ESI RTCs December 18, 2001 Page 1 of 6

Responses to Comments On Year 2000 ESI (November 2000) By Douglas Pocze, U.S. Environmental Protection Agency, Dated: January 31, 2001

GENERAL COMMENTS

General Comment 1: The conclusion regarding the condition of the Building 305 floor drain, that the "water and sludge is contained, appears stagnant in the floor drain pit, and does not appear to be leaking onto the ground surface" is confusing as the dye study showed that the flow from the drain was visible at downstream manholes, and therefore, the floor drains connect to the outside sewer lines (p. 3-8 and Figure 4.5-1). Please clarify.

Response to General Comment 1: AFBCA agrees. The conclusions regarding the condition of the Building 305 floor drain have been changed to state that: 1) "Results of the dye trace test indicated that the over flow pipe contained within the paint spray booth floor drain discharges westward into the storm sewer"; and 2) that the standing water and sludge contained within the floor drain sump (beneath the level of the overflow pipe) appears stagnant and does not appear to be leaking into the ground beneath Building 305. Therefore, since the floor drain is currently restricted from use, there is no flow into the storm sewer and the water/sludge remaining in the floor drain pit is contained.

General Comment 2: With regards to PCI Site 20, I cannot at this time agree that "No Further Action" is warranted. Levels of lead have been detected in excess of the screening number (400 ppm). Therefore, I recommend further removal of the soil and confirmatory samples. Because the area is small, 3 samples would be sufficient and the analysis could be limited to metal constituents or just to lead.

Response to General Comment 2: AFBCA agrees that collection of three additional near-surface (NS) soil samples for lead analysis is warranted. The additional soil samples will be collected from within the small area surrounding NS soil sample locations PCI20-NS03 and NS04, which were found to contain levels of lead in excess of USEPA screening criteria (400 ppm). However, AFBCA does not agree that additional soil removal is warranted. All NS soil samples were collected <u>prior</u> to debris removal from the locations with the most accumulated debris. The three additional NS soil samples would be collected and analyzed to confirm that debris removal has sufficiently reduced/removed any surficial lead contamination.

The Year 2000 ESI Report recommendation for PCI Site 20 will be changed from NFS to Further Sampling. The proposed sampling will be submitted to USEPA and NYSDEC for review and comment prior to inclusion in a future Work Plan.

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SPECIFIC COMMENTS

Specific Comment 1 Figure 4.2-1: The compound 4,4-DDT should be shaded in this figure because 5.6 ppm exceeds the 2.9 ppm NYSDEC TAGM value.

Response to Specific Comment 1: AFBCA does not agree. All analytical data presented on Figure 4.2-1 is in excess of NYSDEC criteria. The shading is used to indicate that a contaminant was detected at a concentration that exceeds both the USEPA risk-based screening criteria and the NYSDEC criteria. Therefore, the figure is correct.

Specific Comment 2 Section 4.4.5, Near-surface Soil, Inorganics, Page 4-45: <u>Eighth</u> <u>Sentence</u>: Correct the text to indicate that eight, not seven, mercury detections exceeded the NYSDEC TAGM, as shown in Table 4.4-2.

Last Sentence: Currently, the text implies that the USEPA RBC for mercury is 1 mg/kg. However, I did not see any RBC listed for mercury. Please confirm.

Responses to Specific Comment 2: <u>Eighth Sentence:</u> AFBCA agrees. The text has been corrected as requested to state that eight (including one duplicate), not seven, mercury detections exceeded the NYSDEC TAGM.

Last Sentence: AFBCA agrees. Generally, the RBC for mercuric chloride is used for mercury, since inorganic mercury in the environment is usually in the form of a salt rather than the elemental form (there is no soil RBC for the elemental form of mercury). The industrial soil RBC for mercuric chloride is 610 mg/kg. The statement as written is merely pointing out that detected mercury concentrations are below 1mg/kg, which is well below this RBC. The text has been revised to include this information.

Specific Comment 3 Section 4.4.5, Subsurface Soil, Organics, Second Paragraph, Last Sentence, Page 4-47: Revise the text to read "transformer pad" instead of "transformer pond".

