		8.41E-07		6E-08		5.94E-08		4E-09		1.32E-08		1E-09
Chrysene	N/A	7.3E-03	2.9E+00	1.7E+00		1.02E-06		7E-09		7.72E-08		6E-10		1.60E-08		1E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	2.2E-01	2.1E-01		7.74E-08		6E-07		9.54E-09		7E-08		1.21E-09		9E-09
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	3.6E-01	3.0E-01		1.25E-07		9E-08		1.38E-08		1E-08		1.96E-09		1E-09
Pesticides/PCBs																
Dieldrin	5E-05	1.6E+01	1.4E-02	7.3E-03	1.36E-08	4.86E-09	3E-04	8E-08	2.34E-08	3.34E-10	5E-04	5E-09	1.07E-09	7.63E-11	2E-05	1E-09
Aroclor-1242	N/A	2.0E+00	1.6E-02	1.4E-02		5.49E-09		1E-08		6.64E-10		1E-09		8.60E-11		2E-10
Aroclor-1254	2E-05	2.0E+00	2.8E-01	1.4E-01	2.74E-07	9.78E-08	1E-02	2E-07	4.61E-07	6.58E-09	2E-02	1E-08	2.15E-08	1.53E-09	1E-03	3E-09
Aroclor-1260	N/A	2.0E+00	3.0E-02	3.3E-02		1.05E-08		2E-08		1.54E-09		3E-09		1.65E-10		3E-10
Metals																
Antimony	4E-04	N/A	6.04E+01	3.0E+01	5.91E-05		1E-01		9.67E-05		2E-01		4.63E-06		1E-02	
Arsenic	3E-04	1.5E+00	5.79E+00	5.7E+00	5.67E-06	2.02E-06	2E-02	3E-06	1.85E-05	2.64E-07	6E-02	4E-07	4.45E-07	3.18E-08	1E-03	5E-08
Copper	4E-02	N/A	2.868E+03	1.5E+03	2.81E-03		7E-02		4.77E-03		1E-01		2.20E-04		5E-03	
Iron	3E-01	N/A	2.6903E+04	2.8E+04	2.63E-02		9E-02		8.88E-02		3E-01		2.06E-03		7E-03	
Total Hazard Quotient and Cancer Risk:							**3E-01**	**1E-05**			**7E-01**	**1E-06**			**3E-02**	**2E-07**

	Assumptions for Industrial Worker	**Assumptions for Construction Worker**	**Assumptions for Adolescent Trespasser**
CF =	1E-06 kg/mg	1E-06 kg/mg	1E-06 kg/mg
EPC=	EPC Surface Only	EPC Surface and Subsurface	EPC Surface Only
BW =	70 kg	70 kg	50 kg
IR =	100 mg/day	330 mg/day	100 mg/day
FI =	1 unitless	1 unitless	1 unitless
EF =	250 days/year	250 days/year	14 days/year
ED =	25 years	1 years	5 years
AT (Nc) =	9,125 days	365 days	1,825 days
AT (Car) =	25,550 days	25,550 days	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE E-1B
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF SOIL
CENTRAL TENDENCY (CT) - SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Surface Soil	EPC Total Soils	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Volatile Organic Compounds																
Benzene	4.0E-03	5.5E-02	N/A	1.9E-01					1.67E-07	2.38E-09	4E-05	1E-10				
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	3.1E+00	1.8E+00		1.70E-07		1E-07		2.15E-08		2E-08		8.46E-09		6E-09
Benzo(a)pyrene	N/A	7.3E+00	3.4E+00	1.8E+00		1.89E-07		1E-06		2.22E-08		2E-07		9.38E-09		7E-08
Benzo(b)fluoranthene	N/A	7.3E-01	4.5E+00	2.4E+00		2.50E-07		2E-07		2.90E-08		2E-08		1.24E-08		9E-09
Benzo(k)fluoranthene	N/A	7.3E-02	2.4E+00	1.3E+00		1.33E-07		1E-08		1.58E-08		1E-09		6.59E-09		5E-10
Chrysene	N/A	7.3E-03	2.9E+00	1.7E+00		1.61E-07		1E-09		2.05E-08		1E-10		8.01E-09		6E-11
Dibenz(a,h)anthracene	N/A	7.3E+00	2.2E-01	2.1E-01		1.22E-08		9E-08		2.53E-09		2E-08		6.07E-10		4E-09
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	3.6E-01	3.0E-01		1.97E-08		1E-08		3.67E-09		3E-09		9.78E-10		7E-10
Pesticides/PCBs																
Dieldrin	5.0E-05	1.6E+01	1.4E-02	7.3E-03	5.97E-09	7.67E-10	1E-04	1E-08	6.21E-09	8.88E-11	1E-04	1E-09	5.34E-10	3.81E-11	1E-05	6E-10
Aroclor-1242	N/A	2.0E+00	1.6E-02	1.4E-02		8.65E-10		2E-09		1.76E-10		4E-10		4.30E-11		9E-11
Aroclor-1254	2.0E-05	2.0E+00	2.8E-01	1.4E-01	1.20E-07	1.54E-08	6E-03	3E-08	1.22E-07	1.75E-09	6E-03	3E-09	1.07E-08	7.67E-10	5E-04	2E-09
Aroclor-1260	N/A	2.0E+00	3.0E-02	3.3E-02		1.66E-09		3E-09		4.10E-10		8E-10		8.27E-11		2E-10
Metals																
Antimony	4.0E-04	N/A	6.04E+01	3.0E+01	2.59E-05		6E-02		2.57E-05		6E-02		2.32E-06		6E-03	
Arsenic	3.0E-04	1.5E+00	5.79E+00	5.7E+00	2.48E-06	3.19E-07	8E-03	5E-07	4.91E-06	7.01E-08	2E-02	1E-07	2.22E-07	1.59E-08	7E-04	2E-08
Copper	4.0E-02	N/A	2.868E+03	1.5E+03	1.23E-03		3E-02		1.27E-03		3E-02		1.10E-04		3E-03	
Iron	3.0E-01	N/A	2.6903E+04	2.8E+04	1.15E-02		4E-02		2.36E-02		8E-02		1.03E-03		3E-03	
Total Hazard Quotient and Cancer Risk:							**1E-01**	**2E-06**			**2E-01**	**3E-07**			**1E-02**	**1E-07**

Assumptions for Industrial Worker			**Assumptions for Construction Worker**			**Assumptions for Adolescent Trespasser**		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
EPC=	EPC Surface Only		EPC=	EPC Surface and Subsurface		EPC=	EPC Surface Only	
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	50	mg/day	IR =	100	mg/day	IR =	50	mg/day
FI =	1	unitless	FI =	1	unitless	FI =	1	unitless
EF =	219	days/year	EF =	219	days/year	EF =	14	days/year
ED =	9	years	ED =	1	years	ED =	5	years
AT (Nc) =	3,285	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE E-2A
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Surface Soil	EPC Total Soils	Industrial Worker				Construction Worker				Adolescent Trespasser			
						Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Volatile Organic Compounds																	
Benzene	4E-03	5.5E-02	1.0E-02	N/A	1.9E-01					1.88E-08	2.69E-10	5E-06	1E-11				
Semivolatile Organic Compounds																	
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	3.1E+00	1.8E+00		9.25E-07		7E-07		3.16E-08		2E-08		9.03E-09		7E-09
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	3.4E+00	1.8E+00		1.03E-06		7E-06		3.26E-08		2E-07		1.00E-08		7E-08
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	4.5E+00	2.4E+00		1.36E-06		1E-06		4.27E-08		3E-08		1.33E-08		1E-08
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	2.4E+00	1.3E+00		7.22E-07		5E-08		2.32E-08		2E-09		7.04E-09		5E-10
Chrysene	N/A	7.3E-03	1.3E-01	2.9E+00	1.7E+00		8.77E-07		6E-09		3.01E-08		2E-10		8.55E-09		6E-11
Dibenz(a,h)anthracene	N/A	7.3E+00	1.3E-01	2.2E-01	2.1E-01		6.64E-08		5E-07		3.72E-09		3E-08		6.48E-10		5E-09
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	3.6E-01	3.0E-01		1.07E-07		8E-08		5.39E-09		4E-09		1.04E-09		8E-10
Pesticides/PCBs																	
Dieldrin	5E-05	1.6E+01	1.0E-01	1.4E-02	7.3E-03	8.99E-09	3.21E-09	2E-04	5E-08	7.02E-09	1.00E-10	1E-04	2E-09	4.39E-10	3.13E-11	9E-06	5E-10
Aroclor-1242	N/A	2.0E+00	1.4E-01	1.6E-02	1.4E-02		5.07E-09		1E-08		2.79E-10		6E-10		4.95E-11		1E-10
Aroclor-1254	2E-05	2.0E+00	1.4E-01	2.8E-01	1.4E-01	2.53E-07	9.04E-08	1E-02	2E-07	1.93E-07	2.76E-09	1E-02	6E-09	1.23E-08	8.82E-10	6E-04	2E-09
Aroclor-1260	N/A	2.0E+00	1.4E-01	3.0E-02	3.3E-02		9.74E-09		2E-08		6.48E-10		1E-09		9.51E-11		2E-10
Metals																	
Antimony	6E-05	N/A	1.0E-03	6.0E+01	3.0E+01	3.90E-07		7E-03		2.90E-07		5E-03		1.90E-08		3E-04	
Arsenic	3E-04	1.5E+00	3.0E-02	5.8E+00	5.7E+00	1.12E-06	4.01E-07	4E-03	6E-07	1.66E-06	2.38E-08	6E-03	4E-08	5.48E-08	3.91E-09	2E-04	6E-09
Copper	4E-02	N/A	1.0E-03	2.9E+03	1.5E+03	1.85E-05		5E-04		1.43E-05		4E-04		9.03E-07		2E-05	
Iron	3E-01	N/A	1.0E-03	2.7E+04	2.8E+04	1.74E-04		6E-04		2.66E-04		9E-04		8.48E-06		3E-05	
Total Hazard Quotient and Cancer Risk:								**2E-02**	**1E-05**			**2E-02**	**4E-07**			**1E-03**	**1E-07**

	Assumptions for Industrial Worker	**Assumptions for Construction Worker**	**Assumptions for Adolescent Trespasser**
CF =	1E-06 kg/mg	1E-06 kg/mg	1E-06 kg/mg
EPC =	EPC Surface Only	EPC Surface and Subsurface	EPC Surface Only
BW =	70 kg	70 kg	50 kg
SA =	3,300 cm^2	3,300 cm^2	5,867 cm^2
AF =	0.2 mg/cm^2-event	0.3 mg/cm^2-event	0.07 mg/cm^2-event
EV =	1 event/day	1 event/day	1 event/day
EF =	250 days/year	250 days/year	14 days/year
ED =	25 years	1 years	5 years
AT (Nc) =	9,125 days	365 days	1,825 days
AT (Car) =	25,550 days	25,550 days	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
N/A= Information not available.
* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factors for antimony, copper, and iron were assumed to be 0.001 in accordance with the USEPA Region 4 (2000).
Absorption factor for benzene was assumed to be 0.01 in accordance with the USEPA Region 4 (2000) guidance for VOCs.
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

TABLE E-2B
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SOIL
CENTRAL TENDENCY (CT) - SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) =

$$\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Surface Soil	EPC Total Soils	Industrial Worker				Construction Worker				Adolescent Trespasser			
						Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Volatile Organic Compounds																	
Benzene	4.00E-03	5.5E-02	1.0E-02	N/A	1.9E-01					1.65E-08	2.35E-10	4E-06	1E-11				
Semivolatile Organic Compounds																	
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	3.1E+00	1.8E+00		2.92E-08		2E-08		2.76E-08		2E-08		1.29E-09		9.42E-10
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	3.4E+00	1.8E+00		3.24E-08		2E-07		2.85E-08		2E-07		1.43E-09		1.04E-08
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	4.5E+00	2.4E+00		4.29E-08		3E-08		3.74E-08		3E-08		1.90E-09		1.38E-09
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	2.4E+00	1.3E+00		2.28E-08		2E-09		2.03E-08		1E-09		1.01E-09		7.34E-11
Chrysene	N/A	7.3E-03	1.3E-01	2.9E+00	1.7E+00		2.76E-08		2E-10		2.64E-08		2E-10		1.22E-09		8.92E-12
Dibenz(a,h)anthracene	N/A	7.3E+00	1.3E-01	2.2E-01	2.1E-01		2.09E-09		2E-08		3.26E-09		2E-08		9.25E-11		6.75E-10
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	3.6E-01	3.0E-01		3.37E-09		2E-09		4.72E-09		3E-09		1.49E-10		1.09E-10
Pesticides/PCBs																	
Dieldrin	5.00E-05	1.6E+01	1.0E-01	1.4E-02	7.3E-03	7.87E-10	1.01E-10	2E-05	2E-09	6.15E-09	8.79E-11	1E-04	1E-09	6.27E-11	4.48E-12	1.25E-06	7.16E-11
Aroclor-1242	N/A	2.0E+00	1.4E-01	1.6E-02	1.4E-02		1.60E-10		3E-10		2.44E-10		5E-10		7.07E-12		1.41E-11
Aroclor-1254	2.00E-05	2.0E+00	1.4E-01	2.8E-01	1.4E-01	2.22E-08	2.85E-09	1E-03	6E-09	1.69E-07	2.42E-09	8E-03	5E-09	1.76E-09	1.26E-10	8.82E-05	2.52E-10
Aroclor-1260	N/A	2.0E+00	1.4E-01	3.0E-02	3.3E-02		3.07E-10		6E-10		5.68E-10		1E-09		1.36E-11		2.72E-11
Metals																	
Antimony	6.00E-05	N/A	1.0E-03	6.0E+01	3.0E+01	3.42E-08		6E-04		2.54E-07		4E-03		2.72E-09		4.53E-05	
Arsenic	3.00E-04	1.5E+00	3.0E-02	5.8E+00	5.7E+00	9.83E-08	1.26E-08	3E-04	2E-08	1.46E-06	2.08E-08	5E-03	3E-08	7.82E-09	5.59E-10	2.61E-05	8.38E-10
Copper	4.00E-02	N/A	1.0E-03	2.9E+03	1.5E+03	1.62E-06		4E-05		1.25E-05		3E-04		1.29E-07		3.23E-06	
Iron	3.00E-01	N/A	1.0E-03	2.7E+04	2.8E+04	1.52E-05		5E-05		2.33E-04		8E-04		1.21E-06		4.04E-06	
Total Hazard Quotient and Cancer Risk:								**2E-03**	**3E-07**			**2E-02**	**3E-07**			**2E-04**	**1E-08**

Assumptions for Industrial Worker			Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
CS =	EPC Surface Only		EPC =	EPC Surface and Subsurface		EPC =	EPC Surface Only	
BW =	70	kg	BW =	70	kg	BW =	50	kg
SA =	3,300	cm^2	SA =	3,300	cm^2	SA =	5,867	cm^2
AF =	0.02	mg/cm^2-event	AF =	0.3	mg/cm^2-event	AF =	0.01	mg/cm^2-event
EV =	1	event/day	EV =	1	event/day	EV =	1	event/day
EF =	219	days/year	EF =	219	days/year	EF =	14	days/year
ED =	9	years	ED =	1	years	ED =	5	years
AT (Nc) =	3,285	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
N/A= Information not available.
* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factors for antimony, copper, and iron were assumed to be 0.001 in accordance with the USEPA Region 4 (2000).
Absorption factor for benzene was assumed to be 0.01 in accordance with the USEPA Region 4 (2000) guidance for VOCs.
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

TABLE E-3A
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{\text{EPC x IR x EF x ED}}{\text{BW x AT}}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC from Surface Soil (1)	Air EPC from Total Soils (2)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m^3)	(mg/m^3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Volatile Organic Compounds																
Benzene	8.57E-03	2.73E-02	N/A	1.9E-07					3.63E-08	5.18E-10	4E-06	1E-11				
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	5.2E-08	1.7E-06												
Benzo(a)pyrene	N/A	3.10E+00	5.8E-08	1.7E-06		4.07E-09		1E-08		4.83E-09		1E-08		5.10E-12		2E-11
Benzo(b)fluoranthene	N/A	N/A	7.7E-08	2.3E-06												
Benzo(k)fluoranthene	N/A	N/A	4.1E-08	1.2E-06												
Chrysene	N/A	N/A	5.0E-08	1.6E-06												
Dibenz(a,h)anthracene	N/A	N/A	3.8E-09	2.0E-07												
Indeno(1,2,3-cd)pyrene	N/A	N/A	6.1E-09	2.9E-07												
Pesticides/PCBs																
Dieldrin	N/A	1.61E+01	2.4E-10	6.9E-09		1.65E-11		3E-10		1.93E-11		3E-10		2.07E-14		3E-13
Aroclor-1242	N/A	2.00E+00	2.7E-10	1.4E-08		1.87E-11		4E-11		3.84E-11		8E-11		2.34E-14		5E-14
Aroclor-1254	N/A	2.00E+00	4.8E-09	1.4E-07		3.33E-10		7E-10		3.80E-10		8E-10		4.17E-13		8E-13
Aroclor-1260	N/A	2.00E+00	5.1E-10	3.2E-08		3.58E-11		7E-11		8.93E-11		2E-10		4.50E-14		9E-14
Metals																
Antimony	N/A	N/A	1.0E-06	2.9E-05												
Arsenic	N/A	1.51E+01	9.9E-08	5.5E-06		6.88E-09		1E-07		1.53E-08		2E-07		8.64E-12		1E-10
Copper	N/A	N/A	4.9E-05	1.4E-03												
Iron	N/A	N/A	4.6E-04	2.6E-02												
Total Hazard Quotient and Cancer Risk:								**1E-07**			**4E-06**	**2E-07**				**1E-10**

	Assumptions for Industrial Worker			Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
	EPC =	EPC Surface Only		EPC =	EPC Surface and Subsurface		EPC =	EPC Surface Only	
	BW =	70	kg	BW =	70	kg	BW =	50	kg
	IR =	20	m^3/day	IR =	20	m^3/day	IR =	1.6	m^3/day
	EF =	250	days/year	EF =	250	days/year	EF =	14	days/year
	ED =	25	years	ED =	1	year	ED =	5	years
	AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
	AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
(1) This EPC was used for the industrial worker and the adolescent trespasser.
(2) This EPC was used for the construction worker.

TABLE E-3B
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
CENTRAL TENDENCY (CT) - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD (mg/kg-day)	Carc. Slope Inhalation (mg/kg-day)-1	Air EPC from Surface Soil (1) (mg/m^3)	Air EPC from Total Soils (2) (mg/m^3)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
					(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Volatile Organic Compounds																
Benzene	8.57E-03	2.73E-02	N/A	1.9E-07					3.18E-08	4.54E-10	4E-06	1E-11				
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	5.2E-08	1.7E-06												
Benzo(a)pyrene	N/A	3.10E+00	5.8E-08	1.7E-06		6.67E-10		2E-09		4.23E-09		1E-08		5.10E-12		2E-11
Benzo(b)fluoranthene	N/A	N/A	7.7E-08	2.3E-06												
Benzo(k)fluoranthene	N/A	N/A	4.1E-08	1.2E-06												
Chrysene	N/A	N/A	5.0E-08	1.6E-06												
Dibenz(a,h)anthracene	N/A	N/A	3.8E-09	2.0E-07												
Indeno(1,2,3-cd)pyrene	N/A	N/A	6.1E-09	2.9E-07												
Pesticides/PCBs																
Dieldrin	N/A	1.61E+01	2.4E-10	6.9E-09		2.71E-12		4E-11		1.69E-11		3E-10		2.07E-14		3E-13
Aroclor-1242	N/A	2.00E+00	2.7E-10	1.4E-08		3.06E-12		6E-12		3.36E-11		7E-11		2.34E-14		5E-14
Aroclor-1254	N/A	2.00E+00	4.8E-09	1.4E-07		5.45E-11		1E-10		3.33E-10		7E-10		4.17E-13		8E-13
Aroclor-1260	N/A	2.00E+00	5.1E-10	3.2E-08		5.88E-12		1E-11		7.82E-11		2E-10		4.50E-14		9E-14
Metals																
Antimony	N/A	N/A	1.0E-06	2.9E-05												
Arsenic	N/A	1.51E+01	9.9E-08	5.5E-06		1.13E-09		2E-08		1.34E-08		2E-07		8.64E-12		1E-10
Copper	N/A	N/A	4.9E-05	1.4E-03												
Iron	N/A	N/A	4.6E-04	2.6E-02												
Total Hazard Quotient and Cancer Risk:								**2E-08**			**4E-06**	**2E-07**				**1E-10**

	Assumptions for Industrial Worker	Assumptions for Construction Worker	Assumptions for Adolescent Trespasser
EPC =	EPC Surface Only	EPC Surface and Subsurface	EPC Surface Only
BW =	70 kg	70 kg	50 kg
IR =	10.4 m^3/day	20 m^3/day	1.6 m^3/day
EF =	219 days/year	219 days/year	14 days/year
ED =	9 years	1 year	5 years
AT (Nc) =	3,285 days	365 days	1,825 days
AT (Car) =	25,550 m^3/day	25,550 m^3/day	25,550 m^3/day

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
(1) This EPC was used for the industrial worker and the adolescent trespasser.
(2) This EPC was used for the construction worker.

TABLE E-4A
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF DITCH SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{\text{EPC x IR x CF x FI x EF x ED}}{\text{BW x AT}}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg

IR = Ingestion Rate

CF = Conversion Factor

FI = Fraction Ingested

EF = Exposure Frequency

ED = Exposure Duration

BW = Bodyweight

AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Ditch Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
				Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds															
Benzo(a)anthracene	N/A	7.3E-01	6.8E-01		4.73E-08		3E-08		3.12E-08		2E-08		3.71E-09		3E-09
Benzo(a)pyrene	N/A	7.3E+00	6.3E-01		4.42E-08		3E-07		2.91E-08		2E-07		3.46E-09		3E-08
Benzo(b)fluoranthene	N/A	7.3E-01	6.7E-01		4.71E-08		3E-08		3.11E-08		2E-08		3.69E-09		3E-09
Benzo(k)fluoranthene	N/A	7.3E-02	5.8E-01		4.07E-08		3E-09		2.68E-08		2E-09		3.19E-09		2E-10
Chrysene	N/A	7.3E-03	7.0E-01		4.89E-08		4E-10		3.23E-08		2E-10		3.83E-09		3E-11
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	5.8E-01		4.07E-08		3E-08		2.69E-08		2E-08		3.19E-09		2E-09
Metals															
Arsenic	3E-04	1.5E+00	4.3E+00	8.34E-07	2.98E-07	3E-03	4E-07	1.38E-05	1.97E-07	5E-02	3E-07	3.27E-07	2.34E-08	1E-03	4E-08
Iron	3E-01	N/A	2.2E+04	4.25E-03		1E-02		7.02E-02		2E-01		1.67E-03		6E-03	
Total Hazard Quotient and Cancer Risk:						**2E-02**	**9E-07**			**3E-01**	**6E-07**			**7E-03**	**7E-08**

Assumptions for Industrial Worker			**Assumptions for Construction Worker**			**Assumptions for Adolescent Trespasser**		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	100	mg/day	IR =	330	mg/day	IR =	100	mg/day
FI =	1	unitless	FI =	1	unitless	FI =	1	unitless
EF =	50	days/year	EF =	250	days/year	EF =	14	days/year
ED =	25	years	ED =	1	years	ED =	5	years
AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data

NA= Information not available

TABLE E-4B
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF DITCH SOIL
CENTRAL TENDENCY (CT) - SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Ditch Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
				Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds															
Benzo(a)anthracene	N/A	7.3E-01	6.8E-01		8.51E-09		6E-09		8.28E-09		6E-09		1.85E-09		1E-09
Benzo(a)pyrene	N/A	7.3E+00	6.3E-01		7.95E-09		6E-08		7.74E-09		6E-08		1.73E-09		1E-08
Benzo(b)fluoranthene	N/A	7.3E-01	6.7E-01		8.48E-09		6E-09		8.26E-09		6E-09		1.85E-09		1E-09
Benzo(k)fluoranthene	N/A	7.3E-02	5.8E-01		7.32E-09		5E-10		7.13E-09		5E-10		1.59E-09		1E-10
Chrysene	N/A	7.3E-03	7.0E-01		8.80E-09		6E-11		8.57E-09		6E-11		1.92E-09		1E-11
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	5.8E-01		7.33E-09		5E-09		7.14E-09		5E-09		1.60E-09		1E-09
Metals															
Arsenic	3.0E-04	1.5E+00	4.3E+00	4.17E-07	5.36E-08	1E-03	8E-08	3.65E-06	5.22E-08	1E-02	8E-08	1.64E-07	1.17E-08	5E-04	2E-08
Iron	3.0E-01	N/A	2.2E+04	2.13E-03		7E-03		1.86E-02		6E-02		8.33E-04		3E-03	
Total Hazard Quotient and Cancer Risk:						**8E-03**	**2E-07**			**7E-02**	**2E-07**			**3E-03**	**3E-08**

Assumptions for Industrial Worker			Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	50	mg/day	IR =	100	mg/day	IR =	50	mg/day
FI =	1	unitless	FI =	1	unitless	FI =	1	unitless
EF =	50	days/year	EF =	219	days/year	EF =	14	days/year
ED =	9	years	ED =	1	years	ED =	5	years
AT (Nc) =	3,285	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE E-5A
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO DITCH SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD (mg/kg-day)	Carc. Slope Dermal (mg/kg-day)-1	Absorption Factor* (unitless)	EPC Ditch Soil (mg/kg)	Industrial Worker Absorbed Dose (mg/kg-day) (Nc)	Industrial Worker Absorbed Dose (mg/kg-day) (Car)	Industrial Worker Hazard Quotient	Industrial Worker Cancer Risk	Construction Worker Absorbed Dose (mg/kg-day) (Nc)	Construction Worker Absorbed Dose (mg/kg-day) (Car)	Construction Worker Hazard Quotient	Construction Worker Cancer Risk	Adolescent Trespasser Absorbed Dose (mg/kg-day) (Nc)	Adolescent Trespasser Absorbed Dose (mg/kg-day) (Car)	Adolescent Trespasser Hazard Quotient	Adolescent Trespasser Cancer Risk
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	6.8E-01		4.06E-08		3E-08		1.22E-08		9E-09		1.98E-09		1E-09
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	6.3E-01		3.79E-08		3E-07		1.14E-08		8E-08		1.85E-09		1E-08
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	6.7E-01		4.04E-08		3E-08		1.21E-08		9E-09		1.97E-09		1E-09
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	5.8E-01		3.49E-08		3E-09		1.05E-08		8E-10		1.70E-09		1E-10
Chrysene	N/A	7.3E-03	1.3E-01	7.0E-01		4.20E-08		3E-10		1.26E-08		9E-11		2.05E-09		1E-11
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	5.8E-01		3.49E-08		3E-08		1.05E-08		8E-09		1.70E-09		1E-09
Metals																
Arsenic	3E-04	1.5E+00	3.0E-02	4.3E+00	1.65E-07	5.90E-08	6E-04	9E-08	1.24E-06	1.77E-08	4E-03	3E-08	4.03E-08	2.88E-09	1E-04	4E-09
Iron	3E-01	N/A	1.0E-03	2.2E+04	2.81E-05		9E-05		2.10E-04		7E-04		6.85E-06		2E-05	
Total Hazard Quotient and Cancer Risk:							**6E-04**	**5E-07**			**5E-03**	**1E-07**			**2E-04**	**2E-08**

Assumptions for Industrial Worker		**Assumptions for Construction Worker**		**Assumptions for Adolescent Trespasser**	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
BW =	70 kg	BW =	70 kg	BW =	50 kg
SA =	3,300 cm^2	SA =	3,300 cm^2	SA =	5,867 cm^2
AF =	0.2 mg/cm^2-event	AF =	0.3 mg/cm^2-event	AF =	0.07 mg/cm^2-event
EV =	1 event/day	EV =	1 event/day	EV =	1 event/day
EF =	50 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 years	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.

N/A= Information not available.

* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factor for iron was assumed to be 0.001 in accordance with the USEPA Region 4 (2000)
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

TABLE E-5B
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO DITCH SOIL
CENTRAL TENDENCY (CT) - SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Ditch Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	6.8E-01		1.46E-09		1E-09		1.07E-08		8E-09		2.83E-10		2.06E-10
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	6.3E-01		1.36E-09		1E-08		9.96E-09		7E-08		2.64E-10		1.93E-09
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	6.7E-01		1.46E-09		1E-09		1.06E-08		8E-09		2.82E-10		2.06E-10
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	5.8E-01		1.26E-09		9E-11		9.17E-09		7E-10		2.43E-10		1.78E-11
Chrysene	N/A	7.3E-03	1.3E-01	7.0E-01		1.51E-09		1E-11		1.10E-08		8E-11		2.92E-10		2.13E-12
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	5.8E-01		1.26E-09		9E-10		9.18E-09		7E-09		2.44E-10		1.78E-10
Metals																
Arsenic	3.00E-04	1.5E+00	3.0E-02	4.3E+00	1.65E-08	2.12E-09	6E-05	3E-09	1.09E-06	1.55E-08	4E-03	2E-08	5.76E-09	4.11E-10	1.92E-05	6.17E-10
Iron	3.00E-01	N/A	1.0E-03	2.2E+04	2.81E-06		9E-06		1.84E-04		6E-04		9.78E-07		3.26E-06	
Total Hazard Quotient and Cancer Risk:							**6E-05**	**2E-08**			**4E-03**	**1E-07**			**2E-05**	**3E-09**

Assumptions for Industrial Worker			Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
BW =	70	kg	BW =	70	kg	BW =	50	kg
SA =	3,300	cm^2	SA =	3,300	cm^2	SA =	5,867	cm^2
AF =	0.02	mg/cm^2-event	AF =	0.3	mg/cm^2-event	AF =	0.01	mg/cm^2-event
EV =	1	event/day	EV =	1	event/day	EV =	1	event/day
EF =	50	days/year	EF =	219	days/year	EF =	14	days/year
ED =	9	years	ED =	1	years	ED =	5	years
AT (Nc) =	3,285	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
N/A= Information not available.
* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factor for iron was assumed to be 0.001 in accordance with the USEPA Region 4 (2000)
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

TABLE E-6A
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC from Ditch Soil (1)	Air EPC from Ditch Soil Const. Worker (2)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m^3)	(mg/m^3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	1.1E-08	7.4E-08												
Benzo(a)pyrene	N/A	3.10E+00	1.1E-08	6.9E-08		7.51E-10		2E-09		1.94E-10		6E-10		9.42E-13		3E-12
Benzo(b)fluoranthene	N/A	N/A	1.1E-08	7.4E-08												
Benzo(k)fluoranthene	N/A	N/A	9.9E-09	6.4E-08												
Chrysene	N/A	N/A	1.2E-08	7.7E-08												
Indeno(1,2,3-cd)pyrene	N/A	N/A	9.9E-09	6.4E-08												
Metals																
Arsenic	N/A	1.51E+01	7.2E-08	4.7E-07		5.07E-09		8E-08		1.31E-09		2E-08		6.35E-12		1E-10
Iron	N/A	N/A	3.7E-04	2.4E-03												
Total Hazard Quotient and Cancer Risk:								**8E-08**				**2E-08**				**1E-10**

Assumptions for Industrial Worker			**Assumptions for Construction Worker**			**Assumptions for Adolescent Trespasser**		
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	20	m^3/day	IR =	20	m^3/day	IR =	1.6	m^3/day
EF =	250	days/year	EF =	250	days/year	EF =	14	days/year
ED =	25	years	ED =	1	year	ED =	5	years
AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
(1) This EPC was used for the industrial worker and the adolescent trespasser.
(2) This EPC was used for the construction worker.

TABLE E-6B
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
CENTRAL TENDENCY (CT) - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC from Ditch Soil (1)	Air EPC from Ditch Soil Const. Worker (2)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m^3)	(mg/m^3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	1.1E-08	7.4E-08												
Benzo(a)pyrene	N/A	3.10E+00	1.1E-08	6.9E-08		1.23E-10		4E-10		1.70E-10		5E-10		9.42E-13		3E-12
Benzo(b)fluoranthene	N/A	N/A	1.1E-08	7.4E-08												
Benzo(k)fluoranthene	N/A	N/A	9.9E-09	6.4E-08												
Chrysene	N/A	N/A	1.2E-08	7.7E-08												
Indeno(1,2,3-cd)pyrene	N/A	N/A	9.9E-09	6.4E-08												
Metals																
Arsenic	N/A	1.51E+01	7.2E-08	4.7E-07		8.31E-10		1E-08		1.15E-09		2E-08		6.35E-12		1E-10
Iron	N/A	N/A	3.7E-04	2.4E-03												
Total Hazard Quotient and Cancer Risk:								**1E-08**				**2E-08**				**1E-10**

Assumptions for Industrial Worker			Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	10.4	m^3/day	IR =	20	m^3/day	IR =	1.6	m^3/day
EF =	219	days/year	EF =	219	days/year	EF =	14	days/year
ED =	9	years	ED =	1	year	ED =	5	years
AT (Nc) =	3,285	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
(1) This EPC was used for the industrial worker and the adolescent trespasser.
(2) This EPC was used for the construction worker.

TABLE E-7A
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SURFACE WATER
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Dermal (mg/kg-day) = $\frac{DA \times SA \times EF \times ED \times EV}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

DA = Absorbed Dose per Event, mg/cm^2-event
SA = Surface Area Contact
EF = Exposure Frequency
EV = Event Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Absorbed Dose per Event (DA):

For inorganics: DA = Kp x EPC x t_{event} x C

K_p = Permeability Coefficient, cm/hr
EPC = EPC in Groundwater, mg/L
C = Conversion Factor, 10^3 L/cm^3

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose (RfD)

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factc

Analyte	Dermal RfD	Carc. Slope Dermal	Permeability Coefficient *Kp*	EPC Surface Water	Absorbed Dose/Event	Industrial Worker				Construction Worker				Adolescent Trespasser			
						Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(cm/hr)	(mg/L)	(mg/cm²-event)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Metals																	
Arsenic	3.0.E-04	1.5E+00	1.0.E-03	5.03.E-02	2.52E-08	Dermal Contact to Surface Water Not Applicable for Industrial Worker				2.45E-07	3.50E-09	8E-04	5E-09	1.13E-07	8.09E-09	4E-04	1E-08
Cadmium	2.5.E-05	N/A	1.0.E-03	1.95.E-02	9.75E-09					9.50E-08		4E-03		4.39E-08		2E-03	
Chromium	7.5.E-05	N/A	2.0.E-03	1.29.E-01	1.29E-07					1.26E-06		2E-02		5.81E-07		8E-03	
Iron	3.0.E-01	N/A	1.0.E-03	1.10.E+02	5.50E-05					5.36E-04		2E-03		2.48E-04		8E-04	
Manganese	9.3.E-04	N/A	1.0.E-03	2.38.E+00	1.19E-06					1.16E-05		1E-02		5.36E-06		6E-03	
Thallium	6.5.E-04	N/A	1.0.E-03	6.30.E-03	3.15E-09					3.07E-08		5E-05		1.42E-08		2E-05	
Vanadium	1.8.E-04	N/A	1.0.E-03	2.33.E-01	1.17E-07					1.14E-06		6E-03		5.24E-07		3E-03	
Total Hazard Quotient and Cancer Risk:												**4E-02**	**5E-09**			**2E-02**	**1E-08**

Assumptions for Construction Worker			**Assumptions for Adolescent Trespasser**		
BW =	70	kg	BW =	50	kg
SA =	2,490	cm^2	SA =	5,867	cm^2
EV=	1	event/day	EV=	1	event/day
EF =	100	days/year	EF =	14	days/year
ED =	1	year	ED =	5	year
t_{event} =	0.5	hr/event	t_{event} =	0.5	hr/event
AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.

NA= Information not available.

Kp value from Exhibit 3-1 of "Supplemental Guidance for Dermal Risk Assessment", Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume 1), August 16, 2004. For arsenic, iron, manganese, thallium, and vanadium the default inorganic value of 0.001 was used.

Kp for Cr(VI) was used for chromium.

TABLE E-7B
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SURFACE WATER
CENTRAL TENDENCY (CT) - SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Dermal (mg/kg-day) = $\frac{DA \times SA \times EF \times ED \times EV}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

DA = Absorbed Dose per Event, mg/cm^2-event
SA = Surface Area Contact
EF = Exposure Frequency
EV = Event Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Absorbed Dose per Event (DA):

For inorganics: DA = Kp x EPC x t_{event} x C

K_p = Permeability Coefficient, cm/hr
EPC = EPC in Groundwater, mg/L
C = Conversion Factor, 10^{-3} L/cm^3

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose (RfD)

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Permeability Coefficient *Kp*	EPC Surface Water	Absorbed Dose/Event	Industrial Worker				Construction Worker				Adolescent Trespasser			
						Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(cm/hr)	(mg/L)	(mg/cm²-event)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Metals																	
Arsenic	3.0.E-04	1.5E+00	1.0.E-03	5.03.E-02	2.52E-08	Dermal Contact to Surface Water Not Applicable for Industrial Worker				1.95E-07	2.78E-09	6E-04	4E-09	1.13E-07	8.09E-09	4E-04	1E-08
Cadmium	2.5.E-05	N/A	1.0.E-03	1.95.E-02	9.75E-09					7.56E-08		3E-03		4.39E-08		2E-03	
Chromium	7.5.E-05	N/A	2.0.E-03	1.29.E-01	1.29E-07					1.00E-06		1E-02		5.81E-07		8E-03	
Iron	3.0.E-01	N/A	1.0.E-03	1.10.E+02	5.50E-05					4.26E-04		1E-03		2.48E-04		8E-04	
Manganese	9.3.E-04	N/A	1.0.E-03	2.38.E+00	1.19E-06					9.22E-06		1E-02		5.36E-06		6E-03	
Thallium	6.5.E-04	N/A	1.0.E-03	6.30.E-03	3.15E-09					2.44E-08		4E-05		1.42E-08		2E-05	
Vanadium	1.8.E-04	N/A	1.0.E-03	2.33.E-01	1.17E-07					9.03E-07		5E-03		5.24E-07		3E-03	
Total Hazard Quotient and Cancer Risk:												**3E-02**	**4E-09**			**2E-02**	**1E-08**

Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
BW =	70	kg	BW =	50	kg
SA =	1,980	cm2	SA =	5,867	cm2
EV=	1	event/day	EV=	1	event/day
EF =	100	days/year	EF =	14	days/year
ED =	1	year	ED =	5	year
t_{event} =	0.5	hr/event	t_{event} =	0.33	hr/event
AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.

NA= Information not available.

Kp value from Exhibit 3-1 of "Supplemental Guidance for Dermal Risk Assessment", Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume 1), August 16, 2004. For arsenic, iron, manganese, thallium, and vanadium the default inorganic value of 0.001 was used.

Kp for Cr(VI) was used for chromium.

Table E-8A
Calculation of Blood Lead Concentration - Industrial Worker Exposed to Surface Soil at SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1]		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
					Using Equation 1		Using Equation 2	
	1*	2**			GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	735	735	735	735
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.050	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**2.6**	**2.8**	**2.6**	**2.8**
$PbB_{fetal, 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**7.8**	**9.8**	**7.8**	**9.8**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**2.4%**	**4.7%**	**2.4%**	**4.7%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} = $(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$

$PbB_{fetal, 0.95}$ = $PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} = $PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$

$PbB_{fetal, 0.95}$ = $PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

TABLE E-8B
CALCULATION OF BLOOD LEAD CONCENTRATION – RESIDENTIAL CHILD EXPOSED TO SURFACE SOIL AT SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

```
                  LEAD MODEL FOR WINDOWS Version 1.0


===============================================================================
     Model Version: 1.0 Build 261
     User Name:
     Date:
     Site Name:
     Operable Unit:
     Run Mode: Research

===============================================================================
     The time step used in this model run: 1 - Every 4 Hours (6 times a day).

     ****** Air ******

     Indoor Air Pb Concentration: 30.000 percent of outdoor.
     Other Air Parameters:

     Age        Time        Ventilation         Lung         Outdoor Air
              Outdoors          Rate          Absorption        Pb Conc
              (hours)        (m^3/day)           (%)         (ug Pb/m^3)
     ----------------------------------------------------------------------
     .5-1      1.000           2.000            32.000           0.100
     1-2       2.000           3.000            32.000           0.100
     2-3       3.000           5.000            32.000           0.100
     3-4       4.000           5.000            32.000           0.100
     4-5       4.000           5.000            32.000           0.100
     5-6       4.000           7.000            32.000           0.100
     6-7       4.000           7.000            32.000           0.100

     ****** Diet ******

     Age     Diet Intake(ug/day)
     -----------------------------------
     .5-1      5.530
     1-2       5.780
     2-3       6.490
     3-4       6.240
     4-5       6.010
     5-6       6.340
     6-7       7.000

     ****** Drinking Water ******

     Water Consumption:
     Age     Water (L/day)
     -----------------------------------
     .5-1      0.200
     1-2       0.500
```

TABLE E-8B
CALCULATION OF BLOOD LEAD CONCENTRATION – RESIDENTIAL CHILD EXPOSED TO SURFACE SOIL AT SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

```
2-3       0.520
3-4       0.530
4-5       0.550
5-6       0.580
6-7       0.590

Drinking Water Concentration: 4.000 ug Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 524.500 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age          Soil (ug Pb/g)       House Dust (ug Pb/g)
--------------------------------------------------------
.5-1              735.000             524.500
1-2               735.000             524.500
2-3               735.000             524.500
3-4               735.000             524.500
4-5               735.000             524.500
5-6               735.000             524.500
6-7               735.000             524.500

****** Alternate Intake ******

Age      Alternate (ug Pb/day)
-----------------------------------
.5-1     0.000
1-2      0.000
2-3      0.000
3-4      0.000
4-5      0.000
5-6      0.000
6-7      0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 2.500 ug Pb/dL

*****************************************
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
*****************************************

Year         Air                Diet               Alternate       Water
           (ug/day)           (ug/day)              (ug/day)      (ug/day)
--------------------------------------------------------------------------
```

TABLE E-8B
CALCULATION OF BLOOD LEAD CONCENTRATION – RESIDENTIAL CHILD EXPOSED TO SURFACE SOIL AT SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

```
.5-1        0.021               2.301               0.000          0.333
1-2         0.034               2.340               0.000          0.810
2-3         0.062               2.694               0.000          0.863
3-4         0.067               2.654               0.000          0.902
4-5         0.067               2.685               0.000          0.983
5-6         0.093               2.885               0.000          1.056
6-7         0.093               3.216               0.000          1.084

 Year     Soil+Dust             Total               Blood
          (ug/day)            (ug/day)            (ug/dL)
----------------------------------------------------------------
.5-1       13.140              15.795               8.4
1-2        20.302              23.485               9.6
2-3        20.821              24.441               9.0
3-4        21.335              24.958               8.6
4-5        16.598              20.333               7.2
5-6        15.217              19.251               6.1
6-7        14.509              18.902               5.4
```

Table E-9A
Calculation of Blood Lead Concentration - Industrial Worker Exposed to Ditch Soil at SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1]		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
					Using Equation 1		Using Equation 2	
	1*	2**			GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	144	144	144	144
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.050	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}			**PbB of adult worker, geometric mean**	**ug/dL**	**1.7**	**1.9**	**1.7**	**1.9**
$PbB_{fetal, 0.95}$			**95th percentile PbB among fetuses of adult workers**	**ug/dL**	**5.2**	**6.8**	**5.2**	**6.8**
PbB_t			**Target PbB level of concern (e.g., 10 ug/dL)**	**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$			**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**0.6%**	**1.7%**	**0.6%**	**1.7%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

TABLE E-9B
CALCULATION OF BLOOD LEAD CONCENTRATION – RESIDENTIAL CHILD EXPOSED TO DITCH SOIL AT SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

```
                 LEAD MODEL FOR WINDOWS Version 1.0


===============================================================================
     Model Version: 1.0 Build 261
     User Name:
     Date:
     Site Name:
     Operable Unit:
     Run Mode: Research

===============================================================================
     The time step used in this model run: 1 - Every 4 Hours (6 times a day).

     ****** Air ******

     Indoor Air Pb Concentration: 30.000 percent of outdoor.
     Other Air Parameters:

     Age        Time        Ventilation          Lung          Outdoor Air
              Outdoors         Rate           Absorption         Pb Conc
              (hours)       (m^3/day)            (%)          (ug Pb/m^3)
     ----------------------------------------------------------------------
     .5-1      1.000           2.000            32.000           0.100
     1-2       2.000           3.000            32.000           0.100
     2-3       3.000           5.000            32.000           0.100
     3-4       4.000           5.000            32.000           0.100
     4-5       4.000           5.000            32.000           0.100
     5-6       4.000           7.000            32.000           0.100
     6-7       4.000           7.000            32.000           0.100

     ****** Diet ******

     Age     Diet Intake(ug/day)
     -----------------------------------
     .5-1      5.530
     1-2       5.780
     2-3       6.490
     3-4       6.240
     4-5       6.010
     5-6       6.340
     6-7       7.000

     ****** Drinking Water ******

     Water Consumption:
     Age     Water (L/day)
     -----------------------------------
     .5-1      0.200
     1-2       0.500
```

TABLE E-9B
CALCULATION OF BLOOD LEAD CONCENTRATION – RESIDENTIAL CHILD EXPOSED TO DITCH SOIL AT SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

```
2-3       0.520
3-4       0.530
4-5       0.550
5-6       0.580
6-7       0.590

Drinking Water Concentration: 4.000 ug Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 110.800 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age          Soil (ug Pb/g)       House Dust (ug Pb/g)
--------------------------------------------------------
.5-1              144.000             110.800
1-2               144.000             110.800
2-3               144.000             110.800
3-4               144.000             110.800
4-5               144.000             110.800
5-6               144.000             110.800
6-7               144.000             110.800

****** Alternate Intake ******

Age      Alternate (ug Pb/day)
-----------------------------------
.5-1     0.000
1-2      0.000
2-3      0.000
3-4      0.000
4-5      0.000
5-6      0.000
6-7      0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 2.500 ug Pb/dL

*****************************************
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
*****************************************

Year         Air                Diet               Alternate       Water
           (ug/day)           (ug/day)              (ug/day)      (ug/day)
--------------------------------------------------------------------------
```

TABLE E-9B
CALCULATION OF BLOOD LEAD CONCENTRATION – RESIDENTIAL CHILD EXPOSED TO DITCH SOIL AT SEAD-121C
SEAD-121C AND SEAD-121I RI REPORT
SENECA ARMY DEPOT ACTIVITY

```
.5-1        0.021                2.584                0.000           0.374
1-2         0.034                2.686                0.000           0.929
2-3         0.062                3.039                0.000           0.974
3-4         0.067                2.951                0.000           1.003
4-5         0.067                2.883                0.000           1.055
5-6         0.093                3.057                0.000           1.119
6-7         0.093                3.383                0.000           1.141

 Year     Soil+Dust              Total                Blood
          (ug/day)             (ug/day)              (ug/dL)
----------------------------------------------------------------
.5-1        2.996                5.974                 3.3
1-2         4.732                8.382                 3.5
2-3         4.770                8.845                 3.3
3-4         4.816                8.836                 3.1
4-5         3.619                7.625                 2.7
5-6         3.274                7.544                 2.4
6-7         3.099                7.717                 2.2
```

APPENDIX F

SEAD-121I HUMAN HEALTH RISK ASSESSMENT CALCULATION TABLES

F-1A Calculation of Intake and Risk from the Ingestion of Soil – RME
F-1B Calculation of Intake and Risk from the Ingestion of Soil – CT
F-2A Calculation of Absorbed Dose and Risk from Dermal Contact to Soil – RME
F-2B Calculation of Absorbed Dose and Risk from Dermal Contact to Soil – CT
F-3A Calculation of Intake and Risk from Inhalation of Dust in Ambient Air – Soil – RME
F-3B Calculation of Intake and Risk from Inhalation of Dust in Ambient Air – Soil – CT
F-4A Calculation of Intake and Risk from the Ingestion of Ditch Soil – RME
F-4B Calculation of Intake and Risk from the Ingestion of Ditch Soil – CT
F-5A Calculation of Absorbed Dose and Risk from Dermal Contact to Ditch Soil – RME
F-5B Calculation of Absorbed Dose and Risk from Dermal Contact to Ditch Soil – CT
F-6A Calculation of Intake and Risk from Inhalation of Dust in Ambient Air – Ditch Soil – RME
F-6B Calculation of Intake and Risk from Inhalation of Dust in Ambient Air – Ditch Soil – CT

TABLE F-1A
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Surface Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
				Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds															
Benzo(a)anthracene	N/A	7.3E-01	1.0E+01		3.48E-06		3E-06		4.60E-07		3E-07		5.46E-08		4E-08
Benzo(a)pyrene	N/A	7.3E+00	8.5E+00		2.98E-06		2E-05		3.93E-07		3E-06		4.67E-08		3E-07
Benzo(b)fluoranthene	N/A	7.3E-01	1.0E+01		3.50E-06		3E-06		4.62E-07		3E-07		5.49E-08		4E-08
Benzo(k)fluoranthene	N/A	7.3E-02	8.7E+00		3.03E-06		2E-07		4.01E-07		3E-08		4.76E-08		3E-09
Chrysene	N/A	7.3E-03	1.2E+01		4.20E-06		3E-08		5.55E-07		4E-09		6.59E-08		5E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	1.2E+00		4.04E-07		3E-06		5.33E-08		4E-07		6.33E-09		5E-08
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	3.9E+00		1.35E-06		1E-06		1.79E-07		1E-07		2.12E-08		2E-08
Pesticides															
Dieldrin	5.0E-05	1.6E+01	6.8E-03	6.66E-09	2.38E-09	1E-04	4E-08	2.20E-08	3.14E-10	4E-04	5E-09	5.22E-10	3.73E-11	1E-05	6E-10
Heptachlor epoxide	5.0E-04	9.1E+00	2.3E-02	2.30E-08	8.20E-09	5E-05	7E-08	7.58E-08	1.08E-09	2E-04	1E-08	1.80E-09	1.29E-10	4E-06	1E-09
Metals															
Arsenic	3.0E-04	1.5E+00	1.49E+01	1.46E-05	5.21E-06	5E-02	8E-06	4.82E-05	6.88E-07	2E-01	1E-06	1.14E-06	8.17E-08	4E-03	1E-07
Chromium	3.0E-03	N/A	8.27E+01	8.09E-05		3E-02		2.67E-04		9E-02		6.35E-06		2E-03	
Iron	3.0E-01	N/A	2.1627E+04	2.12E-02		7E-02		6.98E-02		2E-01		1.66E-03		6E-03	
Manganese	2.3E-02	N/A	1.06E+05	1.04E-01		4E+00		3.43E-01		1E+01		8.16E-03		3E-01	
Thallium	6.5E-04	N/A	5.34E+01	5.23E-05		8E-02		1.73E-04		3E-01		4.10E-06		6E-03	
Vanadium	7.0E-03	N/A	4.27E+01	4.17E-05		6E-03		1.38E-04		2E-02		3.27E-06		5E-04	
Total Hazard Quotient and Cancer Risk:						**5E+00**	**4E-05**			**2E+01**	**5E-06**			**4E-01**	**6E-07**

	Assumptions for Industrial Worker			**Assumptions for Construction Worker**			**Assumptions for Adolescent Trespasser**	
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
EPC=	EPC Surface Only		EPC=	EPC Surface and Subsurface		EPC=	EPC Surface Only	
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	100	mg/day	IR =	330	mg/day	IR =	100	mg/day
FI =	1	unitless	FI =	1	unitless	FI =	1	unitless
EF =	250	days/year	EF =	250	days/year	EF =	14	days/year
ED =	25	years	ED =	1	years	ED =	5	years
AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE F-1B
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF SOIL
CENTRAL TENDENCY (CT) - SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD (mg/kg-day)	Carc. Slope Oral (mg/kg-day)-1	EPC Surface Soil (mg/kg)	Industrial Worker				Construction Worker				Adolescent Trespasser			
				Intake (mg/kg-day) (Nc)	Intake (mg/kg-day) (Car)	Hazard Quotient	Cancer Risk	Intake (mg/kg-day) (Nc)	Intake (mg/kg-day) (Car)	Hazard Quotient	Cancer Risk	Intake (mg/kg-day) (Nc)	Intake (mg/kg-day) (Car)	Hazard Quotient	Cancer Risk
Semivolatile Organic Compounds															
Benzo(a)anthracene	N/A	7.3E-01	1.0E+01		5.49E-07		4E-07		1.22E-07		9E-08		2.73E-08		2E-08
Benzo(a)pyrene	N/A	7.3E+00	8.5E+00		4.70E-07		3E-06		1.04E-07		8E-07		2.34E-08		2E-07
Benzo(b)fluoranthene	N/A	7.3E-01	1.0E+01		5.52E-07		4E-07		1.23E-07		9E-08		2.74E-08		2E-08
Benzo(k)fluoranthene	N/A	7.3E-02	8.7E+00		4.79E-07		3E-08		1.06E-07		8E-09		2.38E-08		2E-09
Chrysene	N/A	7.3E-03	1.2E+01		6.62E-07		5E-09		1.47E-07		1E-09		3.29E-08		2E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	1.2E+00		6.36E-08		5E-07		1.41E-08		1E-07		3.16E-09		2E-08
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	3.9E+00		2.13E-07		2E-07		4.74E-08		3E-08		1.06E-08		8E-09
Pesticides															
Dieldrin	5.0E-05	1.6E+01	6.8E-03	2.92E-09	3.75E-10	6E-05	6E-09	5.83E-09	8.33E-11	1E-04	1E-09	2.61E-10	1.86E-11	5E-06	3E-10
Heptachlor epoxide	5.0E-04	9.1E+00	2.3E-02	1.01E-08	1.29E-09	2E-05	1E-08	2.01E-08	2.87E-10	4E-05	3E-09	9.01E-10	6.43E-11	2E-06	6E-10
Metals															
Arsenic	3.0E-04	1.5E+00	1.49E+01	6.39E-06	8.22E-07	2E-02	1E-06	1.28E-05	1.83E-07	4E-02	3E-07	5.72E-07	4.09E-08	2E-03	6E-08
Chromium	3.0E-03	N/A	8.27E+01	3.55E-05		1E-02		7.09E-05		2E-02		3.17E-06		1E-03	
Iron	3.0E-01	N/A	2.1627E+04	9.27E-03		3E-02		1.85E-02		6E-02		8.30E-04		3E-03	
Manganese	2.3E-02	N/A	1.06E+05	4.56E-02		2E+00		9.12E-02		4E+00		4.08E-03		2E-01	
Thallium	6.5E-04	N/A	5.34E+01	2.29E-05		4E-02		4.58E-05		7E-02		2.05E-06		3E-03	
Vanadium	7.0E-03	N/A	4.27E+01	1.83E-05		3E-03		3.66E-05		5E-03		1.64E-06		2E-04	
Total Hazard Quotient and Cancer Risk:						**2E+00**	**6E-06**			**4E+00**	**1E-06**			**2E-01**	**3E-07**

Assumptions for Industrial Worker			**Assumptions for Construction Worker**			**Assumptions for Adolescent Trespasser**		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
EPC=	EPC Surface Only		EPC=	EPC Surface Only		EPC=	EPC Surface Only	
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	50	mg/day	IR =	100	mg/day	IR =	50	mg/day
FI =	1	unitless	FI =	1	unitless	FI =	1	unitless
EF =	219	days/year	EF =	219	days/year	EF =	14	days/year
ED =	9	years	ED =	1	years	ED =	5	years
AT (Nc) =	3,285	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE F-2A
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Surface Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	1.0E+01		2.99E-06		2E-06		1.79E-07		1E-07		2.92E-08		2E-08
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	8.5E+00		2.56E-06		2E-05		1.53E-07		1E-06		2.50E-08		2E-07
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	1.0E+01		3.00E-06		2E-06		1.80E-07		1E-07		2.93E-08		2E-08
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	8.7E+00		2.60E-06		2E-07		1.56E-07		1E-08		2.54E-08		2E-09
Chrysene	N/A	7.3E-03	1.3E-01	1.2E+01		3.60E-06		3E-08		2.16E-07		2E-09		3.52E-08		3E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	1.3E-01	1.2E+00		3.46E-07		3E-06		2.08E-08		2E-07		3.38E-09		2E-08
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	3.9E+00		1.16E-06		8E-07		6.97E-08		5E-08		1.13E-08		8E-09
Pesticides																
Dieldrin	5.0E-05	1.6E+01	1.0E-01	6.8E-03	4.39E-09	1.57E-09	9E-05	3E-08	6.59E-09	9.41E-11	1E-04	2E-09	2.14E-10	1.53E-11	4E-06	2E-10
Heptachlor epoxide	5.0E-04	9.1E+00	1.0E-01	2.3E-02	1.52E-08	5.42E-09	3E-05	5E-08	2.27E-08	3.25E-10	5E-05	3E-09	7.40E-10	5.28E-11	1E-06	5E-10
Metals																
Arsenic	3.0E-04	1.5E+00	3.0E-02	1.49E+01	2.89E-06	1.03E-06	1E-02	2E-06	4.34E-06	6.19E-08	1E-02	9E-08	1.41E-07	1.01E-08	5E-04	2E-08
Chromium	7.5E-05	N/A	1.0E-03	8.27E+01	5.34E-07		7E-03		8.01E-07		1E-02		2.61E-08		3E-04	
Iron	3.0E-01	N/A	1.0E-03	2.1627E+04	1.40E-04		5E-04		2.09E-04		7E-04		6.81E-06		2E-05	
Manganese	9.3E-04	N/A	1.0E-03	1.06E+05	6.87E-04		7E-01		1.03E-03		1E+00		3.35E-05		4E-02	
Thallium	6.5E-04	N/A	1.0E-03	5.34E+01	3.45E-07		5E-04		5.18E-07		8E-04		1.68E-08		3E-05	
Vanadium	1.8E-04	N/A	1.0E-03	4.27E+01	2.76E-07		2E-03		4.13E-07		2E-03		1.34E-08		7E-05	
Total Hazard Quotient and Cancer Risk:							**8E-01**	**3E-05**			**1E+00**	**2E-06**			**4E-02**	**3E-07**

Assumptions for Industrial Worker		**Assumptions for Construction Worker**		**Assumptions for Adolescent Trespasser**	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
EPC =	EPC Surface Only	EPC =	EPC Surface Only	EPC =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
SA =	3,300 cm^2	SA =	3,300 cm^2	SA =	5,867 cm^2
AF =	0.2 mg/cm^2-event	AF =	0.3 mg/cm^2-event	AF =	0.07 mg/cm^2-event
EV =	1 event/day	EV =	1 event/day	EV =	1 event/day
EF =	250 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 years	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
N/A= Information not available.
* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factors for chromium, iron, manganese, thallium, and vanadium were assumed to be 0.001 in accordance with the USEPA Region 4 (2000)
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

TABLE F-2B
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SOIL
CENTRAL TENDENCY (CT) - SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $$\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Surface Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	1.0E+01		9.43E-08		7E-08		1.57E-07		1E-07		4.17E-09		3.04E-09
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	8.5E+00		8.06E-08		6E-07		1.34E-07		1E-06		3.56E-09		2.60E-08
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	1.0E+01		9.47E-08		7E-08		1.58E-07		1E-07		4.19E-09		3.06E-09
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	8.7E+00		8.21E-08		6E-09		1.37E-07		1E-08		3.63E-09		2.65E-10
Chrysene	N/A	7.3E-03	1.3E-01	1.2E+01		1.14E-07		8E-10		1.89E-07		1E-09		5.02E-09		3.67E-11
Dibenz(a,h)anthracene	N/A	7.3E+00	1.3E-01	1.2E+00		1.09E-08		8E-08		1.82E-08		1E-07		4.83E-10		3.52E-09
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	3.9E+00		3.66E-08		3E-08		6.10E-08		4E-08		1.62E-09		1.18E-09
Pesticides																
Dieldrin	5.0E-05	1.6E+01	1.0E-01	6.8E-03	3.85E-10	4.95E-11	8E-06	8E-10	5.77E-09	8.25E-11	1E-04	1E-09	3.06E-11	2.19E-12	6.12E-07	3.50E-11
Heptachlor epoxide	5.0E-04	9.1E+00	1.0E-01	2.3E-02	1.33E-09	1.71E-10	3E-06	2E-09	1.99E-08	2.85E-10	4E-05	3E-09	1.06E-10	7.55E-12	2.11E-07	6.87E-11
Metals																
Arsenic	3.0E-04	1.5E+00	3.0E-02	1.49E+01	2.53E-07	3.26E-08	8E-04	5E-08	3.80E-06	5.43E-08	1E-02	8E-08	2.01E-08	1.44E-09	6.71E-05	2.16E-09
Chromium	7.5E-05	N/A	1.0E-03	8.27E+01	4.68E-08		6E-04		7.02E-07		9E-03		3.72E-09		4.96E-05	
Iron	3.0E-01	N/A	1.0E-03	2.1627E+04	1.22E-05		4E-05		1.84E-04		6E-04		9.73E-07		3.24E-06	
Manganese	9.3E-04	N/A	1.0E-03	1.06E+05	6.02E-05		6E-02		9.03E-04		1E+00		4.79E-06		5.13E-03	
Thallium	6.5E-04	N/A	1.0E-03	5.34E+01	3.02E-08		5E-05		4.54E-07		7E-04		2.41E-09		3.72E-06	
Vanadium	1.8E-04	N/A	1.0E-03	4.27E+01	2.41E-08		1E-04		3.62E-07		2E-03		1.92E-09		1.06E-05	
Total Hazard Quotient and Cancer Risk:							**7E-02**	**9E-07**			**1E+00**	**1E-06**			**5E-03**	**4E-08**

Assumptions for Industrial Worke		**Assumptions for Construction Worke**		**Assumptions for Adolescent Trespasse**	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
CS =	EPC Surface Only	EPC =	EPC Surface Only	EPC =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
SA =	3,300 cm^2	SA =	3,300 cm^2	SA =	5,867 cm^2
AF =	0.02 mg/cm^2-event	AF =	0.3 mg/cm^2-event	AF =	0.01 mg/cm^2-event
EV =	1 event/day	EV =	1 event/day	EV =	1 event/day
EF =	219 days/year	EF =	219 days/year	EF =	14 days/year
ED =	9 years	ED =	1 years	ED =	5 years
AT (Nc) =	3,285 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.

N/A= Information not available.

* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factors for chromium, manganese, thallium, and vanadium were assumed to be 0.001 in accordance with the USEPA Region 4 (2000)
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

TABLE F-3A
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC from Surface Soil (1)	Air EPC from Surface Soil Const. Worker (2)	Industrial Worker Intake (mg/kg-day)		Industrial Worker Hazard Quotient	Industrial Worker Cancer Risk	Construction Worker Intake (mg/kg-day)		Construction Worker Hazard Quotient	Construction Worker Cancer Risk	Adolescent Trespasser Intake (mg/kg-day)		Adolescent Trespasser Hazard Quotient	Adolescent Trespasser Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m^3)	(mg/m^3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	1.7E-07	1.1E-06												
Benzo(a)pyrene	N/A	3.10E+00	1.4E-07	9.4E-07		1.01E-08		3E-08		2.62E-09		8E-09		1.27E-11		4E-11
Benzo(b)fluoranthene	N/A	N/A	1.7E-07	1.1E-06												
Benzo(k)fluoranthene	N/A	N/A	1.5E-07	9.6E-07												
Chrysene	N/A	N/A	2.0E-07	1.3E-06												
Dibenz(a,h)anthracene	N/A	N/A	2.0E-08	1.3E-07												
Indeno(1,2,3-cd)pyrene	N/A	N/A	6.6E-08	4.3E-07												
Pesticides																
Dieldrin	N/A	1.61E+01	1.2E-10	7.5E-10		8.08E-12		1E-10		2.09E-12		3E-11		1.01E-14		2E-13
Heptachlor epoxide	N/A	9.10E+00	4.0E-10	2.6E-09		2.79E-11		3E-10		7.22E-12		7E-11		3.50E-14		3E-13
Metals																
Arsenic	N/A	1.51E+01	2.5E-07	1.6E-06		1.77E-08		3E-07		4.59E-09		7E-08		2.22E-11		3E-10
Chromium	2.86E-05	4.20E+01	1.4E-06	9.1E-06	2.75E-07	9.83E-08	1E-02	4E-06	1.78E-06	2.54E-08	6E-02	1E-06	1.73E-09	1.23E-10	6E-05	5E-09
Iron	N/A	N/A	3.7E-04	2.4E-03												
Manganese	1.43E-05	N/A	1.8E-03	1.2E-02	3.54E-04		2E+01		2.29E-03		2E+02		2.22E-06		2E-01	
Thallium	N/A	N/A	9.1E-07	5.9E-06												
Vanadium	N/A	N/A	7.3E-07	4.7E-06												
Total Hazard Quotient and Cancer Risk:							**2E+01**	**4E-06**			**2E+02**	**1E-06**			**2E-01**	**6E-09**

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Adolescent Trespasser	
EPC =	EPC Surface Only	EPC =	EPC Surface Only for Construction Worker	EPC =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
IR =	20 m^3/day	IR =	20 m^3/day	IR =	1.6 m^3/day
EF =	250 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 year	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
(1) This EPC was used for the industrial worker and the adolescent trespasser.
(2) This EPC was used for the construction worker.

TABLE F-3B
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
CENTRAL TENDENCY (CT) - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{\text{EPC x IR x EF x ED}}{\text{BW x AT}}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD (mg/kg-day)	Carc. Slope Inhalation (mg/kg-day)-1	Air EPC from Surface Soil (1) (mg/m^3)	Air EPC from Surface Soil Const. Worker (2) (mg/m^3)	Industrial Worker Intake (mg/kg-day) (Nc)	Industrial Worker Intake (mg/kg-day) (Car)	Industrial Worker Hazard Quotient	Industrial Worker Cancer Risk	Construction Worker Intake (mg/kg-day) (Nc)	Construction Worker Intake (mg/kg-day) (Car)	Construction Worker Hazard Quotient	Construction Worker Cancer Risk	Adolescent Trespasser Intake (mg/kg-day) (Nc)	Adolescent Trespasser Intake (mg/kg-day) (Car)	Adolescent Trespasser Hazard Quotient	Adolescent Trespasser Cancer Risk
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	1.7E-07	1.1E-06												
Benzo(a)pyrene	N/A	3.10E+00	1.4E-07	9.4E-07		1.66E-09		5E-09		2.30E-09		7E-09		1.27E-11		4E-11
Benzo(b)fluoranthene	N/A	N/A	1.7E-07	1.1E-06												
Benzo(k)fluoranthene	N/A	N/A	1.5E-07	9.6E-07												
Chrysene	N/A	N/A	2.0E-07	1.3E-06												
Dibenz(a,h)anthracene	N/A	N/A	2.0E-08	1.3E-07												
Indeno(1,2,3-cd)pyrene	N/A	N/A	6.6E-08	4.3E-07												
Pesticides																
Dieldrin	N/A	1.61E+01	1.2E-10	7.5E-10		1.33E-12		2E-11		1.83E-12		3E-11		1.01E-14		2E-13
Heptachlor epoxide	N/A	9.10E+00	4.0E-10	2.6E-09		4.57E-12		4E-11		6.32E-12		6E-11		3.50E-14		3E-13
Metals																
Arsenic	N/A	1.51E+01	2.5E-07	1.6E-06		2.91E-09		4E-08		4.02E-09		6E-08		2.22E-11		3E-10
Chromium	2.86E-05	4.20E+01	1.4E-06	9.1E-06	1.25E-07	1.61E-08	4E-03	7E-07	1.56E-06	2.23E-08	5E-02	9E-07	1.73E-09	1.23E-10	6E-05	5E-09
Iron	N/A	N/A	3.7E-04	2.4E-03												
Manganese	1.43E-05	N/A	1.8E-03	1.2E-02	1.61E-04		1E+01		2.01E-03		1E+02		2.22E-06		2E-01	
Thallium	N/A	N/A	9.1E-07	5.9E-06												
Vanadium	N/A	N/A	7.3E-07	4.7E-06												
Total Hazard Quotient and Cancer Risk:							**1E+01**	**7E-07**			**1E+02**	**1E-06**			**2E-01**	**6E-09**

	Assumptions for Industrial Worker		**Assumptions for Construction Worker**		**Assumptions for Adolescent Trespasser**	
EPC =	EPC Surface Only	EPC =	EPC Surface Only for Construction Worker	EPC =	EPC Surface Only	
BW =	70 kg	BW =	70 kg	BW =	50 kg	
IR =	10.4 m^3/day	IR =	20 m^3/day	IR =	1.6 m^3/day	
EF =	219 days/year	EF =	219 days/year	EF =	14 days/year	
ED =	9 years	ED =	1 year	ED =	5 years	
AT (Nc) =	3,285 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days	
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days	

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
(1) This EPC was used for the industrial worker and the adolescent trespasser.
(2) This EPC was used for the construction worker.

TABLE F-4A
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF DITCH SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

$$\text{Equation for Intake (mg/kg-day)} = \frac{EPC \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Ditch Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
				Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds															
Benzo(a)anthracene	N/A	7.3E-01	5.9E+00		4.11E-07		3E-07		2.71E-07		2E-07		3.22E-08		2E-08
Benzo(a)pyrene	N/A	7.3E+00	6.2E+00		4.36E-07		3E-06		2.88E-07		2E-06		3.42E-08		2E-07
Benzo(b)fluoranthene	N/A	7.3E-01	1.1E+01		7.90E-07		6E-07		5.21E-07		4E-07		6.19E-08		5E-08
Benzo(k)fluoranthene	N/A	7.3E-02	8.9E+00		6.20E-07		5E-08		4.09E-07		3E-08		4.86E-08		4E-09
Chrysene	N/A	7.3E-03	8.6E+00		6.03E-07		4E-09		3.98E-07		3E-09		4.73E-08		3E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	2.4E+00		1.65E-07		1E-06		1.09E-07		8E-07		1.29E-08		9E-08
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.1E+01		7.70E-07		6E-07		5.08E-07		4E-07		6.04E-08		4E-08
Metals															
Arsenic	3E-04	1.5E+00	6.1E+01	1.19E-05	4.24E-06	4E-02	6E-06	1.96E-04	2.80E-06	7E-01	4E-06	4.65E-06	3.32E-07	2E-02	5E-07
Iron	3E-01	N/A	2.1E+04	4.13E-03		1E-02		6.82E-02		2E-01		1.62E-03		5E-03	
Manganese	2E-02	N/A	1.1E+04	2.12E-03		9E-02		3.49E-02		1E+00		8.29E-04		4E-02	
Thallium	6E-04	N/A	1.2E+01	2.28E-06		4E-03		3.76E-05		6E-02		8.92E-07		1E-03	
Total Hazard Quotient and Cancer Risk:						**1E-01**	**1E-05**			**2E+00**	**8E-06**			**6E-02**	**1E-06**

Assumptions for Industrial Worker			Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
EPC=	EPC Surface Only		EPC=	EPC Surface Only		EPC=	EPC Surface Only	
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	100	mg/day	IR =	330	mg/day	IR =	100	mg/day
FI =	1	unitless	FI =	1	unitless	FI =	1	unitless
EF =	50	days/year	EF =	250	days/year	EF =	14	days/year
ED =	25	years	ED =	1	years	ED =	5	years
AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE F-4B
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF DITCH SOIL
CENTRAL TENDENCY (CT) - SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Ditch Soil	Industrial Worker Intake (mg/kg-day)		Industrial Worker Hazard Quotient	Industrial Worker Cancer Risk	Construction Worker Intake (mg/kg-day)		Construction Worker Hazard Quotient	Construction Worker Cancer Risk	Adolescent Trespasser Intake (mg/kg-day)		Adolescent Trespasser Hazard Quotient	Adolescent Trespasser Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds															
Benzo(a)anthracene	N/A	7.3E-01	5.9E+00		7.39E-08		5E-08		7.19E-08		5E-08		1.61E-08		1E-08
Benzo(a)pyrene	N/A	7.3E+00	6.2E+00		7.85E-08		6E-07		7.64E-08		6E-07		1.71E-08		1E-07
Benzo(b)fluoranthene	N/A	7.3E-01	1.1E+01		1.42E-07		1E-07		1.38E-07		1E-07		3.10E-08		2E-08
Benzo(k)fluoranthene	N/A	7.3E-02	8.9E+00		1.12E-07		8E-09		1.09E-07		8E-09		2.43E-08		2E-09
Chrysene	N/A	7.3E-03	8.6E+00		1.09E-07		8E-10		1.06E-07		8E-10		2.36E-08		2E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	2.4E+00		2.97E-08		2E-07		2.89E-08		2E-07		6.46E-09		5E-08
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.1E+01		1.39E-07		1E-07		1.35E-07		1E-07		3.02E-08		2E-08
Metals															
Arsenic	3.0E-04	1.5E+00	6.1E+01	5.93E-06	7.63E-07	2E-02	1E-06	5.20E-05	7.42E-07	2E-01	1E-06	2.33E-06	1.66E-07	8E-03	2E-07
Iron	3.0E-01	N/A	2.1E+04	2.07E-03		7E-03		1.81E-02		6E-02		8.10E-04		3E-03	
Manganese	2.3E-02	N/A	1.1E+04	1.06E-03		5E-02		9.27E-03		4E-01		4.15E-04		2E-02	
Thallium	6.5E-04	N/A	1.2E+01	1.14E-06		2E-03		9.97E-06		2E-02		4.46E-07		7E-04	
Total Hazard Quotient and Cancer Risk:						**7E-02**	**2E-06**			**6E-01**	**2E-06**			**3E-02**	**5E-07**

Assumptions for Industrial Worker		**Assumptions for Construction Worker**		**Assumptions for Adolescent Trespasser**	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
EPC=	EPC Surface Only	EPC=	EPC Surface Only	EPC=	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
IR =	50 mg/day	IR =	100 mg/day	IR =	50 mg/day
FI =	1 unitless	FI =	1 unitless	FI =	1 unitless
EF =	50 days/year	EF =	219 days/year	EF =	14 days/year
ED =	9 years	ED =	1 years	ED =	5 years
AT (Nc) =	3,285 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE F-5A
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO DITCH SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Ditch Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	5.9E+00		3.52E-07		3E-07		1.06E-07		8E-08		1.72E-08		1E-08
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	6.2E+00		3.74E-07		3E-06		1.12E-07		8E-07		1.82E-08		1E-07
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	1.1E+01		6.78E-07		5E-07		2.03E-07		1E-07		3.31E-08		2E-08
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	8.9E+00		5.32E-07		4E-08		1.60E-07		1E-08		2.59E-08		2E-09
Chrysene	N/A	7.3E-03	1.3E-01	8.6E+00		5.17E-07		4E-09		1.55E-07		1E-09		2.52E-08		2E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	1.3E-01	2.4E+00		1.41E-07		1E-06		4.24E-08		3E-07		6.90E-09		5E-08
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	1.1E+01		6.61E-07		5E-07		1.98E-07		1E-07		3.22E-08		2E-08
Metals																
Arsenic	3E-04	1.5E+00	3.0E-02	6.1E+01	2.35E-06	8.39E-07	8E-03	1E-06	1.76E-05	2.52E-07	6E-02	4E-07	5.73E-07	4.09E-08	2E-03	6E-08
Iron	3E-01	N/A	1.0E-03	2.1E+04	2.73E-05		9E-05		2.04E-04		7E-04		6.65E-06		2E-05	
Manganese	9E-04	N/A	1.0E-03	1.1E+04	1.40E-05		1E-02		1.05E-04		1E-01		3.41E-06		4E-03	
Thallium	6E-04	N/A	1.0E-03	1.2E+01	1.50E-08		2E-05		1.13E-07		2E-04		3.66E-09		6E-06	
Total Hazard Quotient and Cancer Risk:							**2E-02**	**6E-06**			**2E-01**	**2E-06**			**6E-03**	**3E-07**

Assumptions for Industrial Worker	Assumptions for Construction Worker	Assumptions for Adolescent Trespasser
CF = 1E-06 kg/mg	CF = 1E-06 kg/mg	CF = 1E-06 kg/mg
EPC = EPC Surface Only	EPC = EPC Surface Only	EPC = EPC Surface Only
BW = 70 kg	BW = 70 kg	BW = 50 kg
SA = 3,300 cm^2	SA = 3,300 cm^2	SA = 5,867 cm^2
AF = 0.2 mg/cm^2-event	AF = 0.3 mg/cm^2-event	AF = 0.07 mg/cm^2-event
EV = 1 event/day	EV = 1 event/day	EV = 1 event/day
EF = 50 days/year	EF = 250 days/year	EF = 14 days/year
ED = 25 years	ED = 1 years	ED = 5 years
AT (Nc) = 9,125 days	AT (Nc) = 365 days	AT (Nc) = 1,825 days
AT (Car) = 25,550 days	AT (Car) = 25,550 days	AT (Car) = 25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.

N/A= Information not available.

* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factors for iron, manganese, and thallium were assumed to be 0.001 in accordance with the USEPA Region 4 (2000)
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

TABLE F-5B
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO DITCH SOIL
CENTRAL TENDENCY (CT) - SEAD-121I
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Ditch Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	5.9E+00		1.27E-08		9E-09		9.26E-08		7E-08		2.46E-09		1.79E-09
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	6.2E+00		1.35E-08		1E-07		9.83E-08		7E-07		2.61E-09		1.90E-08
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	1.1E+01		2.44E-08		2E-08		1.78E-07		1E-07		4.72E-09		3.45E-09
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	8.9E+00		1.91E-08		1E-09		1.40E-07		1E-08		3.71E-09		2.71E-10
Chrysene	N/A	7.3E-03	1.3E-01	8.6E+00		1.86E-08		1E-10		1.36E-07		1E-09		3.60E-09		2.63E-11
Dibenz(a,h)anthracene	N/A	7.3E+00	1.3E-01	2.4E+00		5.09E-09		4E-08		3.72E-08		3E-07		9.86E-10		7.20E-09
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	1.1E+01		2.38E-08		2E-08		1.74E-07		1E-07		4.60E-09		3.36E-09
Metals																
Arsenic	3.00E-04	1.5E+00	3.0E-02	6.1E+01	2.35E-07	3.02E-08	8E-04	5E-08	1.54E-05	2.20E-07	5E-02	3E-07	8.18E-08	5.85E-09	2.73E-04	8.77E-09
Iron	3.00E-01	N/A	1.0E-03	2.1E+04	2.73E-06		9E-06		1.79E-04		6E-04		9.50E-07		3.17E-06	
Manganese	9.33E-04	N/A	1.0E-03	1.1E+04	1.40E-06		1E-03		9.17E-05		1E-01		4.87E-07		5.21E-04	
Thallium	6.47E-04	N/A	1.0E-03	1.2E+01	1.50E-09		2E-06		9.87E-08		2E-04		5.23E-10		8.10E-07	
Total Hazard Quotient and Cancer Risk:							**2E-03**	**2E-07**			**2E-01**	**2E-06**			**8E-04**	**4E-08**

Assumptions for Industrial Worke			Assumptions for Construction Worke			Assumptions for Adolescent Trespasse		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
EPC =	EPC Surface Only		EPC =	EPC Surface Only		EPC =	EPC Surface Only	
BW =	70	kg	BW =	70	kg	BW =	50	kg
SA =	3,300	cm^2	SA =	3,300	cm^2	SA =	5,867	cm^2
AF =	0.02	mg/cm^2-event	AF =	0.3	mg/cm^2-event	AF =	0.01	mg/cm^2-event
EV =	1	event/day	EV =	1	event/day	EV =	1	event/day
EF =	50	days/year	EF =	219	days/year	EF =	14	days/year
ED =	9	years	ED =	1	years	ED =	5	years
AT (Nc) =	3,285	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
N/A= Information not available.
* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factors for iron, manganese, and thallium were assumed to be 0.001 in accordance with the USEPA Region 4 (2000)
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

TABLE F-6A
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{\text{EPC x IR x EF x ED}}{\text{BW x AT}}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC from Ditch Soil (1)	Air EPC from Ditch Soil Const. Worker (2)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m^3)	(mg/m^3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	1.0E-07	6.5E-07												
Benzo(a)pyrene	N/A	3.10E+00	1.1E-07	6.9E-07		7.41E-09		2E-08		1.92E-09		6E-09		9.30E-12		3E-11
Benzo(b)fluoranthene	N/A	N/A	1.9E-07	1.2E-06												
Benzo(k)fluoranthene	N/A	N/A	1.5E-07	9.8E-07												
Chrysene	N/A	N/A	1.5E-07	9.5E-07												
Dibenz(a,h)anthracene	N/A	N/A	4.0E-08	2.6E-07												
Indeno(1,2,3-cd)pyrene	N/A	N/A	1.9E-07	1.2E-06												
Metals																
Arsenic	N/A	1.51E+01	1.0E-06	6.7E-06		7.20E-08		1E-06		1.86E-08		3E-07		9.03E-11		1E-09
Iron	N/A	N/A	3.6E-04	2.3E-03												
Manganese	1.43E-05	N/A	1.8E-04	1.2E-03	3.60E-05		3E+00		2.33E-04		2E+01		2.26E-07		2E-02	
Thallium	N/A	N/A	2.0E-07	1.3E-06												
Total Hazard Quotient and Cancer Risk:							**3E+00**	**1E-06**			**2E+01**	**3E-07**			**2E-02**	**1E-09**

Assumptions for Industrial Worker		**Assumptions for Construction Worker**		**Assumptions for Adolescent Trespasser**	
EPC =	EPC Surface Only	EPC =	EPC Surface Only for Construction Worker	EPC =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
IR =	20 m^3/day	IR =	20 m^3/day	IR =	1.6 m^3/day
EF =	250 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 year	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
(1) This EPC was used for the industrial worker and the adolescent trespasser.
(2) This EPC was used for the construction worker.

TABLE F-6B
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
CENTRAL TENDENCY (CT) - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI REPORT
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{\text{EPC x IR x EF x ED}}{\text{BW x AT}}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3

IR = Inhalation Rate

EF = Exposure Frequency

ED = Exposure Duration

BW = Bodyweight

AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC from Ditch Soil (1)	Air EPC from Ditch Soil Const. Worker (2)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m^3)	(mg/m^3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	1.0E-07	6.5E-07												
Benzo(a)pyrene	N/A	3.10E+00	1.1E-07	6.9E-07		1.22E-09		4E-09		1.68E-09		5E-09		9.30E-12		3E-11
Benzo(b)fluoranthene	N/A	N/A	1.9E-07	1.2E-06												
Benzo(k)fluoranthene	N/A	N/A	1.5E-07	9.8E-07												
Chrysene	N/A	N/A	1.5E-07	9.5E-07												
Dibenz(a,h)anthracene	N/A	N/A	4.0E-08	2.6E-07												
Indeno(1,2,3-cd)pyrene	N/A	N/A	1.9E-07	1.2E-06												
Metals																
Arsenic	N/A	1.51E+01	1.0E-06	6.7E-06		1.18E-08		2E-07		1.63E-08		2E-07		9.03E-11		1E-09
Iron	N/A	N/A	3.6E-04	2.3E-03												
Manganese	1.43E-05	N/A	1.8E-04	1.2E-03	1.64E-05		1E+00		2.04E-04		1E+01		2.26E-07		2E-02	
Thallium	N/A	N/A	2.0E-07	1.3E-06												
Total Hazard Quotient and Cancer Risk:							**1E+00**	**2E-07**			**1E+01**	**3E-07**			**2E-02**	**1E-09**

Assumptions for Industrial Worker			Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
EPC =	EPC Surface Only		EPC =	EPC Surface Only for Construction Worker		EPC =	EPC Surface Only	
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	10.4	m^3/day	IR =	20	m^3/day	IR =	1.6	m^3/day
EF =	219	days/year	EF =	219	days/year	EF =	14	days/year
ED =	9	years	ED =	1	year	ED =	5	years
AT (Nc) =	3,285	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.

NA= Information not available.

(1) This EPC was used for the industrial worker and the adolescent trespasser.

(2) This EPC was used for the construction worker.

APPENDIX G

ECOLOGICAL RISK ASSESSMENT CALCULATION TABLES

APPENDIX G

ECOLOGICAL RISK ASSESSMENT CALCULATION TABLES
(Continued)

TABLE G-1
CHEMICAL-SPECIFIC UPTAKE FACTORS
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Soil-To-Soil Invertebrate [1] (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF [2] (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Soil-To-Plant [3] (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)
Volatile Organic Compounds			
Benzene	0.20	1.07E+00	2.27
Ethyl benzene	0.24	7.61E-01	0.59
Meta/Para Xylene	0.24	7.48E-01	0.55
Semivolatile Organic Compounds			
3 or 4-Methylphenol	0.10	1.14E+00	2.89
Acenaphthene	0.07	4.61E-04	0.21
Acenaphthylene	0.07	4.61E-04	0.17
Anthracene	0.07	4.61E-04	0.104
Benzo(a)anthracene	0.03	1.46E-04	0.0202
Benzo(a)pyrene	0.07	4.61E-04	0.011
Benzo(b)fluoranthene	0.07	5.46E-04	0.0101
Benzo(ghi)perylene	0.07	4.61E-04	0.0057
Benzo(k)fluoranthene	0.08	5.43E-04	0.0101
Bis(2-Ethylhexyl)phthalate	0.040	5.50E-05	0.038
Butylbenzylphthalate	0.050	4.49E-01	0.07
Carbazole	0.060	6.29E-01	0.27
Chrysene	0.04	1.88E-04	0.0187
Dibenz(a,h)anthracene	0.07	1.21E-03	0.0064
Dibenzofuran	0.050	5.50E-01	0.16
Di-n-octylphthalate	0.010	7.32E-01	0.000157
Fluoranthene	0.07	4.61E-04	0.0372
Fluorene	0.07	4.61E-04	0.149
Hexachlorobenzene	0.040	1.09E-04	0.0255
Indeno(1,2,3-cd)pyrene	0.08	2.82E-03	0.0039
Naphthalene	0.07	4.61E-04	0.42
Phenanthrene	0.07	4.61E-04	0.102
Phenol	0.110	1.34E+00	5.55
Pyrene	0.07	4.61E-04	0.0443
PCBs			
Aroclor-1242	1.1	5.52E-04	0.01
Aroclor-1254	1.1	5.52E-04	0.01
Aroclor-1260	1.1	5.52E-04	0.01
Pesticides			
4,4'-DDD	1.3	6.18E-04	0.00937
4,4'-DDE	1.3	6.18E-04	0.00937
4,4'-DDT	1.3	6.18E-04	0.00937
Aldrin	0.070	7.97E-01	0.705
Alpha-Chlordane	0.040	3.51E-01	0.027
Delta-BHC	0.050	5.47E-01	0.157
Dieldrin	0.050	4.75E-01	0.090
Endosulfan I	0.060	6.06E-01	0.237
Endosulfan II	0.060	6.06E-01	0.237
Endrin	0.050	4.75E-01	0.090

TABLE G-1
CHEMICAL-SPECIFIC UPTAKE FACTORS
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Soil-To-Soil Invertebrate [1] (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF [2] (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Soil-To-Plant [3] (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)
Endrin ketone	0.050	4.75E-01	0.090
Gamma-Chlordane	0.040	3.51E-01	0.027
Heptachlor	1.40	3.55E-05	0.049
Heptachlor epoxide	1.40	3.55E-05	0.029
Inorganics			
Aluminum	0.22	1.50E-03	0.004
Antimony	0.22	1.00E-03	0.2
Arsenic	0.11	2.00E-03	0.036
Barium	0.091	1.50E-04	0.15
Cadmium	0.96	5.50E-04	0.364
Chromium	0.01	5.50E-03	0.0075
Chromium, Hexavalent	0.01	5.50E-03	0.0075
Cobalt	0.122	2.00E-02	0.081
Copper	0.04	1.00E-02	0.4
Cyanide	1.12	1.00E+00	1
Iron	0.22	2.00E-02	0.004
Lead	0.03	3.00E-04	0.045
Manganese	0.054	4.00E-04	0.25
Mercury	0.04	2.50E-01	0.0375
Nickel	0.02	6.00E-03	0.032
Selenium	0.22	1.50E-02	0.016
Silver	0.22	3.00E-03	0.4
Thallium	0.22	4.00E-02	0.004
Vanadium	0.22	2.50E-03	0.0055
Zinc	0.56	1.00E-01	1.2E-12

COPC = Chemicals of Potential Concern
BAF = Bioaccumulation factor
SP = Soil-to-plant uptake factor

1. Values from USEPA. 1999. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities* . Peer Review Draft.

Values for VOCs or SVOCs not available in USEPA 1999 were calculated using the following equation based on the equations presented in USEPA 2005 Eco-SSL, Attachment 4-1 and USEPA 1996 Soil Screening Guidance Technical Background Document. Fraction of organic carbon in soil was assumed to be 1% and earthworm water content was assumed to be 84%.

For SVOC: $BCF=(16\%x10^{0.87logKow-2})/(1\%x10^{0.983logkow+0.00028})$

For VOC: $BCF=(16\%x10^{0.87logKow-2})/(1\%x10^{0.7919logkow+0.0784})$

LogKow from USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, USEPA (1999), or RAIS (http://risk.lsd.ornl.gov/tox/tox_values.shtml).

The values for bis(2-ethylhexyl)phthalate, di-n-octylphthalate, and hexachlorobenze were based on the above equations as the values presented in USEPA (1999) were based on equation published from earlier literature.

The value for Benzo(a)pyrene was used for PAHs with no bioaccumulation values in the USEPA document.

The value for 4,4'-DDE was used for 4,4'-DDT and 4,4'-DDD.

The value for total chromium was used for chromium and chromium (VI).

TABLE G-1
CHEMICAL-SPECIFIC UPTAKE FACTORS
SEAD-121C and SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Soil-To-Soil Invertebrate [1] (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF [2] (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Soil-To-Plant [3] (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)

The value for endrin was used for endrin ketone.

The value for mercuric chloride was used for mercury

For metals without USEPA recommended values, the median value from USEPA (2003) Table 8 (Attachment 4-1) or the arithmetic mean of the recommended values for the available metals was used.

The value for endosulfan I was used for endosulfan II.

The value for alpha chlordane was used for gamma chlordane.

2. Values for inorganics were from Baes, et al., 1984. *A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture.*

Values for organics were from USEPA (1999) Table D-3. The highest value for terrestrial mammals was used.

BCF for Aroclor 1254 was used for Aroclor 1260 and 1242. BCF for 4,4'-DDE was used for 4,4'-DDD and 4,4'-DDT.

BCF for heptachlor was used for heptachlor epoxide.

Values for organics were based on equation provided in USEPA (2003), attachment 4-1. lgBAF=0.338-0.145lgKow.

The value for endrin was used for endrin ketone.

The value for endosulfan I was used for endosulfan II.

The value for alpha chlordane was used for gamma chlordane.

No BCF data were available for cyanide and a default value of 1 was assumed.

3. Values from USEPA. 1999. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities* . Peer Review Draft. 1999.

For PAHs and pesticides, the values were calculated based on the model presented in Travers et al., 1988: logBCF=1.588-0.578xlogKow,

The value for 4,4'-DDE was used for 4,4'-DDT and 4,4'-DDD.

The value for Aroclor 1254 was used for Aroclor 1260 and 1242.

The value for total chromium was used for chromium and chromium (VI).

Values for cobalt and iron were from NRC. 1992. US Nuclear Regulatory Commission.*Residual Radioactive Contamination from Decommissioning: Technical Basis for Translating Contamination Levels to Annual Total Effective Dose Equivalent.*

The value for mercuric chloride was used for mercury

A default value of 1 was used for cyanide.

Values for manganese and vanadium were from Baes, et al., 1984. *A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture.*

TABLE G-2A
DEER MOUSE (Peromyscus maniculatus) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	SP (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Terrestrial Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Deer Mouse Surface Soil Exposure (mg/kg/day)	Deer Mouse Total Soil Exposure (mg/kg/day)
Volatile Organic Compounds							
Benzene	0.041	1.8		2.27E+00	2.0E-01	7.20E-03	3.16E-01
Ethyl benzene	3.3	24		5.85E-01	2.4E-01	3.79E-01	2.76E+00
Meta/Para Xylene	4.4	130		5.48E-01	2.4E-01	4.98E-01	1.47E+01
Semivolatile Organic Compounds							
Acenaphthene	2.6	2.6		2.10E-01	7.0E-02	9.43E-02	9.43E-02
Acenaphthylene	2.5	2.5		1.72E-01	7.0E-02	8.65E-02	8.65E-02
Anthracene	7.1	7.1		1.04E-01	7.0E-02	2.24E-01	2.24E-01
Benzo(a)anthracene	10	10		2.02E-02	3.0E-02	1.33E-01	1.33E-01
Benzo(a)pyrene	8.7	8.7		1.10E-02	7.0E-02	2.38E-01	2.38E-01
Benzo(b)fluoranthene	12	12		1.01E-02	7.0E-02	3.28E-01	3.28E-01
Benzo(ghi)perylene	3.15	3.15		5.70E-03	7.0E-02	8.56E-02	8.56E-02
Benzo(k)fluoranthene	7.5	7.5		1.01E-02	8.0E-02	2.33E-01	2.33E-01
Bis(2-Ethylhexyl)phthalate			0.0042	3.80E-02	4.0E-02	6.34E-04	6.34E-04
Carbazole	4.2	4.2		2.74E-01	6.0E-02	1.49E-01	1.49E-01
Chrysene	9.1	9.1		1.87E-02	4.0E-02	1.53E-01	1.53E-01
Dibenz(a,h)anthracene	0.47	0.47		6.40E-03	7.0E-02	1.28E-02	1.28E-02
Dibenzofuran	1.7	1.7		1.61E-01	5.0E-02	4.56E-02	4.56E-02
Di-n-octylphthalate	0.0232	0.0232		1.57E-04	1.0E-02	1.18E-04	1.18E-04
Fluoranthene	27	27		3.72E-02	7.0E-02	7.72E-01	7.72E-01
Fluorene	3.5	3.5		1.49E-01	7.0E-02	1.17E-01	1.17E-01
Hexachlorobenzene	0.0085	0.0085		2.55E-02	4.0E-02	1.46E-04	1.46E-04
Indeno(1,2,3-cd)pyrene	0.97	0.97		3.90E-03	8.0E-02	2.98E-02	2.98E-02
Naphthalene	0.4	1.9		4.20E-01	7.0E-02	1.83E-02	8.67E-02
Phenanthrene	29	29		1.02E-01	7.0E-02	9.13E-01	9.13E-01
Pyrene	34	34		4.43E-02	7.0E-02	9.82E-01	9.82E-01
PCBs							
Aroclor-1242	0.058	0.058		1.00E-02	1.1E+00	2.40E-02	2.40E-02
Aroclor-1254	0.93	0.93		1.00E-02	1.1E+00	3.84E-01	3.84E-01
Aroclor-1260	0.085	0.2		1.00E-02	1.1E+00	3.51E-02	8.26E-02
Pesticides							
4,4'-DDD	0.044	0.044		9.37E-03	1.3E+00	2.03E-02	2.03E-02
4,4'-DDE	0.069	0.069		9.37E-03	1.3E+00	3.18E-02	3.18E-02

TABLE G-2A
DEER MOUSE (Peromyscus maniculatus) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	SP (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Terrestrial Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Deer Mouse Surface Soil Exposure (mg/kg/day)	Deer Mouse Total Soil Exposure (mg/kg/day)
4,4'-DDT	0.1	0.1		9.37E-03	1.3E+00	4.60E-02	4.60E-02
Aldrin	0.01445	0.01445		7.05E-01	7.0E-02	8.43E-04	8.43E-04
Alpha-Chlordane	0.063	0.063		2.67E-02	4.0E-02	1.08E-03	1.08E-03
Delta-BHC	0.002	0.002		1.57E-01	5.0E-02	5.33E-05	5.33E-05
Dieldrin	0.041	0.041		8.96E-02	5.0E-02	9.69E-04	9.69E-04
Endosulfan I	0.19	0.19		2.37E-01	6.0E-02	6.43E-03	6.43E-03
Endosulfan II	0.009	0.009		2.37E-01	6.0E-02	3.05E-04	3.05E-04
Endrin	0.0215	0.023		8.96E-02	5.0E-02	5.08E-04	5.44E-04
Endrin ketone	0.0075	0.0097		8.96E-02	5.0E-02	1.77E-04	2.29E-04
Gamma-Chlordane	0.0012	0.0012		2.67E-02	4.0E-02	2.06E-05	2.06E-05
Heptachlor	0.014	0.014		4.89E-02	1.4E+00	7.18E-03	7.18E-03
Heptachlor epoxide	0.0028	0.0028		2.93E-02	1.4E+00	1.43E-03	1.43E-03
Metals							
Aluminum			8.76	4.00E-03	2.2E-01	1.32E+00	1.32E+00
Antimony	236	236		2.00E-01	2.2E-01	2.13E+01	2.13E+01
Arsenic	11.6	11.6	0.0503	3.60E-02	1.1E-01	5.07E-01	5.07E-01
Barium	2030	2030		1.50E-01	9.1E-02	8.37E+01	8.37E+01
Cadmium	29.1	29.1	0.0195	3.64E-01	9.6E-01	1.07E+01	1.07E+01
Chromium	74.8	74.8	0.129	7.50E-03	1.0E-02	4.24E-01	4.24E-01
Cobalt	17	19.7	0.047	8.10E-02	1.2E-01	8.48E-01	9.81E-01
Copper	9750	9750	1.16	4.00E-01	4.0E-02	3.30E+02	3.30E+02
Iron			110	4.00E-03	2.2E-01	1.66E+01	1.66E+01
Lead	18900	18900	0.839	4.50E-02	3.0E-02	2.72E+02	2.72E+02
Manganese	858	858		2.50E-01	5.4E-02	2.77E+01	2.77E+01
Mercury	0.47	0.47	0.0021	3.75E-02	4.0E-02	8.62E-03	8.62E-03
Nickel	224	224	0.154	3.20E-02	2.0E-02	2.30E+00	2.30E+00
Selenium	1.3	1.3	0.0046	1.60E-02	2.2E-01	1.08E-01	1.08E-01
Silver	21.8	21.8	0.008	4.00E-01	2.2E-01	2.17E+00	2.17E+00
Thallium	1.1	1.8		4.00E-03	2.2E-01	8.99E-02	1.47E-01
Vanadium	25.4	27	0.233	5.50E-03	2.2E-01	2.11E+00	2.24E+00
Zinc	3610	3610	6.91	1.20E-12	5.6E-01	7.42E+02	7.42E+02

TABLE G-2A
DEER MOUSE (Peromyscus maniculatus) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	SP (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Terrestrial Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Deer Mouse Surface Soil Exposure (mg/kg/day)	Deer Mouse Total Soil Exposure (mg/kg/day)

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = EPC in the appropriate soil exposure interval (mg COPC/kg dry soil)
SP = Soil-to-plant uptake factor ((mg COPC/kg dry tissue)/(mg COPC/kg dry soil))
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-2B
AMERICAN ROBIN (*Turdus migratorius*) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	American Robin Surface Soil Exposure (mg/kg/day)	American Robin Total Soil Exposure (mg/kg/day)
Volatile Organic Compounds							
Benzene	0.041	1.8		2.27E+00	2.00E-01	4.55E-03	2.00E-01
Ethyl benzene	3.3	24		5.85E-01	2.40E-01	3.86E-01	2.81E+00
Meta/Para Xylene	4.4	130		5.48E-01	2.40E-01	5.14E-01	1.52E+01
Semivolatile Organic Compounds							
Acenaphthene	2.6	2.6		2.10E-01	7.00E-02	1.16E-01	1.16E-01
Acenaphthylene	2.5	2.5		1.72E-01	7.00E-02	1.11E-01	1.11E-01
Anthracene	7.1	7.1		1.04E-01	7.00E-02	3.11E-01	3.11E-01
Benzo(a)anthracene	10	10		2.02E-02	3.00E-02	2.68E-01	2.68E-01
Benzo(a)pyrene	8.7	8.7		1.10E-02	7.00E-02	3.76E-01	3.76E-01
Benzo(b)fluoranthene	12	12		1.01E-02	7.00E-02	5.19E-01	5.19E-01
Benzo(ghi)perylene	3.15	3.15		5.70E-03	7.00E-02	1.36E-01	1.36E-01
Benzo(k)fluoranthene	7.5	7.5		1.01E-02	8.00E-02	3.55E-01	3.55E-01
Bis(2-Ethylhexyl)phthalate			0.0042	3.80E-02	4.00E-02	5.75E-04	5.75E-04
Carbazole	4.2	4.2		2.74E-01	6.00E-02	1.71E-01	1.71E-01
Chrysene	9.1	9.1		1.87E-02	4.00E-02	2.81E-01	2.81E-01
Dibenz(a,h)anthracene	0.47	0.47		6.40E-03	7.00E-02	2.03E-02	2.03E-02
Dibenzofuran	1.7	1.7		1.61E-01	5.00E-02	6.11E-02	6.11E-02
Di-n-octylphthalate	0.0232	0.0232		1.57E-04	1.00E-02	4.28E-04	4.28E-04
Fluoranthene	27	27		3.72E-02	7.00E-02	1.17E+00	1.17E+00
Fluorene	3.5	3.5		1.49E-01	7.00E-02	1.54E-01	1.54E-01
Hexachlorobenzene	0.0085	0.0085		2.55E-02	4.00E-02	2.63E-04	2.63E-04
Indeno(1,2,3-cd)pyrene	0.97	0.97		3.90E-03	8.00E-02	4.59E-02	4.59E-02
Naphthalene	0.4	1.9		4.20E-01	7.00E-02	1.83E-02	8.70E-02
Phenanthrene	29	29		1.02E-01	7.00E-02	1.27E+00	1.27E+00
Pyrene	34	34		4.43E-02	7.00E-02	1.48E+00	1.48E+00
PCBs							
Aroclor-1242	0.058	0.058		1.00E-02	1.13E+00	2.79E-02	2.79E-02
Aroclor-1254	0.93	0.93		1.00E-02	1.13E+00	4.47E-01	4.47E-01
Aroclor-1260	0.085	0.2		1.00E-02	1.13E+00	4.09E-02	9.62E-02

TABLE G-2B
AMERICAN ROBIN (*Turdus migratorius*) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	American Robin Surface Soil Exposure (mg/kg/day)	American Robin Total Soil Exposure (mg/kg/day)
Pesticides							
4,4'-DDD	0.044	0.044		9.37E-03	1.26E+00	2.35E-02	2.35E-02
4,4'-DDE	0.069	0.069		9.37E-03	1.26E+00	3.69E-02	3.69E-02
4,4'-DDT	0.1	0.1		9.37E-03	1.26E+00	5.35E-02	5.35E-02
Aldrin	0.01445	0.01445		7.05E-01	7.00E-02	6.88E-04	6.88E-04
Alpha-Chlordane	0.063	0.063		2.67E-02	4.00E-02	1.95E-03	1.95E-03
Delta-BHC	0.002	0.002		1.57E-01	5.00E-02	7.18E-05	7.18E-05
Dieldrin	0.041	0.041		8.96E-02	5.00E-02	1.46E-03	1.46E-03
Endosulfan I	0.19	0.19		2.37E-01	6.00E-02	7.70E-03	7.70E-03
Endosulfan II	0.009	0.009		2.37E-01	6.00E-02	3.65E-04	3.65E-04
Endrin	0.0215	0.023		8.96E-02	5.00E-02	7.63E-04	8.17E-04
Endrin ketone	0.0075	0.0097		8.96E-02	5.00E-02	2.66E-04	3.44E-04
Gamma-Chlordane	0.0012	0.0012		2.67E-02	4.00E-02	3.72E-05	3.72E-05
Heptachlor	0.014	0.014		4.89E-02	1.40E+00	8.30E-03	8.30E-03
Heptachlor epoxide	0.0028	0.0028		2.93E-02	1.40E+00	1.66E-03	1.66E-03
Metals							
Aluminum			8.76	4.00E-03	2.20E-01	1.20E+00	1.20E+00
Antimony	236	236		2.00E-01	2.20E-01	2.51E+01	2.51E+01
Arsenic	11.6	11.6	0.0503	3.60E-02	1.10E-01	7.02E-01	7.02E-01
Barium	2030	2030		1.50E-01	9.10E-02	1.07E+02	1.07E+02
Cadmium	29.1	29.1	0.0195	3.64E-01	9.60E-01	1.20E+01	1.20E+01
Chromium	74.8	74.8	0.129	7.50E-03	1.00E-02	1.40E+00	1.40E+00
Cobalt	17	19.7	0.047	8.10E-02	1.22E-01	1.11E+00	1.29E+00
Copper	9750	9750	1.16	4.00E-01	4.00E-02	3.25E+02	3.25E+02
Iron			110	4.00E-03	2.20E-01	1.51E+01	1.51E+01
Lead	18900	18900	0.839	4.50E-02	3.00E-02	5.10E+02	5.10E+02
Manganese	858	858		2.50E-01	5.40E-02	3.27E+01	3.27E+01
Mercury	0.47	0.47	0.0021	3.75E-02	4.00E-02	1.49E-02	1.49E-02
Nickel	224	224	0.154	3.20E-02	2.00E-02	5.12E+00	5.12E+00
Selenium	1.3	1.3	0.0046	1.60E-02	2.20E-01	1.37E-01	1.37E-01

TABLE G-2B
AMERICAN ROBIN (*Turdus migratorius*) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	American Robin Surface Soil Exposure (mg/kg/day)	American Robin Total Soil Exposure (mg/kg/day)
Silver	21.8	21.8	0.008	4.00E-01	2.20E-01	2.35E+00	2.35E+00
Thallium	1.1	1.8		4.00E-03	2.20E-01	1.16E-01	1.89E-01
Vanadium	25.4	27	0.233	5.50E-03	2.20E-01	2.70E+00	2.87E+00
Zinc	3610	3610	6.91	1.20E-12	5.60E-01	8.87E+02	8.87E+02

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-2C
SHORT-TAILED SHREW (*Blarina brevicauda*) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Short-Tailed Shrew Surface Soil Exposure (mg/kg/day)	Short-Tailed Shrew Total Soil Exposure (mg/kg/day)
Volatile Organic Compounds								
Benzene	0.041	1.8		2.27E+00	2.00E-01	1.07E+00	7.78E-03	3.42E-01
Ethyl benzene	3.3	24		5.85E-01	2.40E-01	7.61E-01	6.09E-01	4.43E+00
Meta/Para Xylene	4.4	130		5.48E-01	2.40E-01	7.48E-01	8.08E-01	2.39E+01
Semivolatile Organic Compounds								
Acenaphthene	2.6	2.6		2.10E-01	7.00E-02	4.61E-04	1.37E-01	1.37E-01
Acenaphthylene	2.5	2.5		1.72E-01	7.00E-02	4.61E-04	1.31E-01	1.31E-01
Anthracene	7.1	7.1		1.04E-01	7.00E-02	4.61E-04	3.68E-01	3.68E-01
Benzo(a)anthracene	10	10		2.02E-02	3.00E-02	1.46E-04	2.98E-01	2.98E-01
Benzo(a)pyrene	8.7	8.7		1.10E-02	7.00E-02	4.61E-04	4.46E-01	4.46E-01
Benzo(b)fluoranthene	12	12		1.01E-02	7.00E-02	5.46E-04	6.15E-01	6.15E-01
Benzo(ghi)perylene	3.15	3.15		5.70E-03	7.00E-02	4.61E-04	1.61E-01	1.61E-01
Benzo(k)fluoranthene	7.5	7.5		1.01E-02	8.00E-02	5.43E-04	4.24E-01	4.24E-01
Bis(2-Ethylhexyl)phthalate			0.0042	3.80E-02	4.00E-02	5.50E-05	6.34E-04	6.34E-04
Carbazole	4.2	4.2		2.74E-01	6.00E-02	6.29E-01	3.33E-01	3.33E-01
Chrysene	9.1	9.1		1.87E-02	4.00E-02	1.88E-04	3.20E-01	3.20E-01
Dibenz(a,h)anthracene	0.47	0.47		6.40E-03	7.00E-02	1.21E-03	2.41E-02	2.41E-02
Dibenzofuran	1.7	1.7		1.61E-01	5.00E-02	5.50E-01	1.18E-01	1.18E-01
Di-n-octylphthalate	0.0232	0.0232		1.57E-04	1.00E-02	7.32E-01	1.29E-03	1.29E-03
Fluoranthene	27	27		3.72E-02	7.00E-02	4.61E-04	1.39E+00	1.39E+00
Fluorene	3.5	3.5		1.49E-01	7.00E-02	4.61E-04	1.83E-01	1.83E-01
Hexachlorobenzene	0.0085	0.0085		2.55E-02	4.00E-02	1.09E-04	2.99E-04	2.99E-04
Indeno(1,2,3-cd)pyrene	0.97	0.97		3.90E-03	8.00E-02	2.82E-03	5.50E-02	5.50E-02
Naphthalene	0.4	1.9		4.20E-01	7.00E-02	4.61E-04	2.16E-02	1.03E-01
Phenanthrene	29	29		1.02E-01	7.00E-02	4.61E-04	1.50E+00	1.50E+00
Pyrene	34	34		4.43E-02	7.00E-02	4.61E-04	1.75E+00	1.75E+00
PCBs								
Aroclor-1242	0.058	0.058		1.00E-02	1.13E+00	5.52E-04	3.59E-02	3.59E-02
Aroclor-1254	0.93	0.93		1.00E-02	1.13E+00	5.52E-04	5.76E-01	5.76E-01
Aroclor-1260	0.085	0.2		1.00E-02	1.13E+00	5.52E-04	5.27E-02	1.24E-01

TABLE G-2C
SHORT-TAILED SHREW (*Blarina brevicauda*) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Short-Tailed Shrew Surface Soil Exposure (mg/kg/day)	Short-Tailed Shrew Total Soil Exposure (mg/kg/day)
Pesticides								
4,4'-DDD	0.044	0.044		9.37E-03	1.26E+00	6.18E-04	3.03E-02	3.03E-02
4,4'-DDE	0.069	0.069		9.37E-03	1.26E+00	6.18E-04	4.76E-02	4.76E-02
4,4'-DDT	0.1	0.1		9.37E-03	1.26E+00	6.18E-04	6.89E-02	6.89E-02
Aldrin	0.01445	0.01445		7.05E-01	7.00E-02	7.97E-01	1.39E-03	1.39E-03
Alpha-Chlordane	0.063	0.063		2.67E-02	4.00E-02	3.51E-01	3.33E-03	3.33E-03
Delta-BHC	0.002	0.002		1.57E-01	5.00E-02	5.47E-01	1.38E-04	1.38E-04
Dieldrin	0.041	0.041		8.96E-02	5.00E-02	4.75E-01	2.66E-03	2.66E-03
Endosulfan I	0.19	0.19		2.37E-01	6.00E-02	6.06E-01	1.48E-02	1.48E-02
Endosulfan II	0.009	0.009		2.37E-01	6.00E-02	6.06E-01	7.00E-04	7.00E-04
Endrin	0.0215	0.023		8.96E-02	5.00E-02	4.75E-01	1.39E-03	1.49E-03
Endrin ketone	0.0075	0.0097		8.96E-02	5.00E-02	4.75E-01	4.87E-04	6.29E-04
Gamma-Chlordane	0.0012	0.0012		2.67E-02	4.00E-02	3.51E-01	6.34E-05	6.34E-05
Heptachlor	0.014	0.014		4.89E-02	1.40E+00	3.55E-05	1.07E-02	1.07E-02
Heptachlor epoxide	0.0028	0.0028		2.93E-02	1.40E+00	3.55E-05	2.14E-03	2.14E-03
Metals								
Aluminum			8.76	4.00E-03	2.20E-01	1.50E-03	1.32E+00	1.32E+00
Antimony	236	236		2.00E-01	2.20E-01	1.00E-03	3.14E+01	3.14E+01
Arsenic	11.6	11.6	0.0503	3.60E-02	1.10E-01	2.00E-03	8.54E-01	8.54E-01
Barium	2030	2030		1.50E-01	9.10E-02	1.50E-04	1.29E+02	1.29E+02
Cadmium	29.1	29.1	0.0195	3.64E-01	9.60E-01	5.50E-04	1.55E+01	1.55E+01
Chromium	74.8	74.8	0.129	7.50E-03	1.00E-02	5.50E-03	1.46E+00	1.46E+00
Cobalt	17	19.7	0.047	8.10E-02	1.22E-01	2.00E-02	1.38E+00	1.59E+00
Copper	9750	9750	1.16	4.00E-01	4.00E-02	1.00E-02	3.73E+02	3.73E+02
Iron			110	4.00E-03	2.20E-01	2.00E-02	1.66E+01	1.66E+01
Lead	18900	18900	0.839	4.50E-02	3.00E-02	3.00E-04	5.67E+02	5.67E+02
Manganese	858	858		2.50E-01	5.40E-02	4.00E-04	3.80E+01	3.80E+01
Mercury	0.47	0.47	0.0021	3.75E-02	4.00E-02	2.50E-01	2.28E-02	2.28E-02
Nickel	224	224	0.154	3.20E-02	2.00E-02	6.00E-03	5.59E+00	5.59E+00
Selenium	1.3	1.3	0.0046	1.60E-02	2.20E-01	1.50E-02	1.73E-01	1.73E-01

TABLE G-2C
SHORT-TAILED SHREW (*Blarina brevicauda*) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Short-Tailed Shrew Surface Soil Exposure (mg/kg/day)	Short-Tailed Shrew Total Soil Exposure (mg/kg/day)
Silver	21.8	21.8	0.008	4.00E-01	2.20E-01	3.00E-03	2.93E+00	2.93E+00
Thallium	1.1	1.8		4.00E-03	2.20E-01	4.00E-02	1.47E-01	2.41E-01
Vanadium	25.4	27	0.233	5.50E-03	2.20E-01	2.50E-03	3.38E+00	3.59E+00
Zinc	3610	3610	6.91	1.20E-12	5.60E-01	1.00E-01	1.15E+03	1.15E+03

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-2D
MEADOW VOLE (*Microtus pennsylvanicus*) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Meadow Vole Surface Soil Exposure (mg/kg/day)	Meadow Vole Total Soil Exposure (mg/kg/day)
Volatile Organic Compounds							
Benzene	0.041	1.8		2.27E+00	2.00E-01	1.11E-02	4.87E-01
Ethyl benzene	3.3	24		5.85E-01	2.40E-01	4.06E-01	2.95E+00
Meta/Para Xylene	4.4	130		5.48E-01	2.40E-01	5.27E-01	1.56E+01
Semivolatile Organic Compounds							
Acenaphthene	2.6	2.6		2.10E-01	7.00E-02	2.34E-01	2.34E-01
Acenaphthylene	2.5	2.5		1.72E-01	7.00E-02	2.17E-01	2.17E-01
Anthracene	7.1	7.1		1.04E-01	7.00E-02	5.74E-01	5.74E-01
Benzo(a)anthracene	10	10		2.02E-02	3.00E-02	7.36E-01	7.36E-01
Benzo(a)pyrene	8.7	8.7		1.10E-02	7.00E-02	6.33E-01	6.33E-01
Benzo(b)fluoranthene	12	12		1.01E-02	7.00E-02	8.72E-01	8.72E-01
Benzo(ghi)perylene	3.15	3.15		5.70E-03	7.00E-02	2.28E-01	2.28E-01
Benzo(k)fluoranthene	7.5	7.5		1.01E-02	8.00E-02	5.45E-01	5.45E-01
Bis(2-Ethylhexyl)phthalate			0.0042	3.80E-02	4.00E-02	8.82E-04	8.82E-04
Carbazole	4.2	4.2		2.74E-01	6.00E-02	4.02E-01	4.02E-01
Chrysene	9.1	9.1		1.87E-02	4.00E-02	6.68E-01	6.68E-01
Dibenz(a,h)anthracene	0.47	0.47		6.40E-03	7.00E-02	3.40E-02	3.40E-02
Dibenzofuran	1.7	1.7		1.61E-01	5.00E-02	1.46E-01	1.46E-01
Di-n-octylphthalate	0.0232	0.0232		1.57E-04	1.00E-02	1.67E-03	1.67E-03
Fluoranthene	27	27		3.72E-02	7.00E-02	2.03E+00	2.03E+00
Fluorene	3.5	3.5		1.49E-01	7.00E-02	2.97E-01	2.97E-01
Hexachlorobenzene	0.0085	0.0085		2.55E-02	4.00E-02	6.29E-04	6.29E-04
Indeno(1,2,3-cd)pyrene	0.97	0.97		3.90E-03	8.00E-02	7.00E-02	7.00E-02
Naphthalene	0.4	1.9		4.20E-01	7.00E-02	4.34E-02	2.06E-01
Phenanthrene	29	29		1.02E-01	7.00E-02	2.34E+00	2.34E+00
Pyrene	34	34		4.43E-02	7.00E-02	2.57E+00	2.57E+00
PCBs							
Aroclor-1242	0.058	0.058		1.00E-02	1.13E+00	4.21E-03	4.21E-03
Aroclor-1254	0.93	0.93		1.00E-02	1.13E+00	6.76E-02	6.76E-02
Aroclor-1260	0.085	0.2		1.00E-02	1.13E+00	6.18E-03	1.45E-02

TABLE G-2D
MEADOW VOLE (*Microtus pennsylvanicus*) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Meadow Vole Surface Soil Exposure (mg/kg/day)	Meadow Vole Total Soil Exposure (mg/kg/day)
Pesticides							
4,4'-DDD	0.044	0.044		9.37E-03	1.26E+00	3.20E-03	3.20E-03
4,4'-DDE	0.069	0.069		9.37E-03	1.26E+00	5.01E-03	5.01E-03
4,4'-DDT	0.1	0.1		9.37E-03	1.26E+00	7.26E-03	7.26E-03
Aldrin	0.01445	0.01445		7.05E-01	7.00E-02	1.93E-03	1.93E-03
Alpha-Chlordane	0.063	0.063		2.67E-02	4.00E-02	4.67E-03	4.67E-03
Delta-BHC	0.002	0.002		1.57E-01	5.00E-02	1.71E-04	1.71E-04
Dieldrin	0.041	0.041		8.96E-02	5.00E-02	3.27E-03	3.27E-03
Endosulfan I	0.19	0.19		2.37E-01	6.00E-02	1.76E-02	1.76E-02
Endosulfan II	0.009	0.009		2.37E-01	6.00E-02	8.33E-04	8.33E-04
Endrin	0.0215	0.023		8.96E-02	5.00E-02	1.71E-03	1.83E-03
Endrin ketone	0.0075	0.0097		8.96E-02	5.00E-02	5.97E-04	7.72E-04
Gamma-Chlordane	0.0012	0.0012		2.67E-02	4.00E-02	8.90E-05	8.90E-05
Heptachlor	0.014	0.014		4.89E-02	1.40E+00	1.07E-03	1.07E-03
Heptachlor epoxide	0.0028	0.0028		2.93E-02	1.40E+00	2.08E-04	2.08E-04
Metals							
Aluminum			8.76	4.00E-03	2.20E-01	1.84E+00	1.84E+00
Antimony	236	236		2.00E-01	2.20E-01	2.11E+01	2.11E+01
Arsenic	11.6	11.6	0.0503	3.60E-02	1.10E-01	8.80E-01	8.80E-01
Barium	2030	2030		1.50E-01	9.10E-02	1.72E+02	1.72E+02
Cadmium	29.1	29.1	0.0195	3.64E-01	9.60E-01	3.02E+00	3.02E+00
Chromium	74.8	74.8	0.129	7.50E-03	1.00E-02	5.45E+00	5.45E+00
Cobalt	17	19.7	0.047	8.10E-02	1.22E-01	1.35E+00	1.56E+00
Copper	9750	9750	1.16	4.00E-01	4.00E-02	1.04E+03	1.04E+03
Iron			110	4.00E-03	2.20E-01	2.31E+01	2.31E+01
Lead	18900	18900	0.839	4.50E-02	3.00E-02	1.43E+03	1.43E+03
Manganese	858	858		2.50E-01	5.40E-02	8.04E+01	8.04E+01
Mercury	0.47	0.47	0.0021	3.75E-02	4.00E-02	3.57E-02	3.57E-02
Nickel	224	224	0.154	3.20E-02	2.00E-02	1.67E+01	1.67E+01
Selenium	1.3	1.3	0.0046	1.60E-02	2.20E-01	9.61E-02	9.61E-02

TABLE G-2D
MEADOW VOLE (*Microtus pennsylvanicus*) EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Meadow Vole Surface Soil Exposure (mg/kg/day)	Meadow Vole Total Soil Exposure (mg/kg/day)
Silver	21.8	21.8	0.008	4.00E-01	2.20E-01	2.33E+00	2.33E+00
Thallium	1.1	1.8		4.00E-03	2.20E-01	7.94E-02	1.30E-01
Vanadium	25.4	27	0.233	5.50E-03	2.20E-01	1.88E+00	2.00E+00
Zinc	3610	3610	6.91	1.20E-12	5.60E-01	2.61E+02	2.61E+02

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-2E
RED FOX *(Vulpes vulpes)* EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Red Fox Surface Soil Exposure (mg/kg/day)	Red Fox Total Soil Exposure (mg/kg/day)
Volatile Organic Compounds								
Benzene	0.041	1.8		2.27E+00	2.00E-01	1.07E+00	6.72E-03	2.95E-01
Ethyl benzene	3.3	24		5.85E-01	2.40E-01	7.61E-01	3.82E-01	2.78E+00
Meta/Para Xylene	4.4	130		5.48E-01	2.40E-01	7.48E-01	5.01E-01	1.48E+01
Semivolatile Organic Compounds								
Acenaphthene	2.6	2.6		2.10E-01	7.00E-02	4.61E-04	7.46E-03	7.46E-03
Acenaphthylene	2.5	2.5		1.72E-01	7.00E-02	4.61E-04	6.95E-03	6.95E-03
Anthracene	7.1	7.1		1.04E-01	7.00E-02	4.61E-04	1.86E-02	1.86E-02
Benzo(a)anthracene	10	10		2.02E-02	3.00E-02	1.46E-04	1.92E-02	1.92E-02
Benzo(a)pyrene	8.7	8.7		1.10E-02	7.00E-02	4.61E-04	2.09E-02	2.09E-02
Benzo(b)fluoranthene	12	12		1.01E-02	7.00E-02	5.46E-04	2.90E-02	2.90E-02
Benzo(ghi)perylene	3.15	3.15		5.70E-03	7.00E-02	4.61E-04	7.53E-03	7.53E-03
Benzo(k)fluoranthene	7.5	7.5		1.01E-02	8.00E-02	5.43E-04	1.89E-02	1.89E-02
Bis(2-Ethylhexyl)phthalate			0.0042	3.80E-02	4.00E-02	5.50E-05	3.62E-04	3.62E-04
Carbazole	4.2	4.2		2.74E-01	6.00E-02	6.29E-01	3.94E-01	3.94E-01
Chrysene	9.1	9.1		1.87E-02	4.00E-02	1.88E-04	1.85E-02	1.85E-02
Dibenz(a,h)anthracene	0.47	0.47		6.40E-03	7.00E-02	1.21E-03	1.17E-03	1.17E-03
Dibenzofuran	1.7	1.7		1.61E-01	5.00E-02	5.50E-01	1.40E-01	1.40E-01
Di-n-octylphthalate	0.0232	0.0232		1.57E-04	1.00E-02	7.32E-01	2.50E-03	2.50E-03
Fluoranthene	27	27		3.72E-02	7.00E-02	4.61E-04	6.65E-02	6.65E-02
Fluorene	3.5	3.5		1.49E-01	7.00E-02	4.61E-04	9.54E-03	9.54E-03
Hexachlorobenzene	0.0085	0.0085		2.55E-02	4.00E-02	1.09E-04	1.74E-05	1.74E-05
Indeno(1,2,3-cd)pyrene	0.97	0.97		3.90E-03	8.00E-02	2.82E-03	2.76E-03	2.76E-03
Naphthalene	0.4	1.9		4.20E-01	7.00E-02	4.61E-04	1.35E-03	6.39E-03
Phenanthrene	29	29		1.02E-01	7.00E-02	4.61E-04	7.59E-02	7.59E-02
Pyrene	34	34		4.43E-02	7.00E-02	4.61E-04	8.43E-02	8.43E-02
PCBs								
Aroclor-1242	0.058	0.058		1.00E-02	1.13E+00	5.52E-04	8.42E-04	8.42E-04
Aroclor-1254	0.93	0.93		1.00E-02	1.13E+00	5.52E-04	1.35E-02	1.35E-02
Aroclor-1260	0.085	0.2		1.00E-02	1.13E+00	5.52E-04	1.23E-03	2.90E-03

TABLE G-2E
RED FOX *(Vulpes vulpes)* EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Red Fox Surface Soil Exposure (mg/kg/day)	Red Fox Total Soil Exposure (mg/kg/day)
Pesticides								
4,4'-DDD	0.044	0.044		9.37E-03	1.26E+00	6.18E-04	7.05E-04	7.05E-04
4,4'-DDE	0.069	0.069		9.37E-03	1.26E+00	6.18E-04	1.11E-03	1.11E-03
4,4'-DDT	0.1	0.1		9.37E-03	1.26E+00	6.18E-04	1.60E-03	1.60E-03
Aldrin	0.01445	0.01445		7.05E-01	7.00E-02	7.97E-01	1.73E-03	1.73E-03
Alpha-Chlordane	0.063	0.063		2.67E-02	4.00E-02	3.51E-01	3.33E-03	3.33E-03
Delta-BHC	0.002	0.002		1.57E-01	5.00E-02	5.47E-01	1.63E-04	1.63E-04
Dieldrin	0.041	0.041		8.96E-02	5.00E-02	4.75E-01	2.91E-03	2.91E-03
Endosulfan I	0.19	0.19		2.37E-01	6.00E-02	6.06E-01	1.72E-02	1.72E-02
Endosulfan II	0.009	0.009		2.37E-01	6.00E-02	6.06E-01	8.15E-04	8.15E-04
Endrin	0.0215	0.023		8.96E-02	5.00E-02	4.75E-01	1.53E-03	1.64E-03
Endrin ketone	0.0075	0.0097		8.96E-02	5.00E-02	4.75E-01	5.33E-04	6.90E-04
Gamma-Chlordane	0.0012	0.0012		2.67E-02	4.00E-02	3.51E-01	6.34E-05	6.34E-05
Heptachlor	0.014	0.014		4.89E-02	1.40E+00	3.55E-05	2.47E-04	2.47E-04
Heptachlor epoxide	0.0028	0.0028		2.93E-02	1.40E+00	3.55E-05	4.92E-05	4.92E-05
Metals								
Aluminum			8.76	4.00E-03	2.20E-01	1.50E-03	7.56E-01	7.56E-01
Antimony	236	236		2.00E-01	2.20E-01	1.00E-03	1.09E+00	1.09E+00
Arsenic	11.6	11.6	0.0503	3.60E-02	1.10E-01	2.00E-03	4.08E-02	4.08E-02
Barium	2030	2030		1.50E-01	9.10E-02	1.50E-04	5.94E+00	5.94E+00
Cadmium	29.1	29.1	0.0195	3.64E-01	9.60E-01	5.50E-04	3.92E-01	3.92E-01
Chromium	74.8	74.8	0.129	7.50E-03	1.00E-02	5.50E-03	1.94E-01	1.94E-01
Cobalt	17	19.7	0.047	8.10E-02	1.22E-01	2.00E-02	1.06E-01	1.22E-01
Copper	9750	9750	1.16	4.00E-01	4.00E-02	1.00E-02	4.26E+01	4.26E+01
Iron			110	4.00E-03	2.20E-01	2.00E-02	9.49E+00	9.49E+00
Lead	18900	18900	0.839	4.50E-02	3.00E-02	3.00E-04	3.79E+01	3.79E+01
Manganese	858	858		2.50E-01	5.40E-02	4.00E-04	2.38E+00	2.38E+00
Mercury	0.47	0.47	0.0021	3.75E-02	4.00E-02	2.50E-01	1.82E-02	1.82E-02
Nickel	224	224	0.154	3.20E-02	2.00E-02	6.00E-03	6.14E-01	6.14E-01
Selenium	1.3	1.3	0.0046	1.60E-02	2.20E-01	1.50E-02	8.50E-03	8.50E-03

TABLE G-2E
RED FOX *(Vulpes vulpes)* EXPOSURE - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Red Fox Surface Soil Exposure (mg/kg/day)	Red Fox Total Soil Exposure (mg/kg/day)
Silver	21.8	21.8	0.008	4.00E-01	2.20E-01	3.00E-03	1.18E-01	1.18E-01
Thallium	1.1	1.8		4.00E-03	2.20E-01	4.00E-02	1.08E-02	1.77E-02
Vanadium	25.4	27	0.233	5.50E-03	2.20E-01	2.50E-03	1.32E-01	1.39E-01
Zinc	3610	3610	6.91	1.20E-12	5.60E-01	1.00E-01	8.14E+01	8.14E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-3A
DEER MOUSE (Peromyscus maniculatus) EXPOSURE - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	SP (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Terrestrial Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Deer Mouse Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
3 or 4-Methylphenol	0.79		2.89E+00	1.0E-01	1.32E-01
Anthracene	0.25		1.04E-01	7.0E-02	7.89E-03
Benzo(a)anthracene	1.1		2.02E-02	3.0E-02	1.46E-02
Benzo(a)pyrene	0.9		1.10E-02	7.0E-02	2.47E-02
Benzo(b)fluoranthene	1.1		1.01E-02	7.0E-02	3.01E-02
Benzo(ghi)perylene	0.29		5.70E-03	7.0E-02	7.88E-03
Benzo(k)fluoranthene	0.58		1.01E-02	8.0E-02	1.80E-02
Bis(2-Ethylhexyl)phthalate		0.0042	3.80E-02	4.0E-02	6.34E-04
Chrysene	1.2		1.87E-02	4.0E-02	2.02E-02
Fluoranthene	2.1		3.72E-02	7.0E-02	6.00E-02
Indeno(1,2,3-cd)pyrene	0.27		3.90E-03	8.0E-02	8.30E-03
Phenanthrene	1.1		1.02E-01	7.0E-02	3.46E-02
Pyrene	2.1		4.43E-02	7.0E-02	6.07E-02
Metals					
Aluminum		8.76	4.00E-03	2.2E-01	1.32E+00
Antimony	4.9		2.00E-01	2.2E-01	4.43E-01
Arsenic	6.1	0.0503	3.60E-02	1.1E-01	2.70E-01
Cadmium	14.3	0.0195	3.64E-01	9.6E-01	5.25E+00
Chromium	29.8	0.129	7.50E-03	1.0E-02	1.81E-01
Cobalt	15.8	0.047	8.10E-02	1.2E-01	7.89E-01
Copper	1,190	1.16	4.00E-01	4.0E-02	4.04E+01
Cyanide	2.36		1.00E+00	1.1E+00	1.07E+00
Iron		110	4.00E-03	2.2E-01	1.66E+01
Lead	436	0.839	4.50E-02	3.0E-02	6.39E+00
Manganese	918		2.50E-01	5.4E-02	2.96E+01
Mercury	0.3	0.0021	3.75E-02	4.0E-02	5.62E-03
Nickel	42.7	0.154	3.20E-02	2.0E-02	4.57E-01
Selenium	2.5	0.0046	1.60E-02	2.2E-01	2.06E-01
Silver	2.6	0.008	4.00E-01	2.2E-01	2.60E-01
Vanadium	29.1	0.233	5.50E-03	2.2E-01	2.41E+00
Zinc	566	6.91	1.20E-12	5.6E-01	1.17E+02

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = EPC in the appropriate soil exposure interval (mg COPC/kg dry soil)
SP = Soil-to-plant uptake factor ((mg COPC/kg dry tissue)/(mg COPC/kg dry soil))
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-3B
AMERICAN ROBIN (*Turdus migratorius*) EXPOSURE - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	American Robin Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
3 or 4-Methylphenol	0.79		2.89E+00	1.00E-01	5.81E-02
Anthracene	0.25		1.04E-01	7.00E-02	1.10E-02
Benzo(a)anthracene	1.1		2.02E-02	3.00E-02	2.95E-02
Benzo(a)pyrene	0.9		1.10E-02	7.00E-02	3.89E-02
Benzo(b)fluoranthene	1.1		1.01E-02	7.00E-02	4.76E-02
Benzo(ghi)perylene	0.29		5.70E-03	7.00E-02	1.25E-02
Benzo(k)fluoranthene	0.58		1.01E-02	8.00E-02	2.75E-02
Bis(2-Ethylhexyl)phthalate		0.0042	3.80E-02	4.00E-02	5.75E-04
Chrysene	1.2		1.87E-02	4.00E-02	3.71E-02
Fluoranthene	2.1		3.72E-02	7.00E-02	9.12E-02
Indeno(1,2,3-cd)pyrene	0.27		3.90E-03	8.00E-02	1.28E-02
Phenanthrene	1.1		1.02E-01	7.00E-02	4.82E-02
Pyrene	2.1		4.43E-02	7.00E-02	9.13E-02
Metals					
Aluminum		8.76	4.00E-03	2.20E-01	1.20E+00
Antimony	4.9		2.00E-01	2.20E-01	5.21E-01
Arsenic	6.1	0.0503	3.60E-02	1.10E-01	3.73E-01
Cadmium	14.3	0.0195	3.64E-01	9.60E-01	5.91E+00
Chromium	29.8	0.129	7.50E-03	1.00E-02	5.68E-01
Cobalt	15.8	0.047	8.10E-02	1.22E-01	1.04E+00
Copper	1,190	1.16	4.00E-01	4.00E-02	3.98E+01
Cyanide	2.36		1.00E+00	1.12E+00	1.14E+00
Iron		110	4.00E-03	2.20E-01	1.51E+01
Lead	436	0.839	4.50E-02	3.00E-02	1.19E+01
Manganese	918		2.50E-01	5.40E-02	3.50E+01
Mercury	0.3	0.0021	3.75E-02	4.00E-02	9.60E-03
Nickel	42.7	0.154	3.20E-02	2.00E-02	9.93E-01
Selenium	2.5	0.0046	1.60E-02	2.20E-01	2.64E-01
Silver	2.6	0.008	4.00E-01	2.20E-01	2.81E-01
Vanadium	29.1	0.233	5.50E-03	2.20E-01	3.09E+00
Zinc	566	6.91	1.20E-12	5.60E-01	1.40E+02

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-3C
SHORT-TAILED SHREW (*Blarina brevicauda*) EXPOSURE - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Short-Tailed Shrew Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds						
3 or 4-Methylphenol	0.79		2.89E+00	1.00E-01	1.14E+00	1.13E-01
Anthracene	0.25		1.04E-01	7.00E-02	4.61E-04	1.30E-02
Benzo(a)anthracene	1.1		2.02E-02	3.00E-02	1.46E-04	3.28E-02
Benzo(a)pyrene	0.9		1.10E-02	7.00E-02	4.61E-04	4.61E-02
Benzo(b)fluoranthene	1.1		1.01E-02	7.00E-02	5.46E-04	5.64E-02
Benzo(ghi)perylene	0.29		5.70E-03	7.00E-02	4.61E-04	1.48E-02
Benzo(k)fluoranthene	0.58		1.01E-02	8.00E-02	5.43E-04	3.28E-02
Bis(2-Ethylhexyl)phthalate		0.0042	3.80E-02	4.00E-02	5.50E-05	6.34E-04
Chrysene	1.2		1.87E-02	4.00E-02	1.88E-04	4.22E-02
Fluoranthene	2.1		3.72E-02	7.00E-02	4.61E-04	1.08E-01
Indeno(1,2,3-cd)pyrene	0.27		3.90E-03	8.00E-02	2.82E-03	1.53E-02
Phenanthrene	1.1		1.02E-01	7.00E-02	4.61E-04	5.70E-02
Pyrene	2.1		4.43E-02	7.00E-02	4.61E-04	1.08E-01
Metals						
Aluminum		8.76	4.00E-03	2.20E-01	1.50E-03	1.32E+00
Antimony	4.9		2.00E-01	2.20E-01	1.00E-03	6.52E-01
Arsenic	6.1	0.0503	3.60E-02	1.10E-01	2.00E-03	4.52E-01
Cadmium	14.3	0.0195	3.64E-01	9.60E-01	5.50E-04	7.59E+00
Chromium	29.8	0.129	7.50E-03	1.00E-02	5.50E-03	5.94E-01
Cobalt	15.8	0.047	8.10E-02	1.22E-01	2.00E-02	1.28E+00
Copper	1,190	1.16	4.00E-01	4.00E-02	1.00E-02	4.57E+01
Cyanide	2.36		1.00E+00	1.12E+00	1.00E+00	1.58E+00
Iron		110	4.00E-03	2.20E-01	2.00E-02	1.66E+01
Lead	436	0.839	4.50E-02	3.00E-02	3.00E-04	1.32E+01
Manganese	918		2.50E-01	5.40E-02	4.00E-04	4.06E+01
Mercury	0.3	0.0021	3.75E-02	4.00E-02	2.50E-01	1.47E-02
Nickel	42.7	0.154	3.20E-02	2.00E-02	6.00E-03	1.08E+00
Selenium	2.5	0.0046	1.60E-02	2.20E-01	1.50E-02	3.32E-01
Silver	2.6	0.008	4.00E-01	2.20E-01	3.00E-03	3.51E-01
Vanadium	29.1	0.233	5.50E-03	2.20E-01	2.50E-03	3.87E+00
Zinc	566	6.91	1.20E-12	5.60E-01	1.00E-01	1.82E+02

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-3D
MEADOW VOLE (*Microtus pennsylvanicus*) EXPOSURE - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Meadow Vole Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
3 or 4-Methylphenol	0.79		2.89E+00	1.00E-01	2.56E-01
Anthracene	0.25		1.04E-01	7.00E-02	2.02E-02
Benzo(a)anthracene	1.1		2.02E-02	3.00E-02	8.09E-02
Benzo(a)pyrene	0.9		1.10E-02	7.00E-02	6.55E-02
Benzo(b)fluoranthene	1.1		1.01E-02	7.00E-02	7.99E-02
Benzo(ghi)perylene	0.29		5.70E-03	7.00E-02	2.10E-02
Benzo(k)fluoranthene	0.58		1.01E-02	8.00E-02	4.22E-02
Bis(2-Ethylhexyl)phthalate		0.0042	3.80E-02	4.00E-02	8.82E-04
Chrysene	1.2		1.87E-02	4.00E-02	8.81E-02
Fluoranthene	2.1		3.72E-02	7.00E-02	1.58E-01
Indeno(1,2,3-cd)pyrene	0.27		3.90E-03	8.00E-02	1.95E-02
Phenanthrene	1.1		1.02E-01	7.00E-02	8.88E-02
Pyrene	2.1		4.43E-02	7.00E-02	1.59E-01
Metals					
Aluminum		8.76	4.00E-03	2.20E-01	1.84E+00
Antimony	4.9		2.00E-01	2.20E-01	4.38E-01
Arsenic	6.1	0.0503	3.60E-02	1.10E-01	4.68E-01
Cadmium	14.3	0.0195	3.64E-01	9.60E-01	1.49E+00
Chromium	29.8	0.129	7.50E-03	1.00E-02	2.19E+00
Cobalt	15.8	0.047	8.10E-02	1.22E-01	1.26E+00
Copper	1,190	1.16	4.00E-01	4.00E-02	1.27E+02
Cyanide	2.36		1.00E+00	1.12E+00	3.76E-01
Iron		110	4.00E-03	2.20E-01	2.31E+01
Lead	436	0.839	4.50E-02	3.00E-02	3.32E+01
Manganese	918		2.50E-01	5.40E-02	8.60E+01
Mercury	0.3	0.0021	3.75E-02	4.00E-02	2.30E-02
Nickel	42.7	0.154	3.20E-02	2.00E-02	3.22E+00
Selenium	2.5	0.0046	1.60E-02	2.20E-01	1.84E-01
Silver	2.6	0.008	4.00E-01	2.20E-01	2.79E-01
Vanadium	29.1	0.233	5.50E-03	2.20E-01	2.15E+00
Zinc	566	6.91	1.20E-12	5.60E-01	4.21E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-3E
RED FOX *(Vulpes vulpes)* EXPOSURE - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Red Fox Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds						
3 or 4-Methylphenol	0.79		2.89E+00	1.00E-01	1.14E+00	1.37E-01
Anthracene	0.25		1.04E-01	7.00E-02	4.61E-04	6.55E-04
Benzo(a)anthracene	1.1		2.02E-02	3.00E-02	1.46E-04	2.11E-03
Benzo(a)pyrene	0.9		1.10E-02	7.00E-02	4.61E-04	2.16E-03
Benzo(b)fluoranthene	1.1		1.01E-02	7.00E-02	5.46E-04	2.65E-03
Benzo(ghi)perylene	0.29		5.70E-03	7.00E-02	4.61E-04	6.93E-04
Benzo(k)fluoranthene	0.58		1.01E-02	8.00E-02	5.43E-04	1.47E-03
Bis(2-Ethylhexyl)phthalate		0.0042	3.80E-02	4.00E-02	5.50E-05	3.62E-04
Chrysene	1.2		1.87E-02	4.00E-02	1.88E-04	2.45E-03
Fluoranthene	2.1		3.72E-02	7.00E-02	4.61E-04	5.17E-03
Indeno(1,2,3-cd)pyrene	0.27		3.90E-03	8.00E-02	2.82E-03	7.67E-04
Phenanthrene	1.1		1.02E-01	7.00E-02	4.61E-04	2.88E-03
Pyrene	2.1		4.43E-02	7.00E-02	4.61E-04	5.21E-03
Metals						
Aluminum		8.76	4.00E-03	2.20E-01	1.50E-03	7.56E-01
Antimony	4.9		2.00E-01	2.20E-01	1.00E-03	2.27E-02
Arsenic	6.1	0.0503	3.60E-02	1.10E-01	2.00E-03	2.35E-02
Cadmium	14.3	0.0195	3.64E-01	9.60E-01	5.50E-04	1.93E-01
Chromium	29.8	0.129	7.50E-03	1.00E-02	5.50E-03	8.38E-02
Cobalt	15.8	0.047	8.10E-02	1.22E-01	2.00E-02	9.87E-02
Copper	1,190	1.16	4.00E-01	4.00E-02	1.00E-02	5.28E+00
Cyanide	2.36		1.00E+00	1.12E+00	1.00E+00	3.81E-01
Iron		110	4.00E-03	2.20E-01	2.00E-02	9.49E+00
Lead	436	0.839	4.50E-02	3.00E-02	3.00E-04	9.45E-01
Manganese	918		2.50E-01	5.40E-02	4.00E-04	2.55E+00
Mercury	0.3	0.0021	3.75E-02	4.00E-02	2.50E-01	1.17E-02
Nickel	42.7	0.154	3.20E-02	2.00E-02	6.00E-03	1.28E-01
Selenium	2.5	0.0046	1.60E-02	2.20E-01	1.50E-02	1.60E-02
Silver	2.6	0.008	4.00E-01	2.20E-01	3.00E-03	1.47E-02
Vanadium	29.1	0.233	5.50E-03	2.20E-01	2.50E-03	1.48E-01
Zinc	566	6.91	1.20E-12	5.60E-01	1.00E-01	1.33E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-3F
GREAT BLUE HERON *(Ardea herodias)* EXPOSURE - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Great Blue Heron Ditch Soil and Surface Water Exposure (mg/kg/day)
Semivolatile Organic Compounds						
3 or 4-Methylphenol	0.79		2.89E+00	1.00E-01	1.14E+00	1.65E-01
Anthracene	0.25		1.04E-01	7.00E-02	4.61E-04	2.28E-03
Benzo(a)anthracene	1.1		2.02E-02	3.00E-02	1.46E-04	9.83E-03
Benzo(a)pyrene	0.9		1.10E-02	7.00E-02	4.61E-04	8.22E-03
Benzo(b)fluoranthene	1.1		1.01E-02	7.00E-02	5.46E-04	1.01E-02
Benzo(ghi)perylene	0.29		5.70E-03	7.00E-02	4.61E-04	2.65E-03
Benzo(k)fluoranthene	0.58		1.01E-02	8.00E-02	5.43E-04	5.33E-03
Bis(2-Ethylhexyl)phthalate		0.0042	3.80E-02	4.00E-02	5.50E-05	1.89E-04
Chrysene	1.2		1.87E-02	4.00E-02	1.88E-04	1.08E-02
Fluoranthene	2.1		3.72E-02	7.00E-02	4.61E-04	1.92E-02
Indeno(1,2,3-cd)pyrene	0.27		3.90E-03	8.00E-02	2.82E-03	2.59E-03
Phenanthrene	1.1		1.02E-01	7.00E-02	4.61E-04	1.00E-02
Pyrene	2.1		4.43E-02	7.00E-02	4.61E-04	1.92E-02
Metals						
Aluminum		8.76	4.00E-03	2.20E-01	1.50E-03	3.94E-01
Antimony	4.9		2.00E-01	2.20E-01	1.00E-03	4.79E-02
Arsenic	6.1	0.0503	3.60E-02	1.10E-01	2.00E-03	6.05E-02
Cadmium	14.3	0.0195	3.64E-01	9.60E-01	5.50E-04	1.78E-01
Chromium	29.8	0.129	7.50E-03	1.00E-02	5.50E-03	2.98E-01
Cobalt	15.8	0.047	8.10E-02	1.22E-01	2.00E-02	2.04E-01
Copper	1,190	1.16	4.00E-01	4.00E-02	1.00E-02	1.28E+01
Cyanide	2.36		1.00E+00	1.12E+00	1.00E+00	4.47E-01
Iron		110	4.00E-03	2.20E-01	2.00E-02	4.95E+00
Lead	436	0.839	4.50E-02	3.00E-02	3.00E-04	3.94E+00
Manganese	918		2.50E-01	5.40E-02	4.00E-04	8.32E+00
Mercury	0.3	0.0021	3.75E-02	4.00E-02	2.50E-01	1.60E-02
Nickel	42.7	0.154	3.20E-02	2.00E-02	6.00E-03	4.31E-01
Selenium	2.5	0.0046	1.60E-02	2.20E-01	1.50E-02	3.08E-02
Silver	2.6	0.008	4.00E-01	2.20E-01	3.00E-03	2.67E-02
Vanadium	29.1	0.233	5.50E-03	2.20E-01	2.50E-03	3.02E-01
Zinc	566	6.91	1.20E-12	5.60E-01	1.00E-01	1.64E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-4A
DEER MOUSE (Peromyscus maniculatus) EXPOSURE - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	SP (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Terrestrial Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Deer Mouse Surface Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Acenaphthene	6.1		2.10E-01	7.0E-02	2.21E-01
Acenaphthylene	0.56		1.72E-01	7.0E-02	1.94E-02
Anthracene	12		1.04E-01	7.0E-02	3.79E-01
Benzo(a)anthracene	28		2.02E-02	3.0E-02	3.71E-01
Benzo(a)pyrene	23		1.10E-02	7.0E-02	6.30E-01
Benzo(b)fluoranthene	29		1.01E-02	7.0E-02	7.94E-01
Benzo(ghi)perylene	29		5.70E-03	7.0E-02	7.88E-01
Benzo(k)fluoranthene	21		1.01E-02	8.0E-02	6.51E-01
Bis(2-Ethylhexyl)phthalate	1.6		3.80E-02	4.0E-02	2.83E-02
Carbazole	6.8		2.74E-01	6.0E-02	2.41E-01
Chrysene	32		1.87E-02	4.0E-02	5.39E-01
Dibenz(a,h)anthracene	4.6		6.40E-03	7.0E-02	1.25E-01
Dibenzofuran	2		1.61E-01	5.0E-02	5.36E-02
Fluoranthene	62		3.72E-02	7.0E-02	1.77E+00
Fluorene	4.2		1.49E-01	7.0E-02	1.41E-01
Indeno(1,2,3-cd)pyrene	8.1		3.90E-03	8.0E-02	2.49E-01
Naphthalene	0.63		4.20E-01	7.0E-02	2.88E-02
Phenanthrene	52		1.02E-01	7.0E-02	1.64E+00
Pyrene	64		4.43E-02	7.0E-02	1.85E+00
PCBs					
Aroclor-1254	0.03		1.00E-02	1.1E+00	1.24E-02
Aroclor-1260	0.046		1.00E-02	1.1E+00	1.90E-02
Pesticides					
4,4'-DDE	0.034		9.37E-03	1.3E+00	1.57E-02
4,4'-DDT	0.039		9.37E-03	1.3E+00	1.80E-02
Aldrin	0.012		7.05E-01	7.0E-02	7.00E-04
Dieldrin	0.034		8.96E-02	5.0E-02	8.04E-04
Endosulfan I	0.095		2.37E-01	6.0E-02	3.21E-03
Endrin	0.03		8.96E-02	5.0E-02	7.09E-04
Heptachlor epoxide	0.055		2.93E-02	1.4E+00	2.82E-02
Metals					
Aluminum		2.050	4.00E-03	2.2E-01	3.10E-01
Antimony	7.5		2.00E-01	2.2E-01	6.78E-01
Arsenic	32.1		3.60E-02	1.1E-01	1.38E+00
Cadmium	6.6	5.4.E-04	3.64E-01	9.6E-01	2.42E+00
Chromium	439	0.006	7.50E-03	1.0E-02	2.38E+00
Cobalt	205.5		8.10E-02	1.2E-01	1.02E+01
Copper	209	0.0112	4.00E-01	4.0E-02	7.07E+00
Cyanide	2		1.00E+00	1.1E+00	9.07E-01
Iron		3.41	4.00E-03	2.2E-01	5.15E-01
Lead	122	0.0263	4.50E-02	3.0E-02	1.76E+00
Manganese	310500		2.50E-01	5.4E-02	1.00E+04
Nickel	342	3.6.E-03	3.20E-02	2.0E-02	3.47E+00
Selenium	145.5	2.45.E-03	1.60E-02	2.2E-01	1.20E+01
Silver	3.05		4.00E-01	2.2E-01	3.03E-01
Thallium	162.5		4.00E-03	2.2E-01	1.33E+01
Vanadium	182		5.50E-03	2.2E-01	1.49E+01
Zinc	329	0.19	1.20E-12	5.6E-01	6.76E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = EPC in the appropriate soil exposure interval (mg COPC/kg dry soil)
SP = Soil-to-plant uptake factor ((mg COPC/kg dry tissue)/(mg COPC/kg dry soil))
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-4B
AMERICAN ROBIN (*Turdus migratorius*) EXPOSURE - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	American Robin Surface Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Acenaphthene	6.1		2.10E-01	7.00E-02	2.72E-01
Acenaphthylene	0.56		1.72E-01	7.00E-02	2.48E-02
Anthracene	12		1.04E-01	7.00E-02	5.26E-01
Benzo(a)anthracene	28		2.02E-02	3.00E-02	7.51E-01
Benzo(a)pyrene	23		1.10E-02	7.00E-02	9.95E-01
Benzo(b)fluoranthene	29		1.01E-02	7.00E-02	1.25E+00
Benzo(ghi)perylene	29		5.70E-03	7.00E-02	1.25E+00
Benzo(k)fluoranthene	21		1.01E-02	8.00E-02	9.95E-01
Bis(2-Ethylhexyl)phthalate	1.6		3.80E-02	4.00E-02	4.97E-02
Carbazole	6.8		2.74E-01	6.00E-02	2.77E-01
Chrysene	32		1.87E-02	4.00E-02	9.90E-01
Dibenz(a,h)anthracene	4.6		6.40E-03	7.00E-02	1.99E-01
Dibenzofuran	2		1.61E-01	5.00E-02	7.19E-02
Fluoranthene	62		3.72E-02	7.00E-02	2.69E+00
Fluorene	4.2		1.49E-01	7.00E-02	1.85E-01
Indeno(1,2,3-cd)pyrene	8.1		3.90E-03	8.00E-02	3.84E-01
Naphthalene	0.63		4.20E-01	7.00E-02	2.89E-02
Phenanthrene	52		1.02E-01	7.00E-02	2.28E+00
Pyrene	64		4.43E-02	7.00E-02	2.78E+00
PCBs					
Aroclor-1254	0.03		1.00E-02	1.13E+00	1.44E-02
Aroclor-1260	0.046		1.00E-02	1.13E+00	2.21E-02
Pesticides					
4,4'-DDE	0.034		9.37E-03	1.26E+00	1.82E-02
4,4'-DDT	0.039		9.37E-03	1.26E+00	2.09E-02
Aldrin	0.012		7.05E-01	7.00E-02	5.71E-04
Dieldrin	0.034		8.96E-02	5.00E-02	1.21E-03
Endosulfan I	0.095		2.37E-01	6.00E-02	3.85E-03
Endrin	0.03		8.96E-02	5.00E-02	1.07E-03
Heptachlor epoxide	0.055		2.93E-02	1.40E+00	3.26E-02
Metals					
Aluminum		2.050	4.00E-03	2.20E-01	2.81E-01
Antimony	7.5		2.00E-01	2.20E-01	7.98E-01
Arsenic	32.1		3.60E-02	1.10E-01	1.92E+00
Cadmium	6.6	5.4.E-04	3.64E-01	9.60E-01	2.73E+00
Chromium	439	0.006	7.50E-03	1.00E-02	8.11E+00
Cobalt	205.5		8.10E-02	1.22E-01	1.34E+01
Copper	209	0.0112	4.00E-01	4.00E-02	6.96E+00
Cyanide	2		1.00E+00	1.12E+00	9.66E-01
Iron		3.41	4.00E-03	2.20E-01	4.67E-01
Lead	122	0.0263	4.50E-02	3.00E-02	3.29E+00
Manganese	310500		2.50E-01	5.40E-02	1.18E+04
Nickel	342	3.6.E-03	3.20E-02	2.00E-02	7.78E+00
Selenium	145.5	2.45.E-03	1.60E-02	2.20E-01	1.53E+01
Silver	3.05		4.00E-01	2.20E-01	3.28E-01
Thallium	162.5		4.00E-03	2.20E-01	1.71E+01
Vanadium	182		5.50E-03	2.20E-01	1.91E+01
Zinc	329	0.19	1.20E-12	5.60E-01	8.08E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-4C
Short-Tailed Shrew (*Blarina brevicauda*) EXPOSURE - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Short-Tailed Shrew Surface Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds						
Acenaphthene	6.1		2.10E-01	7.00E-02	4.61E-04	3.21E-01
Acenaphthylene	0.56		1.72E-01	7.00E-02	4.61E-04	2.93E-02
Anthracene	12		1.04E-01	7.00E-02	4.61E-04	6.22E-01
Benzo(a)anthracene	28		2.02E-02	3.00E-02	1.46E-04	8.35E-01
Benzo(a)pyrene	23		1.10E-02	7.00E-02	4.61E-04	1.18E+00
Benzo(b)fluoranthene	29		1.01E-02	7.00E-02	5.46E-04	1.49E+00
Benzo(ghi)perylene	29		5.70E-03	7.00E-02	4.61E-04	1.48E+00
Benzo(k)fluoranthene	21		1.01E-02	8.00E-02	5.43E-04	1.19E+00
Bis(2-Ethylhexyl)phthalate	1.6		3.80E-02	4.00E-02	5.50E-05	5.65E-02
Carbazole	6.8		2.74E-01	6.00E-02	6.29E-01	5.39E-01
Chrysene	32		1.87E-02	4.00E-02	1.88E-04	1.13E+00
Dibenz(a,h)anthracene	4.6		6.40E-03	7.00E-02	1.21E-03	2.36E-01
Dibenzofuran	2		1.61E-01	5.00E-02	5.50E-01	1.38E-01
Fluoranthene	62		3.72E-02	7.00E-02	4.61E-04	3.19E+00
Fluorene	4.2		1.49E-01	7.00E-02	4.61E-04	2.19E-01
Indeno(1,2,3-cd)pyrene	8.1		3.90E-03	8.00E-02	2.82E-03	4.59E-01
Naphthalene	0.63		4.20E-01	7.00E-02	4.61E-04	3.40E-02
Phenanthrene	52		1.02E-01	7.00E-02	4.61E-04	2.70E+00
Pyrene	64		4.43E-02	7.00E-02	4.61E-04	3.29E+00
PCBs						
Aroclor-1254	0.03		1.00E-02	1.13E+00	5.52E-04	1.86E-02
Aroclor-1260	0.046		1.00E-02	1.13E+00	5.52E-04	2.85E-02
Pesticides						
4,4'-DDE	0.034		9.37E-03	1.26E+00	6.18E-04	2.34E-02
4,4'-DDT	0.039		9.37E-03	1.26E+00	6.18E-04	2.69E-02
Aldrin	0.012		7.05E-01	7.00E-02	7.97E-01	1.15E-03
Dieldrin	0.034		8.96E-02	5.00E-02	4.75E-01	2.21E-03
Endosulfan I	0.095		2.37E-01	6.00E-02	6.06E-01	7.39E-03
Endrin	0.03		8.96E-02	5.00E-02	4.75E-01	1.95E-03
Heptachlor epoxide	0.055		2.93E-02	1.40E+00	3.55E-05	4.21E-02
Metals						
Aluminum		2.050	4.00E-03	2.20E-01	1.50E-03	3.10E-01
Antimony	7.5		2.00E-01	2.20E-01	1.00E-03	9.97E-01
Arsenic	32.1		3.60E-02	1.10E-01	2.00E-03	2.34E+00
Cadmium	6.6	5.4.E-04	3.64E-01	9.60E-01	5.50E-04	3.50E+00
Chromium	439	0.006	7.50E-03	1.00E-02	5.50E-03	8.47E+00
Cobalt	205.5		8.10E-02	1.22E-01	2.00E-02	1.66E+01
Copper	209	0.0112	4.00E-01	4.00E-02	1.00E-02	7.99E+00
Cyanide	2		1.00E+00	1.12E+00	1.00E+00	1.34E+00
Iron		3.41	4.00E-03	2.20E-01	2.00E-02	5.15E-01
Lead	122	0.0263	4.50E-02	3.00E-02	3.00E-04	3.66E+00
Manganese	310500		2.50E-01	5.40E-02	4.00E-04	1.37E+04
Nickel	342	3.6.E-03	3.20E-02	2.00E-02	6.00E-03	8.50E+00
Selenium	145.5	2.45.E-03	1.60E-02	2.20E-01	1.50E-02	1.93E+01
Silver	3.05		4.00E-01	2.20E-01	3.00E-03	4.10E-01
Thallium	162.5		4.00E-03	2.20E-01	4.00E-02	2.17E+01
Vanadium	182		5.50E-03	2.20E-01	2.50E-03	2.40E+01
Zinc	329	0.19	1.20E-12	5.60E-01	1.00E-01	1.05E+02

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-4D
Meadow Vole (*Microtus pennsylvanicus*) EXPOSURE - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Meadow Vole Surface Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Acenaphthene	6.1		2.10E-01	7.00E-02	5.50E-01
Acenaphthylene	0.56		1.72E-01	7.00E-02	4.86E-02
Anthracene	12		1.04E-01	7.00E-02	9.71E-01
Benzo(a)anthracene	28		2.02E-02	3.00E-02	2.06E+00
Benzo(a)pyrene	23		1.10E-02	7.00E-02	1.67E+00
Benzo(b)fluoranthene	29		1.01E-02	7.00E-02	2.11E+00
Benzo(ghi)perylene	29		5.70E-03	7.00E-02	2.10E+00
Benzo(k)fluoranthene	21		1.01E-02	8.00E-02	1.53E+00
Bis(2-Ethylhexyl)phthalate	1.6		3.80E-02	4.00E-02	1.20E-01
Carbazole	6.8		2.74E-01	6.00E-02	6.51E-01
Chrysene	32		1.87E-02	4.00E-02	2.35E+00
Dibenz(a,h)anthracene	4.6		6.40E-03	7.00E-02	3.33E-01
Dibenzofuran	2		1.61E-01	5.00E-02	1.72E-01
Fluoranthene	62		3.72E-02	7.00E-02	4.65E+00
Fluorene	4.2		1.49E-01	7.00E-02	3.56E-01
Indeno(1,2,3-cd)pyrene	8.1		3.90E-03	8.00E-02	5.84E-01
Naphthalene	0.63		4.20E-01	7.00E-02	6.84E-02
Phenanthrene	52		1.02E-01	7.00E-02	4.20E+00
Pyrene	64		4.43E-02	7.00E-02	4.84E+00
PCBs					
Aroclor-1254	0.03		1.00E-02	1.13E+00	2.18E-03
Aroclor-1260	0.046		1.00E-02	1.13E+00	3.34E-03
Pesticides					
4,4'-DDE	0.034		9.37E-03	1.26E+00	2.47E-03
4,4'-DDT	0.039		9.37E-03	1.26E+00	2.83E-03
Aldrin	0.012		7.05E-01	7.00E-02	1.60E-03
Dieldrin	0.034		8.96E-02	5.00E-02	2.71E-03
Endosulfan I	0.095		2.37E-01	6.00E-02	8.79E-03
Endrin	0.03		8.96E-02	5.00E-02	2.39E-03
Heptachlor epoxide	0.055		2.93E-02	1.40E+00	4.09E-03
Metals					
Aluminum		2.050	4.00E-03	2.20E-01	4.31E-01
Antimony	7.5		2.00E-01	2.20E-01	6.70E-01
Arsenic	32.1		3.60E-02	1.10E-01	2.41E+00
Cadmium	6.6	5.4.E-04	3.64E-01	9.60E-01	6.84E-01
Chromium	439	0.006	7.50E-03	1.00E-02	3.18E+01
Cobalt	205.5		8.10E-02	1.22E-01	1.62E+01
Copper	209	0.0112	4.00E-01	4.00E-02	2.23E+01
Cyanide	2		1.00E+00	1.12E+00	3.19E-01
Iron		3.41	4.00E-03	2.20E-01	7.16E-01
Lead	122	0.0263	4.50E-02	3.00E-02	9.24E+00
Manganese	310500		2.50E-01	5.40E-02	2.91E+04
Nickel	342	3.6.E-03	3.20E-02	2.00E-02	2.55E+01
Selenium	145.5	2.45.E-03	1.60E-02	2.20E-01	1.07E+01
Silver	3.05		4.00E-01	2.20E-01	3.26E-01
Thallium	162.5		4.00E-03	2.20E-01	1.17E+01
Vanadium	182		5.50E-03	2.20E-01	1.32E+01
Zinc	329	0.19	1.20E-12	5.60E-01	2.37E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-4E
Red Fox *(Vulpes vulpes)* EXPOSURE - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Red Fox Surface Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds						
Acenaphthene	6.1		2.10E-01	7.00E-02	4.61E-04	1.75E-02
Acenaphthylene	0.56		1.72E-01	7.00E-02	4.61E-04	1.56E-03
Anthracene	12		1.04E-01	7.00E-02	4.61E-04	3.15E-02
Benzo(a)anthracene	28		2.02E-02	3.00E-02	1.46E-04	5.38E-02
Benzo(a)pyrene	23		1.10E-02	7.00E-02	4.61E-04	5.53E-02
Benzo(b)fluoranthene	29		1.01E-02	7.00E-02	5.46E-04	7.00E-02
Benzo(ghi)perylene	29		5.70E-03	7.00E-02	4.61E-04	6.93E-02
Benzo(k)fluoranthene	21		1.01E-02	8.00E-02	5.43E-04	5.31E-02
Bis(2-Ethylhexyl)phthalate	1.6		3.80E-02	4.00E-02	5.50E-05	3.30E-03
Carbazole	6.8		2.74E-01	6.00E-02	6.29E-01	6.39E-01
Chrysene	32		1.87E-02	4.00E-02	1.88E-04	6.52E-02
Dibenz(a,h)anthracene	4.6		6.40E-03	7.00E-02	1.21E-03	1.15E-02
Dibenzofuran	2		1.61E-01	5.00E-02	5.50E-01	1.64E-01
Fluoranthene	62		3.72E-02	7.00E-02	4.61E-04	1.53E-01
Fluorene	4.2		1.49E-01	7.00E-02	4.61E-04	1.15E-02
Indeno(1,2,3-cd)pyrene	8.1		3.90E-03	8.00E-02	2.82E-03	2.30E-02
Naphthalene	0.63		4.20E-01	7.00E-02	4.61E-04	2.12E-03
Phenanthrene	52		1.02E-01	7.00E-02	4.61E-04	1.36E-01
Pyrene	64		4.43E-02	7.00E-02	4.61E-04	1.59E-01
PCBs						
Aroclor-1254	0.03		1.00E-02	1.13E+00	5.52E-04	4.36E-04
Aroclor-1260	0.046		1.00E-02	1.13E+00	5.52E-04	6.68E-04
Pesticides						
4,4'-DDE	0.034		9.37E-03	1.26E+00	6.18E-04	5.45E-04
4,4'-DDT	0.039		9.37E-03	1.26E+00	6.18E-04	6.25E-04
Aldrin	0.012		7.05E-01	7.00E-02	7.97E-01	1.43E-03
Dieldrin	0.034		8.96E-02	5.00E-02	4.75E-01	2.42E-03
Endosulfan I	0.095		2.37E-01	6.00E-02	6.06E-01	8.60E-03
Endrin	0.03		8.96E-02	5.00E-02	4.75E-01	2.13E-03
Heptachlor epoxide	0.055		2.93E-02	1.40E+00	3.55E-05	9.67E-04
Metals						
Aluminum		2.050	4.00E-03	2.20E-01	1.50E-03	1.77E-01
Antimony	7.5		2.00E-01	2.20E-01	1.00E-03	3.48E-02
Arsenic	32.1		3.60E-02	1.10E-01	2.00E-03	1.01E-01
Cadmium	6.6	5.4.E-04	3.64E-01	9.60E-01	5.50E-04	8.86E-02
Chromium	439	0.006	7.50E-03	1.00E-02	5.50E-03	1.07E+00
Cobalt	205.5		8.10E-02	1.22E-01	2.00E-02	1.23E+00
Copper	209	0.0112	4.00E-01	4.00E-02	1.00E-02	9.11E-01
Cyanide	2		1.00E+00	1.12E+00	1.00E+00	3.23E-01
Iron		3.41	4.00E-03	2.20E-01	2.00E-02	2.94E-01
Lead	122	0.0263	4.50E-02	3.00E-02	3.00E-04	2.47E-01
Manganese	310500		2.50E-01	5.40E-02	4.00E-04	8.61E+02
Nickel	342	3.6.E-03	3.20E-02	2.00E-02	6.00E-03	9.18E-01
Selenium	145.5	2.45.E-03	1.60E-02	2.20E-01	1.50E-02	9.07E-01
Silver	3.05		4.00E-01	2.20E-01	3.00E-03	1.65E-02
Thallium	162.5		4.00E-03	2.20E-01	4.00E-02	1.60E+00
Vanadium	182		5.50E-03	2.20E-01	2.50E-03	8.00E-01
Zinc	329	0.19	1.20E-12	5.60E-01	1.00E-01	7.38E+00

COPC = Chemical of Potential Concern

EPC = Exposure Point Concentration, the maximum detected concentration

BAF = Bioaccumulation Factor (unitless)

(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW

Cs = Soil concentration (mg/kg)

SP = Soil to plant uptake factor from literature

CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)

PDF = Plant dietary fraction (unitless)

FR = Feeding rate (kg/day)

IDF = Invertebrate dietary fraction (unitless)

ADF = Animal dietary fraction (unitless)

Is = Soil dietary (kg dry/day)

Cw = EPC in surface water (mg COPC/L)

WR = Water intake rate (L/day)

SFF = Site foraging frequency = 1 (unitless)

BW = Body weight (kg)

TABLE G-5A
DEER MOUSE (Peromyscus maniculatus) EXPOSURE - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	SP (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Terrestrial Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Deer Mouse Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Acenaphthene	0.74		2.10E-01	7.0E-02	2.69E-02
Acenaphthylene	0.42		1.72E-01	7.0E-02	1.45E-02
Anthracene	1.8		1.04E-01	7.0E-02	5.68E-02
Benzo(a)anthracene	14		2.02E-02	3.0E-02	1.86E-01
Benzo(a)pyrene	16		1.10E-02	7.0E-02	4.39E-01
Benzo(b)fluoranthene	22		1.01E-02	7.0E-02	6.02E-01
Benzo(ghi)perylene	12		5.70E-03	7.0E-02	3.26E-01
Benzo(k)fluoranthene	23		1.01E-02	8.0E-02	7.13E-01
Butylbenzylphthalate	0.42		7.15E-02	5.0E-02	9.59E-03
Carbazole	1.6		2.74E-01	6.0E-02	5.68E-02
Chrysene	25		1.87E-02	4.0E-02	4.21E-01
Dibenz(a,h)anthracene	5		6.40E-03	7.0E-02	1.36E-01
Dibenzofuran	0.356		1.61E-01	5.0E-02	9.53E-03
Fluoranthene	24		3.72E-02	7.0E-02	6.86E-01
Fluorene	0.645		1.49E-01	7.0E-02	2.16E-02
Indeno(1,2,3-cd)pyrene	12		3.90E-03	8.0E-02	3.69E-01
Naphthalene	0.35		4.20E-01	7.0E-02	1.60E-02
Phenanthrene	6.25		1.02E-01	7.0E-02	1.97E-01
Phenol	0.315		5.55E+00	1.1E-01	9.10E-02
Pyrene	17		4.43E-02	7.0E-02	4.91E-01
PCBs					
Aroclor-1254	0.067		1.00E-02	1.1E+00	2.77E-02
Aroclor-1260	0.014		1.00E-02	1.1E+00	5.78E-03
Pesticides					
4,4'-DDE	0.0076		9.37E-03	1.3E+00	3.48E-03
Metals					
Aluminum		2.05	4.00E-03	2.2E-01	3.10E-01
Arsenic	104		3.60E-02	1.1E-01	4.48E+00
Cadmium	0.8	5.4E-04	3.64E-01	9.6E-01	2.94E-01
Chromium	83.9	0.006	7.50E-03	1.0E-02	4.55E-01
Cobalt	91.9		8.10E-02	1.2E-01	4.54E+00
Copper	130	0.0112	4.00E-01	4.0E-02	4.40E+00
Iron		3.4	4.00E-03	2.2E-01	5.15E-01
Lead	93.3	0.0263	4.50E-02	3.0E-02	1.34E+00
Manganese	14,900		2.50E-01	5.4E-02	4.80E+02
Mercury	0.18		3.75E-02	4.0E-02	3.18E-03
Nickel	153	3.6E-03	3.20E-02	2.0E-02	1.55E+00
Selenium	18	2.45E-03	1.60E-02	2.2E-01	1.48E+00
Silver	10.5		4.00E-01	2.2E-01	1.04E+00
Thallium	21.5		4.00E-03	2.2E-01	1.76E+00
Vanadium	69.4		5.50E-03	2.2E-01	5.67E+00
Zinc	532	0.190	1.20E-12	5.6E-01	1.09E+02

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = EPC in the appropriate soil exposure interval (mg COPC/kg dry soil)
SP = Soil-to-plant uptake factor ((mg COPC/kg dry tissue)/(mg COPC/kg dry soil))
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-5B
AMERICAN ROBIN (*Turdus migratorius*) EXPOSURE - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	American Robin Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Acenaphthene	0.74		2.10E-01	7.00E-02	3.29E-02
Acenaphthylene	0.42		1.72E-01	7.00E-02	1.86E-02
Anthracene	1.8		1.04E-01	7.00E-02	7.89E-02
Benzo(a)anthracene	14		2.02E-02	3.00E-02	3.75E-01
Benzo(a)pyrene	16		1.10E-02	7.00E-02	6.92E-01
Benzo(b)fluoranthene	22		1.01E-02	7.00E-02	9.52E-01
Benzo(ghi)perylene	12		5.70E-03	7.00E-02	5.19E-01
Benzo(k)fluoranthene	23		1.01E-02	8.00E-02	1.09E+00
Butylbenzylphthalate	0.42		7.15E-02	5.00E-02	1.49E-02
Carbazole	1.6		2.74E-01	6.00E-02	6.52E-02
Chrysene	25		1.87E-02	4.00E-02	7.73E-01
Dibenz(a,h)anthracene	5		6.40E-03	7.00E-02	2.16E-01
Dibenzofuran	0.3555		1.61E-01	5.00E-02	1.28E-02
Fluoranthene	24		3.72E-02	7.00E-02	1.04E+00
Fluorene	0.645		1.49E-01	7.00E-02	2.85E-02
Indeno(1,2,3-cd)pyrene	12		3.90E-03	8.00E-02	5.68E-01
Naphthalene	0.35		4.20E-01	7.00E-02	1.60E-02
Phenanthrene	6.25		1.02E-01	7.00E-02	2.74E-01
Phenol	0.315		5.55E+00	1.10E-01	2.97E-02
Pyrene	17		4.43E-02	7.00E-02	7.39E-01
PCBs					
Aroclor-1254	0.067		1.00E-02	1.13E+00	3.22E-02
Aroclor-1260	0.014		1.00E-02	1.13E+00	6.73E-03
Pesticides					
4,4'-DDE	0.00755		9.37E-03	1.26E+00	4.04E-03
Metals					
Aluminum		2.05	4.00E-03	2.20E-01	2.81E-01
Arsenic	104		3.60E-02	1.10E-01	6.23E+00
Cadmium	0.8	5.4E-04	3.64E-01	9.60E-01	3.30E-01
Chromium	83.9	0.01	7.50E-03	1.00E-02	1.55E+00
Cobalt	91.9		8.10E-02	1.22E-01	5.99E+00
Copper	130	0.01	4.00E-01	4.00E-02	4.33E+00
Iron		3.4	4.00E-03	2.20E-01	4.67E-01
Lead	93	0.03	4.50E-02	3.00E-02	2.52E+00
Manganese	14,900		2.50E-01	5.40E-02	5.68E+02
Mercury	0.18		3.75E-02	4.00E-02	5.59E-03
Nickel	153	3.6E-03	3.20E-02	2.00E-02	3.48E+00
Selenium	18	2.5E-03	1.60E-02	2.20E-01	1.89E+00
Silver	10.5		4.00E-01	2.20E-01	1.13E+00
Thallium	21.5		4.00E-03	2.20E-01	2.26E+00
Vanadium	69.4		5.50E-03	2.20E-01	7.30E+00
Zinc	532	0.19	1.20E-12	5.60E-01	1.31E+02

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-5C
Short-Tailed Shrew (*Blarina brevicauda*) EXPOSURE - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Short-Tailed Shrew Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds						
Acenaphthene	0.74		2.10E-01	7.00E-02	4.61E-04	3.89E-02
Acenaphthylene	0.42		1.72E-01	7.00E-02	4.61E-04	2.20E-02
Anthracene	1.8		1.04E-01	7.00E-02	4.61E-04	9.33E-02
Benzo(a)anthracene	14		2.02E-02	3.00E-02	1.46E-04	4.18E-01
Benzo(a)pyrene	16		1.10E-02	7.00E-02	4.61E-04	8.20E-01
Benzo(b)fluoranthene	22		1.01E-02	7.00E-02	5.46E-04	1.13E+00
Benzo(ghi)perylene	12		5.70E-03	7.00E-02	4.61E-04	6.14E-01
Benzo(k)fluoranthene	23		1.01E-02	8.00E-02	5.43E-04	1.30E+00
Butylbenzylphthalate	0.42		7.15E-02	5.00E-02	4.49E-01	2.66E-02
Carbazole	1.6		2.74E-01	6.00E-02	6.29E-01	1.27E-01
Chrysene	25		1.87E-02	4.00E-02	1.88E-04	8.80E-01
Dibenz(a,h)anthracene	5		6.40E-03	7.00E-02	1.21E-03	2.56E-01
Dibenzofuran	0.3555		1.61E-01	5.00E-02	5.50E-01	2.46E-02
Fluoranthene	24		3.72E-02	7.00E-02	4.61E-04	1.23E+00
Fluorene	0.645		1.49E-01	7.00E-02	4.61E-04	3.36E-02
Indeno(1,2,3-cd)pyrene	12		3.90E-03	8.00E-02	2.82E-03	6.80E-01
Naphthalene	0.35		4.20E-01	7.00E-02	4.61E-04	1.89E-02
Phenanthrene	6.25		1.02E-01	7.00E-02	4.61E-04	3.24E-01
Phenol	0.315		5.55E+00	1.10E-01	1.34E+00	5.57E-02
Pyrene	17		4.43E-02	7.00E-02	4.61E-04	8.75E-01
PCBs						
Aroclor-1254	0.067		1.00E-02	1.13E+00	5.52E-04	4.15E-02
Aroclor-1260	0.014		1.00E-02	1.13E+00	5.52E-04	8.68E-03
Pesticides						
4,4'-DDE	0.00755		9.37E-03	1.26E+00	6.18E-04	5.21E-03
Metals						
Aluminum		2.05	4.00E-03	2.20E-01	1.50E-03	3.10E-01
Arsenic	104		3.60E-02	1.10E-01	2.00E-03	7.59E+00
Cadmium	0.8	5.4E-04	3.64E-01	9.60E-01	5.50E-04	4.25E-01
Chromium	83.9	0.01	7.50E-03	1.00E-02	5.50E-03	1.62E+00
Cobalt	91.9		8.10E-02	1.22E-01	2.00E-02	7.40E+00
Copper	130	0.01	4.00E-01	4.00E-02	1.00E-02	4.97E+00
Iron		3.4	4.00E-03	2.20E-01	2.00E-02	5.15E-01
Lead	93	0.03	4.50E-02	3.00E-02	3.00E-04	2.80E+00
Manganese	14,900		2.50E-01	5.40E-02	4.00E-04	6.59E+02
Mercury	0.18		3.75E-02	4.00E-02	2.50E-01	8.61E-03
Nickel	153	3.6E-03	3.20E-02	2.00E-02	6.00E-03	3.80E+00
Selenium	18	2.5E-03	1.60E-02	2.20E-01	1.50E-02	2.38E+00
Silver	10.5		4.00E-01	2.20E-01	3.00E-03	1.41E+00
Thallium	21.5		4.00E-03	2.20E-01	4.00E-02	2.87E+00
Vanadium	69.4		5.50E-03	2.20E-01	2.50E-03	9.14E+00
Zinc	532	0.19	1.20E-12	5.60E-01	1.00E-01	1.70E+02

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-5D
MEADOW VOLE (*Microtus pennsylvanicus*) EXPOSURE - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Meadow Vole Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Acenaphthene	0.74		2.10E-01	7.00E-02	6.67E-02
Acenaphthylene	0.42		1.72E-01	7.00E-02	3.65E-02
Anthracene	1.8		1.04E-01	7.00E-02	1.46E-01
Benzo(a)anthracene	14		2.02E-02	3.00E-02	1.03E+00
Benzo(a)pyrene	16		1.10E-02	7.00E-02	1.16E+00
Benzo(b)fluoranthene	22		1.01E-02	7.00E-02	1.60E+00
Benzo(ghi)perylene	12		5.70E-03	7.00E-02	8.68E-01
Benzo(k)fluoranthene	23		1.01E-02	8.00E-02	1.67E+00
Butylbenzylphthalate	0.42		7.15E-02	5.00E-02	3.28E-02
Carbazole	1.6		2.74E-01	6.00E-02	1.53E-01
Chrysene	25		1.87E-02	4.00E-02	1.84E+00
Dibenz(a,h)anthracene	5		6.40E-03	7.00E-02	3.62E-01
Dibenzofuran	0.3555		1.61E-01	5.00E-02	3.05E-02
Fluoranthene	24		3.72E-02	7.00E-02	1.80E+00
Fluorene	0.645		1.49E-01	7.00E-02	5.47E-02
Indeno(1,2,3-cd)pyrene	12		3.90E-03	8.00E-02	8.66E-01
Naphthalene	0.35		4.20E-01	7.00E-02	3.80E-02
Phenanthrene	6.25		1.02E-01	7.00E-02	5.04E-01
Phenol	0.315		5.55E+00	1.10E-01	1.76E-01
Pyrene	17		4.43E-02	7.00E-02	1.29E+00
PCBs					
Aroclor-1254	0.067		1.00E-02	1.13E+00	4.87E-03
Aroclor-1260	0.014		1.00E-02	1.13E+00	1.02E-03
Pesticides					
4,4'-DDE	0.00755		9.37E-03	1.26E+00	5.48E-04
Metals					
Aluminum		2.05	4.00E-03	2.20E-01	4.31E-01
Arsenic	104		3.60E-02	1.10E-01	7.79E+00
Cadmium	0.8	5.4E-04	3.64E-01	9.60E-01	8.30E-02
Chromium	83.9	0.01	7.50E-03	1.00E-02	6.08E+00
Cobalt	91.9		8.10E-02	1.22E-01	7.25E+00
Copper	130	0.01	4.00E-01	4.00E-02	1.39E+01
Iron		3.4	4.00E-03	2.20E-01	7.16E-01
Lead	93	0.03	4.50E-02	3.00E-02	7.07E+00
Manganese	14,900		2.50E-01	5.40E-02	1.40E+03
Mercury	0.18		3.75E-02	4.00E-02	1.35E-02
Nickel	153	3.6E-03	3.20E-02	2.00E-02	1.14E+01
Selenium	18	2.5E-03	1.60E-02	2.20E-01	1.32E+00
Silver	10.5		4.00E-01	2.20E-01	1.12E+00
Thallium	21.5		4.00E-03	2.20E-01	1.55E+00
Vanadium	69.4		5.50E-03	2.20E-01	5.02E+00
Zinc	532	0.19	1.20E-12	5.60E-01	3.82E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = $[((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW$
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-5E
RED FOX *(Vulpes vulpes)* Exposure - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Red Fox Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds						
Acenaphthene	0.74		2.10E-01	7.00E-02	4.61E-04	2.12E-03
Acenaphthylene	0.42		1.72E-01	7.00E-02	4.61E-04	1.17E-03
Anthracene	1.8		1.04E-01	7.00E-02	4.61E-04	4.72E-03
Benzo(a)anthracene	14		2.02E-02	3.00E-02	1.46E-04	2.69E-02
Benzo(a)pyrene	16		1.10E-02	7.00E-02	4.61E-04	3.84E-02
Benzo(b)fluoranthene	22		1.01E-02	7.00E-02	5.46E-04	5.31E-02
Benzo(ghi)perylene	12		5.70E-03	7.00E-02	4.61E-04	2.87E-02
Benzo(k)fluoranthene	23		1.01E-02	8.00E-02	5.43E-04	5.81E-02
Butylbenzylphthalate	0.42		7.15E-02	5.00E-02	4.49E-01	2.82E-02
Carbazole	1.6		2.74E-01	6.00E-02	6.29E-01	1.50E-01
Chrysene	25		1.87E-02	4.00E-02	1.88E-04	5.10E-02
Dibenz(a,h)anthracene	5		6.40E-03	7.00E-02	1.21E-03	1.25E-02
Dibenzofuran	0.3555		1.61E-01	5.00E-02	5.50E-01	2.92E-02
Fluoranthene	24		3.72E-02	7.00E-02	4.61E-04	5.91E-02
Fluorene	0.645		1.49E-01	7.00E-02	4.61E-04	1.76E-03
Indeno(1,2,3-cd)pyrene	12		3.90E-03	8.00E-02	2.82E-03	3.41E-02
Naphthalene	0.35		4.20E-01	7.00E-02	4.61E-04	1.18E-03
Phenanthrene	6.25		1.02E-01	7.00E-02	4.61E-04	1.64E-02
Phenol	0.315		5.55E+00	1.10E-01	1.34E+00	6.60E-02
Pyrene	17		4.43E-02	7.00E-02	4.61E-04	4.22E-02
PCBs						
Aroclor-1254	0.067		1.00E-02	1.13E+00	5.52E-04	9.73E-04
Aroclor-1260	0.014		1.00E-02	1.13E+00	5.52E-04	2.03E-04
Pesticides						
4,4'-DDE	0.00755		9.37E-03	1.26E+00	6.18E-04	1.21E-04
Metals						
Aluminum		2.05	4.00E-03	2.20E-01	1.50E-03	1.77E-01
Arsenic	104		3.60E-02	1.10E-01	2.00E-03	3.27E-01
Cadmium	0.8	5.4E-04	3.64E-01	9.60E-01	5.50E-04	1.08E-02
Chromium	83.9	0.01	7.50E-03	1.00E-02	5.50E-03	2.05E-01
Cobalt	91.9		8.10E-02	1.22E-01	2.00E-02	5.51E-01
Copper	130	0.01	4.00E-01	4.00E-02	1.00E-02	5.67E-01
Iron		3.4	4.00E-03	2.20E-01	2.00E-02	2.94E-01
Lead	93	0.03	4.50E-02	3.00E-02	3.00E-04	1.89E-01
Manganese	14,900		2.50E-01	5.40E-02	4.00E-04	4.13E+01
Mercury	0.18		3.75E-02	4.00E-02	2.50E-01	6.89E-03
Nickel	153	3.6E-03	3.20E-02	2.00E-02	6.00E-03	4.11E-01
Selenium	18	2.5E-03	1.60E-02	2.20E-01	1.50E-02	1.12E-01
Silver	10.5		4.00E-01	2.20E-01	3.00E-03	5.67E-02
Thallium	21.5		4.00E-03	2.20E-01	4.00E-02	2.11E-01
Vanadium	69.4		5.50E-03	2.20E-01	2.50E-03	3.05E-01
Zinc	532	0.19	1.20E-12	5.60E-01	1.00E-01	1.19E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-5F
GREAT BLUE HERON *(Ardea herodias)* EXPOSURE - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Great Blue Heron Ditch Soil and Surface Water Exposure (mg/kg/day)
Semivolatile Organic Compounds						
Acenaphthene	0.74		2.10E-01	7.00E-02	4.61E-04	6.76E-03
Acenaphthylene	0.42		1.72E-01	7.00E-02	4.61E-04	3.84E-03
Anthracene	1.8		1.04E-01	7.00E-02	4.61E-04	1.64E-02
Benzo(a)anthracene	14		2.02E-02	3.00E-02	1.46E-04	1.25E-01
Benzo(a)pyrene	16		1.10E-02	7.00E-02	4.61E-04	1.46E-01
Benzo(b)fluoranthene	22		1.01E-02	7.00E-02	5.46E-04	2.01E-01
Benzo(ghi)perylene	12		5.70E-03	7.00E-02	4.61E-04	1.10E-01
Benzo(k)fluoranthene	23		1.01E-02	8.00E-02	5.43E-04	2.11E-01
Butylbenzylphthalate	0.42		7.15E-02	5.00E-02	4.49E-01	3.70E-02
Carbazole	1.6		2.74E-01	6.00E-02	6.29E-01	1.92E-01
Chrysene	25		1.87E-02	4.00E-02	1.88E-04	2.24E-01
Dibenz(a,h)anthracene	5		6.40E-03	7.00E-02	1.21E-03	4.63E-02
Dibenzofuran	0.3555		1.61E-01	5.00E-02	5.50E-01	3.77E-02
Fluoranthene	24		3.72E-02	7.00E-02	4.61E-04	2.19E-01
Fluorene	0.645		1.49E-01	7.00E-02	4.61E-04	5.89E-03
Indeno(1,2,3-cd)pyrene	12		3.90E-03	8.00E-02	2.82E-03	1.15E-01
Naphthalene	0.35		4.20E-01	7.00E-02	4.61E-04	3.20E-03
Phenanthrene	6.25		1.02E-01	7.00E-02	4.61E-04	5.71E-02
Phenol	0.315		5.55E+00	1.10E-01	1.34E+00	7.72E-02
Pyrene	17		4.43E-02	7.00E-02	4.61E-04	1.55E-01
PCBs						
Aroclor-1254	0.067		1.00E-02	1.13E+00	5.52E-04	8.69E-04
Aroclor-1260	0.014		1.00E-02	1.13E+00	5.52E-04	1.81E-04
Pesticides						
4,4'-DDE	0.00755		9.37E-03	1.26E+00	6.18E-04	1.01E-04
Metals						
Aluminum		2.05	4.00E-03	2.20E-01	1.50E-03	9.23E-02
Arsenic	104		3.60E-02	1.10E-01	2.00E-03	9.93E-01
Cadmium	0.8	5.4E-04	3.64E-01	9.60E-01	5.50E-04	9.91E-03
Chromium	83.9	0.01	7.50E-03	1.00E-02	5.50E-03	8.23E-01
Cobalt	91.9		8.10E-02	1.22E-01	2.00E-02	1.17E+00
Copper	130	0.01	4.00E-01	4.00E-02	1.00E-02	1.39E+00
Iron		3.4	4.00E-03	2.20E-01	2.00E-02	1.53E-01
Lead	93	0.03	4.50E-02	3.00E-02	3.00E-04	8.37E-01
Manganese	14,900		2.50E-01	5.40E-02	4.00E-04	1.35E+02
Mercury	0.18		3.75E-02	4.00E-02	2.50E-01	9.55E-03
Nickel	153	3.6E-03	3.20E-02	2.00E-02	6.00E-03	1.52E+00
Selenium	18	2.5E-03	1.60E-02	2.20E-01	1.50E-02	2.20E-01
Silver	10.5		4.00E-01	2.20E-01	3.00E-03	1.06E-01
Thallium	21.5		4.00E-03	2.20E-01	4.00E-02	3.58E-01
Vanadium	69.4		5.50E-03	2.20E-01	2.50E-03	6.96E-01
Zinc	532	0.19	1.20E-12	5.60E-01	1.00E-01	1.51E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the maximum detected concentration
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-6A
DEER MOUSE (Peromyscus maniculatus) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	SP (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Terrestrial Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Deer Mouse Surface Soil Exposure (mg/kg/day)	Deer Mouse Total Soil Exposure (mg/kg/day)
Volatile Organic Compounds							
Meta/Para Xylene	0.11	2.4		5.48E-01	2.4E-01	1.26E-02	2.72E-01
Semivolatile Organic Compounds							
Phenanthrene	1.3	0.95		1.02E-01	7.0E-02	3.97E-02	2.98E-02
Pyrene	1.9	1.4		4.43E-02	7.0E-02	5.58E-02	4.14E-02
PCBs							
Aroclor-1254	0.06	0.04		1.00E-02	1.1E+00	2.28E-02	1.74E-02
Pesticides							
4,4'-DDT	0.01	0.01		9.37E-03	1.3E+00	2.99E-03	2.48E-03
Metals							
Antimony	10	7.5		2.00E-01	2.2E-01	9.22E-01	6.80E-01
Barium	231	199		1.50E-01	9.1E-02	9.53E+00	8.23E+00
Cadmium	4.1	3.0	0.0195	3.64E-01	9.6E-01	1.50E+00	1.11E+00
Copper	515	408	1.16	4.00E-01	4.0E-02	1.76E+01	1.40E+01
Lead	735	550	0.839	4.50E-02	3.0E-02	1.07E+01	8.03E+00
Silver	1.6	1.2	0.008	4.00E-01	2.2E-01	1.61E-01	1.21E-01
Thallium	0.4	0.4		4.00E-03	2.2E-01	3.10E-02	3.18E-02
Zinc	450	355	6.91	1.20E-12	5.6E-01	9.35E+01	7.40E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = EPC in the appropriate soil exposure interval (mg COPC/kg dry soil)
SP = Soil-to-plant uptake factor ((mg COPC/kg dry tissue)/(mg COPC/kg dry soil))
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-6B
AMERICAN ROBIN (*Turdus migratorius*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	American Robin Surface Soil Exposure (mg/kg/day)	American Robin Total Soil Exposure (mg/kg/day)
Volatile Organic Compounds							
Meta/Para Xylene	0.11	2.4		5.48E-01	2.40E-01	1.30E-02	2.80E-01
Semivolatile Organic Compounds							
Phenanthrene	1.3	0.95		1.02E-01	7.00E-02	5.53E-02	4.15E-02
Pyrene	1.9	1.4		4.43E-02	7.00E-02	8.39E-02	6.23E-02
PCBs							
Aroclor-1254	0.06	0.04		1.00E-02	1.13E+00	2.65E-02	2.03E-02
Pesticides							
4,4'-DDT	0.01	0.01		9.37E-03	1.26E+00	3.48E-03	2.88E-03
Metals							
Antimony	10	7.5		2.00E-01	2.20E-01	1.08E+00	8.00E-01
Barium	231	199		1.50E-01	9.10E-02	1.22E+01	1.05E+01
Cadmium	4.1	3.0	0.0195	3.64E-01	9.60E-01	1.69E+00	1.25E+00
Copper	515	408	1.16	4.00E-01	4.00E-02	1.73E+01	1.37E+01
Lead	735	550	0.839	4.50E-02	3.00E-02	1.99E+01	1.50E+01
Silver	1.6	1.2	0.008	4.00E-01	2.20E-01	1.74E-01	1.31E-01
Thallium	0.4	0.4		4.00E-03	2.20E-01	3.99E-02	4.09E-02
Zinc	450	355	6.91	1.20E-12	5.60E-01	1.12E+02	8.82E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-6C
SHORT-TAILED SHREW (*Blarina brevicauda*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Short-Tailed Shrew Surface Soil Exposure (mg/kg/day)	Short-Tailed Shrew Total Soil Exposure (mg/kg/day)
Volatile Organic Compounds								
Meta/Para Xylene	0.11	2.4		5.48E-01	2.40E-01	7.48E-01	2.05E-02	4.41E-01
Semivolatile Organic Compounds								
Phenanthrene	1.3	0.95		1.02E-01	7.00E-02	4.61E-04	6.54E-02	4.91E-02
Pyrene	1.9	1.4		4.43E-02	7.00E-02	4.61E-04	9.93E-02	7.37E-02
PCBs								
Aroclor-1254	0.06	0.04		1.00E-02	1.13E+00	5.52E-04	3.42E-02	2.61E-02
Pesticides								
4,4'-DDT	0.01	0.01		9.37E-03	1.26E+00	6.18E-04	4.48E-03	3.72E-03
Metals								
Antimony	10	7.5		2.00E-01	2.20E-01	1.00E-03	1.36E+00	1.00E+00
Barium	231	199		1.50E-01	9.10E-02	1.50E-04	1.47E+01	1.27E+01
Cadmium	4.1	3.0	0.0195	3.64E-01	9.60E-01	5.50E-04	2.17E+00	1.61E+00
Copper	515	408	1.16	4.00E-01	4.00E-02	1.00E-02	1.99E+01	1.58E+01
Lead	735	550	0.839	4.50E-02	3.00E-02	3.00E-04	2.22E+01	1.66E+01
Silver	1.6	1.2	0.008	4.00E-01	2.20E-01	3.00E-03	2.17E-01	1.63E-01
Thallium	0.4	0.4		4.00E-03	2.20E-01	4.00E-02	5.07E-02	5.19E-02
Zinc	450	355	6.91	1.20E-12	5.60E-01	1.00E-01	1.45E+02	1.14E+02

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-6D
MEADOW VOLE (*Microtus pennsylvanicus*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Meadow Vole Surface Soil Exposure (mg/kg/day)	Meadow Vole Total Soil Exposure (mg/kg/day)
Volatile Organic Compounds							
Meta/Para Xylene	0.11	2.4		5.48E-01	2.40E-01	1.33E-02	2.87E-01
Semivolatile Organic Compounds							
Phenanthrene	1.3	0.95		1.02E-01	7.00E-02	1.02E-01	7.64E-02
Pyrene	1.9	1.4		4.43E-02	7.00E-02	1.46E-01	1.08E-01
PCBs							
Aroclor-1254	0.06	0.04		1.00E-02	1.13E+00	4.01E-03	3.07E-03
Pesticides							
4,4'-DDT	0.01	0.01		9.37E-03	1.26E+00	4.72E-04	3.92E-04
Metals							
Antimony	10	7.5		2.00E-01	2.20E-01	9.10E-01	6.71E-01
Barium	231	199		1.50E-01	9.10E-02	1.96E+01	1.69E+01
Cadmium	4.1	3.0	0.0195	3.64E-01	9.60E-01	4.28E-01	3.17E-01
Copper	515	408	1.16	4.00E-01	4.00E-02	5.53E+01	4.38E+01
Lead	735	550	0.839	4.50E-02	3.00E-02	5.58E+01	4.19E+01
Silver	1.6	1.2	0.008	4.00E-01	2.20E-01	1.74E-01	1.30E-01
Thallium	0.4	0.4		4.00E-03	2.20E-01	2.74E-02	2.80E-02
Zinc	450	355	6.91	1.20E-12	5.60E-01	3.38E+01	2.70E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-6E
RED FOX *(Vulpes vulpes)* EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Total Soil (0-4 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/(mg COPC/kg dry soil)	Red Fox Surface Soil Exposure (mg/kg/day)	Red Fox Total Soil Exposure (mg/kg/day)
Volatile Organic Compounds								
Meta/Para Xylene	0.11	2.4		5.48E-01	2.40E-01	7.48E-01	1.27E-02	2.73E-01
Semivolatile Organic Compounds								
Phenanthrene	1.3	0.95		1.02E-01	7.00E-02	4.61E-04	3.30E-03	2.48E-03
Pyrene	1.9	1.4		4.43E-02	7.00E-02	4.61E-04	4.79E-03	3.55E-03
PCBs								
Aroclor-1254	0.06	0.04		1.00E-02	1.13E+00	5.52E-04	8.01E-04	6.13E-04
Pesticides								
4,4'-DDT	0.01	0.01		9.37E-03	1.26E+00	6.18E-04	1.04E-04	8.64E-05
Metals								
Antimony	10	7.5		2.00E-01	2.20E-01	1.00E-03	4.73E-02	3.49E-02
Barium	231	199		1.50E-01	9.10E-02	1.50E-04	6.76E-01	5.83E-01
Cadmium	4.1	3.0	0.0195	3.64E-01	9.60E-01	5.50E-04	5.65E-02	4.22E-02
Copper	515	408	1.16	4.00E-01	4.00E-02	1.00E-02	2.35E+00	1.88E+00
Lead	735	550	0.839	4.50E-02	3.00E-02	3.00E-04	1.54E+00	1.17E+00
Silver	1.6	1.2	0.008	4.00E-01	2.20E-01	3.00E-03	9.38E-03	7.18E-03
Thallium	0.4	0.4		4.00E-03	2.20E-01	4.00E-02	3.73E-03	3.82E-03
Zinc	450	355	6.91	1.20E-12	5.60E-01	1.00E-01	1.07E+01	8.55E+00

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-7A
DEER MOUSE (Peromyscus maniculatus) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	SP (mg COPC/kg dry tissue)/(mg COPC/kg dry soil)	Terrestrial Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Deer Mouse Ditch Soil Exposure (mg/kg/day)
Metals					
Aluminum		8.76	4.00E-03	2.2E-01	1.32E+00
Antimony	2.3		2.00E-01	2.2E-01	2.12E-01
Cadmium	2.8	0.0195	3.64E-01	9.6E-01	1.02E+00
Copper	177	1.16	4.00E-01	4.0E-02	6.15E+00
Cyanide	0.83		1.00E+00	1.1E+00	3.78E-01
Iron		110	4.00E-03	2.2E-01	1.66E+01
Lead	144	0.839	4.50E-02	3.0E-02	2.20E+00
Selenium	1.0	0.0046	1.60E-02	2.2E-01	8.50E-02
Zinc	291	6.91	1.20E-12	5.6E-01	6.08E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = EPC in the appropriate soil exposure interval (mg COPC/kg dry soil)
SP = Soil-to-plant uptake factor ((mg COPC/kg dry tissue)/(mg COPC/kg dry soil))
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-7B
AMERICAN ROBIN (*Turdus migratorius*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	American Robin Ditch Soil Exposure (mg/kg/day)
Metals					
Aluminum		8.76	4.00E-03	2.20E-01	1.20E+00
Antimony	2.3		2.00E-01	2.20E-01	2.49E-01
Cadmium	2.8	0.0195	3.64E-01	9.60E-01	1.14E+00
Copper	177	1.16	4.00E-01	4.00E-02	6.04E+00
Cyanide	0.83		1.00E+00	1.12E+00	4.02E-01
Iron		110	4.00E-03	2.20E-01	1.51E+01
Lead	144	0.839	4.50E-02	3.00E-02	4.00E+00
Selenium	1.0	0.0046	1.60E-02	2.20E-01	1.09E-01
Zinc	291	6.91	1.20E-12	5.60E-01	7.24E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-7C
SHORT-TAILED SHREW (*Blarina brevicauda*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Short-Tailed Shrew Ditch Soil Exposure (mg/kg/day)
Metals						
Aluminum		8.76	4.00E-03	2.20E-01	1.50E-03	1.32E+00
Antimony	2.3		2.00E-01	2.20E-01	1.00E-03	3.11E-01
Cadmium	2.8	0.0195	3.64E-01	9.60E-01	5.50E-04	1.47E+00
Copper	177	1.16	4.00E-01	4.00E-02	1.00E-02	6.93E+00
Cyanide	0.83		1.00E+00	1.12E+00	1.00E+00	5.58E-01
Iron		110	4.00E-03	2.20E-01	2.00E-02	1.66E+01
Lead	144	0.839	4.50E-02	3.00E-02	3.00E-04	4.45E+00
Selenium	1.0	0.0046	1.60E-02	2.20E-01	1.50E-02	1.36E-01
Zinc	291	6.91	1.20E-12	5.60E-01	1.00E-01	9.39E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-7D
MEADOW VOLE (*Microtus pennsylvanicus*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Meadow Vole Ditch Soil Exposure (mg/kg/day)
Metals					
Aluminum		8.76	4.00E-03	2.20E-01	1.84E+00
Antimony	2.3		2.00E-01	2.20E-01	2.09E-01
Cadmium	2.8	0.0195	3.64E-01	9.60E-01	2.91E-01
Copper	177	1.16	4.00E-01	4.00E-02	1.91E+01
Cyanide	0.83		1.00E+00	1.12E+00	1.33E-01
Iron		110	4.00E-03	2.20E-01	2.31E+01
Lead	144	0.839	4.50E-02	3.00E-02	1.11E+01
Selenium	1.0	0.0046	1.60E-02	2.20E-01	7.60E-02
Zinc	291	6.91	1.20E-12	5.60E-01	2.24E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-7E
RED FOX *(Vulpes vulpes)* EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Red Fox Ditch Soil Exposure (mg/kg/day)
Metals						
Aluminum		8.76	4.00E-03	2.20E-01	1.50E-03	7.56E-01
Antimony	2.3		2.00E-01	2.20E-01	1.00E-03	1.09E-02
Cadmium	2.8	0.0195	3.64E-01	9.60E-01	5.50E-04	3.88E-02
Copper	177	1.16	4.00E-01	4.00E-02	1.00E-02	8.69E-01
Cyanide	0.83		1.00E+00	1.12E+00	1.00E+00	1.34E-01
Iron		110	4.00E-03	2.20E-01	2.00E-02	9.49E+00
Lead	144	0.839	4.50E-02	3.00E-02	3.00E-04	3.61E-01
Selenium	1.0	0.0046	1.60E-02	2.20E-01	1.50E-02	6.79E-03
Zinc	291	6.91	1.20E-12	5.60E-01	1.00E-01	7.11E+00

COPC = Chemical of Potential Concern

EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water

BAF = Bioaccumulation Factor (unitless)

(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW

Cs = Soil concentration (mg/kg)

SP = Soil to plant uptake factor from literature

CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)

PDF = Plant dietary fraction (unitless)

FR = Feeding rate (kg/day)

IDF = Invertebrate dietary fraction (unitless)

ADF = Animal dietary fraction (unitless)

Is = Soil dietary (kg dry/day)

Cw = EPC in surface water (mg COPC/L)

WR = Water intake rate (L/day)

SFF = Site foraging frequency = 1 (unitless)

BW = Body weight (kg)

TABLE G-7F
GREAT BLUE HERON *(Ardea herodias)* EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121C DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Great Blue Heron Ditch Soil and Surface Water Exposure (mg/kg/day)
Metals						
Aluminum		8.76	4.00E-03	2.20E-01	1.50E-03	3.94E-01
Antimony	2.3		2.00E-01	2.20E-01	1.00E-03	2.28E-02
Cadmium	2.8	0.0195	3.64E-01	9.60E-01	5.50E-04	3.50E-02
Copper	177	1.16	4.00E-01	4.00E-02	1.00E-02	1.94E+00
Cyanide	0.83		1.00E+00	1.12E+00	1.00E+00	1.57E-01
Iron		110	4.00E-03	2.20E-01	2.00E-02	4.95E+00
Lead	144	0.839	4.50E-02	3.00E-02	3.00E-04	1.33E+00
Selenium	1.0	0.0046	1.60E-02	2.20E-01	1.50E-02	1.27E-02
Zinc	291	6.91	1.20E-12	5.60E-01	1.00E-01	8.59E+00

COPC = Chemical of Potential Concern

EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water

BAF = Bioaccumulation Factor (unitless)

(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW

Cs = Soil concentration (mg/kg)

SP = Soil to plant uptake factor from literature

CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)

PDF = Plant dietary fraction (unitless)

FR = Feeding rate (kg/day)

IDF = Invertebrate dietary fraction (unitless)

ADF = Animal dietary fraction (unitless)

Is = Soil dietary (kg dry/day)

Cw = EPC in surface water (mg COPC/L)

WR = Water intake rate (L/day)

SFF = Site foraging frequency = 1 (unitless)

BW = Body weight (kg)

TABLE G-8A
DEER MOUSE (Peromyscus maniculatus) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	SP (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Terrestrial Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Deer Mouse Surface Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Anthracene	0.7		1.04E-01	7.0E-02	2.21E-02
Benzo(a)anthracene	1.9		2.02E-02	3.0E-02	2.55E-02
Benzo(a)pyrene	1.7		1.10E-02	7.0E-02	4.78E-02
Benzo(b)fluoranthene	1.9		1.01E-02	7.0E-02	5.31E-02
Benzo(ghi)perylene	1.7		5.70E-03	7.0E-02	4.70E-02
Benzo(k)fluoranthene	1.9		1.01E-02	8.0E-02	5.76E-02
Chrysene	2.4		1.87E-02	4.0E-02	4.08E-02
Phenanthrene	2.9		1.02E-01	7.0E-02	9.27E-02
Pyrene	5.0		4.43E-02	7.0E-02	1.44E-01
Pesticides					
4,4'-DDT	0.0028		9.37E-03	1.3E+00	1.27E-03
Metals					
Antimony	2.5		2.00E-01	2.2E-01	2.22E-01
Arsenic	8.3		3.60E-02	1.1E-01	3.59E-01
Cadmium	0.65	0.00054	3.64E-01	9.6E-01	2.38E-01
Chromium	29	0.006	7.50E-03	1.0E-02	1.59E-01
Cobalt	18		8.10E-02	1.2E-01	8.76E-01
Copper	32	0.0112	4.00E-01	4.0E-02	1.08E+00
Cyanide	0.36		1.00E+00	1.1E+00	1.65E-01
Lead	30	0.0263	4.50E-02	3.0E-02	4.31E-01
Manganese	15037		2.50E-01	5.4E-02	4.85E+02
Selenium	6.3	0.0025	1.60E-02	2.2E-01	5.18E-01
Silver	0.64		4.00E-01	2.2E-01	6.40E-02
Thallium	6.5		4.00E-03	2.2E-01	5.32E-01
Vanadium	21		5.50E-03	2.2E-01	1.68E+00

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = EPC in the appropriate soil exposure interval (mg COPC/kg dry soil)
SP = Soil-to-plant uptake factor ((mg COPC/kg dry tissue)/(mg COPC/kg dry soil))
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-8B
AMERICAN ROBIN (*Turdus migratorius*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	American Robin Surface Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Anthracene	0.7		1.04E-01	7.00E-02	3.08E-02
Benzo(a)anthracene	1.9		2.02E-02	3.00E-02	5.16E-02
Benzo(a)pyrene	1.7		1.10E-02	7.00E-02	7.55E-02
Benzo(b)fluoranthene	1.9		1.01E-02	7.00E-02	8.39E-02
Benzo(ghi)perylene	1.7		5.70E-03	7.00E-02	7.49E-02
Benzo(k)fluoranthene	1.9		1.01E-02	8.00E-02	8.81E-02
Chrysene	2.4		1.87E-02	4.00E-02	7.49E-02
Phenanthrene	2.9		1.02E-01	7.00E-02	1.29E-01
Pyrene	5.0		4.43E-02	7.00E-02	2.17E-01
Pesticides					
4,4'-DDT	0.0028		9.37E-03	1.26E+00	1.47E-03
Metals					
Antimony	2.5		2.00E-01	2.20E-01	2.61E-01
Arsenic	8.3		3.60E-02	1.10E-01	4.99E-01
Cadmium	0.65	0.00054	3.64E-01	9.60E-01	2.67E-01
Chromium	29	0.006	7.50E-03	1.00E-02	5.42E-01
Cobalt	18		8.10E-02	1.22E-01	1.16E+00
Copper	32	0.0112	4.00E-01	4.00E-02	1.06E+00
Cyanide	0.36		1.00E+00	1.12E+00	1.75E-01
Lead	30	0.0263	4.50E-02	3.00E-02	8.06E-01
Manganese	15037		2.50E-01	5.40E-02	5.74E+02
Selenium	6.3	0.0025	1.60E-02	2.20E-01	6.63E-01
Silver	0.64		4.00E-01	2.20E-01	6.94E-02
Thallium	6.5		4.00E-03	2.20E-01	6.85E-01
Vanadium	21		5.50E-03	2.20E-01	2.16E+00

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-8C
SHORT-TAILED SHREW (*Blarina brevicauda*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Short-Tailed Shrew Surface Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds						
Anthracene	0.7		1.04E-01	7.00E-02	4.61E-04	3.64E-02
Benzo(a)anthracene	1.9		2.02E-02	3.00E-02	1.46E-04	5.74E-02
Benzo(a)pyrene	1.7		1.10E-02	7.00E-02	4.61E-04	8.94E-02
Benzo(b)fluoranthene	1.9		1.01E-02	7.00E-02	5.46E-04	9.94E-02
Benzo(ghi)perylene	1.7		5.70E-03	7.00E-02	4.61E-04	8.86E-02
Benzo(k)fluoranthene	1.9		1.01E-02	8.00E-02	5.43E-04	1.05E-01
Chrysene	2.4		1.87E-02	4.00E-02	1.88E-04	8.52E-02
Phenanthrene	2.9		1.02E-01	7.00E-02	4.61E-04	1.53E-01
Pyrene	5.0		4.43E-02	7.00E-02	4.61E-04	2.57E-01
Pesticides						
4,4'-DDT	0.0028		9.37E-03	1.26E+00	6.18E-04	1.90E-03
Metals						
Antimony	2.5		2.00E-01	2.20E-01	1.00E-03	3.26E-01
Arsenic	8.3		3.60E-02	1.10E-01	2.00E-03	6.07E-01
Cadmium	0.65	0.00054	3.64E-01	9.60E-01	5.50E-04	3.44E-01
Chromium	29	0.006	7.50E-03	1.00E-02	5.50E-03	5.66E-01
Cobalt	18		8.10E-02	1.22E-01	2.00E-02	1.43E+00
Copper	32	0.0112	4.00E-01	4.00E-02	1.00E-02	1.22E+00
Cyanide	0.36		1.00E+00	1.12E+00	1.00E+00	2.44E-01
Lead	30	0.0263	4.50E-02	3.00E-02	3.00E-04	8.97E-01
Manganese	15037		2.50E-01	5.40E-02	4.00E-04	6.65E+02
Selenium	6.3	0.0025	1.60E-02	2.20E-01	1.50E-02	8.35E-01
Silver	0.64		4.00E-01	2.20E-01	3.00E-03	8.66E-02
Thallium	6.5		4.00E-03	2.20E-01	4.00E-02	8.70E-01
Vanadium	21		5.50E-03	2.20E-01	2.50E-03	2.71E+00

COPC = Chemical of Potential Concern

EPC = Exposure Point Concentration, the mean detected concentration for soil and the maximum detected concentration for surface water

BAF = Bioaccumulation Factor (unitless)

(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW

Cs = Soil concentration (mg/kg)

SP = Soil to plant uptake factor from literature

CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)

PDF = Plant dietary fraction (unitless)

FR = Feeding rate (kg/day)

IDF = Invertebrate dietary fraction (unitless)

ADF = Animal dietary fraction (unitless)

Is = Soil dietary (kg/day)

SFF = Site foraging frequency = 1 (unitless)

BW = Body weight (kg)

TABLE G-8D
MEADOW VOLE (*Microtus pennsylvanicus*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Meadow Vole Surface Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Anthracene	0.7		1.04E-01	7.00E-02	5.68E-02
Benzo(a)anthracene	1.9		2.02E-02	3.00E-02	1.42E-01
Benzo(a)pyrene	1.7		1.10E-02	7.00E-02	1.27E-01
Benzo(b)fluoranthene	1.9		1.01E-02	7.00E-02	1.41E-01
Benzo(ghi)perylene	1.7		5.70E-03	7.00E-02	1.25E-01
Benzo(k)fluoranthene	1.9		1.01E-02	8.00E-02	1.35E-01
Chrysene	2.4		1.87E-02	4.00E-02	1.78E-01
Phenanthrene	2.9		1.02E-01	7.00E-02	2.38E-01
Pyrene	5.0		4.43E-02	7.00E-02	3.77E-01
Pesticides					
4,4'-DDT	0.0028		9.37E-03	1.26E+00	2.00E-04
Metals					
Antimony	2.5		2.00E-01	2.20E-01	2.19E-01
Arsenic	8.3		3.60E-02	1.10E-01	6.24E-01
Cadmium	0.65	0.00054	3.64E-01	9.60E-01	6.72E-02
Chromium	29	0.006	7.50E-03	1.00E-02	2.12E+00
Cobalt	18		8.10E-02	1.22E-01	1.40E+00
Copper	32	0.0112	4.00E-01	4.00E-02	3.41E+00
Cyanide	0.36		1.00E+00	1.12E+00	5.78E-02
Lead	30	0.0263	4.50E-02	3.00E-02	2.26E+00
Manganese	15037		2.50E-01	5.40E-02	1.41E+03
Selenium	6.3	0.0025	1.60E-02	2.20E-01	4.62E-01
Silver	0.64		4.00E-01	2.20E-01	6.88E-02
Thallium	6.5		4.00E-03	2.20E-01	4.70E-01
Vanadium	21		5.50E-03	2.20E-01	1.49E+00

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-8E
RED FOX *(Vulpes vulpes)* EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Surface Soil (0-2 ft bgs) EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Red Fox Surface Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds						
Anthracene	0.7		1.04E-01	7.00E-02	4.61E-04	1.84E-03
Benzo(a)anthracene	1.9		2.02E-02	3.00E-02	1.46E-04	3.70E-03
Benzo(a)pyrene	1.7		1.10E-02	7.00E-02	4.61E-04	4.19E-03
Benzo(b)fluoranthene	1.9		1.01E-02	7.00E-02	5.46E-04	4.68E-03
Benzo(ghi)perylene	1.7		5.70E-03	7.00E-02	4.61E-04	4.14E-03
Benzo(k)fluoranthene	1.9		1.01E-02	8.00E-02	5.43E-04	4.69E-03
Chrysene	2.4		1.87E-02	4.00E-02	1.88E-04	4.94E-03
Phenanthrene	2.9		1.02E-01	7.00E-02	4.61E-04	7.71E-03
Pyrene	5.0		4.43E-02	7.00E-02	4.61E-04	1.24E-02
Pesticides						
4,4'-DDT	0.0028		9.37E-03	1.26E+00	6.18E-04	4.42E-05
Metals						
Antimony	2.5		2.00E-01	2.20E-01	1.00E-03	1.14E-02
Arsenic	8.3		3.60E-02	1.10E-01	2.00E-03	2.62E-02
Cadmium	0.65	0.00054	3.64E-01	9.60E-01	5.50E-04	8.73E-03
Chromium	29	0.006	7.50E-03	1.00E-02	5.50E-03	7.19E-02
Cobalt	18		8.10E-02	1.22E-01	2.00E-02	1.06E-01
Copper	32	0.0112	4.00E-01	4.00E-02	1.00E-02	1.40E-01
Cyanide	0.36		1.00E+00	1.12E+00	1.00E+00	5.86E-02
Lead	30	0.0263	4.50E-02	3.00E-02	3.00E-04	6.18E-02
Manganese	15037		2.50E-01	5.40E-02	4.00E-04	4.17E+01
Selenium	6.3	0.0025	1.60E-02	2.20E-01	1.50E-02	3.95E-02
Silver	0.64		4.00E-01	2.20E-01	3.00E-03	3.48E-03
Thallium	6.5		4.00E-03	2.20E-01	4.00E-02	6.40E-02
Vanadium	21		5.50E-03	2.20E-01	2.50E-03	9.05E-02

COPC = Chemical of Potential Concern

EPC = Exposure Point Concentration, the mean detected concentration for soil and the maximum detected concentration for surface water

BAF = Bioaccumulation Factor (unitless)

(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW

Cs = Soil concentration (mg/kg)

SP = Soil to plant uptake factor from literature

CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)

PDF = Plant dietary fraction (unitless)

FR = Feeding rate (kg/day)

IDF = Invertebrate dietary fraction (unitless)

ADF = Animal dietary fraction (unitless)

Is = Soil dietary (kg dry/day)

Cw = EPC in surface water (mg COPC/L)

WR = Water intake rate (L/day)

SFF = Site foraging frequency = 1 (unitless)

BW = Body weight (kg)

TABLE G-9A
DEER MOUSE (Peromyscus maniculatus) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	SP (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Terrestrial Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Deer Mouse Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Benzo(a)anthracene	2.51		2.02E-02	3.0E-02	3.32E-02
Benzo(a)pyrene	2.70		1.10E-02	7.0E-02	7.41E-02
Benzo(b)fluoranthene	3.75		1.01E-02	7.0E-02	1.03E-01
Benzo(k)fluoranthene	3.00		1.01E-02	8.0E-02	9.30E-02
Chrysene	3.56		1.87E-02	4.0E-02	5.99E-02
Pyrene	5.12		4.43E-02	7.0E-02	1.48E-01
Metals					
Arsenic	18		3.60E-02	1.1E-01	7.62E-01
Cobalt	19		8.10E-02	1.2E-01	9.32E-01
Manganese	3195		2.50E-01	5.4E-02	1.03E+02
Selenium	2.0	0.00245	1.60E-02	2.2E-01	1.69E-01
Silver	1.4		4.00E-01	2.2E-01	1.44E-01
Thallium	2.4		4.00E-03	2.2E-01	1.93E-01
Vanadium	21		5.50E-03	2.2E-01	1.72E+00
Zinc	142	0.19	1.20E-12	5.6E-01	2.92E+01

COPC = Chemical of Potential Concern

EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water

BAF = Bioaccumulation Factor (unitless)

SP = Soil to plant uptake factor (unitless)

(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW

Cs = EPC in the appropriate soil exposure interval (mg COPC/kg dry soil)

SP = Soil-to-plant uptake factor ((mg COPC/kg dry tissue)/(mg COPC/kg dry soil))

CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)

PDF = Plant dietary fraction (unitless)

FR = Feeding rate (kg/day)

IDF = Invertebrate dietary fraction (unitless)

Is = Soil dietary (kg dry/day)

Cw = EPC in surface water (mg COPC/L)

WR = Water intake rate (L/day)

SFF = Site foraging frequency = 1 (unitless)

BW = Body weight (kg)

TABLE G-9B
AMERICAN ROBIN (*Turdus migratorius*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	American Robin Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Benzo(a)anthracene	2.51		2.02E-02	3.00E-02	6.72E-02
Benzo(a)pyrene	2.70		1.10E-02	7.00E-02	1.17E-01
Benzo(b)fluoranthene	3.75		1.01E-02	7.00E-02	1.62E-01
Benzo(k)fluoranthene	3.00		1.01E-02	8.00E-02	1.42E-01
Chrysene	3.56		1.87E-02	4.00E-02	1.10E-01
Pyrene	5.12		4.43E-02	7.00E-02	2.23E-01
Metals					
Arsenic	18		3.60E-02	1.10E-01	1.06E+00
Cobalt	19		8.10E-02	1.22E-01	1.23E+00
Manganese	3195		2.50E-01	5.40E-02	1.22E+02
Selenium	2.0	0.00245	1.60E-02	2.20E-01	2.16E-01
Silver	1.4		4.00E-01	2.20E-01	1.55E-01
Thallium	2.4		4.00E-03	2.20E-01	2.48E-01
Vanadium	21		5.50E-03	2.20E-01	2.21E+00
Zinc	142	0.19	1.20E-12	5.60E-01	3.50E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-9C
SHORT-TAILED SHREW (*Blarina brevicauda*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Short-Tailed Shrew Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds						
Benzo(a)anthracene	2.51		2.02E-02	3.00E-02	1.46E-04	7.48E-02
Benzo(a)pyrene	2.70		1.10E-02	7.00E-02	4.61E-04	1.38E-01
Benzo(b)fluoranthene	3.75		1.01E-02	7.00E-02	5.46E-04	1.92E-01
Benzo(k)fluoranthene	3.00		1.01E-02	8.00E-02	5.43E-04	1.70E-01
Chrysene	3.56		1.87E-02	4.00E-02	1.88E-04	1.25E-01
Pyrene	5.12		4.43E-02	7.00E-02	4.61E-04	2.64E-01
Metals						
Arsenic	18		3.60E-02	1.10E-01	2.00E-03	1.29E+00
Cobalt	19		8.10E-02	1.22E-01	2.00E-02	1.52E+00
Manganese	3195		2.50E-01	5.40E-02	4.00E-04	1.41E+02
Selenium	2.0	0.00245	1.60E-02	2.20E-01	1.50E-02	2.72E-01
Silver	1.4		4.00E-01	2.20E-01	3.00E-03	1.94E-01
Thallium	2.4		4.00E-03	2.20E-01	4.00E-02	3.15E-01
Vanadium	21		5.50E-03	2.20E-01	2.50E-03	2.77E+00
Zinc	142	0.19	1.20E-12	5.60E-01	1.00E-01	4.54E+01

COPC = Chemical of Potential Concern

EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water

BAF = Bioaccumulation Factor (unitless)

(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW

Cs = Soil concentration (mg/kg)

SP = Soil to plant uptake factor from literature

CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)

PDF = Plant dietary fraction (unitless)

FR = Feeding rate (kg/day)

IDF = Invertebrate dietary fraction (unitless)

ADF = Animal dietary fraction (unitless)

Is = Soil dietary (kg/day)

SFF = Site foraging frequency = 1 (unitless)

BW = Body weight (kg)

TABLE G-9D
MEADOW VOLE (*Microtus pennsylvanicus*) EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant Uptake Factor (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Meadow Vole Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds					
Benzo(a)anthracene	2.51		2.02E-02	3.00E-02	1.84E-01
Benzo(a)pyrene	2.70		1.10E-02	7.00E-02	1.97E-01
Benzo(b)fluoranthene	3.75		1.01E-02	7.00E-02	2.73E-01
Benzo(k)fluoranthene	3.00		1.01E-02	8.00E-02	2.18E-01
Chrysene	3.56		1.87E-02	4.00E-02	2.61E-01
Pyrene	5.12		4.43E-02	7.00E-02	3.88E-01
Metals					
Arsenic	18		3.60E-02	1.10E-01	1.33E+00
Cobalt	19		8.10E-02	1.22E-01	1.49E+00
Manganese	3195		2.50E-01	5.40E-02	2.99E+02
Selenium	2.0	0.00245	1.60E-02	2.20E-01	1.50E-01
Silver	1.4		4.00E-01	2.20E-01	1.54E-01
Thallium	2.4		4.00E-03	2.20E-01	1.70E-01
Vanadium	21		5.50E-03	2.20E-01	1.52E+00
Zinc	142	0.19	1.20E-12	5.60E-01	1.03E+01

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
SP = Soil to plant uptake factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil tp plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

TABLE G-9E
RED FOX *(Vulpes vulpes)* EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Soil Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Red Fox Ditch Soil Exposure (mg/kg/day)
Semivolatile Organic Compounds						
Benzo(a)anthracene	2.51		2.02E-02	3.00E-02	1.46E-04	4.81E-03
Benzo(a)pyrene	2.70		1.10E-02	7.00E-02	4.61E-04	6.49E-03
Benzo(b)fluoranthene	3.75		1.01E-02	7.00E-02	5.46E-04	9.05E-03
Benzo(k)fluoranthene	3.00		1.01E-02	8.00E-02	5.43E-04	7.58E-03
Chrysene	3.56		1.87E-02	4.00E-02	1.88E-04	7.26E-03
Pyrene	5.12		4.43E-02	7.00E-02	4.61E-04	1.27E-02
Metals						
Arsenic	18		3.60E-02	1.10E-01	2.00E-03	5.55E-02
Chromium	20	0.006	7.50E-03	1.00E-02	5.50E-03	4.97E-02
Cobalt	19		8.10E-02	1.22E-01	2.00E-02	1.13E-01
Manganese	3195		2.50E-01	5.40E-02	4.00E-04	8.86E+00
Selenium	2.0	0.00245	1.60E-02	2.20E-01	1.50E-02	1.30E-02
Silver	1.4		4.00E-01	2.20E-01	3.00E-03	7.80E-03
Thallium	2.4		4.00E-03	2.20E-01	4.00E-02	2.32E-02
Vanadium	21		5.50E-03	2.20E-01	2.50E-03	9.26E-02
Zinc	142	0.19	1.20E-12	5.60E-01	1.00E-01	3.20E+00

COPC = Chemical of Potential Concern

EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water

BAF = Bioaccumulation Factor (unitless)

(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW

Cs = Soil concentration (mg/kg)

SP = Soil to plant uptake factor from literature

CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)

PDF = Plant dietary fraction (unitless)

FR = Feeding rate (kg/day)

IDF = Invertebrate dietary fraction (unitless)

ADF = Animal dietary fraction (unitless)

Is = Soil dietary (kg dry/day)

Cw = EPC in surface water (mg COPC/L)

WR = Water intake rate (L/day)

SFF = Site foraging frequency = 1 (unitless)

BW = Body weight (kg)

TABLE G-9F
GREAT BLUE HERON *(Ardea herodias)* EXPOSURE BASED ON MEAN CONCENTRATION - SEAD-121I DITCH SOIL
SEAD-121C AND SEAD-121I RI Report
Seneca Army Depot Activity

COPC	Ditch Soil EPC (mg/kg)	Surface Water EPC (mg/L)	Soil-To-Plant (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)	Soil-To-Invertebrate BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Small Mammal BAF (mg COPC/kg wet tissue)/ (mg COPC/kg dry soil)	Great Blue Heron Ditch Soil and Surface Water Exposure (mg/kg/day)
Semivolatile Organic Compounds						
Benzo(a)anthracene	2.51		2.02E-02	3.00E-02	1.46E-04	2.24E-02
Benzo(a)pyrene	2.70		1.10E-02	7.00E-02	4.61E-04	2.47E-02
Benzo(b)fluoranthene	3.75		1.01E-02	7.00E-02	5.46E-04	3.43E-02
Benzo(k)fluoranthene	3.00		1.01E-02	8.00E-02	5.43E-04	2.75E-02
Chrysene	3.56		1.87E-02	4.00E-02	1.88E-04	3.20E-02
Pyrene	5.12		4.43E-02	7.00E-02	4.61E-04	4.68E-02
Metals						
Arsenic	18		3.60E-02	1.10E-01	2.00E-03	1.69E-01
Cobalt	19		8.10E-02	1.22E-01	2.00E-02	2.41E-01
Manganese	3195		2.50E-01	5.40E-02	4.00E-04	2.90E+01
Selenium	2.0	0.00245	1.60E-02	2.20E-01	1.50E-02	2.52E-02
Silver	1.4		4.00E-01	2.20E-01	3.00E-03	1.46E-02
Thallium	2.4		4.00E-03	2.20E-01	4.00E-02	3.93E-02
Vanadium	21		5.50E-03	2.20E-01	2.50E-03	2.11E-01
Zinc	142	0.19	1.20E-12	5.60E-01	1.00E-01	4.06E+00

COPC = Chemical of Potential Concern
EPC = Exposure Point Concentration, the mean detected concentration for ditch soil and the maximum detected concentration for surface water
BAF = Bioaccumulation Factor (unitless)
(1) Exposure = [((Cs*SP*CF*PDF*FR) + (Cs*IDF*BAF*FR) + (Cs*ADF*BAF*FR) + (Cs*Is)+(Cw*WR))*SFF]/BW
Cs = Soil concentration (mg/kg)
SP = Soil to plant uptake factor from literature
CF = Dry weight to wet weight plant matter conversion factor = 0.2 (unitless)
PDF = Plant dietary fraction (unitless)
FR = Feeding rate (kg/day)
IDF = Invertebrate dietary fraction (unitless)
ADF = Animal dietary fraction (unitless)
Is = Soil dietary (kg dry/day)
Cw = EPC in surface water (mg COPC/L)
WR = Water intake rate (L/day)
SFF = Site foraging frequency = 1 (unitless)
BW = Body weight (kg)

APPENDIX H

RESPONSE TO COMMENTS

Army's Response to Comments from the US Environmental Protection Agency

Subject: Draft Field Sampling Report for SEAD 121C & 121I
Seneca Army Depot
Romulus, New York

Comments Dated: March 24, 2004 (received by email)

Date of Comment Response: November 4, 2004

Army's Response to Comments

I. GENERAL COMMENTS

Comment 1: The areas at SEAD-121C that are referred to frequently throughout the document as containment area," "storage cells," and the "former concrete storage pad" should be shown on all appropriate figures (i.e., Figure 1-3, Figure 3-1, etc..) Numerous references to, these objects relative to associated samples are made in the document, yet they are not shown on any figure. Provide additional documentation of these areas.

Response 1: Based on field notes collected during the 2002 field effort, and after review of GIS aerial photographs from 2000 obtained from the State of New York, storage cells, concrete barriers, and debris piles have been known to exist at the DRMO Yard. It should be noted that these features are transitory; changing as material has been moved into and out of the Yard. However, for the purposes of presentation, the approximate locations of these based on the 2000 photographs have been added.

As stated in response to USEPA comments on the Work Plan, there is no available information regarding the location of a rumored concrete pad. Therefore, this feature is not included on site figures.

Comment 2: The various discussions related to surface and subsurface soil samples are unclear and inconsistent. For example, four samples were collected at depths of 0 to 2 inches bgs at the DRMO Yard during the EBS sampling, and are described as soil borings (Page 3-2). However, the twenty samples collected from soil borings at locations in the DRMO Yard during the RI are considered to be surface samples, although they were collected from 0 to 2 feet bgs (Page 3-3). List the sample depths in Table 3-2 (or similar table) and revise callouts accordingly.

Response 2: The Army collected surface soil samples from a depth of 0 to 2 inches below grade surface or beneath the vegetative root ball/cover material. A split spoon was advanced to 2 ft., but the sample was collected from the top 2 inches of the spoon, where vegetative root material, asphalt, or cover materials were not found. The text has been clarified.

The depth of each sample has been added to the revised Table 3-2

Comment 3: Text indicates that the purpose of surface water sampling at SEAD-1211 was to determine background surface water concentrations at areas at the site that have not been impacted by site activities as well as to delineate the extent of contamination at the site. However, as described in Section 3.2.5, four surface water samples were collected immediately around the site (only two upgradient), while the other three were collected at a drainage ditch downgradient of the site that serves as the outfall for drainage from a large area. Therefore, it does not appear that sufficient surface water samples were collected upgradient of the site to provide a baseline for background (or areas not impacted by the site) to characterize background surface water concentrations. In addition, the three samples collected in the downgradient drainage ditch may contain runoff materials from other sites. Additional upgradient (background) samples and delineation samples should be collected.

Response 3: The Army wishes to emphasize that there is no continuous source of surface water located within the bounds of the Rumored Cosmoline Oil Disposal Area. All surface water located at this site is temporal, generally associated with either storm or snowmelt events. Surface water locations that are present within the bounds of the site are restricted to runoff ditches, culverts or infiltration galleries and buried stormwater sewers that convey storm event runoff to locations west of the warehousing area where it is discharged into the headwaters of Kendaia Creek. Additionally, the Army must reiterate that a work plan for this investigation was provided to the EPA prior to the initiation of this effort, and no comments were received indicating that the proposed sampling plan for surface water was insufficient.

Having said this, the Army believes that the surface water in the vicinity of the Rumored Cosmoline Oil Disposal Area has been adequately characterized. Two upgradient, three downgradient and two surface water samples from locations within the site were collected and characterized. No organic contaminants, including TPH, were identified in either of the upgradient samples, while a total of 14 different metals were found in one or more of the two upgradient samples. However, of the 14 metals detected, only lead and aluminum were found at levels above the New York Class C surface water standards, and these were both collocated in the same sample. Similarly, 14 metals and no organic contaminants or TPH, were found at the downgradient sample locations, but in this case none of the detected concentrations were found at levels exceeding the New York Class C standards. Finally, two organic, but not TPH, and up to 17 metal contaminants were identified in the temporal surface water samples that were collected from within the bounds of the Cosmoline oil site. Of these 19 identified contaminants, only four of the metals were found at levels exceeding the Class C surface water standards. Given this information, it is clear that there is no evidence of contaminant transport to locations downgradient of the Cosmoline oil site. Therefore, the Army does not consider further surface water sampling necessary.

Comment 4: For reference, the New York State DEC Technical and Administrative Guidance Memorandum (TAGM) #4046 values should be included in the text where appropriate in Section 4. This will provide the information necessary while reviewing the site- and media- specific analytic results.

Response 4: For the purposes of comparison, the TAGM #4046 guidance value for each parameter and the number of times the TAGM value was exceeded have been added to the summary statistics tables for soils presented in Section 4 (Tables 4-1, 4-2, 4-6, 4-7, and 4-9).

II. SPECIFIC COMMENTS

Comment 1: Executive Summary, Page E-l: Include chemical oxygen demand (COD), alkalinity, ammonia, hardness, phosphates, and nitrate-nitrite/nitrogen in the list of chemical analyses performed, because these analyses were performed on samples collected during the RI portion of the investigation (as per Table 2-5).

Response 1: The text of the *Executive Summary* is correct, and the list of analytes included in Table 2-5 is in error. Analysis for COD, hardness, nitrate-nitrite/nitrogen, and TDS were not performed. Table 2-5 has been revised accordingly. In addition, Tables 2-2 through 2-4 were revised to accurately reflect the analysis performed for each media.

Comment 2: Section 1.3.2. Page 1-3: One goal of the investigation at SEAD-121I was to investigate the potential for contamination at the site resulting from Cosmoline. However, minimal description or discussion of this compound or its military use has been included in the text. Revise this section to describe the nature and use of Cosmoline, and potential contaminants associated with it.

Response 2: Cosmoline is a substance used to prevent corrosion, and it is commonly used to protect metallic components during shipment and storage. According to a material safety data sheet (MSDS) prepared by Goodson Shop Supplies, Cosmoline is composed of a complex mixture of petroleum hydrocarbons, severely hydrotreated heavy naphthenic distillate, Stoddard solvent, wool grease, and butyl stearate. No adverse chronic health effects have been reported due to exposure to Cosmoline. Acute health effects are generally limited to irritation, depending on the duration of the contact. A MSDS for Cosmoline has been included as Appendix D.
This information has been added to the text.

Comment 3: Section 2.2.1, Page 2-3: In the second paragraph of this section, revise text to read "This survey procedure was not employed during the EBS sampling program because the wells insta1led during this investigation were temporary."

Response 3: The text has been revised accordingly.

Comment 4: Section 2.2.3, Page 2-7: Include in this section the season(s) in which the surface water samples were collected at both SEAD-121C and SEAD-121I.

Response 4: The surface water samples were collected in the fall of 2002. This information has been added to the text.

Comment 5: Section 2.2.4.3, Page 2-11: The fifth full paragraph of this section indicates the sampling order for groundwater samples collected during the RI portion of the investigation. This order includes VOCs, SVOCs, metals, pesticides/PCBs, cyanide, and TOC/COD. Table 2-5 indicates that groundwater was also sampled for total petroleum hydrocarbons (TPH), hardness. nitrate-nitrite/nitrogen, and total dissolved solids (TDS). Revise the sampling order to include all analyses performed. The same comment applies to text in Section 4.1 on Page 4-2, which excludes these same analyses.

Response 5: The analyte list provided in this section was written in error. As discussed in Response to Specific Comment 1, analysis for TOC and COD were not performed, while analysis for TRPH was performed.

For groundwater, the correct sampling order is (1) VOCs, (2) SVOCs, (3) Metals, (4) pesticides/PCBs, (5) cyanide, and (6) TRPH. The text has been revised accordingly. Response 1 notes that Table 2-5 has been revised as well.

Section 4.1 is correct and does not require revision.

Comment 6: Section 3.1.4.1, Page 3-2: The text in the "RI Program" section contains should be revised. The sentence, "The sampling interval from 2-4 ft…as one sample" erroneously appears to refer to the four soil borings that contained large amounts of rock which was discussed in the previous sentence (SB121C-2, -8, -15, and -19), and which were sampled only from 0-2 ft bgs.

Revise discussion of sampling depths in the first paragraph, and discussion of sampling of borings SB121C-2, -8, -15, and -19. Clarify that the VOC samples in the composited 2-4 and 4-6 ft bgs sampling intervals were not composited.

Also, confirm that these four borings were sampled from 0 to 2 *feet* bgs, not 0 to 2 *inches* bgs as indicated in the fifth sentence of this section and also on Page 2-5 of Section 2.2.2.1.

Response 6: The text has been revised to state,

> "At these four soil borings, a substantial sample could not be collected from the deeper sampling interval; thus the interval from 0 to 2 ft. was the only one collected for analysis. At the other twelve soil borings, the sampling interval from 2-4 ft. bgs and 4-6 ft. bgs were composited at each hole location as a result of the high rock content and collected as one sample."

The VOC samples were not composited; rather, the soil samples for VOC analysis were collected from the depth interval of 2 – 4 ft. only.

The first interval is 0 to 2 feet. Thus, the text in this section has been revised to indicate *0 to 2 feet*, as shown above. The text on page 2-5 has been revised as well.

Comment 7: Section 3.1.4.2, Page 3-3: Include sample depths of surface soil samples in the text. Also clarify that these samples were the top interval of the soil borings described in the first portion of Section 3.1.4.1.

Response 7: The text has been clarified.

Comment 8: Section 3.5, Page 3-3; Confirm that ditch soil samples described in this section were collected from 0 to 2 inches bgs.

Response 8: The depth range for ditch soil is defined as 0 to 2 inches. In practice, ditch soil samples were collected from the top of the depth interval. Because the ditch soil samples did not seem to vary in character or nature from the surface soil samples (collected from 0 to 2 inches), the ditch soil samples were grouped as surface soil for the purpose of discussion. The text has been clarified.

Comment 9: Section 3.1.6, Page 3-4: Revise the first sentence to read that "There were *no* surface water... field program."

Response 9: The text has been revised accordingly.

Comment 10: Section 3.1.7.1, Page 3-6: The section entitled "RI Program" indicates that four wells with a designation starting with "MWDRMO" were installed in the DRMO Yard during the RI investigation. However, the groundwater sampling section, Section 3.1.7.3 refers to permanent well locations with designations starting with "MWI2IC." Additionally, wells with a designation "MWDRMO" are not included in Tables 3-1, 3-7, 3-8, 3-9, 3-10, or 3-11, all of which include information related to the permanent wells at the DRMO Yard. Clarify text if necessary to report on permanent wells installed at the DRMO Yard.

Response 10: The well designations should start with "MW121C" and not "DRMO". The text has been revised accordingly.

Comment 11: Section 3.1.8.1, Page 3-7: Text in this section indicates that the first round of elevation data was collected on the day of well development. For consistency, include the date of this activity (apparently mid-January 2003) in this section (as well as in Table 3-11) to facilitate comparison to the second, third, and fina1 rounds of measurements.

Response 11: Groundwater elevations were collected on October 29, 2002, January 17, 2003, and February 2, 2003, and May 7, 2003. The text and Table 3-11 have been revised to include this information.

Comment 12: Section 3.2.4.2, Page 3-8: The text in this section indicates that five soil borings were completed at SEAD-121I during the RI investigation. Indicate in this section whether the borings were sampled, and if so, the number of samples collected per boring.

Response 12: A soil sample was collected from each boring at a depth interval of 0 to 2 ft. The text has been revised to incorporate this information. A soil boring was advanced and a sample was collected from the top interval at 0-2 inches in each of the five borings. The auger encountered refusal, therefore additional samples at greater depths were not collected.

Comment 13: Section 3.2.4.3, Page 3-8: Include the sample depths for the four surface soil samples collected at SEAD-121I during the EBS sampling round.

Response 13: The surface soil samples were collected from a depth range of 0 – 0.2 ft. This information has been added to the text.

Comment 14: Section 3.2.6, Page 3-11: The text in this section indicates that no groundwater monitoring wells were installed at SEAD-121I due to shallow refusal. In lieu of discussion of groundwater at this site, include a discussion of the nearest monitoring wells to SEAD121I and the results of any sampling of these wells that is applicable to SEAD-121I.

Response 14: There are no wells at SEAD-121I (as well as at the neighboring SWMU, SEAD-68) since the site is located very near, or at, the top of the apparent groundwater divide, and there is no saturated thickness in the overburden aquifer. A few wells are located downgradient of SEAD-121I, and they are associated with other SWMUs and are potentially impacted by CERCLA and non-CERCLA releases that have occurred in the overall PID Area. Therefore, any attempt to correlate offsite wells with conditions present at SEAD-121I would have many interferences that would make such comparisons virtually meaningless. Therefore, the Army will not provide any discussion of chemistry and will limit its discussion of offsite wells merely to the fact that they exist and do.

Comment 15: Section 4.2, Page 4-3: It appears as though discussion of cyanide results has been omitted from this section even though Tables 2-2 through 2-4 indicate that it was included in the sample analyses for soils, surface water, and ditch soil at SEAD-121C. Similarly, the groundwater section does not include results of COD, hardness, nitrite-nitrate/nitrogen, or TDS although these analyses were reportedly collected from wells at SEAD-I21C. Revise as appropriate.

Response 15: At the DRMO Yard, cyanide (total and amenable) was not detected in any surface soil, subsurface soil, surface water, and groundwater samples. Cyanide was detected once in ditch soil at SDDRMO-4 at an estimated concentration of 2.36 J mg/Kg. At SEAD-121I, total cyanide was detected at three surface soil locations, with a maximum concentration of 2.73 mg/Kg at SS121I-29. Cyanide was not detected in the surface water or ditch soil at SEAD-121I. Discussions of cyanide results for each media where cyanide was detected have been added to the text. As noted in previous responses, analysis for COD, hardness, nitrite-nitrate/nitrogen, and TDS was not performed. Any reference to these analyses has been removed from the text.

Comment 16: Section 4.2, Page 4-7: Signs of soil contamination beyond the boundaries of SEAD-121C are discussed throughout this section. However, those signs are dismissed as either anthropogenic background or source unrelated to SEAD-121C. Please note that any exceedances beyond EPA Region 9 preliminary remedial goals (PRGs) industrial screening levels need further investigation and/or remedial action as per CERCLA. Your anthropological background position has never been formally presented or accepted by the regulatory agencies, and it is considered highly unlikely that such levels of contaminants would have found their way to these areas apart from Army-related operations.

Response 16: The Army has been unable to identify any promulgated standard or law that states that Region 9 PRGs trigger the need for further investigation or action. However, the Army has identified the October 1, 2002 EPA Region 9 PRG update, which states that chemical concentrations exceeding PRG levels do not "trigger a response action."

> "Exceeding a PRG suggests that further evaluation of the potential risks that may be posed by site contaminants is appropriate. Further evaluation may include additional sampling, consideration of ambient levels in the environment, or a reassessment of the assumptions contained in these screening-level estimates."

There is no mention that exceeding a PRG warrants remedial action. "The PRG table is specifically not intended as a . . . set of final cleanup or action levels to be applied at contaminated sites".

In the Sampling Report, the Army presented specific site conditions that could be potential sources for elevated chemical concentrations detected in locations beyond the boundary of the site. If EPA disagrees with this statement, the Army requests that they present an argument to that effect; EPA's statement that this contention "is considered highly unlikely" is insufficient and unsupported.

Comment 17: Figures 3-1 and 3-2: Include the direction of flow of surface water on these figures.

Response 17: The figures have been revised accordingly.

Comment 18: Table 2-5: The table summarizes the groundwater sampling completed at SEAD-121C, but the internal heading in the table refers to SEAD-121I. Revise accordingly.

Response 18: The table has been revised accordingly.

Comment 19: Tables 4-1, 4-2, 4-6, 4-7, 4-9: For consistency, revise these tables to include the appropriate TAGM #4046 values ("criteria") for each parameter as was done in Tables 4-3 through 4-5 and 4-8 (groundwater and Surface water).

Response 19: The TAGM #4046 values are guidance values or criteria to be considered (TBCs) and not ARARs. However, for the purposes of comparison, the TAGM #4046 guidance value for each parameter and the number of times the TAGM value was exceeded have been added to the summary statistics tables for soils presented in Section 4.

Comment 20: Section 4.3, Page 4-21: The second to last paragraph erroneously locates SD121I samples 1, 2 and 3 east of SEAD-121I.

Response 20: These samples are located to the west of the site. The text has been revised accordingly.

Comment 21: Section 4.3, page 4-7: See comment 16 above. This section presents the same types of justification for contaminants found outside the site boundaries.

Response 21: See response to comment 16 above.

Comment 22: Section 6.2, Page 6-1: We do not agree with the "no further investigation/no action" recommendation for this site. Section 4.2 shows significant levels of metal concentrations related to the existing ferrous-manganese ores at this site. Therefore, some kind of controls or remedial work seems to be needed at this site.

Response 22: The site that is the subject of this investigation is the Rumored Cosmoline Oil Disposal Area, and the BRAC program was tasked with investigating this site for contamination associated with Cosmoline oil. Contaminants detected at the site are not consistent with the presence of Cosmoline oil. According to information provided in the MSDS, the main components of Cosmoline oil are a mixture of complex hydrocarbons (e.g., Stoddard solvent), and naphthenic distillate. Naphthalene was detected in only 7 of 52 samples and never exceeded the TAGM level. If Cosmoline oil were present at the site, then it seems likely that heavy hydrocarbons would have been detected in the soils. As the best indicator, the TPH data was reviewed. TPH was detected at 14 locations in the surface soils at scattered locations across SEAD-121I. Due to the delocalized presence of TPH and the absence of significant levels of naphthalene, there is no evidence of a systemic release of Cosmoline oil at the site.

Currently, the location of SEAD-121I is being used as a staging site for planned strategic stockpiles of ferrous-manganese ore. All metals detected appear to be associated with these ore piles. The stockpiles are strategic materials; they are not a waste and are not covered under the CERCLA program. At the time that the strategic piles are removed, residues associated with the historic stockpiling activities will be addressed by the DoD through the authority responsible for management of the piles. Therefore, no further action is warranted for this site under CERCLA by the BRAC office.

Response to US EPA Comments
on the
Draft Final Remedial Investigation Report for SEAD-121C & 121I,
Seneca Army Depot Activity, Romulus, New York
Dated 10/31/05

Response Date: 4/27/06

GENERAL COMMENTS

The subject document makes reference to non-CERCLA language in an effort to justify release exemption. Please note that there is no statutory or regulatory exemption for strategic/logistic materials (i.e., national strategic stockpile). As for the statement concerning "no indication of a systemic or wide-spread release" and "no evidence of a systematic release"— again, there is no exemption from CERCLA based on a de minimis or de micromis nature of a release. It does not matter that a release be systematic or not.

Response: The Army was not attempting to justify an exemption for the release of metals at SEAD-121I; however, phrases that may have been interpreted as such by the EPA (see page 6-48, 6-50, 7-50, and 7-52, etc.) will be removed.

The Army's identification of the ferro-manganese ore piles as strategic materials is a statement of fact; these materials have been staged at the Seneca Army Depot as part of the United States' Strategic Stockpile program. In several locations throughout the document, the Army has indicated that it believes that metal contaminants found at SEAD-121I are associated with the management of the strategic ore piles. Additionally, the Army has evaluated and enumerated the apparent risks that the presence of the identified strategic stockpiles is posing to human health and the environment at the site.

The Army's use of phrases such as "no indication of a systemic or wide-spread release" or "no evidence of a systemic release" was not intended to request an exemption. Again, as was the case of the metals identified around the strategic ore piles, contaminants identified at both sites have been evaluated and their risks enumerated in the risk assessment that has been presented in this document. The risks at both sites have been summarized.

SEAD-121I is known as the Rumored Cosmoline Disposal Area; investigations performed at this site were implemented to address concerns that Cosmoline oil or similar materials may have been released during the historic unpacking and cleanup of equipment and parts previously delivered to the Depot. Based on the data collected and evaluated at SEAD-121I as part of these investigations, there is no evidence that any significant risk results from Cosmoline oil-like substances (i.e., organic hazardous substances) at the site. Therefore, the Army believes that this site, SEAD-121I, the Rumored Cosmoline Oil Disposal Area does not pose a problem that is subject to further regulatory review under CERCLA.

The data and information collected during the investigations indicate that metals are present at the site and that the identified metals are associated with the United States' long-term management of the strategic stockpiles of ferro-manganese at this site. Metal compound residues that remain at SEAD-121I once the ore piles are removed will be addressed as part of the United States' stockpile management program. SEDA has notified personnel responsible for the removal and relocation of the ore piles that metal contamination is present; and have indicated that it currently poses a risk to human receptors.

SPECIFIC COMMENTS

Comment:

Page 6-4, first paragraph - This paragraph explains potential sources of the PAHs that were detected in the soil at SEAD-121I. Although the roofing and maintenance operations may contribute to the PAHs detected at the site, there may be other potential sources, such as runoff from the roads (e.g., asphalt, oil from vehicles, creosote from railroad ties [as mentioned on page 6-6, second paragraph]) and oil leaks from vehicles that utilize the area associated with SEAD-121I, as well as atmospheric deposition. In order to better characterize the source, it would be beneficial to provide documented evidence that the type of PAHs, as well as the ratios observed, are similar to the hypothesized source(s). In addition, comparison to background levels, again by type and ratio of PAHs, observed in soils from other areas that are not impacted by site-related PAHs would enhance this paragraph.

Response: The Army agrees that there may be other sources, such as roadway runoff, leaching from railroad ties, dripping from railroad equipment, etc. contributing to the identified PAH levels detected at SEAD-121I. The Army's purpose for mentioning roofing activities and truck traffic was to use knowledge of activities performed in the area to tag sources that are most likely to have contributed to the PAH contamination identified.

While the information identified by the EPA commenter would most probably add to the overall discussion, it is not the Army's intention to mount a research study to obtain the information. Further, and more importantly, contaminants identified at the site have been documented, and their risk potential has been enumerated.

Table 6-12B summarizes the risks determined for an Industrial Worker, a Construction Worker, and an Adolescent Trespasser in SEAD-121I. Hazardous Indices (HIs) in excess of 1 are calculated for the Industrial Worker and Construction Worker when they are exposed to either soil or ditch soil at either

Reasonable Maximum Exposure (RME) or Central Tendency (CT) concentrations. Metals contaminants, primarily manganese, are the primary cause of the elevated His reported. Cancer Risks in the range of 1 x 10^{-4} to 1 x 10^{-6} were calculated for the Industrial Worker and the Construction Worker when they are exposed to either soil or ditch soil at RME and CT concentrations. The Adolescent Trespasser also exhibited a cancer risk of 1 x 10^{-6} when exposed to RME concentrations of ditch soil. The PAHs are the principal contaminants identified in the soil/ditch soil that account for the identified levels of cancer risk, although Arsenic is also a noted contributor.

As is noted above, the elevated HIs attributable to manganese and a few other metals will be addressed as part of the United States' Strategic Stockpile management program. While PAHs have been identified in the soil and ditch soils at SEAD-121I, they are found at concentrations that do not cause risk above normally accepted industrial scenario levels. A residential land use restriction has already been proposed and implemented for the Planned Industrial / Office Development (PID) Area at the Seneca Army Depot. Based on the PAH results found at SEAD-121I, the Army will proposed to maintain the identified institutional control at the PID Area.

Comment:

Section 6.2.2 - Fate and Transport - The section identifies if contaminant levels exceed TAGM values in a variety of media. As this part of the RI is addressing the risk assessment, which uses the Region IX PRGs for screening criteria, it is more applicable to report the number of compounds that exceeded the respective screening criteria.

Response: The Army screened SEAD-121C and SEAD-121I contaminant levels in ditch soil and soil against the Region IX Residential PRGs and the contaminant levels in groundwater and surface water versus the Region IX tap water PRGs. The approach applied by the Army is consistent with the approach documented by Chuck Nace of USEPA, Region II in his memorandum, dated November 8, 2004, related to human health risk assessment at SEAD-13. Tables 6-2 and 6-3 show the maximum concentrations detected and whether that value exceeded the PRG screening value for SEAD-121C and SEAD-121I, respectively.

The Army will update and modify the discussion presented in Section 6.2.2 to provide more discussion about the number of compounds identified in each media that exceed PRG screening levels.

Comment:

Page 6-5, first paragraph - In this paragraph it is indicated that volatilzation of metals from soil is not considered a realistic mechanism for pollutant migration. While generally true, there are some metals, such as mercury, that can volatilize and migrate through the air. Suggest changing the sentence to say "For example, generally volatilization of metals from soil...." In addition, rationale is provided that indicates that leaching is a potential mechanism for metal transport, but it does not mention of the metals detected at the site were looked at from a leaching perspective (i.e., TLP analysis). Please include this information if the TLP analysis was conducted.

Response: The suggested wording will be used in the document for volatilization. Toxicity Characteristic Leaching Procedure (TCLP) analyses were not performed by the Army.

Comment:

Page 6-5, last paragraph - Please clarify the purpose and use of the earthen bottomed, storage cells that are located on SEAD-121C.

Response: The DRMO Yard (SEAD-121C) at SEDA is inactive, and has been since the Depot closed in 2000. During its active period of operation, the DRMO received and screened all property (including hazardous property) turned in by military services for reutilization and reuse. No records have been identified that detail what materials were stored for what period of time at discrete areas of the DRMO. Based on information provided by USACE personnel remaining at the SEDA, materials stored within the DRMO Yard varied as government equipment and property was identified as surplus and sent for final disposition.

The Army and Parsons provided a detailed description of the materials that were found at various areas within the DRMO Yard in Section 1.3 of the Draft Final Remedial Investigation Report. As was stated in Section 1.3:

> During site visits in 2002, 2003, and 2004, Parsons observed that scrap metal, military items, and old machines were stored in the earthen bottomed storage cell located along the northwest fence, while the ladle-shaped earthen bottomed cell was empty, except for small quantities of metal shavings.

At the time the DRMO Yard was last viewed by Parsons, the site was inactive. Parsons understands that the USACE has recently contracted to remove all remaining debris from the site.

Comment:

Page 6-9 - For several exposure pathways, the subsurface soil is identified as being 2-6 feet in depth. Typically, Region 2 uses 2-10 feet depths to assess the potential risks and hazards from exposure to subsurface soil. It appears that the water table and bedrock are approximately 6 feet in depth, which is why those depths were used. If this is the case, please clarify this in the text so that the discrepancy from the typical subsurface soil depth is documented and justified.

Response: During field activities completed as part of the ESI and the RI, the deepest soil interval sampled and analyzed was from 2 ft. to 6 ft bgs. Bedrock was generally encountered at approximately 6 ft. bgs. Therefore, references to 2-6 feet in depth are specific to SEAD-121C, and the text will be revised accordingly.

Comment:

Page 6-17, Section 6.4 - It is indicated that the maximum detected concentrations were screened against the USEPA Region IX PRGs that correspond to a hazard quotient of 1. Region 2 screens against the USEPA Region IX PRGs that correspond to a hazard quotient of 0.1.

Response: To incorporate the above procedures, the COPC screening was repeated using the residential Region IX PRGs corresponding to either a hazard quotient of 0.1 or a cancer risk of 10^{-6}. As shown in the table below, several additional COPCs (mainly metals) are identified using the requested approach.

Additional COPCs By Using 0.1 PRGs for PRGs Based on Non-Carcinogenic Effects

Medium	SEAD-121C	SEAD-121I
Soil (Surface/Total Soil)	Aluminum, Barium, Cadmium, Manganese, Nickel, Thallium Vanadium, Zinc	Aluminum, Antimony, Cadmium, Cobalt, Nickel, Selenium
Ditch Soil	Aluminum, Antimony, Cadmium, Copper, Manganese, Vanadium	Aluminum, Cobalt, Vanadium
Groundwater	Antimony, Chromium, Manganese	NA
Surface Water	Aluminum, Barium, Copper, Mercury, Nickel, Zinc	Iron, Lead, Manganese, Vanadium

The risk assessment was repeated including all COPCs identified using this screening approach and the risk results in general confirm the conclusions presented in the previous report. Detailed discussion of the revised risk results is presented in Appendix I, Attachment 1 and 2.

Comment:

Page 6-20, last paragraph - Please clarify why groundwater risks associated with SEAD-27 were included in this risk assessment. If there were no contaminants of potential concern associated with groundwater at SEAD-121C, then the assessment would be ended for groundwater at SEAD-121C. This issue is also raised on page 6-31 and 6-47.

Response:

The Steam Cleaning Waste Tank at Building 360 (SEAD-27) abuts the eastern boundary of the DRMO Yard (SEAD-121C). The groundwater at SEAD-27 subsequently flows into SEAD-121C. One of the two monitoring wells (i.e., MW-2) installed to assess the possible release of contaminants from the Steam Cleaning Waste Tank (SEAD-27) is located within the DRMO Yard, and was sampled as part of the SEAD-121C investigation.

Groundwater contamination has been identified at SEAD-27, focused in the groundwater upgradient and beneath the building. As a result of the identified contamination, a groundwater use restriction was implemented at the site, and serves as the basis of the overall groundwater use restriction that the Army has proposed and implemented for the Planned Industrial/Office Development (PID) Area as a whole.

Temporary wells located in SEAD-121C for the preliminary Environmental Baseline Survey investigations conducted in 1998 showed several of the same contaminants as were found in the SEAD-27 groundwater wells. Permanent wells installed at SEAD-121C for the remedial investigation did not show the same contaminants. Therefore, the Army chose to provide a discussion of the SEAD-27 groundwater data to provide insight into upgradient sources that may impact the DRMO Yard in the future.

Comment:

Page 6-23, third paragraph - Please provide additional details that explain why an exposure duration of 14 days was chosen for the adolescent trespasser. As the summer months, when children are not in school, would appear to be prime timing for adolescents to trespass, the exposure duration may need to be increased.

Response: USEPA guidance documents on human health risk assessments do not recommend a specific value for the exposure for an adolescent trespasser. The 14 days/year exposure frequency was selected based on best professional judgment and site-specific conditions. The Depot is situated in a sparsely populated rural area; it is fenced to limit access and is occasionally patrolled by site security personnel. The setting of SEAD-121C/121I is generally similar to the surrounding areas and there are no areas that may attract special attentions from potential adolescent trespassers. Therefore, trespassing at the sites is considered unlikely to occur frequently or for extended periods without individuals being challenged or noticed. On this basis, a 14 days/year exposure frequency is considered a reasonable assumption for the sites. Nonetheless, an elevated exposure frequency (50 days/year) was evaluated and this evaluation indicates that no unacceptable risks are expected for SEAD-121C/121I. Although elevated non-cancer risk was observed at SEAD-121C for the trespasser, the elevated hazard index is mainly caused by manganese in soil.

Comment:

Page 6-34, Section 6.5.3.7, first paragraph - It is indicated that the adult lead model is based on the assumption of continuing long term exposure and that the risk for short-term exposure was not estimated. However, as stated, the adult lead model protects the developing fetus and as the fetus is the most sensitive receptor, which is at most 10 months of age prior to birth, the short-term exposure to a construction worker should be included in the risk assessment. This is also referenced on page 6-42.

Response: The Army does not see the need to include a short-term exposure for lead to a construction worker in the risk assessment conducted for the DRMO Yard (SEAD-121C). Although a few of the surficial soil samples collected from the area exhibit elevated concentrations of lead, the overall average value for lead found in soil from the former DRMO Yard is 735 mg/Kg, which is below the Region IX Industrial PRG. Similarly, the overall site average is lower that the state of New York's recently proposed restricted commercial and restricted industrial exposure levels for lead at brownfield site (1,000 and 3,900 mg/Kg, respectively). The DRMO Yard is located in within the PID Area at the SEDA, in an area that the Army has already imposed a use restriction prohibiting the use of the land for any residential purpose.

Comment:

Page 6-46, second paragraph - The guidance that is referenced does present a revised approach for assessing carcinogenicity of mutagenic chemicals, however, the agency is still developing a plan for the implementation of the guidance as it relates to CERCLA risk assessments. The approach that was used is one option, however, it may not be the preferred option, thus please note that a different methodology may be required for future risk assessments.

Response:

Noted.

Comment:

Page 6-48, first paragraph - This describes the strategic stockpiles of ferrous-manganese ore that are staged on SEAD-121I. The legal interpretation of the stockpiles (i.e., if they are CERCLA regulated wastes or not) was stated within the General Comments section above.

Response: See the first part of the response to General Comments above.

Army's Response to Comments from the New York State Department of Environmental Conservation

Subject: Draft Final Remedial Investigation Report
SEAD-121C and SEAD-121I
Seneca Army Depot
Romulus, New York

Comments Dated: January 30, 2006

Date of Comment Response: April 27, 2006

Army's Response to Comments

SPECIFIC COMMENTS

Comment 1: Section E.1.1, Page E-2
The statement shows the presence of the elevated level of Heavy Metals in the Surface Soil – FS report will need to address it.

Response 1:

Disagree. The Army does not agree with the NYSDEC's direction that a feasibility study is needed to assess the possible remedial actions for SEADs 121C (the DRMO Yard) and 121I (the Rumored Cosmoline Oil Disposal Area). Both of these sites are located in the portion of the former Depot where the designated future land use is Planned Industrial / Office Development (PID). Due to prior decisions made and formally documented by all parties involved with the continuing closure of sites at the former Depot, institutional controls (ICs) prohibiting access to and use of groundwater, and use of the land within the PID area for residential purposes has been imposed on this area. The residential use restriction includes prohibiting the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds.

The results of the remedial investigation (RI) performed in these two areas, and discussed in the RI Report reviewed, confirm that contamination is present at locations within each of the sites. Generally, all computed industrial scenario human health risk levels are consistent with EPA's referenced ranges (HIs = 1 or less and cancer risks in range of 1E-04 to 1E-06 or less), with the exceptions of HIs computed for industrial and construction workers at SEAD-121I. The elevated HIs at SEAD-121I result primarily from manganese and are directly associated with the United States' continuing storage of strategic ferro-manganese ore piles in this area. Residues that remain once the strategic stockpiles are removed will be addressed by the authority responsible for their management.

The Army also acknowledges that chemical concentrations found at the two sites will preclude the future use of these two former solid waste management units for residential purposes without some remedial action. However, this is not considered to be an onerous restriction because the overall site is classified as an area where the most probable future land use is industrial / office development, and there are other areas in close proximity of these sites where necessary residential like (e.g., day care center, school, playground, and housing activities can be performed).

Therefore, the Army sees no reason to or benefit from preparing a feasibility study (FS) to assess potential remedial actions for either site. Its proposed path is to recommend that the area-wide groundwater use restriction remain in place in these areas, and that neither of these sites be used for residential purposes including residential housing, elementary and secondary schools, child care facilities and playgrounds. The Army reiterates that the groundwater restriction is not a punitive restriction because a distribution system is present throughout the PID area for potable water, and this system can be tapped to provide water that may be needed. The Army also does not believe that the residential use restriction is punitive, given the local redevelopment authorities decision to use this area for industrial/commercial purposes.

The CERCLA process does not mandate that a FS be completed for all sites, especially given the obvious remedial alternative option that exists for these sites. The Army proposes that the CERCLA process move forward to the preparation, review and approval of necessary proposed plans and records of decisions for these two sites, as are described above. In fact this exact path forward was used at other sites (SEAD-27, SEAD-64A, and SEAD-66) in the PID area at SEDA, and approved by the EPA with concurrence from the NYSDEC in September 2004.

Comment 2: Section E.2.1, Page E-5
The statement shows the presence of elevated level of Iron and Manganese concentrations in the soil around the areas surrounding the two ferrous-manganese ore piles. Issue will need to be addressed in FS.

Response 2:

See Response to Comment 1.

Comment 3: Section 8.2, Page 8-1
DEC does not agree with the Recommendations from Remedial Investigation that "…the army recommends that these restrictions remain in effect for SEAD-121C and SEAD-121I until additional data is developed and evaluated to substantiate their removal at either or both of the sites" without specifying a time frame. When will the restrictions be removed? Specify that it will be at the time that the strategic piles are removed from SEAD-121I? Or is it at the time the historic stockpiling activities will be addressed by the DoD through the authority responsible for management of the piles (see Section 5.2.3, Page 5-11). Please clarify this further in your recommendations.

Response 3:

The need for the continuance of the proposed ICs will be reviewed at five year intervals, consistent with the requirements of CERCLA, once the proposed plan and ROD are finalized. At this time, the Army does not anticipate collecting more data for the former DRMO Yard (SEAD-121C) because there is no industrial scenario human health risk defined, and a land use restriction is proposed for implementation in this area. Additional data will be collected in the area of the ferro-manganese ore stockpiles once the strategic reserves are used or moved. The Army currently does not have a timetable defined for removal of these piles.

Comment 4: The DEC ecological section reviewed the document and the data and agrees with the conclusions in perspective to move forward to the feasibility study. Please provide a hard copy of the draft final RI report for ecological section, to this office before we review the FS.

Response 4:

The Army does not anticipate preparing a FS for these sites, as per discussions above. A copy of the RI will be forwarded to the NYSDEC per its request.

APPENDIX I

QUANTITATIVE UNCERTAINTY ANALYSIS FOR BASELINE HUMAN HEALTH RISK ASSESSMENT SEAD-121C AND SEAD-121I

Appendix I, Attachment 1
Quantitative Uncertainty Analysis for Baseline Human Health Risk Assessment
SEAD-121C and SEAD-121I

A risk assessment was re-performed for SEAD-121C and SEAD-121I under the RME scenario with the revised COPC screening protocol to evaluate potential uncertainty to the human health risk assessment. The COPC screening presented in the RI report was conducted by comparing the maximum detected concentrations with Region 9 PRGs corresponding to a target cancer risk of $1x10^{-6}$ or a target hazard quotient of 1, whichever is lower. To incorporate procedures requested in the USEPA comment letter dated 10/31/05, the COPC screening was revised by using Region 9 PRGs corresponding to a target cancer risk of $1x10^{-6}$ or a target hazard quotient of 0.1, whichever is lower. As shown in the table below, several additional COPCs (all metals) were identified using the revised approach.

Additional COPCs By Using 0.1PRGs for PRGs Based on Non-Carcinogenic Effects

Medium	SEAD-121C	SEAD-121I
Soil (Surface/Total Soil)	Aluminum, Barium, Cadmium, Manganese, Nickel, Thallium Vanadium, Zinc	Aluminum, Antimony, Cadmium, Cobalt, Nickel, Selenium
Ditch Soil	Aluminum, Antimony, Cadmium, Copper, Manganese, Vanadium	Aluminum, Cobalt, Vanadium
Groundwater	Antimony, Chromium, Manganese	NA
Surface Water	Aluminum, Barium, Copper, Mercury, Nickel, Zinc	Iron, Lead, Manganese, Vanadium

The risk calculation sheets are presented in **Attachment 2 Table 1A** through **Table 10G** and the risk results are summarized in **Table 11A** and **Table 11B** of **Attachment 2** for SEAD-121C and SEAD-121I, respectively. This section presents a discussion of the risk results and potential impact to the human health risk assessment conclusion caused by the above revision.

1 Quantitative Uncertainty Analysis Results Summary

Section 1.1 and **Section 1.2** summarize quantitative uncertainty analysis results for SEAD-121C and SEAD-121I, respectively.

1.1 SEAD-121C Quantitative Uncertainty Analysis Results Summary

The cancer risks resulted from the revised COPC screening approach for all receptors based on the RME scenario are below the USEPA upper limit of $1x10^{-4}$. These results are summarized in **Table 11A.**

The total non-cancer hazard indices based on the RME for the industrial worker and adolescent trespasser receptors are below the USEPA target limit of 1. The non-cancer hazard index for the construction worker exposed to soil and groundwater is 9 and the non-cancer hazard index for the construction worker exposed to ditch soil, surface water, and groundwater is 3.

With respect to the construction worker exposed to soil and groundwater, the potential non-cancer risks due to the inhalation of dust caused by construction activities, soil ingestion, and groundwater intake contribute 86%, 10%, and 4%, respectively, to the total non-cancer risk. Aluminum and manganese levels found in SEAD-121C soil contribute more than 98% to the non-cancer risk associated with inhalation of dust. Aluminum, iron, and manganese in SEAD-121C soil contribute more than 45% to the non-cancer risk associated with soil ingestion. However, the aluminum, iron, and manganese concentrations found in SEAD-121C soil are consistent with the Seneca background levels, as is discussed in **Section 2**. Further, the Army has proposed institutional controls in the form of a residential activity land use restriction, and access to or use of groundwater until Class GA Groundwater Standards are met on the PID parcel (including SEAD-121C and SEAD-121I). If non-cancer contributions from background concentrations of metals in soil were not included in the total risk, and with the imposition of the groundwater use restriction, the total non-cancer risk for the construction worker exposed to soil and groundwater at SEAD-121C would be below the USEPA limit of 1.

With reference to the construction worker exposed to ditch soil, surface water, and groundwater, the non-cancer risks associated with inhalation of dust caused by construction activities, ditch soil ingestion, and groundwater intake contribute 58%, 27%, and 13%, respectively, to the total non-cancer risk. Identified concentrations of aluminum and manganese in SEAD-121C ditch soil contribute more than 99% to the non-cancer risk associated with inhalation of dust in ambient air. Further, identified concentrations of aluminum, iron, and manganese in SEAD-121C ditch soil contribute more than 61% to the non-cancer risk associated with ditch soil ingestion. However, as discussed in **Section 2**, aluminum, iron, and manganese in SEAD-121C ditch soil are consistent with the Seneca soil background levels. Further, the Army has proposed institutional controls in the form of a residential activity land use restriction, and access to or use of groundwater until Class GA Groundwater Standards are met on the PID parcel (including SEAD-121C and SEAD-121I). Again, if the non-cancer contributions from background concentrations were not included in the total risk, and with the groundwater use/access restriction in place, the total non-cancer risk for the construction worker exposed to ditch soil, surface water, and groundwater at SEAD-121C would be below the USEPA limit of 1.

1.2 SEAD-121I Quantitative Uncertainty Analysis Results Summary

The cancer risks resulted from the revised COPC screening approach for all receptors based on the RME scenario are below the USEPA upper limit of $1x10^{-4}$. These results are summarized in **Table 11B.**

The total non-cancer hazard indices based on the RME for the adolescent trespasser are below the USEPA target limit of 1. The non-cancer hazard indices for the industrial worker exposed to SEAD-121I soil and SEAD-121I ditch soil are approximately 30 and 4, respectively. The non-cancer hazard indices for the construction worker exposed to SEAD-121I soil and construction workers exposed to SEAD-121I ditch soil and surface water are approximately 200 and 30, respectively.

For the industrial worker exposed to SEAD-121I soil, the non-cancer risks associated with inhalation of dust, soil ingestion, and dermal soil contact contribute 82%, 16%, and 2%, respectively, to the total non-cancer risk. **Table 12** indicates that concentrations of manganese in SEAD-121I soil contribute almost 100% to the non-cancer risk that results from the inhalation of dust in ambient air. In addition, soil concentrations of manganese contribute approximately 95% and 97% to the non-cancer risks associated with soil ingestion and soil dermal contact, respectively.

With reference to the industrial worker exposed to ditch soil, the non-cancer risks associated with inhalation of dust, ditch soil ingestion, and dermal ditch soil contact contribute 93%, 6%, and 1%, respectively, to the total non-cancer risk. Again **Table 12** indicates that manganese in SEAD-121I ditch soil contributes approximately 98% to the non-cancer risk associated with inhalation of dust in ambient air. As discussed in Section 6.9.2 of the RI report, the levels of manganese detected at SEAD-121I are directly associated with the ferro-manganese ore piles that are present at the site, and which are also part of the United State's strategic stockpile of raw materials. When the Strategic Stockpiles are removed, residues associated with the historic stockpiling activities will be addressed by the DoD through the authority responsible for management of the piles. Therefore, manganese is not considered a COC at SEAD-121I. If manganese were not included in the risk assessment, the total non-cancer and cancer risks for the industrial worker would be below the USEPA target limits.

Similar results are found for the construction worker. For the construction worker exposed to SEAD-121I soil, the non-cancer risks associated with inhalation of dust, soil ingestion, and dermal soil contact contribute 91%, 9%, and 1%, respectively, to the total non-cancer risk. Again **Table 12** shows that manganese in SEAD-121I soil contributes almost 100% to the non-cancer risk associated with inhalation of dust in ambient air caused by construction activities. In addition, manganese in SEAD-121I soil contributes approximately 95% and 97% to the non-cancer risks associated with soil ingestion and soil dermal contact, respectively.

With reference to the construction worker exposed to ditch soil and surface water, the non-cancer risks associated with inhalation of dust, ditch soil ingestion, and dermal ditch soil contact contribute 85%, 14%, and 1%, respectively, to the total non-cancer risk. Review of **Table 12** again indicates that concentrations of manganese in SEAD-121I ditch soil contribute approximately 98%, 56%, and 59% to the non-cancer risk associated with inhalation of dust, ditch soil ingestion, and ditch soil dermal contact, respectively. The iron concentrations in SEAD-121I ditch soil contribute approximately 9% to the non-cancer risk via ditch soil ingestion. In addition, the arsenic concentrations in SEAD-121I ditch soil contribute 30% to the non-cancer risk via ditch soil ingestion. The levels of manganese and iron detected at SEAD-121I are associated with strategic materials and therefore neither manganese nor iron is considered a COC at SEAD-121I. For arsenic in ditch soil, as discussed in **Section 2** below, there is no evidence that the levels in SEAD-121I ditch soil are significantly higher than the background levels in Seneca soil. If manganese in SEAD-121I soil and ditch soil and arsenic and iron in SEAD-121I ditch soil were not included in the risk assessment, the total non-cancer and cancer risks for all receptors would be below the USEPA target limits.

2 Background Comparison

As discussed in the previous section, aluminum, iron, and manganese in SEAD-121C soil and ditch soil resulted in non-cancer risks for potential construction workers exceeding the USEPA limit of 1. Arsenic in SEAD-121I ditch soil contributed significantly to the elevated risks for potential construction workers. This section presents a comparison of the Seneca background levels with the aluminum, iron, and manganese concentrations in SEAD-121C soil and ditch soil and with the arsenic concentrations in SEAD-121I ditch soil. Information of Seneca background data is presented in Section 6.3.2 of the RI report and the data are presented in Appendix D of the report.

Summary descriptive statistics are presented in **Table 13** that compare aluminum, iron, and manganese concentrations found in SEAD-121C soil and ditch soil with Seneca soil background, and in **Table 14** that compare arsenic concentrations measured in SEAD-121I ditch soil with Seneca soil background.

Review of **Table 13** shows that the four descriptive statistics parameters (i.e., maximum, minimum, arithmetic mean, and 95% UCL) computed for aluminum and manganese in SEAD-121C soil are all below or close to the corresponding statistics computed for these parameters for Seneca background. For iron in SEAD-121C soil, the maximum concentration is above the maximum level detected in Seneca background (54,100 mg/kg vs. 38,600 mg/kg); however, the other three descriptive statistics parameters are below or close to the corresponding statistics parameters for Seneca background.

Comparably, for aluminum, iron, and manganese in SEAD-121C ditch soil, the four descriptive statistics parameters (i.e., maximum, minimum, arithmetic mean, and 95% UCL) are all below or close to the corresponding statistics parameters for Seneca background.

Results presented in **Table 14** for arsenic in SEAD-121I ditch soil show that the maximum concentration measured for arsenic in SEAD-121I ditch soil was 104 mg/kg, found at location SD121I-8, collocated with the maximum manganese concentration. The next highest level of arsenic observed in SEAD-121I ditch soil was 27.4 mg/kg, which is close to the maximum arsenic level observed in the background data set. The other three descriptive statistics parameters are elevated for arsenic in SEAD-121I ditch soil when compared with Seneca soil background. However, further statistical tests, as discussed below, do not demonstrate significant difference between the SEAD-121I ditch soil data set and the Seneca soil background data set.

In addition to the descriptive statistics comparison, both non-parametric (Mann-Whitney T test) and parametric (Student's T test) statistical test methods were used for the background comparison analysis. One-tailed (one-sided) or two-tailed (two-sided) Mann-Whitney tests and Student's T tests were conducted for the data using XLSTAT (Version 2006.2). Both tests assumed 0.05 as the significance level. The statistical test results are presented in **Table 15A** through **Table 21C**. It should be noted that although the Student's T test is based on normal distribution assumption, USEPA (2002c) recommends the use of Student's T Test if a larger number of data points are available ($n > 25$) and indicates that the parametric test will work well when the sample size is large.

The SEAD-121C soil data sets for aluminum, iron, and manganese and the Seneca background data sets for aluminum, arsenic, iron, and manganese all have more than 50 data points; therefore, the Student's T tests should perform sufficiently for the background comparison. The SEAD-121C ditch soil data sets for aluminum, iron, and manganese and the SEAD-121I ditch soil data set for arsenic have limited sample size ($n \leq 10$) and ultimately the power of the test (or chance to detect the difference between the two data sets) would be relatively low.

As shown in **Table 15A** through **Table 21C**, the results from the Student's T tests are consistent with the Mann-Whitney test results with the following exceptions.

- For manganese in SEAD-121C ditch soil, the Student's T test would reject the null hypothesis (the mean of the SEAD-121C ditch soil data is not significantly different from the mean of Seneca background) and accept the alternative hypothesis (the mean of the SEAD-121C ditch soil data is significantly smaller than the mean of Seneca background). The Man-Whitney test would accept the null hypothesis.
- For arsenic in SEAD-121I ditch soil, the Student's T test would accept the null hypothesis (the mean of the SEAD-121I ditch soil data is not significantly different from the mean of

> Seneca background) while the Man-Whitney test would reject the null hypothesis and accept the alternative hypothesis (the mean of the SEAD-121I ditch soil data is significantly different from the mean of Seneca background) for arsenic. However, when the alternative hypothesis was revised to reflect that the mean of the SEAD-121I ditch soil data is significantly greater than the mean of Seneca background, the Man-Whitney test accepts the null hypothesis (the mean of the SEAD-121I ditch soil data is not significantly different from the mean of Seneca background).

In summary, although the two tests provide contradictory conclusions for the hypothesis tests, for both cases, the two tests indicate the same conclusion that the site data are not statistically above Seneca background. In brief, both the Student's T test and the Mann-Whitney test conclude that

- Aluminum, iron, and manganese in SEAD-121C soil is consistent with or below Seneca soil background,
- Aluminum, iron, and manganese in SEAD-121C ditch soil is consistent with or below Seneca soil background, and
- Arsenic levels in SEAD-121I ditch soil are not statistically above Seneca soil background.

3 Adolescent Trespasser Exposure Frequency Uncertainty Analysis

Table 9A through **Table 10G** present the risk calculation for an adolescent trespasser (ages 11-16 yr) with exposure to contaminants in SEAD-121C and SEAD-121I impacted mediums for an exposure frequency of 14 days/year. The 14 days/year exposure frequency was selected based on best professional judgment and knowledge of site-specific conditions. The Depot is situated in a sparsely populated rural area; it is fenced to limit access and is occasionally patrolled by site security personnel. SEAD-121C and SEAD-121I are both located in close proximity to the Army's current office locations, and both are typified as relatively open and generally flat. Further, the setting of SEAD-121C/121I is generally similar to the surrounding areas and there are no specific features (e.g., vehicles, buildings, towers, culverts, etc.) that would attract special attention from potential adolescent trespassers. Therefore, trespassing at SEAD-121C/121I is considered unlikely to occur frequently or for extended periods without individuals being challenged or noticed. On this basis, a 14 days/year exposure frequency is considered a reasonable assumption for the sites. Nonetheless, an elevated exposure frequency, 50 days/year (equivalent to two days a week for 25 weeks or approximately half a year), was evaluated for the uncertainty analysis.

The risks (including total cancer risk and non-cancer hazard index) are in linear relationship with the exposure frequency for the adolescent trespasser (as illustrated in the generic intake equation presented in Section 6.5.3 of the RI report, along with the risk characterization equation presented in Section 6.7 of the RI report; specific equations for each exposure pathway are also presented in the risk calculation sheets presented in Appendix G of the RI report). Therefore, the risks for the adolescent receptor with an exposure frequency of 50 days/year can be easily inferred from the risks associated with 14 days/year exposure frequency (as presented in **Tables 9A** through **10G**) and are summarized in **Table 22**.

As shown in **Table 22**, the total cancer risks and non-cancer risks for the adolescent trespasser with an exposure frequency of 50 days/year at SEAD-121C are below the USEPA limits (1E-4 for cancer risk and 1 for hazard index).

The total cancer risk and non-cancer risk for the adolescent trespasser exposed to COPCs in SEAD-121I ditch soil and surface water with an exposure frequency of 50 days/year are below the USEPA limits (**Table 22**).

The total cancer risk for the adolescent trespasser exposed to COPCs in SEAD-121I soil with an exposure frequency of 50 days/year is below the USEPA limit. The hazard index for the adolescent trespasser exposed to COPCs in SEAD-121I soil with an exposure frequency of 50 days/year is slightly above the USEPA limit (2 vs. 1). The elevated hazard index is mainly caused by manganese in SEAD-121I soil, which contributes 100%, 95%, and 97% respectively to the ambient air inhalation, soil ingestion, and soil dermal contract exposure pathways. As discussed in **Section 1**, the levels of manganese detected at SEAD-121I are associated with strategic materials and therefore manganese is not considered a COC at SEAD-121I. If manganese in SEAD-121I soil were not included in the risk assessment, the total non-cancer and cancer risks for the adolescent trespasser with an exposure frequency of 50 days/year would be below the USEPA target limits.

In summary, the 14 days/year exposure frequency used for this risk assessment was a reasonable and conservative assumption based on the site-specific conditions and uses. However, even if an elevated exposure frequency (50 days/year) were applied, there would be no unacceptable risks to the adolescent trespasser at SEAD-121C or SEAD-121I once the strategic materials at SEAD-121I are removed and their associated residues are addressed.

4 Quantitative Uncertainty Analysis Conclusion

The risk assessment was repeated with the following revised approach/assumptions to evaluate potential uncertainty of the analysis.

- The COPC screening was conducted by comparing the maximum detected concentrations with Region 9 PRGs corresponding to a target cancer risk of $1x10^{-6}$ or a target hazard quotient of 0.1, whichever is lower; and
- Risk assessment was repeated for an elevated exposure frequency of 50 days/year for the adolescent trespasser (ages 11-16 yr).

In summary, the above approach or assumption revisions are not expected to impact the overall risk assessment conclusions at the sites. Although elevated non-cancer risks were identified for construction workers exposed to COPCs in the impacted mediums at SEAD-121C, the risks were caused by background metal levels at the site and groundwater intake. Elevated non-cancer risks were identified for industrial workers, construction workers, and adolescent trespassers with elevated exposure frequency (i.e., 50 days/year) who may potentially be exposed to COPCs in the impacted mediums at SEAD-121I, the risks were caused by manganese and iron associated with the ore piles and background metal levels at the site. Once the strategic materials at SEAD-121I and their associated residues are removed by the DoD, and with the recommended institutional control (i.e., restriction of groundwater use and access and prohibition of residential housing, school, childcare facility and playground development) in place for the sites, the sites would not pose unacceptable risks to human health.

Attachment 2
Uncertainty Analysis Risk Calculation Tables

Attachment 2
Uncertainty Analysis Risk Calculation Tables (Continued)

Attachment 2

Table 1A

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SOIL

SEAD-121C

Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
Volatile Organic Compounds														
67-64-1	Acetone	0.0032	J	0.028	J	SB121C-4	22 / 67	0.0022 - 0.03	0.028		1,400	0.2	NO	BSL
71-43-2	Benzene	0.002	J	1.8	J	SBDRMO-9	3 / 68	0.0022 - 0.012	1.8		0.64	0.06	YES	ASL
75-15-0	Carbon disulfide	0.0022	J	0.0047		SBDRMO-9	2 / 68	0.0022 - 0.012	0.0047		36	2.7	NO	BSL
67-66-3	Chloroform	0.002	J	0.0048	J	SB121C-4 (dup)	4 / 68	0.0022 - 0.012	0.0048		0.22	0.3	NO	BSL
100-41-4	Ethyl benzene	0.001005	J	24	J	SBDRMO-9	3 / 68	0.0022 - 0.012	24		400	5.5	NO	BSL
SA0078	Meta/Para Xylene	0.002	J	130	J	SBDRMO-9	4 / 56	0.0022 - 0.0033	130		27		NO	BSL
78-93-3	Methyl ethyl ketone	0.0032		0.0076	J	SBDRMO-14	2 / 68	0.0022 - 0.012	0.0076		2,200	0.3	NO	BSL
75-09-2	Methylene chloride	0.0026	J	0.0035		SBDRMO-24	3 / 68	0.00084 - 0.012	0.0035		9.1	0.1	NO	BSL
95-47-6	Ortho Xylene	0.016		0.075		SBDRMO-9	2 / 56	0.0022 - 0.0033	0.075		27		NO	BSL
100-42-5	Styrene	0.0027	J	0.0027	J	SBDRMO-9	1 / 68	0.0022 - 0.012	0.0027		1,700		NO	BSL
108-88-3	Toluene	0.002	J	0.084		SBDRMO-9	13 / 68	0.0022 - 0.005	0.084		520	1.5	NO	BSL
Semivolatile Organic Compounds														
121-14-2	2,4-Dinitrotoluene	0.045	J	0.045	J	SB121C-2	1 / 68	0.069 - 1.8	0.045		12		NO	BSL
91-57-6	2-Methylnaphthalene	0.0055	J	2.5	J	SBDRMO-12	13 / 68	0.069 - 1.8	2.5		31	36.4	NO	BSL
83-32-9	Acenaphthene	0.0065	J	2.6		SSDRMO-12	14 / 68	0.0715 - 1.8	2.6		370	50	NO	BSL
208-96-8	Acenaphthylene	0.042	J	2.5		SBDRMO-24	12 / 68	0.069 - 1.8	2.5			41	NO	NSV
120-12-7	Anthracene	0.0065	J	7.1		SSDRMO-12	23 / 68	0.0715 - 1.8	7.1		2,200	50	NO	BSL
56-55-3	Benzo(a)anthracene	0.0046	J	10	J	SSDRMO-12	33 / 67	0.072 - 1.8	10		0.62	0.224	YES	ASL
50-32-8	Benzo(a)pyrene	0.006	J	8.7	J	SSDRMO-12	30 / 66	0.0715 - 0.43	8.7		0.062	0.061	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.0058	J	12	J	SSDRMO-12	38 / 66	0.072 - 0.43	12		0.62	1.1	YES	ASL
191-24-2	Benzo(ghi)perylene	0.0062	J	3.2	J	SSDRMO-7 (dup)	32 / 66	0.0715 - 0.43	3.2			50	NO	NSV
207-08-9	Benzo(k)fluoranthene	0.0057	J	7.5	J	SSDRMO-12	28 / 66	0.0715 - 0.43	7.5		6.2	1.1	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.0072	J	0.2		SS121C-3	35 / 68	0.073 - 1.8	0.2		35	50	NO	BSL
85-68-7	Butylbenzylphthalate	0.0064	J	0.12	J	SSDRMO-14	8 / 68	0.0715 - 1.8	0.12		1,200	50	NO	BSL
86-74-8	Carbazole	0.014	J	4.2		SSDRMO-12	20 / 68	0.0715 - 1.8	4.2		24		NO	BSL
218-01-9	Chrysene	0.0055	J	9.1	J	SSDRMO-12	32 / 67	0.072 - 1.8	9.1		62	0.4	YES	CSG
53-70-3	Dibenz(a,h)anthracene	0.0076	J	0.47	J	SSDRMO-7 (dup)	15 / 66	0.0715 - 0.43	0.47		0.062	0.014	YES	ASL
132-64-9	Dibenzofuran	0.008	J	1.7		SSDRMO-12	13 / 68	0.069 - 1.8	1.7		15	6.2	NO	BSL
84-66-2	Diethylphthalate	0.0047	J	0.25	J	SBDRMO-24	11 / 68	0.073 - 1.8	0.25		4,900	7.1	NO	BSL
84-74-2	Di-n-butylphthalate	0.0053	J	0.13	J	SSDRMO-7 (dup)	7 / 68	0.069 - 1.8	0.13		610	8.1	NO	BSL
117-84-0	Di-n-octylphthalate	0.0038	J	0.023	J	SB121C-1 (dup)	5 / 68	0.0715 - 1.8	0.023		240	50	NO	BSL
206-44-0	Fluoranthene	0.0048	J	27		SSDRMO-12	43 / 68	0.072 - 1.8	27		230	50	NO	BSL
86-73-7	Fluorene	0.005	J	3.5		SSDRMO-12	17 / 68	0.0715 - 1.8	3.5		270	50	NO	BSL
118-74-1	Hexachlorobenzene	0.0085	J	0.0085	J	SB121C-2	1 / 68	0.069 - 1.8	0.0085		0.3	0.41	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.0059	J	0.97	J	SSDRMO-7 (dup)	28 / 68	0.0715 - 1.8	0.97		0.62	3.2	YES	ASL
91-20-3	Naphthalene	0.004	J	1.9	J	SBDRMO-12	13 / 68	0.0715 - 1.8	1.9		5.6	13	NO	BSL

Attachment 2
Table 1A
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SOIL
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
86-30-6	N-Nitrosodiphenylamine	0.0048	J	0.0048	J	SB121C-2	1 / 68	0.069 - 1.8	0.0048		99		NO	BSL
85-01-8	Phenanthrene	0.0059	J	29		SSDRMO-12	33 / 68	0.072 - 1.8	29			50	NO	NSV
129-00-0	Pyrene	0.0047	J	34	J	SSDRMO-12	40 / 68	0.072 - 1.8	34		230	50	NO	BSL
PCBs														
53469-21-9	Aroclor-1242	0.058	J	0.058	J	SS121C-4	1 / 68	0.0024 - 0.038	0.058		0.22		YES	CSG
11097-69-1	Aroclor-1254	0.044	J	0.93		SBDRMO-18	9 / 68	0.011 - 0.038	0.93		0.22	10	YES	ASL
11096-82-5	Aroclor-1260	0.009	J	0.20		SB121C-2	8 / 68	0.0021 - 0.038	0.20		0.22	10	YES	CSG
Pesticides														
72-54-8	4,4'-DDD	0.0019	J	0.044	J	SBDRMO-18	5 / 59	0.00022 - 0.0039	0.044		2.4	2.9	NO	BSL
72-55-9	4,4'-DDE	0.0025	J	0.069	J	SS121C-3	18 / 67	0.00022 - 0.0038	0.069		1.7	2.1	NO	BSL
50-29-3	4,4'-DDT	0.0021	J	0.1	J	SS121C-3	16 / 67	0.00022 - 0.0038	0.10		1.7	2.1	NO	BSL
309-00-2	Aldrin	0.0045		0.014	J	SBDRMO-16 (dup)	4 / 68	0.00011 - 0.0022	0.014		0.029	0.041	NO	BSL
5103-71-9	Alpha-Chlordane	0.001	J	0.063	J	SBDRMO-16 (dup)	4 / 68	0.00032 - 0.0022	0.063		1.6		NO	BSL
319-86-8	Delta-BHC	0.000975	J	0.002	J	SS121C-4	4 / 68	0.00022 - 0.0022	0.002		0.09	0.3	NO	BSL
60-57-1	Dieldrin	0.039	J	0.041	J	SBDRMO-16 (dup)	2 / 67	0.00011 - 0.0038	0.041		0.030	0.044	YES	ASL
959-98-8	Endosulfan I	0.0058		0.19	J	SSDRMO-7 (dup)	19 / 68	0.00054 - 0.0022	0.19		37	0.9	NO	BSL
33213-65-9	Endosulfan II	0.009		0.009		SBDRMO-24	1 / 67	0.00034 - 0.0038	0.009		37	0.9	NO	BSL
72-20-8	Endrin	0.022	J	0.023	J	SBDRMO-16	2 / 67	0.00086 - 0.0038	0.023		1.8	0.1	NO	BSL
53494-70-5	Endrin ketone	0.0034	NJ	0.0097	NJ	SBDRMO-16	4 / 68	0.00011 - 0.0038	0.0097		1.8		NO	BSL
5103-74-2	Gamma-Chlordane	0.0012	J	0.0012	J	SS121C-4	1 / 68	0.00032 - 0.0022	0.0012		1.6	0.54	NO	BSL
76-44-8	Heptachlor	0.0021	J	0.014	J	SBDRMO-18	2 / 67	0.0011 - 0.0022	0.014		0.11	0.1	NO	BSL
1024-57-3	Heptachlor epoxide	0.0011	J	0.0028	J	SS121C-3	3 / 65	0.00032 - 0.0022	0.0028		0.053	0.02	NO	BSL
Inorganics														
7429-90-5	Aluminum	1,730		17,600		SBDRMO-13	68 / 68		17,600	20,500	7,600	19,300	YES	ASL
7440-36-0	Antimony	0.32	J	236		SSDRMO-24	43 / 68	0.26 - 1.2	236	6.55	3.1	5.9	YES	ASL
7440-38-2	Arsenic	2.4	J	11.6		SSDRMO-24	68 / 68		11.6	21.5	0.39	8.2	YES	ASL
7440-39-3	Barium	18.1		2,030	J	SSDRMO-24	68 / 68		2,030	159	540	300	YES	ASL
7440-41-7	Beryllium	0.21		1.2		SBDRMO-8	68 / 68		1.2	1.4	15	1.1	NO	BSL
7440-43-9	Cadmium	0.06	J	29.1		SSDRMO-14	31 / 68	0.06 - 0.16	29.1	2.9	3.7	2.3	YES	ASL
7440-70-2	Calcium	2,100	J	296,000		SS121C-4	68 / 68		296,000	293,000	2,500,000	121,000	NO	NUT
7440-47-3	Chromium	3.8		74.8		SBDRMO-18	68 / 68		74.8	32.7	210	29.6	NO	BSL
7440-48-4	Cobalt	3.5		19.7		SB121C-4	55 / 55		19.7	29.1	90	30	NO	BSL
7440-50-8	Copper	8.8	J	9,750		SB121C-2	68 / 68		9,750	62.8	310	33	YES	ASL
7439-89-6	Iron	4,230		54,100		SB121C-2	68 / 68		54,100	38,600	2,300	36,500	YES	ASL
7439-92-1	Lead	6.2	J	18,900		SSDRMO-24	68 / 68		18,900	266	400	24.8	YES	ASL
7439-95-4	Magnesium	3,610		24,900	J	SBDRMO-23	68 / 68		24,900	29,100	400,000	21,500	NO	NUT
7439-96-5	Manganese	213		858		SSDRMO-11	68 / 68		858	2,380	180	1,060	YES	ASL
7439-97-6	Mercury	0.01		0.47		SBDRMO-18	62 / 67	0.04 - 0.06	0.47	0.13	2.3	0.1	NO	BSL
7440-02-0	Nickel	11.6		224		SS121C-2	68 / 68		224	62.3	160	49	YES	ASL
7440-09-7	Potassium	787	J	1,990		SB121C-2	68 / 68		1,990	3,160	5,000,000	2,380	NO	NUT

Attachment 2

Table 1A

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SOIL

SEAD-121C

Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration 1 (mg/kg)	Q	Maximum Detected Concentration 1 (mg/kg)	Q	Location of Maximum Concentration 1	Detection Frequency 1	Range of Reporting Limits 1 (mg/kg)	Concentration Used for Screening 2 (mg/kg)	Maximum Background Value 3 (mg/kg)	Screening Value 4 (mg/kg)	Potential ARAR / TBC Value 5 (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
7782-49-2	Selenium	0.49	J	1.3		SSDRMO-14	10 / 68	0.36 - 1.1	1.3	1.7	39	2	NO	BSL
7440-22-4	Silver	0.34		21.8		SS121C-1	20 / 68	0.28 - 0.49	21.8	0.87	39	0.75	NO	BSL
7440-23-5	Sodium	58.2		478		SSDRMO-14	56 / 68	106 - 141	478	269	1,125,000	172	NO	NUT
7440-28-0	Thallium	0.5	J	1.8	J	SBDRMO-24	12 / 68	0.32 - 1.5	1.8	1.2	0.52	0.7	YES	ASL
7440-62-2	Vanadium	5.1		27	J	SBDRMO-13	68 / 68		27	32.7	7.8	150	YES	ASL
7440-66-6	Zinc	29.8		3,610		SBDRMO-15	68 / 68		3,610	126	2,300	110	YES	ASL
Other Analytes														
SA0019	Total Organic Carbon	2800		9,500		SBDRMO-7	56 / 56						NO	NSV
SA0020	Total Petroleum Hydrocarbons	43	J	7,600	J	SBDRMO-17	14 / 56	42.5 - 53					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation.
   (dup) indicates that the maximum concentration was detected in a duplicate pair. The maximum concentration reported is the average value
   of the sample and its duplicate. Lab duplicates were not included in the assessment. Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. Background value is the maximum detected concentration of the Seneca background dataset.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil. On-line resources available at
   http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Direct contact exposure (ingestion, dermal contact, and inhalation) is evaluated to derive the PRGs.
   PRG for xylenes was used as screening value for meta/para xylenes and ortho xylene.
   EPA Region III Risk Based Concentration (RBC) for residential soil was used as screening value for 2-methylnaphthalene
   as no Region 9 PRG is available. EPA Region III RBC, available on-line at http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1004.XLS,
   was calculated based on soil ingestion exposure and a target cancer risk of 1E-6 and a target hazard quotient of 1.
   The PRGs or RBCs corresponding to a hazard quotient of 1 were adjusted by multiplying 0.1 before they were used as screening values.
   PRG for Aroclor 1254 was used as screening value for Aroclor 1260.
   PRG for gamma-chlordane was used as screening value for alpha-chlordane.
   PRG for alpha-BHC was used as screening value for delta-BHC.
   PRG for endosulfan was used as screening value for endosulfan I and endosulfan II.
   PRG for endrin was used as screening value for endrin ketone.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 200 mg/day soil ingestion
   and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and
   minimum requirements for 1 yr children (225 mg/day and 1000 mg/day for sodium and potassium)
   from Marilyn Wright (2001) Dietary Reference Intakes.
   PRG for total chromium (1:6 ratio Cr VI: Cr III) was used as screening value for chromium.
   PRG for nickel (soluble salts) was used as screening value for nickel.
5. Potential TBC values are from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. No ARARs were identified.
   (on-line resources available at http://www.dec.state.ny.us/website/der/tagms/prtg4046.html)
6. Rationale codes

6. Rationale codes	Selection Reason:	Above Screening Levels (ASL)
		Chemicals in the Same Group were retained as COPC (CSG)
	Deletion Reason:	Essential Nutrient (NUT)
		Below Screening Level (BSL)
		No Screening Value or Toxicity Value (NSV)
		Individual Chemicals Evaluated (ICE)
Definitions:	COPC = Chemical of Potential Concern	
	ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered	
	Q = Qualifier	
	J = Estimated Value	
	NJ = Presence of the analyte has been "tentatively identified" and the associated numerical value represents its approximate concentration.	

Attachment 2
Table 1B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SURFACE SOIL
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
Volatile Organic Compounds														
67-64-1	Acetone	0.0032	J	0.013	J	SBDRMO-19	13 / 47	0.0025 - 0.021	0.013		1,400	0.2	NO	BSL
71-43-2	Benzene	0.041		0.041		SBDRMO-9	1 / 48	0.0025 - 0.012	0.041		0.64	0.06	NO	BSL
75-15-0	Carbon disulfide	0.0022	J	0.0047		SBDRMO-9	2 / 48	0.0025 - 0.012	0.0047		36	2.7	NO	BSL
67-66-3	Chloroform	0.004	J	0.0048	J	SB121C-4 (dup)	2 / 48	0.0025 - 0.012	0.0048		0.22	0.3	NO	BSL
100-41-4	Ethyl benzene	0.00101	J	3.3	J	SBDRMO-9	2 / 48	0.0025 - 0.012	3.3		400	5.5	NO	BSL
SA0078	Meta/Para Xylene	0.002	J	4.4	J	SBDRMO-9	3 / 40	0.0025 - 0.0033	4.4		27		NO	BSL
75-09-2	Methylene chloride	0.0026	J	0.0026	J	SSDRMO-21	1 / 48	0.00084 - 0.012	0.0026		9.1	0.1	NO	BSL
95-47-6	Ortho Xylene	0.016		0.016		SBDRMO-9	1 / 40	0.0025 - 0.0033	0.016		27		NO	BSL
108-88-3	Toluene	0.002	J	0.028	J	SS121C-2	9 / 48	0.0025 - 0.0033	0.028		520	1.5	NO	BSL
Semivolatile Organic Compounds														
121-14-2	2,4-Dinitrotoluene	0.045	J	0.045	J	SB121C-2	1 / 48	0.069 - 1.8	0.05		12		NO	BSL
91-57-6	2-Methylnaphthalene	0.0055	J	0.61		SSDRMO-12	9 / 48	0.069 - 1.8	0.61		31	36.4	NO	BSL
83-32-9	Acenaphthene	0.0065	J	2.6		SSDRMO-12	11 / 48	0.0715 - 1.8	2.6		370	50	NO	BSL
208-96-8	Acenaphthylene	0.042	J	2.5		SBDRMO-24	10 / 48	0.069 - 1.8	2.5			41	NO	NSV
120-12-7	Anthracene	0.0065	J	7.1		SSDRMO-12	20 / 48	0.0715 - 1.8	7.1		2,200	50	NO	BSL
56-55-3	Benzo(a)anthracene	0.00545	J	10	J	SSDRMO-12	26 / 47	0.072 - 1.8	10		0.62	0.224	YES	ASL
50-32-8	Benzo(a)pyrene	0.0081	J	8.7	J	SSDRMO-12	24 / 47	0.0715 - 0.43	8.7		0.062	0.061	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.013	J	12	J	SSDRMO-12	30 / 47	0.072 - 0.43	12		0.62	1.1	YES	ASL
191-24-2	Benzo(ghi)perylene	0.011	J	3.2	J	SSDRMO-7 (dup)	25 / 47	0.0715 - 0.43	3.2			50	NO	NSV
207-08-9	Benzo(k)fluoranthene	0.007	J	7.5	J	SSDRMO-12	22 / 47	0.0715 - 0.43	7.5		6.2	1.1	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.0072	J	0.2		SS121C-3	27 / 48	0.073 - 1.8	0.2		35	50	NO	BSL
85-68-7	Butylbenzylphthalate	0.0078	J	0.12	J	SSDRMO-14	6 / 48	0.0715 - 1.8	0.12		1,200	50	NO	BSL
86-74-8	Carbazole	0.014	J	4.2		SSDRMO-12	17 / 48	0.0715 - 1.8	4.2		24		NO	BSL
218-01-9	Chrysene	0.0104	J	9.1	J	SSDRMO-12	25 / 47	0.072 - 1.8	9.1		62	0.4	YES	CSG
53-70-3	Dibenz(a,h)anthracene	0.0076	J	0.47	J	SSDRMO-7 (dup)	12 / 47	0.0715 - 0.43	0.47		0.062	0.014	YES	ASL
132-64-9	Dibenzofuran	0.019	J	1.7		SSDRMO-12	10 / 48	0.069 - 1.8	1.7		15	6.2	NO	BSL
84-66-2	Diethylphthalate	0.0085	J	0.021	J	SB121C-1 (dup)	6 / 48	0.073 - 1.8	0.021		4,900	7.1	NO	BSL
84-74-2	Di-n-butylphthalate	0.0082	J	0.132	J	SSDRMO-7 (dup)	5 / 48	0.069 - 1.8	0.132		610	8.1	NO	BSL
117-84-0	Di-n-octylphthalate	0.0038	J	0.0232	J	SB121C-1 (dup)	2 / 48	0.0715 - 1.8	0.0232		240	50	NO	BSL
206-44-0	Fluoranthene	0.0087	J	27		SSDRMO-12	35 / 48	0.072 - 1.8	27		230	50	NO	BSL
86-73-7	Fluorene	0.005	J	3.5		SSDRMO-12	13 / 48	0.0715 - 1.8	3.5		270	50	NO	BSL
118-74-1	Hexachlorobenzene	0.0085	J	0.0085	J	SB121C-1 (dup)	1 / 48	0.069 - 1.8	0.0085		0.3	0.41	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.0086	J	0.97	J	SSDRMO-7 (dup)	22 / 48	0.0715 - 1.8	0.97		0.62	3.2	YES	ASL
91-20-3	Naphthalene	0.004	J	0.4		SSDRMO-12	9 / 48	0.0715 - 1.8	0.4		5.6	13	NO	BSL
86-30-6	N-Nitrosodiphenylamine	0.0048	J	0.0048	J	SB121C-2	1 / 48	0.069 - 1.8	0.0048		99	13	NO	BSL

Attachment 2
Table 1B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SURFACE SOIL
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration 1 (mg/kg)	Q	Maximum Detected Concentration 1 (mg/kg)	Q	Location of Maximum Concentration 1	Detection Frequency 1	Range of Reporting Limits 1 (mg/kg)	Concentration Used for Screening 2 (mg/kg)	Maximum Background Value 3 (mg/kg)	Screening Value 4 (mg/kg)	Potential ARAR / TBC Value 5 (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
85-01-8	Phenanthrene	0.0082	J	29		SSDRMO-12	25 / 48	0.072 - 1.8	29			50	NO	NSV
129-00-0	Pyrene	0.01115	J	34	J	SSDRMO-12	32 / 48	0.072 - 1.8	34		230	50	NO	BSL
PCBs														
53469-21-9	Aroclor-1242	0.058	J	0.058	J	SS121C-4	1 / 48	0.0024 - 0.038	0.058		0.22		YES	CSG
11097-69-1	Aroclor-1254	0.044	J	0.93		SBDRMO-18	9 / 48	0.011 - 0.038	0.93		0.22	10	YES	ASL
11096-82-5	Aroclor-1260	0.009	J	0.085	J	SS121C-3	5 / 48	0.0021 - 0.037	0.085		0.22	10	YES	CSG
Pesticides														
72-54-8	4,4'-DDD	0.0019	J	0.044	J	SBDRMO-18	5 / 43	0.00022 - 0.0039	0.044		2.4	2.9	NO	BSL
72-55-9	4,4'-DDE	0.00415		0.069	J	SS121C-3	15 / 47	0.00022 - 0.0036	0.069		1.7	2.1	NO	BSL
50-29-3	4,4'-DDT	0.0021	J	0.1	J	SS121C-3	13 / 47	0.00022 - 0.0036	0.1		1.7	2.1	NO	BSL
309-00-2	Aldrin	0.0045		0.014	J	SBDRMO-16 (dup)	3 / 48	0.00011 - 0.0022	0.014		0.029	0.041	NO	BSL
5103-71-9	Alpha-Chlordane	0.001	J	0.063	J	SBDRMO-16 (dup)	4 / 48	0.00032 - 0.0022	0.063		1.6		NO	BSL
319-86-8	Delta-BHC	0.000975	J	0.002	J	SS121C-4	3 / 48	0.00022 - 0.0022	0.002		0.09	0.3	NO	BSL
60-57-1	Dieldrin	0.039	J	0.041	J	SBDRMO-16 (dup)	2 / 48	0.00011 - 0.0038	0.041		0.030	0.044	YES	ASL
959-98-8	Endosulfan I	0.0058		0.19	J	SSDRMO-7 (dup)	18 / 48	0.00054 - 0.0022	0.19		37	0.9	NO	BSL
33213-65-9	Endosulfan II	0.009		0.009		SBDRMO-24	1 / 47	0.00034 - 0.0038	0.009		37	0.9	NO	BSL
72-20-8	Endrin	0.022	J	0.0215	J	SBDRMO-16 (dup)	1 / 47	0.00086 - 0.0038	0.0215		1.8	0.1	NO	BSL
53494-70-5	Endrin ketone	0.0034	NJ	0.0075	J	SBDRMO-16 (dup)	3 / 48	0.00011 - 0.0038	0.0075		1.8		NO	BSL
5103-74-2	Gamma-Chlordane	0.0012	J	0.0012	J	SS121C-4	1 / 48	0.00032 - 0.0022	0.0012		1.6	0.54	NO	BSL
76-44-8	Heptachlor	0.0021	J	0.014	J	SBDRMO-18	2 / 47	0.0011 - 0.0022	0.014		0.11	0.1	NO	BSL
1024-57-3	Heptachlor epoxide	0.0014	J	0.0028	J	SS121C-3	2 / 46	0.00032 - 0.0022	0.0028		0.053	0.02	NO	BSL
Inorganics														
7429-90-5	Aluminum	1,730		17,000		SBDRMO-13	48 / 48		17,000	20,500	7,600	19,300	YES	ASL
7440-36-0	Antimony	0.32	J	236		SSDRMO-24	39 / 48	1 - 1.2	236	6.55	3.1	5.9	YES	ASL
7440-38-2	Arsenic	3.4		11.6		SSDRMO-24	48 / 48		11.6	21.5	0.39	8.2	YES	ASL
7440-39-3	Barium	18.1		2,030	J	SSDRMO-24	48 / 48		2,030	159	540	300	YES	ASL
7440-41-7	Beryllium	0.21		1.2		SBDRMO-8	48 / 48		1.2	1.4	15	1.1	NO	BSL
7440-43-9	Cadmium	0.13	J	29.1		SSDRMO-14	29 / 48	0.06 - 0.16	29.1	2.9	3.7	2.3	YES	ASL
7440-70-2	Calcium	2,100	J	296,000		SS121C-4	48 / 48		296,000	293,000	2,500,000	121,000	NO	NUT
7440-47-3	Chromium	3.8		74.8		SBDRMO-18	48 / 48		74.8	32.7	210	29.6	NO	BSL
7440-48-4	Cobalt	3.5		17		SBDRMO-8	35 / 35		17	29.1	90	30	NO	BSL
7440-50-8	Copper	8.8	J	9,750		SB121C-2	48 / 48		9,750	62.8	310	33	YES	ASL
7439-89-6	Iron	4,230		51,700		SB121C-18	48 / 48		51,700	38,600	2,300	36,500	YES	ASL
7439-92-1	Lead	7.3		18,900		SSDRMO-24	48 / 48		18,900	266	400	24.8	YES	ASL
7439-95-4	Magnesium	3,610		20,700		SSDRMO-5	48 / 48		20,700	29,100	400,000	21,500	NO	NUT
7439-96-5	Manganese	213		858		SSDRMO-11	48 / 48		858	2,380	180	1,060	YES	ASL
7439-97-6	Mercury	0.03		0.47		SBDRMO-18	44 / 48	0.04 - 0.055	0.47	0.13	2.3	0.1	NO	BSL
7440-02-0	Nickel	11.6		224		SS121C-2	48 / 48		224	62.3	160	49	YES	ASL

Attachment 2
Table 1B
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SURFACE SOIL
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration ^{1} (mg/kg)	Q	Maximum Detected Concentration ^{1} (mg/kg)	Q	Location of Maximum Concentration ^{1}	Detection Frequency ^{1}	Range of Reporting Limits ^{1} (mg/kg)	Concentration Used for Screening ^{2} (mg/kg)	Maximum Background Value ^{3} (mg/kg)	Screening Value ^{4} (mg/kg)	Potential ARAR / TBC Value ^{5} (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
7440-09-7	Potassium	787	J	1,990		SB121C-2	48 / 48		1,990	3,160	5,000,000	2,380	NO	NUT
7782-49-2	Selenium	0.49	J	1.3		SSDRMO-14	10 / 48	0.36 - 1.01	1.3	1.7	39	2	NO	BSL
7440-22-4	Silver	0.34		21.8		SS121C-1	18 / 48	0.28 - 0.46	21.8	0.87	39	0.75	NO	BSL
7440-23-5	Sodium	58.2		478		SSDRMO-14	42 / 48	106 - 132	478	269	1,125,000	172	NO	NUT
7440-28-0	Thallium	0.5	J	1.1	J	SBDRMO-24	10 / 48	0.32 - 1.4	1.1	1.2	0.52	0.7	YES	ASL
7440-62-2	Vanadium	5.1		25.4		SBDRMO-8	48 / 48		25.4	32.7	7.8	150	YES	ASL
7440-66-6	Zinc	29.8		3,610		SBDRMO-15	48 / 48		3,610	126	2,300	110	YES	ASL
Other Analytes														
SA0019	Total Organic Carbon	2,800		9,000		SBDRMO-13	40 / 40						NO	NSV
SA0020	Total Petroleum Hydrocarbons	59		7,600	J	SBDRMO-17	10 / 40	42.5 - 53					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment. (dup) indicates that the maximum concentration was detected in a duplicate pair. The maximum concentration reported is the average value of the sample and its duplicate. Range of reporting limits were presented for nondetects only.

4. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil. On-line resources available at http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Direct contact exposure (ingestion, dermal contact, and inhalation) is evaluated to derive the PRGs.
PRG for xylenes was used as screening value for meta/para xylenes and ortho xylene.
EPA Region III Risk Based Concentration (RBC) for residential soil was used as screening value for 2-methylnaphthalene as no Region 9 PRG is available. EPA Region III RBC, available on-line at http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1004.XLS, was calculated based on soil ingestion exposure and a target cancer risk of 1E-6 and a target hazard quotient of 1.
The PRGs or RBCs corresponding to a hazard quotient of 1 were adjusted by multiplying 0.1 before they were used as screening values.
PRG for Aroclor 1254 was used as screening value for Aroclor 1260.
PRG for gamma-chlordane was used as screening value for alpha-chlordane.
PRG for alpha-BHC was used as screening value for delta-BHC.
PRG for endosulfan was used as screening value for endosulfan I, endosulfan II, and endosulfan sulfate.
PRG for endrin was used as screening value for endrin aldehyde and endrin ketone.
Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 200 mg/day soil ingestion and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and minimum requirements for 1 yr children (225 mg/day and 1000 mg/day for sodium and potassium) from Marilyn Wright (2001) Dietary Reference Intakes.
PRG for total chromium (1:6 ratio Cr VI: Cr III) was used as screening value for chromium.
PRG for nickel (soluble salts) was used as screening value for nickel.

5. Potential TBC values are from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. No ARARs were identified. (on-line resources available at http://www.dec.state.ny.us/website/der/tagms/prtg4046.html)

6. Rationale codes

Selection Reason:	Above Screening Levels (ASL)	
	Chemicals in the Same Group were retained as COPC (CSG)	
Deletion Reason:	Essential Nutrient (NUT)	
	Below Screening Level (BSL)	
	No Screening Value or Toxicity Value (NSV)	
	Individual Chemicals Evaluated (ICE)	

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value
NJ = Presence of the analyte has been "tentatively identified" and the associated numerical value represents its approximate concentration.

Attachment 2

Table 1C

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C DITCH SOIL

SEAD-121C

Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Ditch Soil
Exposure Medium:	Ditch Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection [6]
Volatile Organic Compounds														
67-64-1	Acetone	0.012	J	0.15	J	SDDRMO-3	7 / 10	0.0029 - 0.01	0.15		1,400	0.2	NO	BSL
75-15-0	Carbon disulfide	0.005	J	0.012	J	SDDRMO-6	2 / 10	0.0028 - 0.03	0.012		36	2.7	NO	BSL
78-93-3	Methyl ethyl ketone	0.0036	J	0.13	J	SDDRMO-4	3 / 10	0.0029 - 0.03	0.13		2,200	0.3	NO	BSL
Semivolatile Organic Compounds														
106-44-5 108-39-4	3 or 4-Methylphenol	0.79	J	0.79	J	SDDRMO-3	1 / 10	0.36 - 1.6	0.79		31		NO	NSV
120-12-7	Anthracene	0.1	J	0.25	J	SDDRMO-2	2 / 10	0.36 1.7	0.25		2,200	50	NO	BSL
56-55-3	Benzo(a)anthracene	0.23	J	1.1	J	SDDRMO-2	2 / 10	0.36 - 1.7	1.1		0.62	0.224	YES	ASL
50-32-8	Benzo(a)pyrene	0.17	J	0.9	J	SDDRMO-2	2 / 10	0.36 - 1.7	0.9		0.062	0.061	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.18	J	1.1	J	SDDRMO-2	2 / 10	0.36 - 1.7	1.1		0.62	1.1	YES	ASL
191-24-2	Benzo(ghi)perylene	0.29	J	0.29	J	SDDRMO-2	1 / 10	0.36 - 1.7	0.29			50	NO	NSV
207-08-9	Benzo(k)fluoranthene	0.58	J	0.58	J	SDDRMO-2	1 / 10	0.36 - 1.7	0.58		6.2	1.1	YES	CSG
218-01-9	Chrysene	0.24	J	1.2	J	SDDRMO-2	2 / 10	0.36 - 1.7	1.2		62	0.4	YES	CSG
206-44-0	Fluoranthene	0.52	J	2.1	J	SDDRMO-2	2 / 10	0.36 - 1.7	2.1		230	50	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.27	J	0.27	J	SDDRMO-2	1 / 10	0.36 - 1.7	0.27		0.62	3.2	YES	CSG
85-01-8	Phenanthrene	0.41	J	1.1	J	SDDRMO-2	2 / 10	0.36 - 1.7	1.1			50	NO	NSV
129-00-0	Pyrene	0.44	J	2.1	J	SDDRMO-2	2 / 10	0.36 - 1.7	2.1		230	50	NO	BSL
Inorganics														
7429-90-5	Aluminum	2,850		21,500		SDDRMO-9	10 / 10		21,500	20,500	7,600	19,300	YES	ASL
7440-36-0	Antimony	0.97	J	4.9	J	SDDRMO-9	5 / 10	1.2 - 4.3	4.9	6.55	3.1	5.9	YES	ASL
7440-38-2	Arsenic	1.1		6.1	J	SDDRMO-2	10 / 10		6.1	21.5	0.39	8.2	YES	ASL
7440-39-3	Barium	36.6	J	291		SDDRMO-9	10 / 10		291	159	540	300	NO	BSL
7440-41-7	Beryllium	0.2		0.8	J	SDDRMO-8 (dup)	8 / 10	0.64 - 0.68	0.8	1.4	15	1.1	NO	BSL
7440-43-9	Cadmium	1.5	J	14.3		SDDRMO-9	5 / 10	0.13 - 0.33	14.3	2.9	3.7	2.3	YES	ASL
7440-70-2	Calcium	13,200		161,000		SDDRMO-9	10 / 10		161,000	293,000	2,500,000	121,000	NO	NUT
7440-47-3	Chromium	7.3		29.8	J	SDDRMO-2	10 / 10		29.8	32.7	210	29.6	NO	BSL
7440-48-4	Cobalt	3		15.8	J	SDDRMO-8 (dup)	10 / 10		15.8	29.1	90	30	NO	BSL
7440-50-8	Copper	16.2		1,190		SDDRMO-9	10 / 10		1,190	62.8	310	33	YES	ASL
PA0002	Cyanide, Amenable	2.36	J	2.36	J	SDDRMO-4	1 / 10	0.55 - 2.63	2.36		120		NO	BSL
SA0008	Cyanide, Total	2.36	J	2.36	J	SDDRMO-4	1 / 10	0.552 - 2.63	2.36		120		NO	BSL
7439-89-6	Iron	5,650		27,300	J	SDDRMO-8 (dup)	10 / 10		27,300	38,600	2,300	36,500	YES	ASL
7439-92-1	Lead	13.3		436		SDDRMO-9	10 / 10		436	266	400	24.8	YES	ASL
7439-95-4	Magnesium	3,340		17,600		SDDRMO-9	10 / 10		17,600	29,100	400,000	21,500	NO	NUT
7439-96-5	Manganese	126		918	J	SDDRMO-5	10 / 10		918	2,380	180	1,060	YES	ASL

Attachment 2

Table 1C

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C DITCH SOIL

SEAD-121C

Seneca Army Depot Activity

Scenario Timeframe:	Cuurent/Future
Medium:	Ditch Soil
Exposure Medium:	Ditch Soil
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration [1]	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection [6]
7439-97-6	Mercury	0.04		0.3	J	SDDRMO-2	10 / 10		0.3	0.13	2.3	0.1	NO	BSL
7440-02-0	Nickel	8.2		42.7	J	SDDRMO-5	10 / 10		42.7	62.3	160	49	NO	BSL
7440-09-7	Potassium	368		1,410	J	SDDRMO-5	10 / 10		1,410	3,160	5,000,000	2,380	NO	NUT
7782-49-2	Selenium	0.73		2.5	J	SDDRMO-4	4 / 10	0.55 - 2.1	2.5	1.7	39	2	NO	BSL
7440-22-4	Silver	0.83	J	2.6	J	SDDRMO-5	5 / 10	0.35 - 1.4	2.6	0.87	39	0.75	NO	BSL
7440-23-5	Sodium	167		1,120	J	SDDRMO-4	10 / 10		1,120	269	1,125,000	172	NO	NUT
7440-62-2	Vanadium	8.6		29.1	J	SDDRMO-2	10 / 10		29.1	32.7	7.8	150	YES	ASL
7440-66-6	Zinc	51.4	J	566		SDDRMO-5	10 / 10		566	126	2,300	110	NO	BSL
Other Analytes														
SA0019	Total Organic Carbon	4,200		9,100	J	SDDRMO-10	10 / 10						NO	NSV
SA0020	Total Petroleum Hydrocarbons	1,000		2,600	J	SDDRMO-2	2 / 10	53 - 211					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation.
   (dup) indicates that the maximum concentration was detected in a duplicate pair The maximum concentration reported is the average value
   of the sample and its duplicate. Lab duplicates were not included in the assessment. Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. Background value is the maximum detected concentration of the Seneca background dataset.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil. On-line resources available at
   http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated October 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Direct contact exposure (ingestion, dermal contact, and inhalation) is evaluated to derive the PRGs.
   EPA Region III Risk Based Concentration (RBC) for residential soil was used as screening value for 2-methylnaphthalene
   as no Region 9 PRG is available. EPA Region III RBC, available on-line at http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1004.XLS,
   was calculated based on soil ingestion exposure and a target cancer risk of 1E-6 and a target hazard quotient of 1.
   The PRGs or RBCs corresponding to a hazard quotient of 1 were adjusted by multiplying 0.1 before they were used as screening values.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 200 mg/day soil ingestion
   and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and
   minimum requirements for 1 yr children (225 mg/day and 1000 mg/day for sodium and potassium)
   from Marilyn Wright (2001) Dietary Reference Intakes.
   PRG for total chromium (1:6 ratio Cr VI: Cr III) was used as screening value for chromium.
   PRG for cyanide hydrogen was used as screening value for amenable cyanide and total cyanide.
   PRG for nickel (soluble salts) was used as screening value for nickel.
5. Potential TBC values are from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. No ARARs were identified.
   (on-line resources available at http://www.dec.state.ny.us/website/der/tagms/prtg4046.html)
6. Rationale codes

	Selection Reason:	Above Screening Levels (ASL) Chemicals in the Same Group were retained as COPC (CSG)
	Deletion Reason:	Essential Nutrient (NUT) Below Screening Level (BSL) No Screening Value or Toxicity Value (NSV) Individual Chemicals Evaluated (ICE)

Definitions:

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value

Attachment 2
Table 1D
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C GROUNDWATER
SEAD-121C
SENECA ARMY DEPOT ACTIVITY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Groundwater
Exposure Point:	Aquifer -- Tap Water

CAS Number	Chemical	Minimum Detected Concentration ^{1} (ug/L)	Q	Maximum Detected Concentration ^{1} (ug/L)	Q	Location of Maximum Concentration	Detection Frequency ^{1}	Range of Reporting Limits ^{1} (ug/L)	Concentration Used for Screening ^{2} (ug/L)	Screening Value ^{3} (ug/L)	Potential ARAR /TBC Value (ug/L)	Potential ARAR/TBC Source ^{4}	COPC Flag	Rationale for Contaminant Deletion or Selection ^{5}
Semivolatile Organic Compounds														
117-81-7	Bis(2-Ethylhexyl)phthalate	1.4	J	1.4	J	MW121C-4	1 / 6	1 - 1.1	1.4	4.8	5	GA	NO	BSL
84-74-2	Di-n-butylphthalate	1.6	J	1.6	J	MW121C-6	1 / 6	1.2 - 1.3	1.6	360	50	GA	NO	BSL
Inorganics														
7429-90-5	Aluminum	19.9	J	588	J	MW121C-4 (dup)	6 / 6		588	3,600	50	SEC	NO	BSL
7440-36-0	Antimony	7.3	J	8.4	J	MW121C-6	2 / 6	3.8 - 7.5	8.4	1.5	3	GA	YES	ASL
7440-39-3	Barium	18.2	J	73.7		MW121C-3	6 / 6		73.7	260	1,000	GA	NO	BSL
7440-41-7	Beryllium	0.24	J	0.24	J	MW121C-4	1 / 6	0.1 - 0.9	0.24	7.3	4	MCL	NO	
7440-43-9	Cadmium	1.1	J	1.1	J	MW121C-6	1 / 6	0.8 - 0.8	1.1	1.8	5	GA	NO	BSL
7440-70-2	Calcium	114,000		558,000		MW121C-6	6 / 6		558,000	250,000			NO	NUT
7440-47-3	Chromium	1.5	J	21.4		MW121C-6	5 / 6	1.4 - 1.4	21.4	11	50	GA	YES	ASL
7440-48-4	Cobalt	1.5	J	3.0	J	MW121C-4 (dup)	3 / 6	0.7 - 2.3	3.0	73			NO	BSL
7440-50-8	Copper	6.2	J	17.7	J	MW121C-6	3 / 6	2 - 2	17.7	150	200	GA	NO	BSL
7439-89-6	Iron	516		869	J	MW121C-4 (dup)	3 / 6	22.2 - 34.9	869	1,100	300	GA	NO	BSL
7439-92-1	Lead	3.8		10.5		MW121C-6	5 / 6	3 - 3	10.5	15	15	MCL	NO	BSL
7439-95-4	Magnesium	27,700		109,000		MW121C-6	6 / 6		109,000	40,000			NO	NUT
7439-96-5	Manganese	135		297		MW121C-6	6 / 6		297	88	50	SEC	YES	ASL
7439-97-6	Mercury	0.2		0.2		MW121C-3	2 / 6	0.2 - 0.2	0.2	1.1	0.7	GA	NO	BSL
7440-02-0	Nickel	2.1	J	2.1	J	MW121C-4 (dup)	1 / 6	2 - 2	2.1	73	100	GA	NO	BSL
7440-09-7	Potassium	1,790	J	9,400		MW121C-4	6 / 6		9,400	700,000			NO	BSL
7782-49-2	Selenium	1.9	J	6.8		MW121C-6	2 / 6	1.3 - 4.2	6.8	18	10	GA	NO	BSL
7440-23-5	Sodium	17,600		58,400		MW121C-4 (dup)	6 / 6		58,400	1,200,000	20,000	GA	NO	BSL
7440-66-6	Zinc	12.6	J	96.2		MW121C-6	6 / 6		96.2	1,100	5,000	SEC	NO	BSL

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment. (dup) indicates that the maximum concentration was detected in a duplicate pair The maximum concentration reported is the average value of the sample and its duplicate. Range of reporting limits were presented for nondetects only.
   To ensure a reliable dataset, only groundwater samples at the DRMO Yard collected from permanent wells using low flow sampling techniques were included in the screeing process.
2. The maximum detected concentration was used for screening.
3. EPA Region 9 Preliminary Remediation Goals (PRGs) for tap water. On-line resources available at http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Ingestion from drinking and inhalation of volatiles during showering are evaluated to derive the PRGs.
   The PRGs corresponding to a hazard quotient of 1 was adjusted by multiplying 0.1 before they were used as screening values.
   MCL for lead was used as screening value for lead as no Region 9 PRG is available.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 2L/day water intake and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and minimum requirements for 2-5 yr children (1400 mg/day for potassium) from Marilyn Wright (2001) Dietary Reference Intakes.
   For sodium, an upper limit intake of 2,400 mg/day (http://www.mealformation.com/dailyval.html) was used.
   PRG for chromium (VI) was used as screening value for chromium.
4. ARARs or TBCs identified are Maximum Contaminant Levels (MCLs), the GA standard, or the Secondary Drinking Water Regulations (SEC).
5. Rationale codes

	Selection Reason:	Above Screening Levels (ASL)
	Deletion Reason:	Essential Nutrient (NUT)
		Below Screening Level (BSL)

Definitions:

	COPC = Chemical of Potential Concern
Q = Qualifier	ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
J = Estimated Value	MCL = Federal Maximum Contaminant Level
	GA = New York State Class GA Groundwater Standard (TOGS 1.1.1, June 1998 with updates)
	SEC = USEPA Secondary Drinking Water Regulation, non-enforceable (EPA 822-B-00-001, Summer 2000)

Attachment 2

Table 1E

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121C SURFACE WATER

SEAD-121C

SENECA ARMY DEPOT ACTIVITY

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water
Exposure Point:	SEAD-121C

CAS Number	Chemical	Minimum Detected Concentration [1] (ug/L)	Q	Maximum Detected Concentration [1] (ug/L)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (ug/L)	Concentration Used for Screening [2] (ug/L)	Maximum Background Value [3] (ug/L)	Screening Value [4] (ug/L)	Potential ARAR /TBC Value (ug/L)	Potential ARAR/TBC Source[5]	COPC Flag	Rationale for Contaminant Deletion or Selection [6]
Semivolatile Organic Compounds															
117-81-7	Bis(2-Ethylhexyl)phthalate	4.2	J	4.2	J	SWDRMO-2	1 / 10	10 - 10	4.2		4.8	0.6	Class C	NO	BSL
Inorganics															
7429-90-5	Aluminum	14.4		8,760		SWDRMO-2	10 / 10		8,760		3,600	100	Class C	YES	ASL
7440-38-2	Arsenic	50.3		50.3		SWDRMO-2	1 / 10	2.8 - 2.8	50.3		0.045	150	Class C	YES	ASL
7440-39-3	Barium	37.2		423		SWDRMO-2	10 / 10		423		260			YES	ASL
7440-41-7	Beryllium	0.12	J	0.86	J	SWDRMO-2	9 / 10	0.1 - 0.1	0.86		7.3	1100	Class C	NO	BSL
7440-43-9	Cadmium	0.46		19.5		SWDRMO-2	4 / 10	0.4 - 0.4	19.5		1.8	3.84	Class C	YES	ASL
7440-70-2	Calcium	66,700		166,000		SWDRMO-3	10 / 10		166,000		250,000			NO	NUT
7440-47-3	Chromium	0.69		129		SWDRMO-2	8 / 10	0.6 - 0.6	129		11	139.45	Class C	YES	ASL
7440-48-4	Cobalt	0.6		47		SWDRMO-2	7 / 10	0.6 - 0.6	47		73	5	Class C	NO	BSL
7440-50-8	Copper	1.7		1,160		SWDRMO-2	10 / 10		1,160		150	17.32	Class C	YES	ASL
7439-89-6	Iron	26.6	J	110,000		SWDRMO-2	8 / 10	17.3 - 17.3	110,000		1,100	300	Class C	YES	ASL
7439-92-1	Lead	4.4	J	839		SWDRMO-2	10 / 10		839		15	1.46246	Class C	YES	ASL
7439-95-4	Magnesium	11,100		26,200		SWDRMO-2	10 / 10		26,200		40,000			NO	NUT
7439-96-5	Manganese	3.2		2,380		SWDRMO-2	10 / 10		2,380		88			YES	ASL
7439-97-6	Mercury	0.26		2.1		SWDRMO-2	2 / 10	0.2 - 0.2	2.1		1.1	0.0007	Class C	YES	ASL
7440-02-0	Nickel	10.6		154		SWDRMO-2	3 / 10	1.8 - 1.8	154		73	99.92	Class C	YES	ASL
7440-09-7	Potassium	2,070	J	5,350	J	SWDRMO-3	10 / 10		5,350		700,000			NO	NUT
7782-49-2	Selenium	4.6	J	4.6	J	SWDRMO-2	1 / 10	3 - 3	4.6		18	4.6	Class C	NO	BSL
7440-22-4	Silver	1.7		8		SWDRMO-2	2 / 10	1 - 1	8		18	0.1	Class C	NO	BSL
7440-23-5	Sodium	4,490		123,000	J	SWDRMO-1	10 / 10		123,000		1,200,000			NO	NUT
7440-28-0	Thallium	5.5	J	6.3		SWDRMO-4	2 / 10	5.4 - 5.4	6.3		0.24	8	Class C	YES	ASL
7440-62-2	Vanadium	0.89		233		SWDRMO-2	5 / 10	0.7 - 0.7	233		3.6	14	Class C	YES	ASL
7440-66-6	Zinc	15.4		6,910		SWDRMO-2	10 / 10		6,910		1,100	159.25	Class C	YES	ASL
Other Analytes															
SA0020	Total Petroleum Hydrocarbons	8,080		8,080		SWDRMO-2	1 / 9	1000 - 1000	8,080					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment.
   Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. No background data are available.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for tap water. On-line resources available at http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Ingestion from drinking and inhalation of volatiles during showering are evaluated to derive the PRGs.
   The PRGs corresponding to a hazard quotient of 1 was adjusted by multiplying 0.1 before they were used as screening values.
   Maximum Contaminant Level (MCL) for lead was used as screening value for lead as no Region 9 PRG is available.
   PRG for endrin was used as screening value for endrin ketone.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 2L/day water intake and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and minimum requirements for 2-5 yr children (1400 mg/day for potassium) from Marilyn Wright (2001) Dietary Reference Intakes.
   For sodium, an upper limit intake of 2,400 mg/day (http://www.mealformation.com/dailyval.html) was used.
   PRG for chromium (VI) was used as screening value for chromium.
5. Potential ARAR values are from the New York State Ambient Water Quality Standards, Class C for Surface Water.
6. Rationale codes

Selection Reason:	Above Screening Levels (ASL)	
Deletion Reason:	Essential Nutrient (NUT)	
	Below Screening Level (BSL)	
	Individual Chemicals Evaluated (ICE)	

Definitions:

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value

Attachment 2
Table 2A
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL
SEAD-121I
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
Volatile Organic Compounds														
67-64-1	Acetone	0.0022	J	0.11		SS121I-15	26 / 35	0.003 - 0.0715	0.11		1,400	0.2	NO	BSL
71-43-2	Benzene	0.0046	J	0.041	J	SS121I-29 (dup)	6 / 35	0.0023 - 0.0034	0.041		0.64	0.06	NO	BSL
100-41-4	Ethyl benzene	0.0021	J	0.0078		SS121I-15	5 / 35	0.0023 - 0.0034	0.0078		400	5.5	NO	BSL
	Meta/Para Xylene	0.0021	J	0.0063	J	SS121I-29 (dup)	5 / 35	0.0023 - 0.0034	0.0063		27		NO	BSL
78-93-3	Methyl ethyl ketone	0.0036		0.07		SS121I-15	9 / 35	0.0023 - 0.0034	0.07		2,200	0.3	NO	BSL
75-09-2	Methylene chloride	0.0016	J	0.0028	J	SB121I-4	9 / 35	0.0023 - 0.0034	0.0028		9.1	0.1	NO	BSL
95-47-6	Ortho Xylene	0.0013	J	0.0036	J	SS121I-29 (dup)	5 / 35	0.0023 - 0.0034	0.0036		27		NO	BSL
108-88-3	Toluene	0.0028	J	0.031	J	SS121I-29 (dup)	6 / 35	0.0023 - 0.0034	0.031		520	1.5	NO	BSL
Semivolatile Organic Compounds														
91-57-6	2-Methylnaphthalene	0.054	J	0.26	J	SS121I-20	3 / 39	0.35 - 7.4	0.26		31	36.4	NO	BSL
83-32-9	Acenaphthene	0.053	J	6.1		SS121I-20	17 / 39	0.36 - 2.2	6.1		370	50	NO	BSL
208-96-8	Acenaphthylene	0.064	J	0.56	J	SS121I-21	2 / 39	0.34 - 7.4	0.56			41	NO	NSV
120-12-7	Anthracene	0.069	J	12		SS121I-20	20 / 38	0.36 - 1.8	12		2,200	50	NO	BSL
56-55-3	Benzo(a)anthracene	0.043	J	28	J	SS121I-20	36 / 39	0.37 - 0.38	28		0.62	0.224	YES	ASL
50-32-8	Benzo(a)pyrene	0.061	J	23		SS121I-20	36 / 39	0.37 - 0.39	23		0.062	0.061	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.052	J	29		SS121I-20	37 / 39	0.37 - 0.38	29		0.62	1.1	YES	ASL
191-24-2	Benzo(ghi)perylene	0.05	J	29	J	SS121I-20	33 / 39	0.36 - 0.39	29			50	NO	NSV
207-08-9	Benzo(k)fluoranthene	0.095	J	21	J	SS121I-20	28 / 38	0.36 - 0.4	21		6.2	1.1	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.038	J	1.6		SS121I-31	14 / 39	0.13 - 8.8	1.6		35	50	NO	BSL
85-68-7	Butylbenzylphthalate	0.055	J	0.13	J	SB121I-1	2 / 36	0.35 - 8.8	0.13		1,200	50	NO	BSL
86-74-8	Carbazole	0.06	J	6.8		SS121I-20	20 / 39	0.36 - 1.8	6.8		24		NO	BSL
218-01-9	Chrysene	0.063	J	32	J	SS121I-20	35 / 39	0.37 - 0.39	32		62	0.4	YES	CSG
53-70-3	Dibenz(a,h)anthracene	0.072	J	4.6	J	SS121I-2	10 / 32	0.36 - 2.1	4.6		0.062	0.014	YES	ASL
132-64-9	Dibenzofuran	0.029	J	2		SS121I-20	9 / 39	0.35 - 2.2	2		15	6.2	NO	BSL
84-66-2	Diethylphthalate	0.64	J	0.64	J	SS121I-29 (dup)	1 / 39	0.34 - 7.4	0.64		4,900	7.1	NO	BSL
84-74-2	Di-n-butylphthalate	0.045	J	0.045	J	SS121I-1	1 / 38	0.34 - 7.4	0.045		610	8.1	NO	BSL
206-44-0	Fluoranthene	0.08	J	62		SS121I-20	37 / 39	0.37 - 0.38	62		230	50	NO	BSL
86-73-7	Fluorene	0.043	J	4.2		SS121I-20	13 / 39	0.35 - 2.2	4.2		270	50	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.061	J	8.1	J	SS121I-20	26 / 37	0.36 - 2.1	8.1		0.62	3.2	YES	ASL
91-20-3	Naphthalene	0.051	J	0.63	J	SS121I-21	5 / 39	0.35 - 7.4	0.63		5.6	13	NO	BSL
85-01-8	Phenanthrene	0.052	J	52		SS121I-20	37 / 39	0.37 - 0.38	52			50	NO	NSV
129-00-0	Pyrene	0.072	J	64	J	SS121I-23	37 / 39	0.37 - 0.38	64		230	50	NO	BSL

Attachment 2
Table 2A
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL
SEAD-121I
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
PCBs														
11097-69-1	Aroclor-1254	0.03	J	0.03	J	SS121I-22	1 / 35	0.018 - 0.022	0.03		0.22	10	NO	BSL
11096-82-5	Aroclor-1260	0.0083	J	0.046	J	SS121I-14	2 / 35	0.018 - 0.022	0.046		0.22	10	NO	BSL
Pesticides														
72-55-9	4,4'-DDE	0.011	NJ	0.034	NJ	SS121I-23	4 / 35	0.0018 - 0.0023	0.034		1.7	2.1	NO	BSL
50-29-3	4,4'-DDT	0.024	NJ	0.039	J	SS121I-21	2 / 34	0.0018 - 0.0023	0.039		1.7	2.1	NO	BSL
309-00-2	Aldrin	0.0032	J	0.012		SS121I-20	4 / 35	0.0018 - 0.0045	0.012		0.029	0.041	NO	BSL
60-57-1	Dieldrin	0.016	J	0.034	J	SS121I-21	2 / 35	0.0018 - 0.0023	0.034		0.030	0.044	YES	ASL
959-98-8	Endosulfan I	0.0026		0.095	J	SS121I-20	24 / 35	0.0018 - 0.002	0.095		37	0.9	NO	BSL
72-20-8	Endrin	0.0065	J	0.03	J	SS121I-21	2 / 35	0.0018 - 0.0023	0.03		1.8	0.1	NO	BSL
1024-57-3	Heptachlor epoxide	0.0061		0.055	J	SS121I-21	8 / 33	0.0018 - 0.0023	0.055		0.053	0.02	YES	ASL
Inorganics														
7429-90-5	Aluminum	1,510		13,200		SB121I-5	35 / 35		13,200	20,500	7,600	19,300	YES	ASL
7440-36-0	Antimony	0.99		7.5		SS121I-28	14 / 35	0.96 - 7.3	7.5	6.55	3.1	5.9	YES	ASL
7440-38-2	Arsenic	3.5		32.1	J	SB121I-2 (dup)	24 / 24		32.1	21.5	0.39	8.2	YES	ASL
7440-39-3	Barium	38.2		207		SS121I-26	35 / 35		207	159	540	300	NO	BSL
7440-41-7	Beryllium	0.16		0.68		SB121I-5	34 / 35	0.17 - 0.17	0.68	1.4	15	1.1	NO	BSL
7440-43-9	Cadmium	0.15		6.6		SB121I-3	13 / 35	0.13 - 0.61	6.6	2.9	3.7	2.3	YES	ASL
7440-70-2	Calcium	5,370	J	298,000	J	SS121I-26	35 / 35		298,000	293,000	2,500,000	121,000	NO	NUT
7440-47-3	Chromium	3.9		439		SS121I-29 (dup)	35 / 35		439	32.7	210	29.6	YES	ASL
7440-48-4	Cobalt	4.6		205.5	J	SS121I-29 (dup)	35 / 35		205.5	29.1	90	30	YES	ASL
7440-50-8	Copper	10.4	J	209		SS121I-29 (dup)	30 / 30		209	62.8	310	33	NO	BSL
	Cyanide, Total	0.559	J	2.00		SS121I-29 (dup)	3 / 35	0.526 - 0.61	2.00		120		NO	BSL
7439-89-6	Iron	5,720		58,400		SS121I-29 (dup)	35 / 35		58,400	38,600	2,300	36,500	YES	ASL
7439-92-1	Lead	8.6	J	122		SS121I-25	35 / 35		122	266	400	24.8	NO	BSL
7439-95-4	Magnesium	4,430	J	22,300	J	SS121I-27	35 / 35		22,300	29,100	400,000	21,500	NO	NUT
7439-96-5	Manganese	377		310,500		SS121I-29 (dup)	35 / 35		310,500	2,380	180	1,060	YES	ASL
7439-97-6	Mercury	0.01		0.07		SB121I-1	35 / 35		0.07	0.13	2.3	0.1	NO	BSL
7440-02-0	Nickel	11.1		342	J	SS121I-29 (dup), SS121I-33	35 / 35		342	62.3	160	49	YES	ASL
7440-09-7	Potassium	634		1,300		SS121I-30	35 / 35		1,300	3,160	5,000,000	2,380	NO	NUT
7782-49-2	Selenium	0.48	J	146	J	SS121I-29 (dup)	20 / 35	0.43 - 0.61	146	1.7	39	2	YES	ASL
7440-22-4	Silver	0.29		3.1	J	SB121I-2 (dup)	4 / 24	0.3 - 1.2	3.1	0.87	39	0.75	NO	BSL

Attachment 2

Table 2A

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL

SEAD-121I

Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration ^{1} (mg/kg)	Q	Maximum Detected Concentration ^{1} (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency ^{1}	Range of Reporting Limits ^{1} (mg/kg)	Concentration Used for Screening ^{2} (mg/kg)	Maximum Background Value ^{3} (mg/kg)	Screening Value ^{4} (mg/kg)	Potential ARAR / TBC Value ^{5} (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
7440-23-5	Sodium	117		372		SB121I-1	29 / 35	106 - 595	372	269	1,125,000	172	NO	NUT
7440-28-0	Thallium	0.38		163	J	SS121I-29 (dup)	7 / 35	0.32 - 1.2	163	1.2	0.52	0.7	YES	ASL
7440-62-2	Vanadium	5.9		182	J	SS121I-29 (dup)	35 / 35		182	32.7	7.8	150	YES	ASL
7440-66-6	Zinc	42.75	J	329		SS121I-33	35 / 35		329	126	2,300	110	NO	BSL
Other Analytes														
	Total Organic Carbon	3,000		8,900		SS121I-6	35 / 35						NO	NSV
	Total Petroleum Hydrocarbons	100	J	2,200		SS121I-27	10 / 35	43 - 48					NO	ICE

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment. (dup) indicates that the maximum concentration was detected in a duplicate pair. The maximum concentration reported is the average value of the sample and its duplicate. Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. Background value is the maximum detected concentration of the Seneca background dataset.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil. On-line resources available at http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Direct contact exposure (ingestion, dermal contact, and inhalation) is evaluated to derive the PRGs.
   The PRGs or RBCs corresponding to a hazard quotient of 1 were adjusted by multiplying 0.1 before they were used as screening values.
   PRG for xylenes was used as screening value for meta/para xylenes and ortho xylene.
   EPA Region III Risk Based Concentration (RBC) for residential soil was used as screening value for 2-methylnaphthalene as no Region 9 PRG is available. EPA Region III RBC, available on-line at http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1004.XLS, was calculated based on soil ingestion exposure and a target cancer risk of 1E-6 and a target hazard quotient of 1.
   PRG for Aroclor 1254 was used as screening value for Aroclor 1260.
   PRG for endosulfan was used as screening value for endosulfan I.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 200 mg/day soil ingestion and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and minimum requirements for 1 yr children (225 mg/day and 1000 mg/day for sodium and potassium) from Marilyn Wright (2001) Dietary Reference Intakes.
   PRG for total chromium (1:6 ratio Cr VI: Cr III) was used as screening value for chromium.
   PRG for nickel (soluble salts) was used as screening value for nickel.
   PRG for cyanide hydrogen was used for total cyanide.
5. Potential TBC values are from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. No ARARs were identified. (on-line resources available at http://www.dec.state.ny.us/website/der/tagms/prtg4046.html)

Attachment 2
Table 2A
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE SOIL
SEAD-121I
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration 1 (mg/kg)	Q	Maximum Detected Concentration 1 (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency 1	Range of Reporting Limits 1 (mg/kg)	Concentration Used for Screening 2 (mg/kg)	Maximum Background Value 3 (mg/kg)	Screening Value 4 (mg/kg)	Potential ARAR / TBC Value 5 (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection

6. Rationale codes

Selection Reason:
Above Screening Levels (ASL)
Chemicals in the Same Group were retained as COPC (CSG)

Deletion Reason:
Essential Nutrient (NUT)
Below Screening Level (BSL)
No Screening Value or Toxicity Value (NSV)
Individual Chemicals Evaluated (ICE)

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value
NJ = Presence of the analyte has been "tentatively identified" and the associated numerical value represents its approximate concentration.

Attachment 2

Table 2B

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I DITCH SOIL

SEAD-121I

Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Ditch Soil
Exposure Medium:	Ditch Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
Volatile Organic Compounds														
67-64-1	Acetone	0.008		0.15		SD121I-8	10 / 10		0.15		1,400	0.2	NO	BSL
71-43-2	Benzene	0.0012	J	0.039		SD121I-8	3 / 10	0.0032 - 0.0037	0.039		0.64	0.06	NO	BSL
100-41-4	Ethyl benzene	0.0052		0.0052		SD121I-8	1 / 10	0.0027 - 0.0044	0.0052		400	5.5	NO	BSL
SA0078	Meta/Para Xylene	0.0048		0.0048		SD121I-8	1 / 10	0.0027 - 0.0044	0.0048		27		NO	BSL
78-93-3	Methyl ethyl ketone	0.0072		0.078		SD121I-8	2 / 10	0.0031 - 0.0044	0.078		2,200	0.3	NO	BSL
95-47-6	Ortho Xylene	0.003		0.003		SD121I-8	1 / 10	0.0027 - 0.0044	0.003		27		NO	BSL
108-88-3	Toluene	0.0017	J	0.026		SD121I-8	2 / 10	0.0031 - 0.0044	0.026		520	1.5	NO	BSL
Semivolatile Organic Compounds														
91-57-6	2-Methylnaphthalene	0.033	J	0.17	J	SD121I-7 (dup)	2 / 12	0.38 - 4.4	0.17		31	36.4	NO	BSL
91-94-1	3,3'-Dichlorobenzidine	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4	0.315		1.1		NO	BSL
83-32-9	Acenaphthene	0.066	J	0.74	J	SD121I-7 (dup)	9 / 12	0.38 - 0.46	0.74		370	50	NO	BSL
208-96-8	Acenaphthylene	0.076	J	0.42	J	SD121I-2EBS	4 / 12	0.38 - 0.53	0.42			41	NO	NSV
120-12-7	Anthracene	0.11	J	1.8	J	SD121I-2EBS	9 / 12	0.38 - 0.46	1.8		2,200	50	NO	BSL
56-55-3	Benzo(a)anthracene	0.049	J	14		SD121I-2EBS	10 / 12	0.38 - 0.46	14		0.62	0.224	YES	ASL
50-32-8	Benzo(a)pyrene	0.29	J	16		SD121I-2EBS	9 / 12	0.38 - 0.46	16		0.062	0.061	YES	ASL
205-99-2	Benzo(b)fluoranthene	0.044	J	22		SD121I-2EBS	11 / 12	0.46 - 0.46	22		0.62	1.1	YES	ASL
191-24-2	Benzo(ghi)perylene	0.11	J	12		SD121I-2EBS	9 / 12	0.38 - 0.46	12			50	NO	NSV
207-08-9	Benzo(k)fluoranthene	0.14	J	23		SD121I-2EBS	9 / 12	0.38 - 0.46	23		6.2	1.1	YES	ASL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.025	J	0.093	J	SD121I-7 (dup)	3 / 12	0.38 - 4.4	0.093		35	50	NO	BSL
85-68-7	Butylbenzylphthalate	0.42	J	0.42	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4	0.42		1,200	50	NO	BSL
86-74-8	Carbazole	0.1	J	1.6	J	SD121I-2EBS	9 / 12	0.38 - 0.46	1.6		24		NO	BSL
218-01-9	Chrysene	0.34	J	25		SD121I-2EBS	9 / 12	0.38 - 0.46	25		62	0.4	YES	CSG
53-70-3	Dibenz(a,h)anthracene	0.086	J	5	J	SD121I-2EBS	5 / 12	0.38 - 0.53	5		0.062	0.014	YES	ASL
132-64-9	Dibenzofuran	0.058	J	0.356	J	SD121I-7 (dup)	5 / 12	0.38 - 4.4	0.356		15	6.2	NO	BSL
117-84-0	Di-n-octylphthalate	0.42	J	0.42	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4	0.42		240	50	NO	BSL
206-44-0	Fluoranthene	0.099	J	24		SD121I-2EBS	11 / 12	0.46 - 0.46	24		230	50	NO	BSL
86-73-7	Fluorene	0.053	J	0.645	J	SD121I-7 (dup)	9 / 12	0.38 - 0.46	0.645		270	50	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.098	J	12	J	SD121I-2EBS	9 / 12	0.38 - 0.46	12		0.62	3.2	YES	ASL
78-59-1	Isophorone	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4	0.315		510	4.4	NO	BSL
91-20-3	Naphthalene	0.065	J	0.35	J	SD121I-7 (dup)	2 / 12	0.38 - 4.4	0.35		5.6	13	NO	BSL
98-95-3	Nitrobenzene	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.38 - 4.4	0.315		2	0.2	NO	BSL
85-01-8	Phenanthrene	0.05	J	6.25		SD121I-7 (dup)	11 / 12	0.46 - 0.46	6.25			50	NO	NSV

Attachment 2

Table 2B

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I DITCH SOIL

SEAD-121I

Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Ditch Soil
Exposure Medium:	Ditch Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration [1] (mg/kg)	Q	Maximum Detected Concentration [1] (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency [1]	Range of Reporting Limits [1] (mg/kg)	Concentration Used for Screening [2] (mg/kg)	Maximum Background Value [3] (mg/kg)	Screening Value [4] (mg/kg)	Potential ARAR / TBC Value [5] (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection
108-95-2	Phenol	0.315	J	0.315	J	SD121I-7 (dup)	1 / 12	0.39 - 4.4	0.315		1,800	0.03	NO	BSL
129-00-0	Pyrene	0.078	J	17		SD121I-2EBS	11 / 12	0.46 - 0.46	17		230	50	NO	BSL
PCBs														
11097-69-1	Aroclor-1254	0.067		0.067		SD121I-5	1 / 10	0.012 - 0.022	0.067		0.22	10	NO	BSL
11096-82-5	Aroclor-1260	0.014	J	0.014	J	SD121I-7 (dup)	1 / 10	0.0023 - 0.0033	0.014		0.22	10	NO	BSL
Pesticides														
72-55-9	4,4'-DDE	0.0076	J	0.0076	J	SD121I-7 (dup)	1 / 10	0.00024 - 0.00033	0.0076		1.7	2.1	NO	BSL
Inorganics														
7429-90-5	Aluminum	4,180		10,300		SD121I-6	10 / 10		10,300	20,500	7,600	19,300	YES	ASL
7440-38-2	Arsenic	2.6		104		SD121I-8	10 / 10		104	21.5	0.39	8.2	YES	ASL
7440-39-3	Barium	44.1	J	91.1	J	SD121I-8	10 / 10		91.1	159	540	300	NO	BSL
7440-41-7	Beryllium	0.3		0.66		SD121I-6	10 / 10		0.66	1.4	150	1.1	NO	BSL
7440-43-9	Cadmium	0.8		0.8		SD121I-7 (dup)	1 / 10	0.14 - 0.19	0.8	2.9	3.7	2.3	NO	BSL
7440-70-2	Calcium	8,990		127,500		SD121I-7 (dup)	10 / 10		127,500	293,000	2,500,000	121,000	NO	NUT
7440-47-3	Chromium	8.6		83.9		SD121I-8	10 / 10		83.9	32.7	210	29.6	NO	BSL
7440-48-4	Cobalt	5.9		91.9		SD121I-8	10 / 10		91.9	29.1	90	30	YES	ASL
7440-50-8	Copper	17.1	J	130		SD121I-4	10 / 10		130	62.8	310	33	NO	BSL
7439-89-6	Iron	10,100		30,400		SD121I-8	10 / 10		30,400	38,600	2,300	36,500	YES	ASL
7439-92-1	Lead	11.2	J	93.3		SD121I-6	10 / 10		93.3	266	400	24.8	NO	BSL
7439-95-4	Magnesium	2,150		11,300		SD121I-5	10 / 10		11,300	29,100	400,000	21,500	NO	NUT
7439-96-5	Manganese	303		14,900		SD121I-8	10 / 10		14,900	2,380	180	1,060	YES	ASL
7439-97-6	Mercury	0.02		0.18		SD121I-3	9 / 10	0.12 - 0.12	0.18	0.13	2.3	0.1	NO	BSL
7440-02-0	Nickel	16.4		153		SD121I-8	10 / 10		153	62.3	160	49	NO	BSL
7440-09-7	Potassium	541		1,450		SD121I-6	10 / 10		1,450	3,160	5,000,000	2,380	NO	NUT
7782-49-2	Selenium	18		18		SD121I-8	1 / 10	0.48 - 0.68	18	1.7	39	2	NO	BSL
7440-22-4	Silver	2.5		10.5		SD121I-8	2 / 10	0.31 - 0.44	10.5	0.87	39	0.75	NO	BSL
7440-23-5	Sodium	162		266		SD121I-10	8 / 10	118 - 132	266	269	1,125,000	172	NO	NUT
7440-28-0	Thallium	0.44	J	21.5		SD121I-8	2 / 10	0.36 - 0.5	21.5	1.2	0.52	0.7	YES	ASL
7440-62-2	Vanadium	8.1		69.4		SD121I-8	10 / 10		69.4	32.7	7.8	150	YES	ASL
7440-66-6	Zinc	57.3	J	532		SD121I-6	10 / 10		532	126	2,300	110	NO	BSL
Other Analytes														
SA0019	Total Organic Carbon	2,800		7,200	J	SD121I-1	10 / 10		7,200				NO	NSV
SA0020	Total Petroleum Hydrocarbons	150		910		SD121I-9	5 / 10	52 - 66					NO	ICE

Attachment 2

Table 2B

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I DITCH SOIL

SEAD-121I

Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Ditch Soil
Exposure Medium:	Ditch Soil
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration 1 (mg/kg)	Q	Maximum Detected Concentration 1 (mg/kg)	Q	Location of Maximum Concentration	Detection Frequency 1	Range of Reporting Limits 1 (mg/kg)	Concentration Used for Screening 2 (mg/kg)	Maximum Background Value 3 (mg/kg)	Screening Value 4 (mg/kg)	Potential ARAR / TBC Value 5 (mg/kg)	COPC Flag	Rationale for Contaminant Deletion or Selection

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation.
   Lab duplicates were not included in the assessment. (dup) indicates that the maximum concentration was detected in a duplicate pair The
   maximum concentration reported is the average value of the sample and its duplicate. Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. Background value is the maximum detected concentration of the Seneca background dataset.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil. On-line resources available at
   http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Direct contact exposure (ingestion, dermal contact, and inhalation) is evaluated to derive the PRGs.
   The PRGs or RBCs corresponding to a hazard quotient of 1 were adjusted by multiplying 0.1 before they were used as screening values.
   PRG for xylenes was used as screening value for meta/para xylenes and ortho xylene.
   EPA Region III Risk Based Concentration (RBC) for residential soil was used as screening value for 2-methylnaphthalene
   as no Region 9 PRG is available. EPA Region III RBC, available on-line at http://www.epa.gov/reg3hwmd/risk/human/rbc/rbc1004.XLS,
   was calculated based on soil ingestion exposure and a target cancer risk of 1E-6 and a target hazard quotient of 1.
   http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 200 mg/day soil ingestion
   and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and
   minimum requirements for 1 yr children (225 mg/day and 1000 mg/day for sodium and potassium)
   from Marilyn Wright (2001) Dietary Reference Intakes.
   PRG for total chromium (1:6 ratio Cr VI: Cr III) was used as screening value for chromium.
   PRG for nickel (soluble salts) was used as screening value for nickel.
5. Potential TBC values are from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. No ARARs were identified.
   (on-line resources available at http://www.dec.state.ny.us/website/der/tagms/prtg4046.html)
6. Rationale codes

	Selection Reason:	Above Screening Levels (ASL)
		Chemicals in the Same Group were retained as COPC (CSG)
	Deletion Reason:	Essential Nutrient (NUT)
		Below Screening Level (BSL)
		No Screening Value or Toxicity Value (NSV)
		Individual Chemicals Evaluated (ICE)

Definitions:

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value

Attachment 2

Table 2C

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SEAD-121I SURFACE WATER

SEAD-121I

Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water
Exposure Point:	SEAD-121I

CAS Number	Chemical	Minimum Detected Concentration[1] (ug/L)	Q	Maximum Detected Concentration[1] (ug/L)	Q	Location of Maximum Concentration	Detection Frequency[1]	Range of Reporting Limits[1] (ug/L)	Concentration Used for Screening[2] (ug/L)	Maximum Background Value[3] (ug/L)	Screening Value[4] (ug/L)	Potential ARAR /TBC Value[5] (ug/L)	COPC Flag	Rationale for Contaminant Deletion or Selection[6]
Semivolatile Organic Compounds														
85-68-7	Butylbenzylphthalate	1.1	J	1.1	J	SW121I-10	1 / 7	10 - 10	1.1		730		NO	BSL
206-44-0	Fluoranthene	1.1	J	1.1	J	SW121I-6	1 / 7	10 - 10	1.1		150		NO	BSL
Inorganics														
7429-90-5	Aluminum	23.9		2,050		SW121I-6	7 / 7		2,050		3,600	100	NO	BSL
7440-39-3	Barium	22.5		49.2		SW121I-1	6 / 7	9.9 - 9.9	49.2		260		NO	BSL
7440-41-7	Beryllium	0.14		0.28		SW121I-6	6 / 7	0.1 - 0.1	0.28		7.3	1,100	NO	BSL
7440-43-9	Cadmium	0.54		0.54		SW121I-10	1 / 7	0.4 - 0.8	0.54		1.8	3.84	NO	BSL
7440-70-2	Calcium	18,000		74,200		SW121I-1	7 / 7		74,200		250,000		NO	NUT
7440-47-3	Chromium	1.1		6		SW121I-6	5 / 7	0.6 - 1.4	6		11	139.45	NO	BSL
7440-48-4	Cobalt	2.8		3		SW121I-6	2 / 7	0.6 - 0.7	3		73	5	NO	BSL
7440-50-8	Copper	1.2		11.2		SW121I-6	6 / 7	3.6 - 3.6	11.2		150	17.32	NO	BSL
7439-89-6	Iron	32.3	J	3,410		SW121I-6	5 / 7	17.3 - 17.3	3,410		1,100	300	YES	ASL
7439-92-1	Lead	4.3	J	26.3		SW121I-6	4 / 7	2.1 - 3	26.3		15	1.46	YES	ASL
7439-95-4	Magnesium	3,635		11,100		SW121I-1	7 / 7		11,100		40,000		NO	NUT
7439-96-5	Manganese	0.8		206		SW121I-6	7 / 7		206		88		YES	ASL
7440-02-0	Nickel	3.5		3.6		SW121I-6	2 / 7	1.8 - 2	3.6		73	99.92	NO	BSL
7440-09-7	Potassium	645		4,640	J	SW121I-6	7 / 7		4,640		700,000		NO	NUT
7782-49-2	Selenium	2.5	J	2.5	J	SW121I-7 (dup)	1 / 7	3 - 3	2.5		18	4.6	NO	BSL
7440-23-5	Sodium	2,240		38,500	J	SW121I-10	7 / 7		38,500		1,200,000		NO	NUT
7440-62-2	Vanadium	2.1		3.9		SW121I-6	3 / 7	0.7 - 1.4	3.9		3.6	14	YES	ASL
7440-66-6	Zinc	12.5		190		SW121I-6	7 / 7		190		1,100	159.25	NO	BSL

Notes:

1. Field duplicates were averaged and regarded as one entry. Half the reporting limits were assumed for non-detects for the average calculation. Lab duplicates were not included in the assessment. Range of reporting limits were presented for nondetects only.
2. The maximum detected concentration was used for screening.
3. No background values available for surface water.
4. EPA Region 9 Preliminary Remediation Goals (PRGs) for tap water. On-line resources available at http://www.epa.gov/region09/waste/sfund/prg/files/prgtable2004.xls. Last updated December 2004.
   Target Cancer Risk = 1E-6; Target Hazard Quotient =1. Ingestion from drinking and inhalation of volatiles during showering are evaluated to derive the PRGs.
   The PRGs corresponding to a hazard quotient of 1 was adjusted by multiplying 0.1 before they were used as screening values.
   Maximum Contaminant Level (MCL) for lead was used as screening value for lead as no Region 9 PRG is available.
   Screening values for calcium, magnesium, potassium, and sodium were calculated based on an assumption of 2L/day water intake
   and recommended dietary allowances and adequate intakes for 1-3 yr children (500 mg/day and 80 mg/day for calcium and magnesium) and
   minimum requirements for 2-5 yr children (1400 mg/day for potassium) from Marilyn Wright (2001) Dietary Reference Intakes.
   For sodium, an upper limit intake of 2,400 mg/day (http://www.mealformation.com/dailyval.html) was used.
   PRG for chromium (VI) was used as screening value for chromium.
5. Potential ARAR values are from the New York State Ambient Water Quality Standards, Class C for Surface Water.
6. Rationale codes

	Selection Reason:	Above Screening Levels (ASL)
	Deletion Reason:	Essential Nutrient (NUT)
		Below Screening Level (BSL)

Definitions:

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
Q = Qualifier
J = Estimated Value

Attachment 2
Table 3A
SOIL EXPOSURE POINT CONCENTRATION SUMMARY - TOTAL SOIL AT SEAD-121C
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data	Maximum Detected Concentration (1)	Q	EPC Units	Total Soil Reasonable Maximum Exposure (2)		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Volatile Organic Compounds									
Benzene	mg/kg	0.029	0.073	1.8	J	mg/kg	0.19	97.5% Chebyshev	Non-parametric, MH
Semivolatile Organic Compounds									
Benzo(a)anthracene	mg/kg	0.58	0.90	10	J	mg/kg	1.8	97.5% Chebyshev	Non-parametric, MH
Benzo(a)pyrene	mg/kg	0.61	0.93	8.7	J	mg/kg	1.8	97.5% Chebyshev	Non-parametric, MH
Benzo(b)fluoranthene	mg/kg	0.84	1.2	12	J	mg/kg	2.4	97.5% Chebyshev	Non-parametric, MH
Benzo(k)fluoranthene	mg/kg	0.46	0.68	7.5	J	mg/kg	1.3	97.5% Chebyshev	Non-parametric, MH
Chrysene	mg/kg	0.58	0.87	9.1	J	mg/kg	1.7	97.5% Chebyshev	Non-parametric, MH
Dibenz(a,h)anthracene	mg/kg	0.17	0.18	0.47	J	mg/kg	0.21	95% Chebyshev	Non-parametric, MO
Indeno(1,2,3-cd)pyrene	mg/kg	0.20	0.24	0.97	J	mg/kg	0.30	95% Chebyshev	Non-parametric, MO
Pesticides/PCBs									
Dieldrin	mg/kg	0.0021	0.0035	0.041	J	mg/kg	0.0073	97.5% Chebyshev	Non-parametric, MH
Aroclor-1242	mg/kg	0.010	0.012	0.058	J	mg/kg	0.014	95% Chebyshev	Non-parametric, MO
Aroclor-1254	mg/kg	0.042	0.069	0.93		mg/kg	0.14	97.5% Chebyshev	Non-parametric, MH
Aroclor-1260	mg/kg	0.014	0.019	0.20		mg/kg	0.033	97.5% Chebyshev	Non-parametric, MH
Metals									
Aluminum	mg/kg	11,072	11,758	17,600		mg/kg	11,250	95% Student's-t	Normal
Antimony	mg/kg	7.52	13.5	236		mg/kg	29.9	97.5% Chebyshev	Non-parametric, MH
Arsenic	mg/kg	5.45	5.73	11.6		mg/kg	5.73	95% Approximate Gamma	Approximate Gamma, Lognormal
Barium	mg/kg	199	397	2,030	J	mg/kg	82	95% Chebyshev	Non-parametric, MO
Cadmium	mg/kg	3.02	10.50	29.1		mg/kg	0.08	99% Chebyshev	Non-parametric, HE
Copper	mg/kg	408	694	9,750		mg/kg	1,477	97.5% Chebyshev	Non-parametric, MH
Iron	mg/kg	25,557	27,489	54,100		mg/kg	27,507	Mod-t UCL (Adjusted for skewness)	Non-parametric, M
Lead	mg/kg	550	1,033	18,900		mg/kg	550	Mean	See Note
Manganese	mg/kg	482	510	858		mg/kg	473.5	95% Student's-t	Normal
Nickel	mg/kg	40.00	43.28	224		mg/kg	35.95	95% H-UCL	Lognormal, M
Thallium	mg/kg	0.39	0.55	1.8	J	mg/kg	0.20	95% Chebyshev	Non-parametric, MO
Vanadium	mg/kg	18.15	19.05	27	J	mg/kg	18.75	95% Student's-t	Normal
Zinc	mg/kg	355	831	3610		mg/kg	114	97.5% Chebyshev	Non-parametric, MH

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Non-detects were assumed to be half the reporting limit.
2. The EPCs were calculated using the ProUCL (Version 3.00.02) and the EPCs were selected in accordance with the ProUCL Version 3.0 User Guide (USEPA, 2004) and the Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, 2002). The average lead concentration was used as the lead EPC in accordance with the User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows® Version – 32 bit Version (USEPA, 2002).

HE - highly skewed to extremely highly skewed (standard deviation of log-transformed data in the interval (2.0, 3.0] data set.
MH - moderately to highly skewed (standard deviation of log-transformed data in the interval (1.0, 2.0] data set.
MO - moderately skewed (standard deviation of log-transformed data in the interval (0.5,1] data set.
M - mildly skewed (standard deviation of log-transformed data less than or equal to 0.5) data set.

Q - qualifier
J = Estimated Value

Attachemnt 2
Table 3B
SOIL EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE SOIL AT SEAD-121C
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data	Maximum Detected Concentration (1)	Q	EPC Units	Surface Soil (0-2 ft bgs) Reasonable Maximum Exposure (2)		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Semivolatile Organic Compounds									
Benzo(a)anthracene	mg/kg	0.64	1.1	10	J	mg/kg	3.1	99% Chebyshev	Non-parametric, MH
Benzo(a)pyrene	mg/kg	0.78	1.2	8.7	J	mg/kg	3.4	99% Chebyshev	Non-parametric, MH
Benzo(b)fluoranthene	mg/kg	1.0	1.6	12	J	mg/kg	4.5	99% Chebyshev	Non-parametric, MH
Benzo(k)fluoranthene	mg/kg	0.57	0.88	7.5	J	mg/kg	2.4	99% Chebyshev	Non-parametric, MH
Chrysene	mg/kg	0.64	1.0	9.1	J	mg/kg	2.9	99% Chebyshev	Non-parametric, MH
Dibenz(a,h)anthracene	mg/kg	0.17	0.19	0.47	J	mg/kg	0.22	95% Chebyshev	Non-parametric, MO
Indeno(1,2,3-cd)pyrene	mg/kg	0.22	0.28	0.97	J	mg/kg	0.36	95% Chebyshev	Non-parametric, MO
Pesticides/PCBs									
Dieldrin	mg/kg	0.0026	0.0045	0.041	J	mg/kg	0.014	99% Chebyshev	Non-parametric, MH
Aroclor-1242	mg/kg	0.010	0.012	0.058	J	mg/kg	0.016	95% Chebyshev	Non-parametric, MO
Aroclor-1254	mg/kg	0.055	0.093	0.93		mg/kg	0.28	99% Chebyshev	Non-parametric, MH
Aroclor-1260	mg/kg	0.012	0.015	0.085	J	mg/kg	0.030	99% Chebyshev	Non-parametric, MH
Metals									
Aluminum	mg/kg	10,085	10,847	17,000		mg/kg	10,550	95% Student's-t	Normal
Antimony	mg/kg	10.2	18.7	236		mg/kg	60.4	99% Chebyshev	Non-parametric, MH
Arsenic	mg/kg	5.46	5.81	11.6		mg/kg	5.79	95% Approximate Gamma	Approximate Gamma, Lognormal
Barium	mg/kg	231	834	2,030	J	mg/kg	83.8	99% Chebyshev	Non-parametric, HE
Cadmium	mg/kg	4.09	14.2	29.1		mg/kg	0.54	99% Chebyshev	Non-parametric, MH
Copper	mg/kg	515	912	9,750		mg/kg	2,868	99% Chebyshev	Non-parametric, MH
Iron	mg/kg	24,518	26,875	51,700		mg/kg	26,903	Mod-t UCL (Adjusted for skewness)	Non-parametric, M
Lead	mg/kg	735	1,417	18,900		mg/kg	735	Mean	See Note
Manganese	mg/kg	462	493	858		mg/kg	470	95% Student's-t	Normal
Nickel	mg/kg	40.2	45.7	224		mg/kg	35	95% Approximate Gamma	Approximate Gamma
Thallium	mg/kg	0.38	0.54	1.1	J	mg/kg	0.26	95% Chebyshev	Non-parametric, MO
Vanadium	mg/kg	17.0	18.0	25.4		mg/kg	17.5	95% Student's-t	Normal
Zinc	mg/kg	450	1,490	3,610		mg/kg	134	99% Chebyshev	Non-parametric, MH

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Non-detects were assumed to be half the reporting limit.
2. The EPCs were calculated using the ProUCL (Version 3.00.02) and the EPCs were selected in accordance with the ProUCL Version 3.0 User Guide (USEPA, 2004) and the Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, 2002). The average lead concentration was used as the lead EPC in accordance with the User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows® Version – 32 bit Version (USEPA, 2002).

HE - highly skewed to extremely highly skewed (standard deviation of log-transformed data in the interval (2.0, 3.0] data set.
MH - moderately to highly skewed (standard deviation of log-transformed data in the interval (1.0, 2.0] data set.
MO - moderately skewed (standard deviation of log-transformed data in the interval (0.5,1] data set.
M - mildly skewed (standard deviation of log-transformed data less than or equal to 0.5) data set.

Q - qualifier
J = Estimated Value

Attachment 2
Table 3C
SOIL EXPOSURE POINT CONCENTRATION SUMMARY - DITCH SOIL AT SEAD-121C
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121C

Chemical of Potential Concern	Units	Arithmetic Mean (1)	Maximum Detected Concentration (1)	Q	EPC Units	Ditch Soil Reasonable Maximum Exposure (2)		
						Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Semivolatile Organic Compounds								
Benzo(a)anthracene	mg/kg	0.49	1.1	J	mg/kg	1.1	MDC	See Note
Benzo(a)pyrene	mg/kg	0.47	0.90	J	mg/kg	0.90	MDC	See Note
Benzo(b)fluoranthene	mg/kg	0.49	1.1	J	mg/kg	1.1	MDC	See Note
Benzo(k)fluoranthene	mg/kg	0.44	0.58	J	mg/kg	0.58	MDC	See Note
Chrysene	mg/kg	0.50	1.2	J	mg/kg	1.2	MDC	See Note
Indeno(1,2,3-cd)pyrene	mg/kg	0.41	0.27	J	mg/kg	0.27	MDC	See Note
Metals								
Aluminum	mg/kg	9,373	21,500		mg/kg	21,500	MDC	See Note
Antimony	mg/kg	2.34	4.9	J	mg/kg	4.9	MDC	See Note
Arsenic	mg/kg	3.3	6.1	J	mg/kg	6.1	MDC	See Note
Cadmium	mg/kg	2.77	14.3		mg/kg	14.3	MDC	See Note
Copper	mg/kg	177	1,190		mg/kg	1,190	MDC	See Note
Iron	mg/kg	18,305	27,300	J	mg/kg	27,300	MDC	See Note
Lead	mg/kg	144	436		mg/kg	436	MDC	See Note
Manganese	mg/kg	556	918	J	mg/kg	918	MDC	See Note
Vanadium	mg/kg	18.0	29.1	J	mg/kg	29.1	MDC	See Note

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Non-detects were assumed to be half the reporting limit.
2. The maximum detected concentration was used as EPC for the RME scenario. Since the sample size was small (10 samples), the maximum detected concentration was used as the EPC as a conservative estimate.

EPC = Exposure Point Concentration
MDC = Maximum Detected Concentration
RME = Reasonable Maximum Exposure
Q - qualifier
J = Estimated Value

Attachment 2
Table 3D
EXPOSURE POINT CONCENTRATION SUMMARY - GROUNDWATER AT SEAD-121C
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Groundwater
Exposure Point:	SEAD-121C

Chemical of Potential Concern	Units	Arithmetic Mean (1)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure (2)		
						Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Metals								
Antimony	ug/L	4.2	8.4	J	ug/L	8.4	MDC	See note
Chromium	ug/L	5.54	21.4		ug/L	21.4	MDC	See note
Manganese	ug/L	218	297		ug/L	297	MDC	See note

Notes:

1. Only SEAD-121C RI Groundwater data was used in the EPC calculations.
2. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Concentrations for non-detects were assumed to be half the detection limit.
3. The maximum detected concentration was used as EPC for the RME scenario. Since the sample size was small (10 samples), the maximum detected concentration was used as the EPC as a conservative estimate.

RI = Remedial Investigation

EPC = Exposure Point Concentration
MDC = Maximum Detected Concentration
RME = Reasonable Maximum Exposure

Attachment 2
Table 3E
EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE WATER AT SEAD-121C
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Surface water
Exposure Medium:	Surface water
Exposure Point:	SEAD-121C

Chemical of Potential Concern	Units	Arithmetic Mean (1)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure (2)		
						Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Metals								
Aluminum	ug/L	1,427	8,760		ug/L	8,760	MDC	See note
Arsenic	ug/L	6.3	50.3		ug/L	50	MDC	See note
Barium	ug/L	101	423		ug/L	423	MDC	See note
Cadmium	ug/L	2.7	19.5		ug/L	20	MDC	See note
Chromium	ug/L	15.3	129		ug/L	129	MDC	See note
Copper	ug/L	131.335	1,160		ug/L	1,160	MDC	See note
Iron	ug/L	13,136	110,000		ug/L	110,000	MDC	See note
Lead	ug/L	116	839		ug/L	839	MDC	See note
Manganese	ug/L	394	2,380		ug/L	2,380	MDC	See note
Mercury	ug/L	0.32	2.1		ug/L	2.1	MDC	See note
Nickel	ug/L	19.1	154		ug/L	154	MDC	See note
Thallium	ug/L	3.34	6.3		ug/L	6.3	MDC	See note
Vanadium	ug/L	25.4	233		ug/L	233	MDC	See note
Zinc	ug/L	758	6,910		ug/L	6,910	MDC	See note

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Concentrations for non-detects were assumed to be half the detection limit.
2. The maximum detected concentration was used as EPC for the RME scenario. Since the sample size was small (10 samples), the maximum detected concentration was used as the EPC as a conservative estimate.

EPC = Exposure Point Concentration
MDC = Maximum Detected Concentration
RME = Reasonable Maximum Exposure

Attachment 2

TABLE 4A

SOIL EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE SOIL AT SEAD-121I

SEAD-121I

Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil
Exposure Point:	SEAD-121I

Chemical of Potential Concern	Arithmetic Mean Units	Arithmetic Mean (1)	95% UCL of Normal Data	Maximum Detected Concentration (1)	Q	EPC Units	Surface Soil Reasonable Maximum Exposure (2)		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Semivolatile Organic Compounds									
Benzo(a)anthracene	mg/kg	1.9	3.3	28	J	mg/kg	10	99% Chebyshev	Non-parametric, MH
Benzo(a)pyrene	mg/kg	1.7	2.9	23		mg/kg	8.5	99% Chebyshev	Non-parametric, MH
Benzo(b)fluoranthene	mg/kg	1.9	3.3	29		mg/kg	10	99% Chebyshev	Non-parametric, MH
Benzo(k)fluoranthene	mg/kg	1.9	3.0	21	J	mg/kg	8.7	99% Chebyshev	Non-parametric, MH
Chrysene	mg/kg	2.4	4.0	32	J	mg/kg	12	99% Chebyshev	Non-parametric, MH
Dibenz(a,h)anthracene	mg/kg	0.50	0.75	4.6	J	mg/kg	1.2	95% Chebyshev	Non-parametric, MO
Indeno(1,2,3-cd)pyrene	mg/kg	0.88	1.4	8.1	J	mg/kg	3.9	99% Chebyshev	Non-parametric, MH
Pesticides									
Dieldrin	mg/kg	0.0023	0.0041	0.034	J	mg/kg	0.0068	95% Chebyshev	Non-parametric, MO
Heptachlor epoxide	mg/kg	0.0050	0.0081	0.055	J	mg/kg	0.023	99% Chebyshev	Non-parametric, MH
Metals									
Aluminum	mg/kg	6,274	7,227	13,200		mg/kg	5,810	95% Student's-t	Normal
Antimony	mg/kg	2.45	3.69	7.5		mg/kg	3.15	95% Chebyshev	Non-parametric, MO
Arsenic	mg/kg	8.33	10.9	32.1	J	mg/kg	14.9	95% Chebyshev	Non-parametric, MO
Cadmium	mg/kg	0.65	3.0	6.6		mg/kg	0.27	99% Chebyshev	Non-parametric, MH
Chromium	mg/kg	29.3	50.0	439		mg/kg	82.7	95% Chebyshev	Non-parametric, MO
Cobalt	mg/kg	17.7	43.1	205.5	J	mg/kg	9.5	95% Chebyshev	Non-parametric, MO
Iron	mg/kg	18,569	21,554	58,400		mg/kg	21,627	95% Approximate Gamma	Approximate Gamma, Lognormal
Manganese	mg/kg	15,037	30,559	310,500		mg/kg	106,375	99% Chebyshev	Non-parametric, MH
Nickel	mg/kg	49.1	105	342	J	mg/kg	26.8	95% Chebyshev	Non-parametric, MO
Selenium	mg/kg	6.30	48.5	146	J	mg/kg	0.65	99% Chebyshev	Non-parametric, MH
Thallium	mg/kg	6.51	14.5	163	J	mg/kg	53.4	99% Chebyshev	Non-parametric, MH
Vanadium	mg/kg	20.6	29.1	182	J	mg/kg	42.7	95% Chebyshev	Non-parametric, MO

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment.
   Non-detects were assumed to be half the reporting limit.
2. The EPCs were calculated using the ProUCL (Version 3.00.02) and the EPCs were selected in accordance with the ProUCL Version 3.0 User Guide (USEPA, 2004) and the Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, 2002).
   HE - highly skewed to extremely highly skewed (standard deviation of log-transformed data in the interval (2.0, 3.0] data set.
   MH - moderately to highly skewed (standard deviation of log-transformed data in the interval (1.0, 2.0] data set.
   MO - moderately skewed (standard deviation of log-transformed data in the interval (0.5,1] data set.
   M - mildly skewed (standard deviation of log-transformed data less than or equal to 0.5) data set.

Q - qualifier

J = Estimated Value

Attachment 2
TABLE 4B
SOIL EXPOSURE POINT CONCENTRATION SUMMARY - DITCH SOIL AT SEAD-121I
SEAD-121I
Seneca Army Depot Activity

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: SEAD-121I

Chemical of Potential Concern	Arithmetic Mean Units	Arithmetic Mean (1)	Maximum Detected Concentration (1)	Q	EPC Units	Ditch Soil Reasonable Maximum Exposure (2)		
						Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Semivolatile Organic Compounds								
Benzo(a)anthracene	mg/kg	2.5	14		mg/kg	14	MDC	See Note
Benzo(a)pyrene	mg/kg	2.7	16		mg/kg	16	MDC	See Note
Benzo(b)fluoranthene	mg/kg	3.8	22		mg/kg	22	MDC	See Note
Benzo(k)fluoranthene	mg/kg	3.0	23		mg/kg	23	MDC	See Note
Chrysene	mg/kg	3.6	25		mg/kg	25	MDC	See Note
Dibenz(a,h)anthracene	mg/kg	0.62	5.0	J	mg/kg	5	MDC	See Note
Indeno(1,2,3-cd)pyrene	mg/kg	1.3	12	J	mg/kg	12	MDC	See Note
Metals								
Aluminum	mg/kg	6,340	10,300		mg/kg	10,300	MDC	See Note
Arsenic	mg/kg	17.7	104		mg/kg	104	MDC	See Note
Cobalt	mg/kg	23.3	91.9		mg/kg	91.9	MDC	See Note
Iron	mg/kg	17,415	30,400		mg/kg	30,400	MDC	See Note
Manganese	mg/kg	3,195	14,900		mg/kg	14,900	MDC	See Note
Thallium	mg/kg	2.36	21.5		mg/kg	21.5	MDC	See Note
Vanadium	mg/kg	25.2	69.4		mg/kg	69.4	MDC	See Note

Notes:
1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Non-detects were assumed to be half the reporting limit.
2. The maximum detected concentration was used as EPC for the RME scenario. Since the sample size was small (10 samples), the maximum detected concentration was used as the EPC as a conservative estimate.

EPC = Exposure Point Concentration
MDC = Maximum Detected Concentration
RME = Reasonable Maximum Exposure
Q - qualifier
J = Estimated Value

Attachment 2
Table 4C
EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE WATER AT SEAD-121I
SEAD-121I
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Surface water
Exposure Medium:	Surface water
Exposure Point:	SEAD-121I

Chemical of Potential Concern	Units	Arithmetic Mean (1)	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure (2)		
						Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Metals								
Iron	ug/L	953	3,410		ug/L	3,410	MDC	See note
Lead	ug/L	8.83	26.3		ug/L	26.3	MDC	See note
Manganese	ug/L	59.0	206		ug/L	206	MDC	See note
Vanadium	ug/L	1.58	3.9		ug/L	3.9	MDC	See note

Notes:

1. Field duplicates were averaged and regarded as one sample entry. Lab duplicates were not included in the assessment. Concentrations for non-detects were assumed to be half the detection limit.
2. The maximum detected concentration was used as EPC for the RME scenario. Since the sample size was small (10 samples), the maximum detected concentration was used as the EPC as a conservative estimate.

EPC = Exposure Point Concentration
MDC = Maximum Detected Concentration
RME = Reasonable Maximum Exposure

Attachment 2
Table 5A
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR INDUSTRIAL WORKER AND ADOLESCENT TRESPASSER - SURFACE SOIL AT SEAD-121C
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C

Equation for Air EPC from Surface Soil (mg/m³) = CSsurf x PM10 x CF

Variables:
CSsurf = Chemical Concentration in Surface Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 17 ug/m³
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure EPC Data for Surface Soil (mg/kg)	Calculated Air EPC Surface Soil (mg/m³)
Semivolatile Organic Compounds		
Benzo(a)anthracene	3.1	5.2E-08
Benzo(a)pyrene	3.4	5.8E-08
Benzo(b)fluoranthene	4.5	7.7E-08
Benzo(k)fluoranthene	2.4	4.1E-08
Chrysene	2.9	5.0E-08
Dibenz(a,h)anthracene	0.22	3.8E-09
Indeno(1,2,3-cd)pyrene	0.36	6.1E-09
Pesticides/PCBs		
Dieldrin	0.014	2.4E-10
Aroclor-1242	0.016	2.7E-10
Aroclor-1254	0.28	4.8E-09
Aroclor-1260	0.030	5.1E-10
Metals		
Aluminum	10,550	1.8E-04
Antimony	60.4	1.0E-06
Arsenic	5.79	9.9E-08
Barium	83.75	1.4E-06
Cadmium	0.54	9.1E-09
Copper	2,868	4.9E-05
Iron	26,903	4.6E-04
Manganese	470	8.0E-06
Nickel	35	6.0E-07
Thallium	0.3	4.4E-09
Vanadium	17.5	3.0E-07
Zinc	133.5	2.3E-06

Attachment 2
Table 5B
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR INDUSTRIAL WORKER AND ADOLESCENT TRESPASSER - SURFACE SOIL AT SEAD-121I
SEAD-121I
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121I

Equation for Air EPC from Surface Soil (mg/m^3) = CSsurf x PM10 x CF

Variables:
CSsurf = Chemical Concentration in Surface Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 17 ug/m^3
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure	
	EPC Data for Surface Soil (mg/kg)	Calculated Air EPC Surface Soil (mg/m^3)
Semivolatile Organic Compounds		
Benzo(a)anthracene	10	1.7E-07
Benzo(a)pyrene	8.5	1.4E-07
Benzo(b)fluoranthene	10	1.7E-07
Benzo(k)fluoranthene	8.7	1.5E-07
Chrysene	12	2.0E-07
Dibenz(a,h)anthracene	1.2	2.0E-08
Indeno(1,2,3-cd)pyrene	3.9	6.6E-08
Pesticides		
Dieldrin	0.0068	1.2E-10
Heptachlor epoxide	0.023	4.0E-10
Metals		
Aluminum	5,810	9.9E-05
Antimony	3.2	5.4E-08
Arsenic	14.9	2.5E-07
Cadmium	0.3	4.6E-09
Chromium	83	1.4E-06
Cobalt	9.5	1.6E-07
Iron	21,627.1	3.7E-04
Manganese	106,375	1.8E-03
Nickel	26.8	4.6E-07
Selenium	0.7	1.1E-08
Thallium	53.4	9.1E-07
Vanadium	42.7	7.3E-07

Attachment 2
Table 5C
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR CONSTRUCTION WORKER - SURFACE SOIL AT SEAD-121I
SEAD-121I
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121I

Equation for Air EPC from Surface Soil (mg/m³) = CSsurf x PM10 x CF

Variables:
CSsurf = Chemical Concentration in Surface Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 110 ug/m³
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure	
	EPC Data for Surface Soil (mg/kg)	Calculated Air EPC Surface Soil (mg/m³)
Semivolatile Organic Compounds		
Benzo(a)anthracene	10	1.1E-06
Benzo(a)pyrene	8.5	9.4E-07
Benzo(b)fluoranthene	10	1.1E-06
Benzo(k)fluoranthene	8.7	9.6E-07
Chrysene	12	1.3E-06
Dibenz(a,h)anthracene	1.2	1.3E-07
Indeno(1,2,3-cd)pyrene	3.9	4.3E-07
Pesticides		
Dieldrin	0.0068	7.5E-10
Heptachlor epoxide	0.023	2.6E-09
Metals		
Aluminum	5,810	6.4E-04
Antimony	3.2	3.5E-07
Arsenic	14.9	1.6E-06
Cadmium	0.3	3.0E-08
Chromium	83	9.1E-06
Cobalt	9.5	1.0E-06
Iron	21,627.1	2.4E-03
Manganese	106,375	1.2E-02
Nickel	26.8	2.9E-06
Selenium	0.7	7.2E-08
Thallium	53.4	5.9E-06
Vanadium	42.7	4.7E-06

Attachment 2
Table 6
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR CONSTRUCTION WORKER - TOTAL SOIL AT SEAD-121C
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C

Equation for Air EPC from Total Soil (mg/m^3) = CStotal x PM10 x CF

Variables:
CStotal = Chemical Concentration in Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 954 ug/m^3
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure	
	EPC Data for Total Soil (mg/kg)	Calculated Air EPC Total Soil (mg/m^3)
Volatile Organic Compounds		
Benzene	0.19	1.9E-07
Semivolatile Organic Compounds		
Benzo(a)anthracene	1.8	1.7E-06
Benzo(a)pyrene	1.8	1.7E-06
Benzo(b)fluoranthene	2.4	2.3E-06
Benzo(k)fluoranthene	1.3	1.2E-06
Chrysene	1.7	1.6E-06
Dibenz(a,h)anthracene	0.21	2.0E-07
Indeno(1,2,3-cd)pyrene	0.30	2.9E-07
Pesticides/PCBs		
Dieldrin	0.0073	6.9E-09
Aroclor-1242	0.014	1.4E-08
Aroclor-1254	0.14	1.4E-07
Aroclor-1260	0.033	3.2E-08
Metals		
Aluminum	11,250	1.1E-02
Antimony	29.9	2.9E-05
Arsenic	5.73	5.5E-06
Barium	81.7	7.8E-05
Cadmium	0.1	7.2E-08
Copper	1,477	1.4E-03
Iron	27,507	2.6E-02
Manganese	473.5	4.5E-04
Nickel	36.0	3.4E-05
Thallium	0.2	1.9E-07
Vanadium	18.8	1.8E-05
Zinc	114	1.1E-04

Attachment 2
Table 7A
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR INDUSTRIAL WORKER AND ADOLESCENT TRESPASSER - DITCH SOIL AT SEAD-121C
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C

Equation for Air EPC from Ditch Soil (mg/m^3) = CSditch x PM10 x CF

Variables:
CSditch = Chemical Concentration in Ditch Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 17 ug/m^3
CF = Conversion Factor = 1E-9 kg/ug

Chemicals of Potential Concern	Reasonable Maximum Exposure	
	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m^3)
Semivolatile Organic Compounds		
Benzo(a)anthracene	1.1	1.9E-08
Benzo(a)pyrene	0.9	1.5E-08
Benzo(b)fluoranthene	1.1	1.9E-08
Benzo(k)fluoranthene	0.6	9.9E-09
Chrysene	1.2	2.0E-08
Indeno(1,2,3-cd)pyrene	0.3	4.6E-09
Metals		
Aluminum	21,500	3.7E-04
Antimony	4.9	8.3E-08
Arsenic	6.1	1.0E-07
Cadmium	14.3	2.4E-07
Copper	1,190	2.0E-05
Iron	27,300	4.6E-04
Manganese	918.0	1.6E-05
Vanadium	29.1	4.9E-07

Attachment 2
Table 7B
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR INDUSTRIAL WORKER AND ADOLESCENT TRESPASSER - DITCH SOIL AT SEAD-121I
SEAD-121I
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121I

Equation for Air EPC from Ditch Soil (mg/m^3) = CSditch x PM10 x CF

Variables:
CSditch = Chemical Concentration in Ditch Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 17 ug/m^3
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure	
	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m^3)
Semivolatile Organic Compounds		
Benzo(a)anthracene	14	2.4E-07
Benzo(a)pyrene	16	2.7E-07
Benzo(b)fluoranthene	22	3.7E-07
Benzo(k)fluoranthene	23	3.9E-07
Chrysene	25	4.3E-07
Dibenz(a,h)anthracene	5	8.5E-08
Indeno(1,2,3-cd)pyrene	12	2.0E-07
Metals		
Aluminum	10,300	1.8E-04
Arsenic	104	1.8E-06
Cobalt	91.9	1.6E-06
Iron	30,400	5.2E-04
Manganese	14,900	2.5E-04
Thallium	21.5	3.7E-07
Vanadium	69.4	1.2E-06

Attachment 2
Table 7C
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR CONSTRUCTION WORKER - DITCH SOIL AT SEAD-121C
SEAD-121C
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121C

Equation for Air EPC from Ditch Soil (mg/m^3) = CSditch x PM10 x CF

Variables:
Csditch = Chemical Concentration in Ditch Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 110 ug/m^3
CF = Conversion Factor = 1E-9 kg/ug

Chemicals of Potential Concern	Reasonable Maximum Exposure	
	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m^3)
Semivolatile Organic Compounds		
Benzo(a)anthracene	1.1	1.2E-07
Benzo(a)pyrene	0.9	9.9E-08
Benzo(b)fluoranthene	1.1	1.2E-07
Benzo(k)fluoranthene	0.6	6.4E-08
Chrysene	1.2	1.3E-07
Indeno(1,2,3-cd)pyrene	0.3	3.0E-08
Metals		
Aluminum	21,500	2.4E-03
Antimony	4.9	5.4E-07
Arsenic	6.1	6.7E-07
Cadmium	14.3	1.6E-06
Copper	1,190	1.3E-04
Iron	27,300	3.0E-03
Manganese	918.0	1.0E-04
Vanadium	29.1	3.2E-06

Attachment 2
Table 7D
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS FOR CONSTRUCTION WORKER - DITCH SOIL AT SEAD-121I
SEAD-121I
Seneca Army Depot Activity

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Air
Exposure Point:	SEAD-121I

Equation for Air EPC from Ditch Soil (mg/m³) = CSditch x PM10 x CF

Variables:
CSditch = Chemical Concentration in Ditch Soil, from EPC data (mg/kg)
PM10 = Average Measured PM10 Concentration = 110 ug/m³
CF = Conversion Factor = 1E-9 kg/ug

Chemical of Potential Concern	Reasonable Maximum Exposure	
	EPC Data for Ditch Soil (mg/kg)	Calculated Air EPC Ditch Soil (mg/m³)
Semivolatile Organic Compounds		
Benzo(a)anthracene	14	1.5E-06
Benzo(a)pyrene	16	1.8E-06
Benzo(b)fluoranthene	22	2.4E-06
Benzo(k)fluoranthene	23	2.5E-06
Chrysene	25	2.8E-06
Dibenz(a,h)anthracene	5	5.5E-07
Indeno(1,2,3-cd)pyrene	12	1.3E-06
Metals		
Aluminum	10,300	1.1E-03
Arsenic	104	1.1E-05
Cobalt	91.9	1.0E-05
Iron	30,400	3.3E-03
Manganese	14,900	1.6E-03
Thallium	21.5	2.4E-06
Vanadium	69.4	7.6E-06

Attachment 2
Table 8A
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
1,1,2,2-Tetrachloroethane	Chronic	6.0E-02	mg/kg-day	1	6.0E-02	mg/kg-day	N/A	N/A	PPRTV	4/7/2005
1,2-Dichloropropane	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
1,4-Dichlorobenzene	Chronic	3.0E-02	N/A	1	3.0E-02	mg/kg-day	N/A	N/A	NCEA	4/7/2005
Benzene	Chronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	Blood	300	IRIS	3/24/2005
Vinyl chloride	Chronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Liver	30	IRIS	3/10/2005
2-Methylnaphthalene	Chronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	Lungs	1000	IRIS	3/10/2005
Benzo(a)anthracene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)pyrene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(b)fluoranthene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(k)fluoranthene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Chrysene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Dibenz(a,h)anthracene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Indeno(1,2,3-cd)pyrene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Naphthalene	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Body Weight	3000	IRIS	3/15/2005
Phenanthrene	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Aroclor-1242	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Aroclor-1254	Chronic	2.0E-05	mg/Kg-day	1	2.0E-05	mg/kg-day	Eye, Immune System	300	IRIS	3/24/2005
Aroclor-1260	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
4,4'-DDD	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
4,4'-DDE	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
4,4'-DDT	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver	100	IRIS	12/03/2004
Alpha-BHC	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Beta-BHC	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Delta-BHC	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Dieldrin	Chronic	5.0E-05	mg/kg-day	1	5.0E-05	mg/kg-day	Liver	100	IRIS	3/15/2005
Gamma-Chlordane (4)	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver	300	IRIS	3/15/2005
Heptachlor	Chronic	1.3E-05	mg/kg-day	1	1.3E-05	mg/kg-day	Liver	1000	IRIS	12/03/2004
Heptachlor epoxide	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver	300	IRIS	3/15/2005
Aluminum	Chronic	1.0E+00	mg/kg-day	1	1.0E+00	mg/kg-day	N/A	N/A	NCEA	8/26/1996
Antimony	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Whole Body Blood	1000	IRIS	12/03/2004

Attachment 2
Table 8A
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Arsenic	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Skin	3	IRIS	12/03/2004
Barium	Chronic	2E-01	mg/kg-day	0.07	1E-02	mg/kg-day	Kidney	300	IRIS	2/24/06
Cadmium (5)	Chronic	5.0E-04	mg/kg-day	0.05	2.5E-05	mg/kg-day	Kidney	10	IRIS	3/24/2005
Chromium (6)	Chronic	3.0E-03	mg/kg-day	0.025	7.5E-05	mg/kg-day	N/A	900	IRIS	3/24/2005
Cobalt	N/A	2E-02	mg/kg-day	1	2.0E-02	mg/kg-day	N/A	N/A	Region 9	2/24/06
Copper	Chronic	4.0E-02	mg/kg-day	1	4.0E-02	mg/kg-day	Gastrointestinal		HEAST	3/24/2005
Cyanide, Total (7)	Subchronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Whole Body, Thyroid	500	IRIS	3/15/2005
Iron	Chronic	3.0E-01	mg/kg-day	1	3.0E-01	mg/kg-day	N/A	1	NCEA	4E+04
Manganese (8)	Chronic	2.3E-02	mg/kg-day	0.04	9.3E-04	mg/kg-day	Central Nervous System	3	IRIS	12/23/2004
Mercury (9)	Chronic	3.0E-04	mg/kg-day	0.07	2.1E-05	mg/kg-day	Immune System	1000	IRIS	3/16/2005
Nickel	Chronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	Whole Body, Organs	300	IRIS	3/15/2005
Selenium	Chronic	5E-03	mg/kg-day	1	5.0E-03	mg/kg-day	Cellular Necrosis	3	IRIS	2/24/06
Silver	Chronic	5.0E-03	mg/kg-day	0.04	2.0E-04	mg/kg-day	Skin	3	IRIS	3/15/2005
Thallium (10)	Chronic	6.5E-04	mg/kg-day	1	6.5E-04	mg/kg-day	Liver, Blood, Hair	3000	IRIS	12/23/2004
Vanadium	Chronic	7.0E-03	mg/kg-day	0.026	I.8E-04	mg/kg-day	N/A	100	HEAST	3/15/2005
Zinc	Chronic	3.E-01	mg/kg-day	I	3E-01	mg/kg-day	erythrocyte Cu, Zn-superoxide dismutase activity	3	IRIS	2/13/2006

N/A = Not Applicable
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
PPRTV = EPA's Provisional Peer Reviewed Toxicity Values

(1) Source: Supplemental Guidance for Dermal Risk Assessment. Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I). Final. USEPA. 2004.
A default value of 1 was used if no value was available in the USEPA (2004) document.

(2) Dermal RfD = Oral RfD x Adjustment Factor

(3) For IRIS values, the date was the last time IRIS was checked.
For NCEA values, the date was the date of the article provided by NCEA.
For PPRTV values, the date was the date of the Region III RBC table, where the PPRTV was cited from.

Attachment 2
Table 8A
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)

(4) The chronic oral RfD for gamma-chlordane was based on the chronic RfD of chlordane.

(5) The chronic oral RfD for cadmium was based on water, since cadmium is only a COC for surface water

(6) The chronic oral RfD for chromium was based on the chronic RfD of chromium (VI).

(7) The chronic oral RfD for cyanide was based on the chronic RfD of hydrogen cyanide.

(8) The chronic oral RfD for manganese was adjusted by using a modifying factor of 3 in accordance with the IRIS recommendation. In addition, dietary exposure (assumed 5 mg/day) was subtracted. Thus, the RfD used in this risk assessment is 1/6 of the value listed in the IRIS.

(9) The chronic oral RfD for mercury was based on the chronic RfD of mercuric chloride.

(10) The chronic oral RfD for thallium was based on the chronic oral RfD of thallium sulfate adjusted for molecular weight differences.

Attachment 2
Table 8B
NON-CANCER TOXICITY DATA -- INHALATION
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)	Notes
1,1,2,2-Tetrachloroethane	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1,2-Dichloropropane	Chronic	4.0E-03	mg/m^3	1.1E-03	mg/kg-day	respiratory system	300	IRIS	3/10/2005	
1,4-Dichlorobenzene	Chronic	8.0E-01	mg/m^3	2.3E-01	mg/kg-day	liver	100	IRIS	3/10/2005	
Benzene	Chronic	3.0E-02	mg/m^3	8.6E-03	mg/kg-day	Blood	300	IRIS	3/24/2005	
Vinyl chloride	Chronic	1.0E-01	mg/m^3	2.9E-02	mg/kg-day	liver	30	IRIS	3/10/2005	
2-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Benzo(a)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Benzo(a)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Benzo(b)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Benzo(ghi)perylene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Benzo(k)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Chrysene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Dibenz(a,h)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Indeno(1,2,3-cd)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Napthalene	Chronic	3.0E-03	mg/m^3	8.6E-04	mg/kg-day	respiratory system	3000	IRIS	3/15/2005	
Phenanthrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Aroclor-1242	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Aroclor-1254	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Aroclor-1260	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
4,4'-DDD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
4,4'-DDE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
4,4'-DDT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Alpha-BHC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Beta-BHC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Delta-BHC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Dieldrin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Attachment 2
Table 8B
NON-CANCER TOXICITY DATA -- INHALATION
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)	Notes
Gamma-Chlordane	Chronic	7.0E-04	mg/m^3	2.0E-04	mg/kg-day	Liver	1000	IRIS	3/14/2005	
Heptachlor	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Heptachlor epoxide	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Aluminum	Chronic	5E-03	mg/m^3	1.43E-03	mg/kg-day	N/A	N/A	NCEA	6/20/1997	
Antimony	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Arsenic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Barium	Chronic	5.00E-04	mg/m^3	1.43E-04	mg/kg-day	Fetus	1000	HEAST	1997	
Cadmium	Chronic	2.0E-04	mg/m^3	5.7E-05	mg/kg-day	N/A	N/A	NCEA	4/7/2005	
Chromium	Chronic	1.0E-04	mg/m^3	2.9E-05	mg/kg-day	respiratory system	300	IRIS	3/24/2005	(3)
Cobalt	N/A	2E-05	mg/m^3	5.7E-06	mg/kg-day	N/A	N/A	Region 9	2/24/06	
Copper	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Cyanide, Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Iron	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Manganese	Chronic	5.0E-05	mg/m^3	1.4E-05	mg/kg-day	Central Nervous System	1000	IRIS	12/23/04	
Mercury	Chronic	3.0E-04	mg/m3	8.6E-05	mg/kg-day	Body, Brain	30	IRIS	3/14/05	(4)
Nickel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Selenium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Silver	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Thallium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Vanadium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Zinc	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Notes:

N/A = Not Applicable

IRIS = Integrated Risk Information System

PPRTV = EPA's Provisional Peer Reviewed Toxicity Values

(1) Inhalation RfD was adjusted based on the assumption of 70 kg body weight and 20 m^3/day inhalation rate.

Attachment 2
Table 8B
NON-CANCER TOXICITY DATA -- INHALATION
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)	Notes

(2) For IRIS values, the date was the last time IRIS was checked.

For PPRTV or NCEA values, the date was the date of the Region III RBC table, where the PPRTV was cited from.

(3) The chronic oral RfD for chromium was based on the chronic RfD of chromium (VI).

(4) The chronic data for mercury was based on the chronic data of elemental mercury.

Attachment 2
Table 8C
CANCER TOXICITY DATA -- ORAL/DERMAL
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral Cancer Slope Factor Source	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Weight of Evidence Source	Date (3) (MM/DD/YY)
1,1,2,2-Tetrachloroethane	2.0E-01	IRIS	1	2.0E-01	(mg/kg-day)-1	C	IRIS	3/14/2005
1,2-Dichloropropane	6.8E-02	HEAST, 1997	1	6.8E-02	(mg/kg-day)-1	B2	HEAST, 1997	3/14/2005
1,4-Dichlorobenzene	2.4E-02	HEAST, 1997	1	2.4E-02	(mg/kg-day)-1	C	HEAST, 1997	3/14/2005
Benzene	5.5E-02	IRIS	1	5.5E-02	(mg/kg-day)-1	A	IRIS	3/24/2005
Vinyl chloride	1.4E+00	IRIS	1	1.4E+00	(mg/kg-day)-1	A	IRIS	3/14/2005
2-Methylnaphthalene	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A
Acenaphthylene	N/A	N/A	1	N/A	N/A	D	IRIS	12/03/2004
Benzo(a)anthracene	7.3E-01	NCEA	1	7.3E-01	$(mg/kg-day)^{-1}$	B2	IRIS	12/03/2004
Benzo(a)pyrene	7.3E+00	IRIS	1	7.3E+00	$(mg/kg-day)^{-1}$	B2	IRIS	12/03/2004
Benzo(b)fluoranthene	7.3E-01	NCEA	1	7.3E-01	$(mg/kg-day)^{-1}$	B2	IRIS	12/03/2004
Benzo(ghi)perylene	N/A	N/A	1	N/A	N/A	D	IRIS	12/03/2004
Benzo(k)fluoranthene	7.3E-02	NCEA	1	7.3E-02	$(mg/kg-day)^{-1}$	B2	IRIS	12/03/2004
Carbazole	2.0E-02	HEAST, 1997	1	2.0E-02	$(mg/kg-day)^{-1}$	N/A	N/A	N/A
Chrysene	7.3E-03	NCEA	1	7.3E-03	$(mg/kg-day)^{-1}$	B2	IRIS	12/03/2004
Dibenz(a,h)anthracene	7.3E+00	NCEA	1	7.3E+00	$(mg/kg-day)^{-1}$	B2	IRIS	12/03/2004
Indeno(1,2,3-cd)pyrene	7.3E-01	NCEA	1	7.3E-01	$(mg/kg-day)^{-1}$	B2	IRIS	12/03/2004
Naphthalene	N/A	N/A	1	N/A	N/A	C	IRIS	3/15/2005
Phenanthrene	N/A	N/A	1	N/A	N/A	D	IRIS	12/03/2004
Aroclor-1242	2.0E+00	IRIS	1	2.0E+00	(mg/kg-day)-1	B2	IRIS	3/24/2005
Aroclor-1254	2.0E+00	IRIS	1	2.0E+00	(mg/kg-day)-1	B2	IRIS	3/24/2005
Aroclor-1260	2.0E+00	IRIS	1	2.0E+00	(mg/kg-day)-1	B2	IRIS	3/24/2005
4,4'-DDD	2.4E-01	IRIS	1	2.4E-01	(mg/kg-day)-1	B2	IRIS	3/15/2005
4,4'-DDE	3.4E-01	IRIS	1	3.4E-01	$(mg/kg-day)^{-1}$	B2	IRIS	12/03/2004
4,4'-DDT	3.4E-01	IRIS	1	3.4E-01	$(mg/kg-day)^{-1}$	B2	IRIS	12/03/2004
Alpha-BHC	6.3E+00	IRIS	1	6.3E+00	$(mg/kg-day)^{-1}$	B2	IRIS	3/15/2005
Beta-BHC	1.8E+00	IRIS	1	1.8E+00	$(mg/kg-day)^{-1}$	C	IRIS	3/15/2005

Attachment 2
Table 8C
CANCER TOXICITY DATA -- ORAL/DERMAL
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral Cancer Slope Factor Source	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Weight of Evidence Source	Date (3) (MM/DD/YY)
Delta-BHC	N/A	N/A	1	N/A	N/A	D	IRIS	3/15/2005
Dieldrin	1.6E+01	IRIS	1	1.6E+01	(mg/kg-day)-1	B2	IRIS	3/15/2005
Gamma-Chlordane	3.5E-01	IRIS	1	3.5E-01	(mg/kg-day)-1	B2	IRIS	3/15/2005
Heptachlor epoxide	9.1E+00	IRIS	1	9.1E+00	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Heptachlor	4.5E+00	IRIS	1	4.5E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/15/2005
Aluminum	N/A	N/A	N/A	N/A	N/A	D	NCEA	6/20/1997
Antimony	N/A	N/A	0.15	N/A	N/A	N/A	N/A	N/A
Arsenic	1.5E+00	IRIS	1	1.5E+00	(mg/kg-day)$^{-1}$	A	IRIS	12/03/2004
Barium	N/A	N/A	N/A	N/A	N/A	D	IRIS	2/24/06
Cadmium	N/A	N/A	1	N/A	N/A	B1	IRIS	3/24/2005
Chromium	N/A	N/A	1	N/A	N/A	D	IRIS	3/24/2005
Cobalt	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Copper	N/A	N/A	1	N/A	N/A	D	IRIS	3/24/2005
Cyanide, Total	N/A	N/A	1	N/A	N/A	D	IRIS	3/15/2005
Iron	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A
Manganese	N/A	N/A	0.04	N/A	N/A	D	N/A	N/A
Mercury	N/A	N/A	0.07	N/A	N/A	D	IRIS	3/15/2005
Nickel	N/A	N/A	0.04	N/A	N/A	N/A	N/A	N/A
Selenium	N/A	N/A	N/A	N/A	N/A	D	IRIS	2/24/06
Silver	N/A	N/A	0.04	N/A	N/A	D	N/A	N/A
Thallium	N/A	N/A	1	N/A	N/A	D	N/A	N/A
Vanadium	N/A	N/A	0.026	N/A	N/A	N/A	N/A	N/A
Zinc	N/A	N/A	N/A	N/A	N/A	inadequate information	IRIS	02/13/06

IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
PPRTV = EPA's Provisional Peer Reviewed Toxicity Values

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen

Attachment 2
Table 8C
CANCER TOXICITY DATA -- ORAL/DERMAL
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral Cancer Slope Factor Source	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Weight of Evidence Source	Date (3) (MM/DD/YY)

Notes:

E - Evidence of noncarcinogenicity

(1) Source: USEPA (2004) Supplemental Guidance for Dermal Risk Assessment. Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I). Final. A default value of 1 was used if no value was available in the USEPA (2004) document.

(2) Dermal Cancer Slope Factor = Oral Cancer Slope Factor/Adjustment Factor

(3) For IRIS values, the date was the last time IRIS was checked.
For PPRTV values, the date was the date of the Region III RBC table, where the PPRTV was cited from.

Attachment 2
Table 8D
CANCER TOXICITY DATA -- INHALATION
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Unit Risk	Units	Unit Risk Source	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Weight of Evidence Source	Date (2) (MM/DD/YY)
1,1,2,2-Tetrachloroethane	5.8E-05	(ug/m^{3})$^{-1}$	IRIS	3500	2.0E-01	(mg/kg-day)-^{1}	C	IRIS	3/14/2005
1,2-Dichloropropane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	2.2E-02	(mg/kg-day)$^{-1}$	C	HEAST	3/14/2005
Benzene	7.8E-06	(ug/m^{3})$^{-1}$	IRIS	3500	2.7E-02	(mg/kg-day)-1	A	IRIS	3/24/2005
Vinyl chloride	8.8E-06	(ug/m^{3})$^{-1}$	IRIS	3500	3.1E-02	(mg/kg-day)$^{-1}$	A	IRIS	3/14/2005
2-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Acenaphthylene	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	12/03/2004
Benzo(a)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Benzo(a)pyrene	8.9E-04	(ug/m^{3})$^{-1}$	NCEA	3500	3.1E+00	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Benzo(b)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Benzo(ghi)perylene	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	12/03/2004
Benzo(k)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Carbazole	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chrysene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Dibenz(a,h)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Indeno(1,2,3-cd)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
Napthalene	N/A	N/A	N/A	N/A	N/A	N/A	C	IRIS	3/15/2005
Phenanthrene	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	12/03/2004
Aroclor-1242	5.7E-04	N/A	N/A	3500	2.0E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/24/2005
Aroclor-1254	5.7E-04	N/A	N/A	3500	2.0E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/24/2005
Aroclor-1260	5.7E-04	N/A	N/A	3500	2.0E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/24/2005
4,4'-DDD	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	3/15/2005
4,4'-DDE	N/A	N/A	N/A	N/A	N/A	N/A	B2	IRIS	12/03/2004
4,4'-DDT	9.7E-05	(ug/m^{3})$^{-1}$	IRIS	3500	3.4E-01	(mg/kg-day)$^{-1}$	B2	IRIS	12/03/2004
Alpha-BHC	1.8E-03	(ug/m^{3})$^{-1}$	IRIS	3500	6.3E+00	(mg/kg-day)$^{-1}$	B2	IRIS	3/15/2005
Beta-BHC	5.3E-04	(ug/m^{3})$^{-1}$	IRIS	3500	1.9E+00	(mg/kg-day)$^{-1}$	C	IRIS	3/15/2005
Delta-BHC	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	3/15/2005

Attachment 2
Table 8D
CANCER TOXICITY DATA -- INHALATION
SEAD-121C and SEAD-121I
Seneca Army Depot Activity

Chemical of Potential Concern	Unit Risk	Units	Unit Risk Source	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Weight of Evidence Source	Date (2) (MM/DD/YY)
Dieldrin	4.6E-03	$(ug/m^3)^{-1}$	IRIS	3500	1.6E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	3/15/2005
Gamma-Chlordane	1.00E-04	$(ug/m^3)^{-1}$	IRIS	3500	3.5E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	3/15/2005
Heptachlor epoxide	2.6E-03	$(ug/m^3)^{-1}$	IRIS	3500	9.1E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	12/03/2004
Heptachlor	1.3E-03	$(ug/m^3)^{-1}$	IRIS	3500	4.6E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	3/15/2005
Aluminum	N/A	N/A	N/A	N/A	N/A	N/A	D	NCEA	6/20/1997
Antimony	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	IRIS	3500	1.5E+01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	12/03/2004
Barium	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	2/24/2006
Cadmium	1.8E-03	$(ug/m^3)^{-1}$	IRIS	3500	6.3E+00	$(mg/kg\text{-}day)^{-1}$	B1	IRIS	3/24/2005
Chromium	1.2E-02	$(ug/m^3)^{-1}$	IRIS	3500	4.2E+01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	3/24/2005
Cobalt	2.8E-03	$(ug/m^3)^{-1}$	Region 9	3500	9.8E+00	$(mg/kg\text{-}day)^{-1}$	N/A	N/A	N/A
Copper	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	3/24/2005
Cyanide, Total	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	3/15/2005
Iron	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	12/23/2004
Mercury	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	03/15/05
Nickel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selenium	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	2/24/06
Silver	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	03/15/05
Thallium	N/A	N/A	N/A	N/A	N/A	N/A	D	IRIS	12/23/2004
Vanadium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Zinc	N/A	N/A	N/A	N/A	N/A	N/A	inadequate information	IRIS	02/13/06

IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Notes:

(1) The adjustment was based on an assumption of 70 kg body weight and 20 m^3/day inhalation rate.
(2) The date was the last time IRIS was checked.

Attachment 2
Table 9A
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{\text{EPC x IR x CF x FI x EF x ED}}{\text{BW x AT}}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD (mg/kg-day)	Carc. Slope Oral (mg/kg-day)-1	EPC Surface Soil (mg/kg)	EPC Total Soils (mg/kg)	Industrial Worker Intake (mg/kg-day) (Nc)	Industrial Worker Intake (mg/kg-day) (Car)	Industrial Worker Hazard Quotient	Industrial Worker Cancer Risk	Construction Worker Intake (mg/kg-day) (Nc)	Construction Worker Intake (mg/kg-day) (Car)	Construction Worker Hazard Quotient	Construction Worker Cancer Risk	Adolescent Trespasser Intake (mg/kg-day) (Nc)	Adolescent Trespasser Intake (mg/kg-day) (Car)	Adolescent Trespasser Hazard Quotient	Adolescent Trespasser Cancer Risk
Volatile Organic Compounds																
Benzene	4E-03	5.5E-02	N/A	1.9E-01					6.27E-07	8.96E-09	2E-04	5E-10				
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	3.1E+00	1.8E+00		1.08E-06		8E-07		8.09E-08		6E-08		1.69E-08		1E-08
Benzo(a)pyrene	N/A	7.3E+00	3.4E+00	1.8E+00		1.20E-06		9E-06		8.36E-08		6E-07		1.88E-08		1E-07
Benzo(b)fluoranthene	N/A	7.3E-01	4.5E+00	2.4E+00		1.58E-06		1E-06		1.09E-07		8E-08		2.48E-08		2E-08
Benzo(k)fluoranthene	N/A	7.3E-02	2.4E+00	1.3E+00		8.41E-07		6E-08		5.94E-08		4E-09		1.32E-08		1E-09
Chrysene	N/A	7.3E-03	2.9E+00	1.7E+00		1.02E-06		7E-09		7.72E-08		6E-10		1.60E-08		1E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	2.2E-01	2.1E-01		7.74E-08		6E-07		9.54E-09		7E-08		1.21E-09		9E-09
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	3.6E-01	3.0E-01		1.25E-07		9E-08		1.38E-08		1E-08		1.96E-09		1E-09
Pesticides/PCBs																
Dieldrin	5E-05	1.6E+01	1.4E-02	7.3E-03	1.36E-08	4.86E-09	3E-04	8E-08	2.34E-08	3.34E-10	5E-04	5E-09	1.07E-09	7.63E-11	2E-05	1E-09
Aroclor-1242	N/A	2.0E+00	1.6E-02	1.4E-02		5.49E-09		1E-08		6.64E-10		1E-09		8.60E-11		2E-10
Aroclor-1254	2E-05	2.0E+00	2.8E-01	1.4E-01	2.74E-07	9.78E-08	1E-02	2E-07	4.61E-07	6.58E-09	2E-02	1E-08	2.15E-08	1.53E-09	1E-03	3E-09
Aroclor-1260	N/A	2.0E+00	3.0E-02	3.3E-02		1.05E-08		2E-08		1.54E-09		3E-09		1.65E-10		3E-10
Metals																
Aluminum	1E+00	N/A	1.1E+04	1.1E+04	1.03E-02		1E-02		3.63E-02		4E-02		8.09E-04		8E-04	
Antimony	4E-04	N/A	6.0E+01	3.0E+01	5.91E-05		1E-01		9.67E-05		2E-01		4.63E-06		1E-02	
Arsenic	3E-04	1.5E+00	5.8E+00	5.7E+00	5.67E-06	2.02E-06	2E-02	3E-06	1.85E-05	2.64E-07	6E-02	4E-07	4.45E-07	3.18E-08	1E-03	5E-08
Barium	2E-01	N/A	8.4E+01	8.2E+01	8.19E-05		4E-04		2.64E-04		1E-03		6.42E-06		3E-05	
Cadmium	5E-04	N/A	5.4E-01	7.5E-02	5.26E-07		1E-03		2.42E-07		5E-04		4.12E-08		8E-05	
Copper	4E-02	N/A	2.9E+03	1.5E+03	2.81E-03		7E-02		4.77E-03		1E-01		2.20E-04		5E-03	
Iron	3E-01	N/A	2.7E+04	2.8E+04	2.63E-02		9E-02		8.88E-02		3E-01		2.06E-03		7E-03	
Manganese	2E-02	N/A	4.7E+02	4.7E+02	4.60E-04		2E-02		1.53E-03		7E-02		3.61E-05		2E-03	
Nickel	2E-02	N/A	3.5E+01	3.6E+01	3.42E-05		2E-03		1.16E-04		6E-03		2.68E-06		1E-04	
Thallium	6E-04	N/A	2.6E-01	2.0E-01	2.54E-07		4E-04		6.38E-07		1E-03		1.99E-08		3E-05	
Vanadium	7E-03	N/A	1.8E+01	1.9E+01	1.71E-05		2E-03		6.05E-05		9E-03		1.34E-06		2E-04	
Zinc	3E-01	N/A	1.3E+02	1.1E+02	1.31E-04		4E-04		3.68E-04		1E-03		1.02E-05		3E-05	
Total Hazard Quotient and Cancer Risk:							**4E-01**	**1E-05**			**9E-01**	**1E-06**			**3E-02**	**2E-07**

Assumptions for Industrial Worker		**Assumptions for Construction Worker**		**Assumptions for Adolescent Trespasser**	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
EPC=	EPC Surface Only	EPC=	EPC Surface and Subsurface	EPC=	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
IR =	100 mg/day	IR =	330 mg/day	IR =	100 mg/day
FI =	1 unitless	FI =	1 unitless	FI =	1 unitless
EF =	250 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 years	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

Attachment 2
Table 9B
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = EPC x CF x SA x AF x ABS x EV x EF x ED / BW x AT

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD (mg/kg-day)	Carc. Slope Dermal (mg/kg-day)-1	Absorption Factor* (unitless)	EPC Surface Soil (mg/kg)	EPC Total Soils (mg/kg)	Industrial Worker				Construction Worker				Adolescent Trespasser			
						Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
						(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Volatile Organic Compounds																	
Benzene	4E-03	5.5E-02	1.0E-02	N/A	1.9E-01					1.88E-08	2.69E-10	5E-06	1E-11				
Semivolatile Organic Compounds																	
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	3.1E+00	1.8E+00		9.25E-07		7E-07		3.16E-08		2E-08		9.03E-09		7E-09
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	3.4E+00	1.8E+00		1.03E-06		7E-06		3.26E-08		2E-07		1.00E-08		7E-08
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	4.5E+00	2.4E+00		1.36E-06		1E-06		4.27E-08		3E-08		1.33E-08		1E-08
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	2.4E+00	1.3E+00		7.22E-07		5E-08		2.32E-08		2E-09		7.04E-09		5E-10
Chrysene	N/A	7.3E-03	1.3E-01	2.9E+00	1.7E+00		8.77E-07		6E-09		3.01E-08		2E-10		8.55E-09		6E-11
Dibenz(a,h)anthracene	N/A	7.3E+00	1.3E-01	2.2E-01	2.1E-01		6.64E-08		5E-07		3.72E-09		3E-08		6.48E-10		5E-09
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	3.6E-01	3.0E-01		1.07E-07		8E-08		5.39E-09		4E-09		1.04E-09		8E-10
Pesticides/PCBs																	
Dieldrin	5E-05	1.6E+01	1.0E-01	1.4E-02	7.3E-03	8.99E-09	3.21E-09	2E-04	5E-08	7.02E-09	1.00E-10	1E-04	2E-09	4.39E-10	3.13E-11	9E-06	5E-10
Aroclor-1242	N/A	2.0E+00	1.4E-01	1.6E-02	1.4E-02		5.07E-09		1E-08		2.79E-10		6E-10		4.95E-11		1E-10
Aroclor-1254	2E-05	2.0E+00	1.4E-01	2.8E-01	1.4E-01	2.53E-07	9.04E-08	1E-02	2E-07	1.93E-07	2.76E-09	1E-02	6E-09	1.23E-08	8.82E-10	6E-04	2E-09
Aroclor-1260	N/A	2.0E+00	1.4E-01	3.0E-02	3.3E-02		9.74E-09		2E-08		6.48E-10		1E-09		9.51E-11		2E-10
Metals																	
Aluminum	1E+00	N/A	1.0E-03	1.1E+04	1.1E+04	6.81E-05		7E-05		1.09E-04		1E-04		3.32E-06		3E-06	
Antimony	6E-05	N/A	1.0E-03	6.0E+01	3.0E+01	3.90E-07		7E-03		2.90E-07		5E-03		1.90E-08		3E-04	
Arsenic	3E-04	1.5E+00	3.0E-02	5.8E+00	5.7E+00	1.12E-06	4.01E-07	4E-03	6E-07	1.66E-06	2.38E-08	6E-03	4E-08	5.48E-08	3.91E-09	2E-04	6E-09
Barium	1E-02	N/A	1.0E-03	8.4E+01	8.2E+01	5.41E-07		4E-05		7.91E-07		6E-05		2.64E-08		2E-06	
Cadmium	3E-05	N/A	1.0E-03	5.4E-01	7.5E-02	3.47E-09		1E-04		7.27E-10		3E-05		1.69E-10		7E-06	
Copper	4E-02	N/A	1.0E-03	2.9E+03	1.5E+03	1.85E-05		5E-04		1.43E-05		4E-04		9.03E-07		2E-05	
Iron	3E-01	N/A	1.0E-03	2.7E+04	2.8E+04	1.74E-04		6E-04		2.66E-04		9E-04		8.48E-06		3E-05	
Manganese	9E-04	N/A	1.0E-03	4.7E+02	4.7E+02	3.04E-06		3E-03		4.59E-06		5E-03		1.48E-07		2E-04	
Nickel	8E-04	N/A	1.0E-03	3.5E+01	3.6E+01	2.26E-07		3E-04		3.48E-07		4E-04		1.10E-08		1E-05	
Thallium	6E-04	N/A	1.0E-03	2.6E-01	2.0E-01	1.68E-09		3E-06		1.91E-09		3E-06		8.19E-11		1E-07	
Vanadium	2E-04	N/A	1.0E-03	1.8E+01	1.9E+01	1.13E-07		6E-04		1.82E-07		1E-03		5.51E-09		3E-05	
Zinc	3E-01	N/A	1.0E-03	1.3E+02	1.1E+02	8.62E-07		3E-06		1.10E-06		4E-06		4.21E-08		1E-07	
Total Hazard Quotient and Cancer Risk:								**3E-02**	**1E-05**			**3E-02**	**4E-07**			**1E-03**	**1E-07**

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Adolescent Trespasser	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
EPC =	EPC Surface Only	EPC =	EPC Surface and Subsurface	EPC =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
SA =	3,300 cm^2	SA =	3,300 cm^2	SA =	5,867 cm^2
AF =	0.2 mg/cm^2-event	AF =	0.3 mg/cm^2-event	AF =	0.07 mg/cm^2-event
EV =	1 event/day	EV =	1 event/day	EV =	1 event/day
EF =	250 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 years	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
N/A= Information not available.
* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factors for antimony, copper, and iron were assumed to be 0.001 in accordance with the USEPA Region 4 (2000).
Absorption factor for benzene was assumed to be 0.01 in accordance with the USEPA Region 4 (2000) guidance for VOCs.
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

Attachment 2
Table 9C
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C SOIL
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD (mg/kg-day)	Carc. Slope Inhalation (mg/kg-day)-1	Air EPC from Surface Soil (1) (mg/m^3)	Air EPC from Total Soils (2) (mg/m^3)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
					(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Volatile Organic Compounds																
Benzene	8.57E-03	2.73E-02	N/A	1.9E-07					3.63E-08	5.18E-10	4E-06	1E-11				
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	5.2E-08	1.7E-06												
Benzo(a)pyrene	N/A	3.10E+00	5.8E-08	1.7E-06		4.07E-09		1E-08		4.83E-09		1E-08		5.10E-12		2E-11
Benzo(b)fluoranthene	N/A	N/A	7.7E-08	2.3E-06												
Benzo(k)fluoranthene	N/A	N/A	4.1E-08	1.2E-06												
Chrysene	N/A	N/A	5.0E-08	1.6E-06												
Dibenz(a,h)anthracene	N/A	N/A	3.8E-09	2.0E-07												
Indeno(1,2,3-cd)pyrene	N/A	N/A	6.1E-09	2.9E-07												
Pesticides/PCBs																
Dieldrin	N/A	1.61E+01	2.4E-10	6.9E-09		1.65E-11		3E-10		1.93E-11		3E-10		2.07E-14		3E-13
Aroclor-1242	N/A	2.00E+00	2.7E-10	1.4E-08		1.87E-11		4E-11		3.84E-11		8E-11		2.34E-14		5E-14
Aroclor-1254	N/A	2.00E+00	4.8E-09	1.4E-07		3.33E-10		7E-10		3.80E-10		8E-10		4.17E-13		8E-13
Aroclor-1260	N/A	2.00E+00	5.1E-10	3.2E-08		3.58E-11		7E-11		8.93E-11		2E-10		4.50E-14		9E-14
Metals																
Aluminum	1.43E-03	N/A	1.8E-04	1.1E-02	3.51E-05		2E-02		2.10E-03		1E+00		2.20E-07		2E-04	
Antimony	N/A	N/A	1.0E-06	2.9E-05												
Arsenic	N/A	1.51E+01	9.9E-08	5.5E-06		6.88E-09		1E-07		1.53E-08		2E-07		8.64E-12		1E-10
Barium	1.43E-04	N/A	1.4E-06	7.8E-05	2.79E-07		2E-03		1.52E-05		1E-01		1.75E-09		1E-05	
Cadmium	5.70E-05	6.30E+00	9.1E-09	7.2E-08	1.79E-09	6.39E-10	3E-05	4E-09	1.40E-08	2.00E-10	2E-04	1E-09	1.12E-11	8.01E-13	2E-07	5E-12
Copper	N/A	N/A	4.9E-05	1.4E-03												
Iron	N/A	N/A	4.6E-04	2.6E-02												
Manganese	1.43E-05	N/A	8.0E-06	4.5E-04	1.56E-06		1E-01		8.84E-05		6E+00		9.81E-09		7E-04	
Nickel	N/A	N/A	6.0E-07	3.4E-05												
Thallium	N/A	N/A	4.4E-09	1.9E-07												
Vanadium	N/A	N/A	3.0E-07	1.8E-05												
Zinc	N/A	N/A	2.3E-06	1.1E-04												
Total Hazard Quotient and Cancer Risk:							**1E-01**	**1E-07**			**8E+00**	**2E-07**			**9E-04**	**2E-10**

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Adolescent Trespasser	
EPC =	EPC Surface Only	EPC =	EPC Surface and Subsurface	EPC =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
IR =	20 m^3/day	IR =	20 m^3/day	IR =	1.6 m^3/day
EF =	250 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 year	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
(1) This EPC was used for the industrial worker and the adolescent trespasser.
(2) This EPC was used for the construction worker.

Attachment 2
Table 9D
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF DITCH SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Ditch Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
				Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds															
Benzo(a)anthracene	N/A	7.3E-01	1.1E+00		7.69E-08		6E-08		5.07E-08		4E-08		6.03E-09		4E-09
Benzo(a)pyrene	N/A	7.3E+00	9.0E-01		6.29E-08		5E-07		4.15E-08		3E-07		4.93E-09		4E-08
Benzo(b)fluoranthene	N/A	7.3E-01	1.1E+00		7.69E-08		6E-08		5.07E-08		4E-08		6.03E-09		4E-09
Benzo(k)fluoranthene	N/A	7.3E-02	5.8E-01		4.05E-08		3E-09		2.68E-08		2E-09		3.18E-09		2E-10
Chrysene	N/A	7.3E-03	1.2E+00		8.39E-08		6E-10		5.54E-08		4E-10		6.58E-09		5E-11
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	2.7E-01		1.89E-08		1E-08		1.25E-08		9E-09		1.48E-09		1E-09
Metals															
Aluminum	1E+00	N/A	2.2E+04	4.21E-03		4E-03		6.94E-02		7E-02		1.65E-03		2E-03	
Antimony	4E-04	N/A	4.9E+00	9.59E-07		2E-03		1.58E-05		4E-02		3.76E-07		9E-04	
Arsenic	3E-04	1.5E+00	6.1E+00	1.19E-06	4.26E-07	4E-03	6E-07	1.97E-05	2.81E-07	7E-02	4E-07	4.68E-07	3.34E-08	2E-03	5E-08
Cadmium	5E-04	N/A	1.4E+01	2.80E-06		6E-03		4.62E-05		9E-02		1.10E-06		2E-03	
Copper	4E-02	N/A	1.2E+03	2.33E-04		6E-03		3.84E-03		1E-01		9.13E-05		2E-03	
Iron	3E-01	N/A	2.7E+04	5.34E-03		2E-02		8.82E-02		3E-01		2.09E-03		7E-03	
Manganese	2E-02	N/A	9.2E+02	1.80E-04		8E-03		2.96E-03		1E-01		7.04E-05		3E-03	
Vanadium	7E-03	N/A	2.9E+01	5.69E-06		8E-04		9.40E-05		1E-02		2.23E-06		3E-04	
Total Hazard Quotient and Cancer Risk:						**5E-02**	**1E-06**			**8E-01**	**8E-07**			**2E-02**	**1E-07**

Assumptions for Industrial Worker			**Assumptions for Construction Worker**			**Assumptions for Adolescent Trespasser**		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	100	mg/day	IR =	330	mg/day	IR =	100	mg/day
FI =	1	unitless	FI =	1	unitless	FI =	1	unitless
EF =	50	days/year	EF =	250	days/year	EF =	14	days/year
ED =	25	years	ED =	1	years	ED =	5	years
AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

Attachment 2
Table 9E
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO DITCH SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD (mg/kg-day)	Carc. Slope Dermal (mg/kg-day)-1	Absorption Factor* (unitless)	EPC Ditch Soil (mg/kg)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
					(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	1.1E+00		6.60E-08		5E-08		1.98E-08		1E-08		3.22E-09		2E-09
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	9.0E-01		5.40E-08		4E-07		1.62E-08		1E-07		2.63E-09		2E-08
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	1.1E+00		6.60E-08		5E-08		1.98E-08		1E-08		3.22E-09		2E-09
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	5.8E-01		3.48E-08		3E-09		1.04E-08		8E-10		1.70E-09		1E-10
Chrysene	N/A	7.3E-03	1.3E-01	1.2E+00		7.20E-08		5E-10		2.16E-08		2E-10		3.51E-09		3E-11
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	2.7E-01		1.62E-08		1E-08		4.86E-09		4E-09		7.90E-10		6E-10
Metals																
Aluminum	1E+00	N/A	1.0E-03	2.2E+04	2.78E-05		3E-05		2.08E-04		2E-04		6.77E-06		7E-06	
Antimony	6E-05	N/A	1.0E-03	4.9E+00	6.33E-09		1E-04		4.75E-08		8E-04		1.54E-09		3E-05	
Arsenic	3E-04	1.5E+00	3.0E-02	6.1E+00	2.36E-07	8.44E-08	8E-04	1E-07	1.77E-06	2.53E-08	6E-03	4E-08	5.77E-08	4.12E-09	2E-04	6E-09
Cadmium	3E-05	N/A	1.0E-03	1.4E+01	1.85E-08		7E-04		1.39E-07		6E-03		4.51E-09		2E-04	
Copper	4E-02	N/A	1.0E-03	1.2E+03	1.54E-06		4E-05		1.15E-05		3E-04		3.75E-07		9E-06	
Iron	3E-01	N/A	1.0E-03	2.7E+04	3.53E-05		1E-04		2.64E-04		9E-04		8.60E-06		3E-05	
Manganese	9E-04	N/A	1.0E-03	9.2E+02	1.19E-06		1E-03		8.89E-06		1E-02		2.89E-07		3E-04	
Vanadium	2E-04	N/A	1.0E-03	2.9E+01	3.76E-08		2E-04		2.82E-07		2E-03		9.17E-09		5E-05	
Total Hazard Quotient and Cancer Risk:							**3E-03**	**6E-07**			**2E-02**	**2E-07**			**8E-04**	**3E-08**

Assumptions for Industrial Worker			**Assumptions for Construction Worker**			**Assumptions for Adolescent Trespasser**		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
BW =	70	kg	BW =	70	kg	BW =	50	kg
SA =	3,300	cm^2	SA =	3,300	cm^2	SA =	5,867	cm^2
AF =	0.2	mg/cm^2-event	AF =	0.3	mg/cm^2-event	AF =	0.07	mg/cm^2-event
EV =	1	event/day	EV =	1	event/day	EV =	1	event/day
EF =	50	days/year	EF =	250	days/year	EF =	14	days/year
ED =	25	years	ED =	1	years	ED =	5	years
AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
N/A= Information not available.
* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factor for iron was assumed to be 0.001 in accordance with the USEPA Region 4 (2000)
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

Attachment 2
Table 9F
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C DITCH SOIL
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD (mg/kg-day)	Carc. Slope Inhalation (mg/kg-day)-1	Air EPC from Ditch Soil (1) (mg/m^3)	Air EPC from Ditch Soil Const. Worker (2) (mg/m^3)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
					(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	1.9E-08	1.2E-07												
Benzo(a)pyrene	N/A	3.10E+00	1.5E-08	9.9E-08		1.07E-09		3E-09		2.77E-10		9E-10		1.34E-12		4E-12
Benzo(b)fluoranthene	N/A	N/A	1.9E-08	1.2E-07												
Benzo(k)fluoranthene	N/A	N/A	9.9E-09	6.4E-08												
Chrysene	N/A	N/A	2.0E-08	1.3E-07												
Indeno(1,2,3-cd)pyrene	N/A	N/A	4.6E-09	3.0E-08												
Metals																
Aluminum	1.43E-03	N/A	3.7E-04	2.4E-03	7.15E-05		5E-02		4.63E-04		3E-01		4.49E-07		3E-04	
Antimony	N/A	N/A	8.3E-08	5.4E-07												
Arsenic	N/A	1.51E+01	1.0E-07	6.7E-07		7.25E-09		1E-07		1.88E-09		3E-08		9.09E-12		1E-10
Cadmium	5.70E-05	6.30E+00	2.4E-07	1.6E-06	4.76E-08	1.70E-08	8E-04	1E-07	3.08E-07	4.40E-09	5E-03	3E-08	2.98E-10	2.13E-11	5E-06	1E-10
Copper	N/A	N/A	2.0E-05	1.3E-04												
Iron	N/A	N/A	4.6E-04	3.0E-03												
Manganese	1.43E-05	N/A	1.6E-05	1.0E-04	3.05E-06		2E-01		1.98E-05		1E+00		1.92E-08		1E-03	
Vanadium	N/A	N/A	4.9E-07	3.2E-06												
Total Hazard Quotient and Cancer Risk:							**3E-01**	**2E-07**			**2E+00**	**6E-08**			**2E-03**	**3E-10**

Assumptions for Industrial Worker		**Assumptions for Construction Worker**		**Assumptions for Adolescent Trespasser**	
BW =	70 kg	BW =	70 kg	BW =	50 kg
IR =	20 m^3/day	IR =	20 m^3/day	IR =	1.6 m^3/day
EF =	250 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 year	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
(1) This EPC was used for the industrial worker and the adolescent trespasser.
(2) This EPC was used for the construction worker.

Attachment 2
Table 9G
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SURFACE WATER
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
Seneca Army Depot Activity

Equation for Dermal (mg/kg-day) = $\frac{DA \times SA \times EF \times ED \times EV}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

DA = Absorbed Dose per Event, mg/cm^2-event
SA = Surface Area Contact
EF = Exposure Frequency
EV = Event Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Absorbed Dose per Event (DA):

For inorganics: DA = Kp x EPC x t_{event} x C

K_p = Permeability Coefficient, cm/hr
EPC = EPC in Groundwater, mg/L
C = Conversion Factor, 10^{-3} L/cm^3

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose (RfD)

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Permeability Coefficient *Kp*	EPC Surface Water	Absorbed Dose/Event	Industrial Worker				Construction Worker				Adolescent Trespasser			
						Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(cm/hr)	(mg/L)	(mg/cm²-event)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Metals																	
Aluminum	1.0.E+00	N/A	1.0.E-03	8.76.E+00	4.38E-06	Dermal Contact to Surface Water Not Applicable for Industrial Worker				4.27E-05		4E-05		1.97E-05		2E-05	
Arsenic	3.0.E-04	1.5E+00	1.0.E-03	5.03.E-02	2.52E-08					2.45E-07	3.50E-09	8E-04	5E-09	1.13E-07	8.09E-09	4E-04	1E-08
Barium	1.4.E-02	N/A	1.0.E-03	4.23.E-01	2.12E-07					2.06E-06		1E-04		9.52E-07		7E-05	
Cadmium	2.5.E-05	N/A	1.0.E-03	1.95.E-02	9.75E-09					9.50E-08		4E-03		4.39E-08		2E-03	
Chromium	7.5.E-05	N/A	2.0.E-03	1.29.E-01	1.29E-07					1.26E-06		2E-02		5.81E-07		8E-03	
Copper	4.0.E-02	N/A	1.0.E-03	1.16.E+00	5.80E-07					5.65E-06		1E-04		2.61E-06		7E-05	
Iron	3.0.E-01	N/A	1.0.E-03	1.10.E+02	5.50E-05					5.36E-04		2E-03		2.48E-04		8E-04	
Manganese	9.3.E-04	N/A	1.0.E-03	2.38.E+00	1.19E-06					1.16E-05		1E-02		5.36E-06		6E-03	
Mercury	2.1.E-05	N/A	1.0.E-03	2.10.E-03	1.05E-09					1.02E-08		5E-04		4.73E-09		2E-04	
Nickel	8.0.E-04	N/A	2.0.E-04	1.54.E-01	1.54E-08					1.50E-07		2E-04		6.93E-08		9E-05	
Thallium	6.5.E-04	N/A	1.0.E-03	6.30.E-03	3.15E-09					3.07E-08		5E-05		1.42E-08		2E-05	
Vanadium	1.8.E-04	N/A	1.0.E-03	2.33.E-01	1.17E-07					1.14E-06		6E-03		5.24E-07		3E-03	
Zinc	3.0.E-01	N/A	6.00E-04	6.91.E+00	2.07E-06					2.02E-05		7E-05		9.33E-06		3E-05	
Total Hazard Quotient and Cancer Risk:												**4E-02**	**5E-09**			**2E-02**	**1E-08**

Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
BW =	70	kg	BW =	50	kg
SA =	2,490	cm^2	SA =	5,867	cm^2
EV=	1	event/day	EV=	1	event/day
EF =	100	days/year	EF =	14	days/year
ED =	1	year	ED =	5	year
t_{event} =	0.5	hr/event	t_{event} =	0.5	hr/event
AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
Kp value from Exhibit 3-1 of "Supplemental Guidance for Dermal Risk Assessment", Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume 1), August 16, 2004. For arsenic, iron, manganese, thallium, and vanadium the default inorganic value of 0.001 was used.
Kp for Cr(VI) was used for chromium.

Attachment 2
Table 9H
CALCULATION OF INTAKE AND RISK FROM THE INTAKE OF GROUNDWATER
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
Seneca Army Depot Activity

$$\text{Equation for Intake (mg/kg-day)} = \frac{EPC \times IR \times EF \times ED}{BW \times AT}$$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Groundwater (mg/L)

IR = Intake Rate

EF = Exposure Frequency

ED=Exposure Duration

BW=Bodyweight

AT=Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD (mg/kg-day)	Carc. Slope Oral (mg/kg-day)-1	EPC Groundwater (mg/liter)	Industrial Worker				Construction Worker				Adolescent Trespasser			
				Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
				(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Antimony	4.E-04	N/A	0.0084	8.2E-05	2.9E-05	2E-01		8.2E-05	1.2E-06	2E-01		1.3E-05	9.2E-07	3E-02	
Chromium	3.E-03	N/A	0.0214	2.1E-04	7.5E-05	7E-02		2.1E-04	3.0E-06	7E-02		3.3E-05	2.3E-06	1E-02	
Manganese	2.E-02	N/A	0.297	2.9E-03	1.0E-03	1E-01		2.9E-03	4.2E-05	1E-01		4.6E-04	3.3E-05	2E-02	
Total Hazard Quotient and Cancer Risk:						**4E-01**	**0E+00**			**4E-01**	**0E+00**			**6E-02**	**0E+00**

Assumptions for Industrial Worker			Assumptions for Construction Worker			Assumptions for Child Trespasser		
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	1	liters/day	IR =	1	liters/day	IR =	2.0	liters/day
EF =	250	days/year	EF =	250	days/year	EF =	14	days/year
ED =	25	years	ED =	1	years	ED =	5	years
AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.

N/A= Information not available.

Attachment 2
Table 9I
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO GROUNDWATER
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121C
Seneca Army Depot Activity

Equation for Dermal (mg/kg-day) = $\frac{DA \times SA \times EF \times ED \times EV}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

DA = Absorbed Dose per Event, mg/cm^2-event
SA = Surface Area Contact
EF = Exposure Frequency
EV = Event Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Absorbed Dose per Event (DA):

For inorganics: $DA = K_p \times EPC \times t_{event} \times CF$

K_p = Permeability Coefficient, cm/hr
EPC = EPC in Groundwater, mg/L
CF = Conversion Factor, 10^{-3} L/cm^3

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD (mg/kg-day)	Carc. Slope Dermal (mg/kg-day)-1	Permeability Coefficient Kp (cm/hr)	t_{event} (hr/event)	EPC Ground Water (mg/L)	Absorbed Dose/Event (mg/cm²-event)	Industrial Worker Intake (mg/kg-day) (Nc)	Industrial Worker Intake (mg/kg-day) (Car)	Industrial Worker Hazard Quotient	Industrial Worker Cancer Risk	Construction Worker Intake (mg/kg-day) (Nc)	Construction Worker Intake (mg/kg-day) (Car)	Construction Worker Hazard Quotient	Construction Worker Cancer Risk	Adolescent Trespasser Intake (mg/kg-day) (Nc)	Adolescent Trespasser Intake (mg/kg-day) (Car)	Adolescent Trespasser Hazard Quotient	Adolescent Trespasser Cancer Risk
Metals							Dermal Contact to Ground Water Not Applicable								Dermal Contact to Ground Water Not Applicable			
Antimony	4.E-04	N/A	1.E-03	5.E-01	8.E-03	4.20E-09					4.09E-08		1E-04					
Chromium	3.E-03	N/A	2.E-03	5.E-01	2.E-02	2.14E-08					2.09E-07		7E-05					
Manganese	2.E-02	N/A	1.E-03	5.E-01	3.E-01	1.49E-07					1.45E-06		6E-05					
Total Hazard Quotient and Cancer Risk:													2E-04	0E+00				

Assumptions for Construction Worker

BW =	70	kg
SA =	2,490	cm2
EV=	1	event/day
EF =	100	days/year
ED =	1	years
t_{event} =	0.5	hr/event
AT (Nc) =	365	days
AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

Attachment 2
Table 10A
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Surface Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
				Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds															
Benzo(a)anthracene	N/A	7.3E-01	1.0E+01		3.48E-06		3E-06		4.60E-07		3E-07		5.46E-08		4E-08
Benzo(a)pyrene	N/A	7.3E+00	8.5E+00		2.98E-06		2E-05		3.93E-07		3E-06		4.67E-08		3E-07
Benzo(b)fluoranthene	N/A	7.3E-01	1.0E+01		3.50E-06		3E-06		4.62E-07		3E-07		5.49E-08		4E-08
Benzo(k)fluoranthene	N/A	7.3E-02	8.7E+00		3.03E-06		2E-07		4.01E-07		3E-08		4.76E-08		3E-09
Chrysene	N/A	7.3E-03	1.2E+01		4.20E-06		3E-08		5.55E-07		4E-09		6.59E-08		5E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	1.2E+00		4.04E-07		3E-06		5.33E-08		4E-07		6.33E-09		5E-08
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	3.9E+00		1.35E-06		1E-06		1.79E-07		1E-07		2.12E-08		2E-08
Pesticides															
Dieldrin	5E-05	1.6E+01	6.8E-03	6.66E-09	2.38E-09	1E-04	4E-08	2.20E-08	3.14E-10	4E-04	5E-09	5.22E-10	3.73E-11	1E-05	6E-10
Heptachlor epoxide	5E-04	9.1E+00	2.3E-02	2.30E-08	8.20E-09	5E-05	7E-08	7.58E-08	1.08E-09	2E-04	1E-08	1.80E-09	1.29E-10	4E-06	1E-09
Metals															
Aluminum	1E+00	N/A	5.8E+03	5.68E-03		6E-03		1.88E-02		2E-02		4.46E-04		4E-04	
Antimony	4E-04	N/A	3.2E+00	3.08E-06		8E-03		1.02E-05		3E-02		2.42E-07		6E-04	
Arsenic	3E-04	1.5E+00	1.5E+01	1.46E-05	5.21E-06	5E-02	8E-06	4.82E-05	6.88E-07	2E-01	1E-06	1.14E-06	8.17E-08	4E-03	1E-07
Cadmium	5E-04	N/A	2.7E-01	2.64E-07		5E-04		8.72E-07		2E-03		2.07E-08		4E-05	
Chromium	3E-03	N/A	8.3E+01	8.09E-05		3E-02		2.67E-04		9E-02		6.35E-06		2E-03	
Cobalt	2E-02	N/A	9.5E+00	9.30E-06		5E-04		3.07E-05		2E-03		7.29E-07		4E-05	
Iron	3E-01	N/A	2.2E+04	2.12E-02		7E-02		6.98E-02		2E-01		1.66E-03		6E-03	
Manganese	2E-02	N/A	1.1E+05	1.04E-01		4E+00		3.43E-01		1E+01		8.16E-03		3E-01	
Nickel	2E-02	N/A	2.7E+01	2.62E-05		1E-03		8.65E-05		4E-03		2.06E-06		1E-04	
Selenium	5E-03	N/A	6.5E-01	6.36E-07		1E-04		2.10E-06		4E-04		4.99E-08		1E-05	
Thallium	6E-04	N/A	5.3E+01	5.23E-05		8E-02		1.73E-04		3E-01		4.10E-06		6E-03	
Vanadium	7E-03	N/A	4.3E+01	4.17E-05		6E-03		1.38E-04		2E-02		3.27E-06		5E-04	
Total Hazard Quotient and Cancer Risk:						**5E+00**	**4E-05**			**2E+01**	**5E-06**			**4E-01**	**6E-07**

Assumptions for Industrial Worker			Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
EPC=	EPC Surface Only		EPC=	EPC Surface and Subsurface		EPC=	EPC Surface Only	
BW =	70	kg	BW =	70	kg	BW =	50	kg
IR =	100	mg/day	IR =	330	mg/day	IR =	100	mg/day
FI =	1	unitless	FI =	1	unitless	FI =	1	unitless
EF =	250	days/year	EF =	250	days/year	EF =	14	days/year
ED =	25	years	ED =	1	years	ED =	5	years
AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

Attachment 2
Table 10B
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Surface Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	1.0E+01		2.99E-06		2E-06		1.79E-07		1E-07		2.92E-08		2E-08
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	8.5E+00		2.56E-06		2E-05		1.53E-07		1E-06		2.50E-08		2E-07
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	1.0E+01		3.00E-06		2E-06		1.80E-07		1E-07		2.93E-08		2E-08
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	8.7E+00		2.60E-06		2E-07		1.56E-07		1E-08		2.54E-08		2E-09
Chrysene	N/A	7.3E-03	1.3E-01	1.2E+01		3.60E-06		3E-08		2.16E-07		2E-09		3.52E-08		3E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	1.3E-01	1.2E+00		3.46E-07		3E-06		2.08E-08		2E-07		3.38E-09		2E-08
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	3.9E+00		1.16E-06		8E-07		6.97E-08		5E-08		1.13E-08		8E-09
Pesticides																
Dieldrin	5E-05	1.6E+01	1.0E-01	6.8E-03	4.39E-09	1.57E-09	9E-05	3E-08	6.59E-09	9.41E-11	1E-04	2E-09	2.14E-10	1.53E-11	4E-06	2E-10
Heptachlor epoxide	5E-04	9.1E+00	1.0E-01	2.3E-02	1.52E-08	5.42E-09	3E-05	5E-08	2.27E-08	3.25E-10	5E-05	3E-09	7.40E-10	5.28E-11	1E-06	5E-10
Metals																
Aluminum	1E+00	N/A	1.0E-03	5.8E+03	3.75E-05		4E-05		5.63E-05		6E-05		1.83E-06		2E-06	
Antimony	6E-05	N/A	1.0E-03	3.2E+00	2.03E-08		3E-04		3.05E-08		5E-04		9.92E-10		2E-05	
Arsenic	3E-04	1.5E+00	3.0E-02	1.5E+01	2.89E-06	1.03E-06	1E-02	2E-06	4.34E-06	6.19E-08	1E-02	9E-08	1.41E-07	1.01E-08	5E-04	2E-08
Cadmium	3E-05	N/A	1.0E-03	2.7E-01	1.74E-09		7E-05		2.62E-09		1E-04		8.51E-11		3E-06	
Chromium	8E-05	N/A	1.0E-03	8.3E+01	5.34E-07		7E-03		8.01E-07		1E-02		2.61E-08		3E-04	
Cobalt	2E-02	N/A	1.0E-03	9.5E+00	6.14E-08		3E-06		9.20E-08		5E-06		2.99E-09		1E-07	
Iron	3E-01	N/A	1.0E-03	2.2E+04	1.40E-04		5E-04		2.09E-04		7E-04		6.81E-06		2E-05	
Manganese	9E-04	N/A	1.0E-03	1.1E+05	6.87E-04		7E-01		1.03E-03		1E+00		3.35E-05		4E-02	
Nickel	8E-04	N/A	1.0E-03	2.7E+01	1.73E-07		2E-04		2.60E-07		3E-04		8.44E-09		1E-05	
Selenium	5E-03	N/A	1.0E-03	6.5E-01	4.20E-09		8E-07		6.30E-09		1E-06		2.05E-10		4E-08	
Thallium	6E-04	N/A	1.0E-03	5.3E+01	3.45E-07		5E-04		5.18E-07		8E-04		1.68E-08		3E-05	
Vanadium	2E-04	N/A	1.0E-03	4.3E+01	2.76E-07		2E-03		4.13E-07		2E-03		1.34E-08		7E-05	
Total Hazard Quotient and Cancer Risk:							**8E-01**	**3E-05**			**1E+00**	**2E-06**			**4E-02**	**3E-07**

	Assumptions for Industrial Worker	Assumptions for Construction Worker	Assumptions for Adolescent Trespasser
CF =	1E-06 kg/mg	1E-06 kg/mg	1E-06 kg/mg
EPC =	EPC Surface Only	EPC Surface Only	EPC Surface Only
BW =	70 kg	70 kg	50 kg
SA =	3,300 cm^2	3,300 cm^2	5,867 cm^2
AF =	0.2 mg/cm^2-event	0.3 mg/cm^2-event	0.07 mg/cm^2-event
EV =	1 event/day	1 event/day	1 event/day
EF =	250 days/year	250 days/year	14 days/year
ED =	25 years	1 years	5 years
AT (Nc) =	9,125 days	365 days	1,825 days
AT (Car) =	25,550 days	25,550 days	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
N/A= Information not available.
* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factors for chromium, iron, manganese, thallium, and vanadium were assumed to be 0.001 in accordance with the USEPA Region 4 (2000) Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

Attachment 2
Table 10C
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I SOIL
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC from Surface Soil (1)	Air EPC from Surface Soil Const. Worker (2)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m^3)	(mg/m^3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	1.7E-07	1.1E-06												
Benzo(a)pyrene	N/A	3.10E+00	1.4E-07	9.4E-07		1.01E-08		3E-08		2.62E-09		8E-09		1.27E-11		4E-11
Benzo(b)fluoranthene	N/A	N/A	1.7E-07	1.1E-06												
Benzo(k)fluoranthene	N/A	N/A	1.5E-07	9.6E-07												
Chrysene	N/A	N/A	2.0E-07	1.3E-06												
Dibenz(a,h)anthracene	N/A	N/A	2.0E-08	1.3E-07												
Indeno(1,2,3-cd)pyrene	N/A	N/A	6.6E-08	4.3E-07												
Pesticides																
Dieldrin	N/A	1.61E+01	1.2E-10	7.5E-10		8.08E-12		1E-10		2.09E-12		3E-11		1.01E-14		2E-13
Heptachlor epoxide	N/A	9.10E+00	4.0E-10	2.6E-09		2.79E-11		3E-10		7.22E-12		7E-11		3.50E-14		3E-13
Metals																
Aluminum	1.43E-03	N/A	9.9E-05	6.4E-04	1.93E-05		1E-02		1.25E-04		9E-02		1.21E-07		8E-05	
Antimony	N/A	N/A	5.4E-08	3.5E-07												
Arsenic	N/A	1.51E+01	2.5E-07	1.6E-06		1.77E-08		3E-07		4.59E-09		7E-08		2.22E-11		3E-10
Cadmium	5.70E-05	6.30E+00	4.6E-09	3.0E-08	8.98E-10	3.21E-10	2E-05	2E-09	5.81E-09	8.30E-11	1E-04	5E-10	5.63E-12	4.02E-13	1E-07	3E-12
Chromium	2.86E-05	4.20E+01	1.4E-06	9.1E-06	2.75E-07	9.83E-08	1E-02	4E-06	1.78E-06	2.54E-08	6E-02	1E-06	1.73E-09	1.23E-10	6E-05	5E-09
Cobalt	5.71E-06	9.80E+00	1.6E-07	1.0E-06	3.16E-08	1.13E-08	6E-03	1E-07	2.05E-07	2.92E-09	4E-02	3E-08	1.98E-10	1.42E-11	3E-05	1E-10
Iron	N/A	N/A	3.7E-04	2.4E-03												
Manganese	1.43E-05	N/A	1.8E-03	1.2E-02	3.54E-04		2E+01		2.29E-03		2E+02		2.22E-06		2E-01	
Nickel	N/A	N/A	4.6E-07	2.9E-06												
Selenium	N/A	N/A	1.1E-08	7.2E-08												
Thallium	N/A	N/A	9.1E-07	5.9E-06												
Vanadium	N/A	N/A	7.3E-07	4.7E-06												
Total Hazard Quotient and Cancer Risk:							**2E+01**	**5E-06**			**2E+02**	**1E-06**			**2E-01**	**6E-09**

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Adolescent Trespasser	
EPC =	EPC Surface Only	EPC =	EPC Surface Only for Construction Worker	EPC =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
IR =	20 m^3/day	IR =	20 m^3/day	IR =	1.6 m^3/day
EF =	250 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 year	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.
(1) This EPC was used for the industrial worker and the adolescent trespasser.
(2) This EPC was used for the construction worker.

Attachment 2
Table 10D
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF DITCH SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Ditch Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
				Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds															
Benzo(a)anthracene	N/A	7.3E-01	1.4E+01		9.78E-07		7E-07		6.46E-07		5E-07		7.67E-08		6E-08
Benzo(a)pyrene	N/A	7.3E+00	1.6E+01		1.12E-06		8E-06		7.38E-07		5E-06		8.77E-08		6E-07
Benzo(b)fluoranthene	N/A	7.3E-01	2.2E+01		1.54E-06		1E-06		1.01E-06		7E-07		1.21E-07		9E-08
Benzo(k)fluoranthene	N/A	7.3E-02	2.3E+01		1.61E-06		1E-07		1.06E-06		8E-08		1.26E-07		9E-09
Chrysene	N/A	7.3E-03	2.5E+01		1.75E-06		1E-08		1.15E-06		8E-09		1.37E-07		1E-09
Dibenz(a,h)anthracene	N/A	7.3E+00	5.0E+00		3.49E-07		3E-06		2.31E-07		2E-06		2.74E-08		2E-07
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.2E+01		8.39E-07		6E-07		5.54E-07		4E-07		6.58E-08		5E-08
Metals															
Aluminum	1E+00	N/A	1.0E+04	2.02E-03		2E-03		3.33E-02		3E-02		7.90E-04		8E-04	
Arsenic	3E-04	1.5E+00	1.0E+02	2.04E-05	7.27E-06	7E-02	1E-05	3.36E-04	4.80E-06	1E+00	7E-06	7.98E-06	5.70E-07	3E-02	9E-07
Cobalt	2E-02	N/A	9.2E+01	1.80E-05		9E-04		2.97E-04		1E-02		7.05E-06		4E-04	
Iron	3E-01	N/A	3.0E+04	5.95E-03		2E-02		9.82E-02		3E-01		2.33E-03		8E-03	
Manganese	2E-02	N/A	1.5E+04	2.92E-03		1E-01		4.81E-02		2E+00		1.14E-03		5E-02	
Thallium	6E-04	N/A	2.2E+01	4.21E-06		7E-03		6.94E-05		1E-01		1.65E-06		3E-03	
Vanadium	7E-03	N/A	6.9E+01	1.36E-05		2E-03		2.24E-04		3E-02		5.32E-06		8E-04	
Total Hazard Quotient and Cancer Risk:						**2E-01**	**2E-05**			**4E+00**	**2E-05**			**9E-02**	**2E-06**

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Adolescent Trespasser	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
EPC=	EPC Surface Only	EPC=	EPC Surface Only	EPC=	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
IR =	100 mg/day	IR =	330 mg/day	IR =	100 mg/day
FI =	1 unitless	FI =	1 unitless	FI =	1 unitless
EF =	50 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 years	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

Attachment 2
Table 10E
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO DITCH SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times CF \times SA \times AF \times ABS \times EV \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = Exposure Point Concentration in Ditch Soil, mg/kg
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EV = Event Frequency
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Ditch Soil	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	7.3E-01	1.3E-01	1.4E+01		8.40E-07		6E-07		2.52E-07		2E-07		4.10E-08		3E-08
Benzo(a)pyrene	N/A	7.3E+00	1.3E-01	1.6E+01		9.59E-07		7E-06		2.88E-07		2E-06		4.68E-08		3E-07
Benzo(b)fluoranthene	N/A	7.3E-01	1.3E-01	2.2E+01		1.32E-06		1E-06		3.96E-07		3E-07		6.44E-08		5E-08
Benzo(k)fluoranthene	N/A	7.3E-02	1.3E-01	2.3E+01		1.38E-06		1E-07		4.14E-07		3E-08		6.73E-08		5E-09
Chrysene	N/A	7.3E-03	1.3E-01	2.5E+01		1.50E-06		1E-08		4.50E-07		3E-09		7.31E-08		5E-10
Dibenz(a,h)anthracene	N/A	7.3E+00	1.3E-01	5.0E+00		3.00E-07		2E-06		8.99E-08		7E-07		1.46E-08		1E-07
Indeno(1,2,3-cd)pyrene	N/A	7.3E-01	1.3E-01	1.2E+01		7.20E-07		5E-07		2.16E-07		2E-07		3.51E-08		3E-08
Metals																
Aluminum	1E+00	N/A	1.0E-03	1.0E+04	1.33E-05		1E-05		9.98E-05		1E-04		3.25E-06		3E-06	
Arsenic	3E-04	1.5E+00	3.0E-02	1.0E+02	4.03E-06	1.44E-06	1E-02	2E-06	3.02E-05	4.32E-07	1E-01	6E-07	9.83E-07	7.02E-08	3E-03	1E-07
Cobalt	2E-02	N/A	1.0E-03	9.2E+01	1.19E-07		6E-06		8.90E-07		4E-05		2.90E-08		1E-06	
Iron	3E-01	N/A	1.0E-03	3.0E+04	3.93E-05		1E-04		2.94E-04		1E-03		9.58E-06		3E-05	
Manganese	9E-04	N/A	1.0E-03	1.5E+04	1.92E-05		2E-02		1.44E-04		2E-01		4.69E-06		5E-03	
Thallium	6E-04	N/A	1.0E-03	2.2E+01	2.78E-08		4E-05		2.08E-07		3E-04		6.77E-09		1E-05	
Vanadium	2E-04	N/A	1.0E-03	6.9E+01	8.96E-08		5E-04		6.72E-07		4E-03		2.19E-08		1E-04	
Total Hazard Quotient and Cancer Risk:							**3E-02**	**1E-05**			**3E-01**	**4E-06**			**8E-03**	**7E-07**

Assumptions for Industrial Worker			Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
CF =	1E-06	kg/mg	CF =	1E-06	kg/mg	CF =	1E-06	kg/mg
EPC =	EPC Surface Only		EPC =	EPC Surface Only		EPC =	EPC Surface Only	
BW =	70	kg	BW =	70	kg	BW =	50	kg
SA =	3,300	cm^2	SA =	3,300	cm^2	SA =	5,867	cm^2
AF =	0.2	mg/cm^2-event	AF =	0.3	mg/cm^2-event	AF =	0.07	mg/cm^2-event
EV =	1	event/day	EV =	1	event/day	EV =	1	event/day
EF =	50	days/year	EF =	250	days/year	EF =	14	days/year
ED =	25	years	ED =	1	years	ED =	5	years
AT (Nc) =	9,125	days	AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
N/A= Information not available.
* Absorption factors from Exhibit 3-4 of USEPA (2004) Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume I).
Absorption factors for iron, manganese, and thallium were assumed to be 0.001 in accordance with the USEPA Region 4 (2000)
Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins (http://www.epa.gov/region4/waste/ots/healtbul.htm).

Attachment 2
Table 10F
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I DITCH SOIL
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{EPC \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

EPC = EPC in Air, mg/m^3

IR = Inhalation Rate

EF = Exposure Frequency

ED = Exposure Duration

BW = Bodyweight

AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC from Ditch Soil (1)	Air EPC from Ditch Soil Const. Worker (2)	Industrial Worker				Construction Worker				Adolescent Trespasser			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m^3)	(mg/m^3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Semivolatile Organic Compounds																
Benzo(a)anthracene	N/A	N/A	2.4E-07	1.5E-06												
Benzo(a)pyrene	N/A	3.10E+00	2.7E-07	1.8E-06		1.90E-08		6E-08		4.92E-09		2E-08		2.38E-11		7E-11
Benzo(b)fluoranthene	N/A	N/A	3.7E-07	2.4E-06												
Benzo(k)fluoranthene	N/A	N/A	3.9E-07	2.5E-06												
Chrysene	N/A	N/A	4.3E-07	2.8E-06												
Dibenz(a,h)anthracene	N/A	N/A	8.5E-08	5.5E-07												
Indeno(1,2,3-cd)pyrene	N/A	N/A	2.0E-07	1.3E-06												
Metals																
Aluminum	1.43E-03	N/A	1.8E-04	1.1E-03	3.43E-05		2E-02		2.22E-04		2E-01		2.15E-07		2E-04	
Arsenic	N/A	1.51E+01	1.8E-06	1.1E-05		1.24E-07		2E-06		3.20E-08		5E-07		1.55E-10		2E-09
Cobalt	5.71E-06	9.80E+00	1.6E-06	1.0E-05	3.06E-07	1.09E-07	5E-02	1E-06	1.98E-06	2.83E-08	3E-01	3E-07	1.92E-09	1.37E-10	3E-04	1E-09
Iron	N/A	N/A	5.2E-04	3.3E-03												
Manganese	1.43E-05	N/A	2.5E-04	1.6E-03	4.96E-05		3E+00		3.21E-04		2E+01		3.11E-07		2E-02	
Thallium	N/A	N/A	3.7E-07	2.4E-06												
Vanadium	N/A	N/A	1.2E-06	7.6E-06												
Total Hazard Quotient and Cancer Risk:							**4E+00**	**3E-06**			**2E+01**	**8E-07**			**2E-02**	**4E-09**

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Adolescent Trespasser	
EPC =	EPC Surface Only	EPC =	EPC Surface Only for Construction Worker	EPC =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	50 kg
IR =	20 m^3/day	IR =	20 m^3/day	IR =	1.6 m^3/day
EF =	250 days/year	EF =	250 days/year	EF =	14 days/year
ED =	25 years	ED =	1 year	ED =	5 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	1,825 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.

NA= Information not available.

(1) This EPC was used for the industrial worker and the adolescent trespasser.

(2) This EPC was used for the construction worker.

Attachment 2
Table 10G
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SURFACE WATER
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-121I
Seneca Army Depot Activity

Equation for Dermal (mg/kg-day) = $\frac{DA \times SA \times EF \times ED \times EV}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

DA = Absorbed Dose per Event, mg/cm^2-event
SA = Surface Area Contact
EF = Exposure Frequency
EV = Event Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Absorbed Dose per Event (DA):

For inorganics: DA = Kp x EPC x t_{event} x C

K_p = Permeability Coefficient, cm/hr
EPC = EPC in Groundwater, mg/L
C = Conversion Factor, 10^{-3} L/cm^3

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose (RfD)

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Permeability Coefficient *Kp*	EPC Surface Water	Absorbed Dose/Event	Industrial Worker				Construction Worker				Adolescent Trespasser			
						Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(cm/hr)	(mg/L)	(mg/cm²-event)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
Metals																	
Iron	3.0.E-01	N/A	1.0.E-03	3.41.E+00	1.71E-06	Dermal Contact to Surface Water Not Applicable for Industrial Worker				1.66E-05		6E-05		7.67E-06		3E-05	
Manganese	9.3.E-04	N/A	1.0.E-03	2.06.E-01	1.03E-07					1.00E-06		1E-03		4.64E-07		5E-04	
Vanadium	1.8.E-04	N/A	1.0.E-03	3.90.E-03	1.95E-09					1.90E-08		1E-04		8.78E-09		5E-05	
Total Hazard Quotient and Cancer Risk:												**1E-03**	**0E+00**			**6E-04**	**0E+00**

Assumptions for Construction Worker			Assumptions for Adolescent Trespasser		
BW =	70	kg	BW =	50	kg
SA =	2,490	cm^2	SA =	5,867	cm^2
EV=	1	event/day	EV=	1	event/day
EF =	100	days/year	EF =	14	days/year
ED =	1	year	ED =	5	year
t_{event} =	0.5	hr/event	t_{event} =	0.5	hr/event
AT (Nc) =	365	days	AT (Nc) =	1,825	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.

NA= Information not available.

Kp value from Exhibit 3-1 of "Supplemental Guidance for Dermal Risk Assessment", Part E of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (Volume 1), August 16, 2004. For arsenic, iron, manganese, thallium, and vanadium the default inorganic value of 0.001 was used.

Kp for Cr(VI) was used for chromium.

Attachment 2
Table 11A
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS - SEAD-121C
REASONABLE MAXIMUM EXPOSURE (RME)
Seneca Army Depot Activity

		REASONABLE MAXIMUM EXPOSURE (RME)			
RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
INDUSTRIAL WORKER (Soil)	**Inhalation of Dust in Ambient Air (Soil)**	1E-01	14%	1E-07	0%
	Ingestion of Soil	4E-01	40%	1E-05	58%
	Dermal Contact to Soil	3E-02	3%	1E-05	42%
	Intake of Groundwater	4E-01	43%	0E+00	0%
	TOTAL RECEPTOR RISK (Nc & Car)	*9E-01*	100%	*3E-05*	100%
INDUSTRIAL WORKER (Ditch Soil)	**Inhalation of Dust in Ambient Air (Ditch)**	3E-01	37%	2E-07	11%
	Ingestion of Ditch Soil	5E-02	7%	1E-06	59%
	Dermal Contact to Ditch Soil	3E-03	0%	6E-07	30%
	Intake of Groundwater	4E-01	56%	0E+00	0%
	TOTAL RECEPTOR RISK (Nc & Car)	*7E-01*	100%	*2E-06*	100%
CONSTRUCTION WORKER (Soil)	**Inhalation of Dust in Ambient Air (Soil)**	8E+00	86%	2E-07	13%
	Ingestion of Soil	9E-01	10%	1E-06	67%
	Dermal Contact to Soil	3E-02	0%	4E-07	20%
	Intake of Groundwater	4E-01	4%	0E+00	0%
	Dermal Contact to Groundwater	2E-04	0%	0E+00	0%
	TOTAL RECEPTOR RISK (Nc & Car)	*9E+00*	100%	*2E-06*	100%
CONSTRUCTION WORKER (Ditch Soil)	**Inhalation of Dust in Ambient Air (Ditch)**	2E+00	58%	6E-08	5%
	Ingestion of Ditch Soil	8E-01	27%	8E-07	76%
	Dermal Contact to Ditch Soil	2E-02	1%	2E-07	18%
	Intake of Groundwater	4E-01	13%	0E+00	0%
	Dermal Contact to Groundwater	2E-04	0%	0E+00	0%
	Dermal Contact to Surface Water	4E-02	1%	5E-09	0%
	TOTAL RECEPTOR RISK (Nc & Car)	*3E+00*	100%	*1E-06*	100%
ADOLESCENT TRESPASSER (Soil)	**Inhalation of Dust in Ambient Air (Soil)**	9E-04	1%	2E-10	0%
	Ingestion of Soil	3E-02	31%	2E-07	69%
	Dermal Contact to Soil	1E-03	1%	1E-07	31%
	Intake of Groundwater	6E-02	66%	0E+00	0%
	TOTAL RECEPTOR RISK (Nc & Car)	*9E-02*	100%	*3E-07*	100%
ADOLESCENT TRESPASSER (Ditch Soil)	**Inhalation of Dust in Ambient Air (Ditch)**	2E-03	2%	3E-10	0%
	Ingestion of Ditch Soil	2E-02	18%	1E-07	69%
	Dermal Contact to Ditch Soil	8E-04	1%	3E-08	22%
	Intake of Groundwater	6E-02	60%	0E+00	0%
	Dermal Contact to Surface Water	2E-02	19%	1E-08	9%
	TOTAL RECEPTOR RISK (Nc & Car)	*1E-01*	100%	*1E-07*	100%

Attachment 2
Table 11B
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS - SEAD-121I
REASONABLE MAXIMUM EXPOSURE (RME)
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 (Soil)	**Inhalation of Dust in Ambient Air (Soil)**	**2E+01**	82%	5E-06	6%
	Ingestion of Soil	**5E+00**	16%	4E-05	54%
	Dermal Contact to Soil	8E-01	2%	3E-05	39%
	TOTAL RECEPTOR RISK (Nc & Car)	***3E+01***	**100%**	***7E-05***	**100%**
INDUSTRIAL WORKER (Ditch Soil)	**Inhalation of Dust in Ambient Air (Ditch)**	**4E+00**	93%	3E-06	7%
	Ingestion of Ditch Soil	2E-01	6%	2E-05	59%
	Dermal Contact to Ditch Soil	3E-02	1%	1E-05	33%
	TOTAL RECEPTOR RISK (Nc & Car)	***4E+00***	**100%**	***4E-05***	**100%**
CONSTRUCTION WORKER (Soil)	**Inhalation of Dust in Ambient Air (Soil)**	**2E+02**	91%	1E-06	15%
	Ingestion of Soil	**1.55E+01**	9%	5E-06	64%
	Dermal Contact to Soil	**1.1E+00**	1%	2E-06	21%
	TOTAL RECEPTOR RISK (Nc & Car)	***2E+02***	**100%**	***8E-06***	**100%**
CONSTRUCTION WORKER (Ditch Soil)	**Inhalation of Dust in Ambient Air (Ditch)**	**2E+01**	85%	8E-07	4%
	Ingestion of Ditch Soil	**4E+00**	14%	2E-05	77%
	Dermal Contact to Ditch Soil	3E-01	1%	4E-06	20%
	Dermal Contact to Surface Water	1E-03	0%	0.0E+00	0%
	TOTAL RECEPTOR RISK (Nc & Car)	***3E+01***	**100%**	***2E-05***	**100%**
ADOLESCENT TRESPASSER (Soil)	**Inhalation of Dust in Ambient Air (Soil)**	2E-01	28%	6E-09	1%
	Ingestion of Soil	4E-01	66%	6E-07	68%
	Dermal Contact to Soil	4E-02	7%	3E-07	31%
	TOTAL RECEPTOR RISK (Nc & Car)	***6E-01***	**100%**	***9E-07***	**100%**
ADOLESCENT TRESPASSER (Ditch Soil)	**Inhalation of Dust in Ambient Air (Ditch)**	2E-02	19%	4E-09	0%
	Ingestion of Ditch Soil	9E-02	74%	2E-06	74%
	Dermal Contact to Ditch Soil	8E-03	7%	7E-07	26%
	Dermal Contact to Surface Water	6E-04	0%	0.0E+00	0%
	TOTAL RECEPTOR RISK (Nc & Car)	***1E-01***	**100%**	***3E-06***	**100%**

Shading indicates that the HQ > 1, or the cancer risk is greater than 10 $^{-4}$.

Attachment 2
Table 12
Contributing COPCs to Human Health Risk at SEAD-121I
SEAD-121I
Seneca Army Depot Activity

Receptors	Exposure Route	Contributing COPC	Hazard Quotient	Percent Contribution
Industrial Worker	Inhalation of Dust in Ambient Air Due to Soil	Manganese	2E+01	100%
	Ingestion of Soil	Manganese	4.5E+00	95%
	Dermal Contact to Soil	Manganese	7E-01	97%
	Inhalation of Dust in Ambient Air Due to Ditch Soil	Manganese	3.5E+00	98%
Construction Worker	Inhalation of Dust in Ambient Air Due to Soil	Manganese	2E+02	100%
	Ingestion of Soil	Manganese	1.47E+01	95%
	Dermal Contact to Soil	Manganese	1E+00	97%
	Inhalation of Dust in Ambient Air Due to Ditch Soil	Manganese	2E+01	98%
	Ingestion of Ditch Soil	Arsenic Iron Manganese	1E+00 3E-01 2E+00	30% 9% 56%
	Dermal Contact to Ditch Soil	Manganese	2E-01	59%
Adolescent Trespasser	Inhalation of Dust in Ambient Air Due to Soil	Manganese	2E-01	100%
	Ingestion of Soil	Manganese	3.50E-01	95%
	Dermal Contact to Soil	Manganese	4E-02	97%

Attachment 2
TABLE 13
Comparison of SEAD-121C Aluminum, Iron, and Manganese Concentrations with Seneca Background
SEAD-121C and SEAD-121I RI
Seneca Army Depot Activity

Preliminary COC	SEAD-121C Soil Concentration (mg/kg)				SEAD-121C Ditch Soil Concentration (mg/kg)				Seneca Soil Background (mg/kg)			
	Maximum	Minimum	Average	95% UCL [1]	Maximum	Minimum	Average	95% UCL [1]	Maximum	Minimum	Average	95% UCL [2]
Aluminum	17,600	1,730	11,072	11,758	21,500	2,850	9,373	12,333	20,500	5,560	13,206	14,315
Iron	54,100	4,230	25,557	27,507	27,300	5,650	18,305	21,728	38,600	8,770	24,700	26489
Manganese	858	213	482	510	918	126	556	688	2,380	207	609	701

1. 95% UCL calculated in accordance with the ProUCL Version 3.0 User Guide (USEPA, 2004c).
2. Based on normal distribution.

Attachment 2
TABLE 14
Comparison of SEAD-121I Arsenic Concentrations with Seneca Background
SEAD-121C and SEAD-121I RI
Seneca Army Depot Activity

Preliminary COC	SEAD-121I Ditch Soil Concentration (mg/kg)				Seneca Soil Background (mg/kg)			
	Maximum	Minimum	Average	95% UCL [1]	Maximum	Minimum	Average	95% UCL [2]
Arsenic [3]	104	3.8	23	57	22	2.3	5	6
Arsenic [4]	27.4	3.8	9.8	20	22	2.3	5	6

Notes:
1. 95% UCL calculated in accordance with the ProUCL Version 3.0 User Guide (USEPA, 2004c).
2. Based on normal distribution.
3. Seven samples collected at the site were included in the evaluation.
4. All samples collected from the site except the highest hit of 104 mg/kg were included in the evaluation.

Attachment 2
Table 15A
Comparison Between Aluminum Concentrations in SEAD-121C Soil and Seneca Background - Student's T Test
Seneca Army Depot Activity

XLSTAT 2006 - Two-sample t-test and z-test - on 4/12/2006 at 9:49:13 AM
Sample 1: Workbook = AlMnFedata.xls / Sheet = 121Cdata / Range = '121Cdata'!$A$3:$A$70 / 68 rows and 1 column (SEAD-121C Soil)
Sample 2: Workbook = AlMnFedata.xls / Sheet = 121Cdata / Range = '!$C$3:$C$56 / 54 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	68	0	68	1730.000	17600.000	11072.426	3389.584
Var1(2)	54	0	54	5560.000	20500.000	13205.741	4158.638

Fisher's F-test / Two-tailed test:

95% confidence interval on the ratio of variances:
] 0.663, 0.663 [

Ratio	0.664
F (Observed value)	13.287
F (Critical value)	1.003
DF1	67
DF2	53
p-value (one-tailed)	< 0.0001
alpha	0.05

Test interpretation:
H0: The ratio between the variances is not significantly different from 0.
Ha: The ratio between the variances is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

t-test for two independent samples / Lower-tailed test (assumed different variances for two samples):

95% confidence interval on the difference between the means:
] -Inf, -972.216 [

Difference	-2133.314
t (Observed value)	-3.050
t (Critical value)	1.660
DF	101
p-value (one-tailed)	< 0.0001
alpha	0.05

The number of degrees of freedom is approximated by the Welch-Satterthwaite formula
The critical t is estimated using the Cochran-Cox approximation

Test interpretation:
H0: The difference between the means is not significantly different from 0.
Ha: The difference between the means is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

Attachment 2
Table 15B
Comparison Between Aluminum Concentrations in SEAD-121C Soil and Seneca Background - Mann-Whitney Test
Seneca Army Depot Activity

XLSTAT 2006 - Comparison of two samples (Wilcoxon, Mann-Whitney, ...) - on 4/12/2006 at 9:54:14 AM
Sample 1: Workbook = AlMnFedata.xls / Sheet = 121Cdata / Range = '121Cdata'!$A$3:$A$70 / 68 rows and 1 column (SEAD-121C Soil)
Sample 2: Workbook = AlMnFedata.xls / Sheet = 121Cdata / Range = '!$C$3:$C$56 / 54 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5
Continuity correction: Yes

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	68	0	68	1730.000	17600.000	11072.426	3389.584
Var1(2)	54	0	54	5560.000	20500.000	13205.741	4158.638

Mann-Whitney test / Lower-tailed test:

U	1327.000
Expected value	1836.000
Variance (U)	37630.786
p-value (one-tailed)	0.004
alpha	0.05

The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The location difference between the samples is not significantly different from 0.
Ha: The location difference between the samples is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.44%.

Ties have been detected in the data and the appropriate corrections have been applied.

Attachment 2
Table 16A
Comparison Between Iron Concentrations in SEAD-121C Soil and Seneca Background - Student's T Test
Seneca Army Depot Activity

XLSTAT 2006 - Two-sample t-test and z-test - on 4/12/2006 at 12:11:59 PM
Sample 1: Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$E$3:$E$70/68 rows and 1 column (SEAD-121C Soil)
Sample 2: Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$G$3:$G$56/54 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	68	0	68	4230.000	54100.000	25557.132	9550.291
Var1(2)	54	0	54	8770.000	38600.000	24660.556	6853.812

Fisher's F-test / Two-tailed test:

95% confidence interval on the ratio of variances:
] 1.937, 1.937 [

Ratio	1.942
F (Observed value)	38.833
F (Critical value)	1.003
DF1	67
DF2	53
p-value (Two-tailed)	< 0.0001
alpha	0.05

Test interpretation:
H0: The ratio between the variances is not significantly different from 0.
Ha: The ratio between the variances is significantly different from 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

t-test for two independent samples / Two-tailed test (assumed different variances for two samples):

95% confidence interval on the difference between the means:
] -2077.203 , 3870.357 [

Difference	896.577
t (Observed value)	0.603
t (Critical value)	-2.000
DF	119
p-value (Two-tailed)	0.548
alpha	0.05

The number of degrees of freedom is approximated by the Welch-Satterthwaite formula
The critical t is estimated using the Cochran-Cox approximation

Test interpretation:
H0: The difference between the means is not significantly different from 0.
Ha: The difference between the means is significantly different from 0.
As the computed p-value is greater than the significance level alpha=0.05, one should accept the null hypothesis H0.
The risk to reject the null hypothesis H0 while it is true is 54.77%.

Attachment 2
Table 16B
Comparison Between Iron Concentrations in SEAD-121C Soil and Seneca Background - Mann-Whitney Test
Seneca Army Depot Activity

XLSTAT 2006 - Comparison of two samples (Wilcoxon, Mann-Whitney, ...) - on 4/12/2006 at 12:13:50 PM
Sample 1: Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$E$3:$E$70/68 rows and 1 column (SEAD-121C Soil)
Sample 2: Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$G$3:$G$56/54 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5
Continuity correction: Yes

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	68	0	68	4230.000	54100.000	25557.132	9550.291
Var1(2)	54	0	54	8770.000	38600.000	24660.556	6853.812

Mann-Whitney test / Two-tailed test:

U	1879.000
Expected value	1836.000
Variance (U)	37635.388
p-value (Two-tailed)	0.827
alpha	0.05

The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The location difference between the samples is not significantly different from 0.
Ha: The location difference between the samples is significantly different from 0.
As the computed p-value is greater than the significance level alpha=0.05, one should accept the null hypothesis H0.
The risk to reject the null hypothesis H0 while it is true is 82.66%.

Ties have been detected in the data and the appropriate corrections have been applied.

Attachment 2
Table 17A
Comparison Between Manganese Concentrations in SEAD-121C Soil and Seneca Background - Student's T Test
Seneca Army Depot Activity

XLSTAT 2006 - Two-sample t-test and z-test - on 4/12/2006 at 10:01:03 AM
Sample 1: Workbook=AlMnFedata.xls/Sheet=121Cdata/Range ='!$I$3:$I$70/68 rows and 1 column (SEAD-121C Soil)
Sample 2: Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$K$3:$K$53/51 rows and 1 column (Seneca Background)
Hypothesized difference (D): 0
Significance level (%): 5

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	68	0	68	213.000	858.000	482.338	138.653
Var1(2)	51	0	51	207.000	2380.000	609.069	334.524

Fisher's F-test / Two-tailed test:

95% confidence interval on the ratio of variances:
] 0.171, 0.171 [

Ratio	0.172
F (Observed value)	3.436
F (Critical value)	1.003
DF1	67
DF2	50
p-value (one-tailed)	< 0.0001
alpha	0.05

Test interpretation:
H0: The ratio between the variances is not significantly different from 0.
Ha: The ratio between the variances is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

t-test for two independent samples / Lower-tailed test (assumed different variances for two samples):

95% confidence interval on the difference between the means:
] -Inf , -43.645 [

Difference	-126.730
t (Observed value)	-2.546
t (Critical value)	1.669
DF	63
p-value (one-tailed)	< 0.0001
alpha	0.05

The number of degrees of freedom is approximated by the Welch-Satterthwaite formula
The critical t is estimated using the Cochran-Cox approximation

Test interpretation:
H0: The difference between the means is not significantly different from 0.
Ha: The difference between the means is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

Attachment 2
Table 17B
Comparison Between Manganese Concentrations in SEAD-121C Soil and Seneca Background - Mann-Whitney Test
Seneca Army Depot Activity

XLSTAT 2006 - Comparison of two samples (Wilcoxon, Mann-Whitney, ...) - on 4/12/2006 at 10:02:07 AM
Sample 1: Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$I$3:$I$70/68 rows and 1 column (SEAD-121C Soil)
Sample 2: Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$K$3:$K$53/51 rows and 1 column (Seneca Background)
Hypothesized difference (D): 0
Significance level (%): 5
Continuity correction: Yes

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	68	0	68	213.000	858.000	482.338	138.653
Var1(2)	51	0	51	207.000	2380.000	609.069	334.524

Mann-Whitney test / Lower-tailed test:

U	1334.500
Expected value	1734.000
Variance (U)	34678.148
p-value (one-tailed)	0.016
alpha	0.05

The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The location difference between the samples is not significantly different from 0.
Ha: The location difference between the samples is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 1.61%.

Ties have been detected in the data and the appropriate corrections have been applied.

Attachment 2
Table 18A
Comparison Between Aluminum Concentrations in SEAD-121C Ditch Soil and Seneca Background - Student's T Test
Seneca Army Depot Activity

XLSTAT 2006 - Two-sample t-test and z-test - on 4/12/2006 at 9:55:16 AM
Sample 1:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$B$3:$B$12/10 rows and 1 column (SEAD-121C Ditch Soil)
Sample 2:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$C$3:$C$56 / 54 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	10	0	10	2850.000	21500.000	9373.000	5106.765
Var1(2)	54	0	54	5560.000	20500.000	13205.741	4158.638

Fisher's F-test / Two-tailed test:

95% confidence interval on the ratio of variances:
] 1.606, 1.606 [

Ratio	1.508
F (Observed value)	30.159
F (Critical value)	0.939
DF1	9
DF2	53
p-value (one-tailed)	< 0.0001
alpha	0.05

Test interpretation:
H0: The ratio between the variances is not significantly different from 0.
Ha: The ratio between the variances is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05,
one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

t-test for two independent samples / Lower-tailed test (assumed different variances for two samples):

95% confidence interval on the difference between the means:
] -Inf, -767.506 [

Difference	-3832.741
t (Observed value)	-2.240
t (Critical value)	1.791
DF	11
p-value (one-tailed)	< 0.0001
alpha	0.05

The number of degrees of freedom is approximated by the Welch-Satterthwaite formula
The critical t is estimated using the Cochran-Cox approximation

Test interpretation:
H0: The difference between the means is not significantly different from 0.
Ha: The difference between the means is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0,
and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

Attachment 2
Table 18B
Comparison Between Aluminum Concentrations in SEAD-121C Ditch Soil and Seneca Background - Mann-Whitney Test
Seneca Army Depot Activity

XLSTAT 2006 - Comparison of two samples (Wilcoxon, Mann-Whitney, ...) - on 4/12/2006 at 9:56:20 AM
Sample 1:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$B$3:$B$12/10 rows and 1 column (SEAD-121C Ditch Soil)
Sample 2:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$C$3:$C$56/54 rows and 1 column (SENECA Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5
Continuity correction: Yes

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	10	0	10	2850.000	21500.000	9373.000	5106.765
Var1(2)	54	0	54	5560.000	20500.000	13205.741	4158.638

Mann-Whitney test / Lower-tailed test:

U	143.000
Expected value	270.000
Variance (U)	2924.330
p-value (one-tailed)	0.010
alpha	0.05

The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The location difference between the samples is not significantly different from 0.
Ha: The location difference between the samples is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.97%.

Ties have been detected in the data and the appropriate corrections have been applied.

Attachment 2
Table 19A
Comparison Between Iron Concentrations in SEAD-121C Ditch Soil and Seneca Background - Student's T Test
Seneca Army Depot Activity

XLSTAT 2006 - Two-sample t-test and z-test - on 4/12/2006 at 9:59:36 AM
Sample 1:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$F$3:$F$12/10 rows and 1 column (SEAD-121C Ditch Soil)
Sample 2:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$G$3:$G$56/54 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	10	0	10	5650.000	27300.000	18305.000	5904.727
Var1(2)	54	0	54	8770.000	38600.000	24660.556	6853.812

Fisher's F-test / Two-tailed test:

95% confidence interval on the ratio of variances:
] 0.791, 0.791 [

Ratio	0.742
F (Observed value)	14.844
F (Critical value)	0.939
DF1	9
DF2	53
p-value (one-tailed)	< 0.0001
alpha	0.05

Test interpretation:
H0: The ratio between the variances is not significantly different from 0.
Ha: The ratio between the variances is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

t-test for two independent samples / Lower-tailed test (assumed different variances for two samples):

95% confidence interval on the difference between the means:
] -Inf , -2677.526 [

Difference	-6355.556
t (Observed value)	-3.045
t (Critical value)	1.762
DF	14
p-value (one-tailed)	< 0.0001
alpha	0.05

The number of degrees of freedom is approximated by the Welch-Satterthwaite formula
The critical t is estimated using the Cochran-Cox approximation

Test interpretation:
H0: The difference between the means is not significantly different from 0.
Ha: The difference between the means is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

Attachment 2
Table 19B
Comparison Between Iron Concentrations in SEAD-121C Ditch Soil and Seneca Background - Mann-Whitney Test
Seneca Army Depot Activity

XLSTAT 2006 - Comparison of two samples (Wilcoxon, Mann-Whitney, ...) - on 4/12/2006 at 10:00:11 AM
Sample 1:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$F$3:$F$12/10 rows and 1 column (SEAD-121C Ditch Soil)
Sample 2:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$G$3:$G$56/54 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5
Continuity correction: Yes

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	10	0	10	5650.000	27300.000	18305.000	5904.727
Var1(2)	54	0	54	8770.000	38600.000	24660.556	6853.812

Mann-Whitney test / Lower-tailed test:

U	133.000
Expected value	270.000
Variance (U)	2924.063
p-value (one-tailed)	0.006
alpha	0.05

The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The location difference between the samples is not significantly different from 0.
Ha: The location difference between the samples is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.58%.

Ties have been detected in the data and the appropriate corrections have been applied.

Attachment 2
Table 20A
Comparison Between Manganese Concentrations in SEAD-121C Ditch Soil and Seneca Background - Student's T Test
Seneca Army Depot Activity

XLSTAT 2006 - Two-sample t-test and z-test - on 4/12/2006 at 10:02:45 AM
Sample 1:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$J$3:$J$12/10 rows and 1 column (SEAD-121C Ditch Soil)
Sample 2:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$K$3:$K$53/51 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	10	0	10	126.000	918.000	556.400	226.822
Var1(2)	51	0	51	207.000	2380.000	609.069	334.524

Fisher's F-test / Two-tailed test:

95% confidence interval on the ratio of variances:
] 0.489, 0.489 [

Ratio	0.460
F (Observed value)	9.195
F (Critical value)	0.940
DF1	9
DF2	50
p-value (one-tailed)	< 0.0001
alpha	0.05

Test interpretation:
H0: The ratio between the variances is not significantly different from 0.
Ha: The ratio between the variances is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

t-test for two independent samples / Lower-tailed test (assumed different variances for two samples):

95% confidence interval on the difference between the means:
] -Inf , 96.007 [

Difference	-52.669
t (Observed value)	-0.615
t (Critical value)	1.735
DF	18
p-value (one-tailed)	< 0.0001
alpha	0.05

The number of degrees of freedom is approximated by the Welch-Satterthwaite formula
The critical t is estimated using the Cochran-Cox approximation

Test interpretation:
H0: The difference between the means is not significantly different from 0.
Ha: The difference between the means is significantly lower than 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

Attachment 2
Table 20B
Comparison Between Manganese Concentrations in SEAD-121C Ditch Soil and Seneca Background - Mann-Whitney Test
Seneca Army Depot Activity

XLSTAT 2006 - Comparison of two samples (Wilcoxon, Mann-Whitney, ...) - on 4/12/2006 at 10:03:20 AM
Sample 1:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$J$3:$J$12/10 rows and 1 column (SEAD-121C Ditch Soil)
Sample 2:Workbook=AlMnFedata.xls/Sheet=121Cdata/Range='!$K$3:$K$53/51 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5
Continuity correction: Yes

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	10	0	10	126.000	918.000	556.400	226.822
Var1(2)	51	0	51	207.000	2380.000	609.069	334.524

Mann-Whitney test / Lower-tailed test:

U	270.500
Expected value	255.000
Variance (U)	2634.721
p-value (one-tailed)	0.622
alpha	0.05

The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The location difference between the samples is not significantly different from 0.
Ha: The location difference between the samples is significantly lower than 0.
As the computed p-value is greater than the significance level alpha=0.05, one should accept the null hypothesis H0.
The risk to reject the null hypothesis H0 while it is true is 62.24%.

Ties have been detected in the data and the appropriate corrections have been applied.

Attachment 2
Table 21A
Comparison Between Arsenic Concentrations in SEAD-121I Ditch Soil and Seneca Background - Student's T Test
Seneca Army Depot Activity

XLSTAT 2006 - Two-sample t-test and z-test - on 4/12/2006 at 10:22:28 AM
Sample 1:Workbook=AlMnFedata.xls/Sheet=121Idata/Range='!$A$3:$A$9/ 7 rows and 1 column (SEAD-121I Ditch Soil)
Sample 2:Workbook=AlMnFedata.xls/Sheet=121Idata/Range='!$B$3:$B$53/51 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	7	0	7	3.800	104.000	23.221	36.521
Var1(2)	51	0	51	2.300	21.500	5.213	2.765

Fisher's F-test / Two-tailed test:

95% confidence interval on the ratio of variances:
] 193.117, 193.117 [

Ratio	174.477
F (Observed value)	3489.548
F (Critical value)	0.903
DF1	6
DF2	50
p-value (Two-tailed)	< 0.0001
alpha	0.05

Test interpretation:
H0: The ratio between the variances is not significantly different from 0.
Ha: The ratio between the variances is significantly different from 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

t-test for two independent samples / Two-tailed test (assumed different variances for two samples):

95% confidence interval on the difference between the means:
] -15.786 , 51.803 [

Difference	18.009
t (Observed value)	1.304
t (Critical value)	-2.447
DF	6
p-value (Two-tailed)	0.240
alpha	0.05

The number of degrees of freedom is approximated by the Welch-Satterthwaite formula
The critical t is estimated using the Cochran-Cox approximation

Test interpretation:
H0: The difference between the means is not significantly different from 0.
Ha: The difference between the means is significantly different from 0.
As the computed p-value is greater than the significance level alpha=0.05, one should accept the null hypothesis H0.
The risk to reject the null hypothesis H0 while it is true is 23.99%.

Attachment 2
Table 21B
Comparison Between Arsenic Concentrations in SEAD-121I Ditch Soil and Seneca Background - Mann-Whitney Test (Two-Tailed Test)
Seneca Army Depot Activity

XLSTAT 2006 - Comparison of two samples (Wilcoxon, Mann-Whitney, ...) - on 4/12/2006 at 12:18:27 PM
Sample 1:Workbook=AlMnFedata.xls/Sheet=121Idata/Range='!$A$3:$A$9/7 rows and 1 column (SEAD-121I Ditch Soil)
Sample 2:Workbook=AlMnFedata.xls/Sheet=121Idata/Range='!$B$3:$B$53/51 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5
Continuity correction: Yes

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	7	0	7	3.800	104.000	23.221	36.521
Var1(2)	51	0	51	2.300	21.500	5.213	2.765

Mann-Whitney test / Two-tailed test:

U	278.500
Expected value	178.500
Variance (U)	1753.576
p-value (Two-tailed)	0.017
alpha	0.05

The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The location difference between the samples is not significantly different from 0.
Ha: The location difference between the samples is significantly different from 0.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 1.75%.

Ties have been detected in the data and the appropriate corrections have been applied.

Attachment 2
Table 21C
Comparison Between Arsenic Concentrations in SEAD-121I Ditch Soil and Seneca Background - Mann-Whitney Test (Lower-Tailed Test)
Seneca Army Depot Activity

XLSTAT 2006 - Comparison of two samples (Wilcoxon, Mann-Whitney, ...) - on 4/12/2006 at 10:25:18 AM
Sample 1:Workbook=AlMnFedata.xls/Sheet=121Idata/Range='!$A$3:$A$9/7 rows and 1 column (SEAD-121I Ditch Soil)
Sample 2:Workbook=AlMnFedata.xls/Sheet=121Idata/Range='!$B$3:$B$53/51 rows and 1 column (Seneca Soil Background)
Hypothesized difference (D): 0
Significance level (%): 5
Continuity correction: Yes

Summary statistics ▼

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Var1	7	0	7	3.800	104.000	23.221	36.521
Var1(2)	51	0	51	2.300	21.500	5.213	2.765

Mann-Whitney test / Lower-tailed test:

U	278.500
Expected value	178.500
Variance (U)	1753.576
p-value (one-tailed)	0.992
alpha	0.05

The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The location difference between the samples is not significantly different from 0.
Ha: The location difference between the samples is significantly lower than 0.
As the computed p-value is greater than the significance level alpha=0.05, one should accept the null hypothesis H0.
The risk to reject the null hypothesis H0 while it is true is 99.18%.

Ties have been detected in the data and the appropriate corrections have been applied.

ATTACHMENT 2
TABLE 22
TOTAL NON-CARCINOGENIC AND CARCINOGENIC RISKS FOR ADOLESCENT TRESPASSER - UNCERTAINTY ANALYSIS
REASONABLE MAXIMUM EXPOSURE (RME)
SEAD-121C AND SEAD-121I RI
Seneca Army Depot Activity

		REASONABLE MAXIMUM EXPOSURE (RME)			
Site	EXPOSURE ROUTE	HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
SEAD-121C	**Inhalation of Dust in Ambient Air**	**3E-03**	**1%**	**5E-10**	**0%**
(Soil)	**Ingestion of Soil**	**1E-01**	**31%**	**8E-07**	**69%**
	Dermal Contact to Soil	**5E-03**	**1%**	**4E-07**	**31%**
	Intake of Groundwater	**2E-01**	**66%**	**0E+00**	**0%**
	TOTAL RECEPTOR RISK (Nc & Car)	***3E-01***	**100%**	***1E-06***	**100%**
SEAD-121C	**Inhalation of Dust in Ambient Air (Ditch)**	**6E-03**	**2%**	**1E-09**	**0%**
(Ditch Soil)	**Ingestion of Ditch Soil**	**7E-02**	**18%**	**3E-07**	**69%**
	Dermal Contact to Ditch Soil	**3E-03**	**1%**	**1E-07**	**22%**
	Intake of Groundwater	**2E-01**	**60%**	**0E+00**	**0%**
	Dermal Contact to Surface Water	**7E-02**	**19%**	**4E-08**	**9%**
	TOTAL RECEPTOR RISK (Nc & Car)	***4E-01***	**100%**	***5E-07***	**100%**
SEAD-121I	**Inhalation of Dust in Ambient Air**	**6E-01**	**28%**	**2E-08**	**1%**
(Soil)	**Ingestion of Soil**	**1E+00**	**66%**	**2E-06**	**68%**
	Dermal Contact to Soil	**1E-01**	**7%**	**1E-06**	**31%**
	TOTAL RECEPTOR RISK (Nc & Car)	***2E+00***	**100%**	***3E-06***	**100%**
SEAD-121I	**Inhalation of Dust in Ambient Air (Ditch)**	**8E-02**	**19%**	**1E-08**	**0%**
(Ditch Soil)	**Ingestion of Ditch Soil**	**3E-01**	**74%**	**7E-06**	**74%**
	Dermal Contact to Ditch Soil	**3E-02**	**7%**	**2E-06**	**26%**
	Dermal Contact to Surface Water	**2E-03**	**0%**	**0E+00**	**0%**
	TOTAL RECEPTOR RISK (Nc & Car)	***4E-01***	**100%**	***9E-06***	**100%**

A 50 days/year exposure frequency was assumed for the adolescent trespasser (11-16 yr).