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Response to Specific Comment 3: AFBCA agrees. The typographical error has been corrected as requested.

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Specific Comment 4 Section 4.4.6, Conclusions and Recommendations, Second Paragraph, Page 4-48: Text currently states that "Total PCBs only exceeded screening criteria in near-surface soil samples..." However, I believe, this statement is not true, as data indicates that total PCBs also exceeded screening criteria in subsurface samples (SS20-Z1). Please confirm.

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Response to Specific Comment 4: AFBCA agrees. The text has been changed to state that SS20-Z1 was collected from 2-inches to 2-feet BGS and contained PCBs in excess of both the surface (0 to 10 inches BGS) and subsurface (greater than 10 inches BGS) NYSDEC soil cleanup levels.

Specific Comment 5 Section 4.4.6, Conclusions and Recommendations, Fourth Paragraph, Page 4-48: The text states that only four PAHs were detected above either NYSDEC or EPA criteria. However, I believe that six were detected above at least one criteria. These six include the four that are listed (in subsurface), but also benzo(b)fluoranthene and benzo(k)fluoranthene (in near-surface) as shown in Table 4.4-2 and in the text. Please confirm.

Response to Specific Comment 5: AFBCA agrees. The text has been changed as requested.

Specific Comment 6 Section 4.5.3, Fourth Paragraph, Page 4-94: From the description, it appears that a removal action, not a CERCLA remediation, was performed.

Response to Specific Comment 6: AFBCA agrees that the text in question needs additional clarification. The text has been changed to state that "Building 305 underwent a closure action under RCRA".

Specific Comment 7 Table 4.5-2: Insert a line labeled "Test: Pesticides SW 8081A" to indicate that these compounds were included in the water sample analysis, but were not detected.

Response to Specific Comment 7: AFBCA does not agree. Each section of the report contains a sample listing table which defines the parameters for which each sample was analyzed. The Positive Hits Tables only present "Positive Hits", therefore, they are correct as is.

Specific Comment 8 Section 4.6.5, Near-Surface Soil Organics, Fourth paragraph, Page 4-111: The sentence that states that phthalates are lab or field artifacts is not appropriate. The only SVOC that was detected at concentrations exceeding NYSDEC TAGMs is benzo(a)pyrene. However, this compound is usually associated as a coal tar pitch semivolatile, not a phthalate. Please clarify.

Response to Specific Comment 8: AFBCA agrees that clarification is warranted. The statement regarding potential sources of phthalate detections has been removed to clarify the discussion regarding SVOC detections, it was not intended to be associated with the benzo(a)pyrene discussion.

to be of significant risk to human health or the environment because the highest level detected in the groundwater was 11.8 $\mu\mu$ g/L, and this level would not be expected to pose any significant health risk.

The text was revised, based on the explanation above, to indicate that selenium is present on site but at questionable concentrations.

Specific Comment 10 Section 4.6.6: This section indicates that a debris removal action was completed at the site. This raises a question. The section does not provide any detail with respect to the types of debris materials removed, the area of removal, the volume of debris removed, or why confirmation sampling was not completed.

Response to Specific Comment 10: AFBCA agrees that additional clarification is warranted. The Debris Removal subsection has been revised to include more detail about the types and volume of debris removed. Confirmation sampling was not conducted for the following reasons: 1) the soil samples collected at the potentially most-contaminated locations (i.e., beneath rusted drums and other containers) showed relatively low contamination, 2) the debris was surficial only (i.e., based on the results of the geophysical surveys there is no evidence of buried waste), and 3) both the topsoil and the debris were removed and found to be non-hazardous by analytical sampling.

Specific Comment 11 Section 4.6: Recommend that the Debris Removal subsection be relocated to Section 4.6.4: Description of Year 2000 ESI Field Investigation. This section does not belong mixed in with sample analytical results.

Response to Specific Comment 11: AFBCA agrees. The Debris Removal subsection has been relocated, as requested, to Section 4.6.4: Description of Year 2000 ESI Field Investigation.

Specific Comment 12 Table 4.7-3: Insert a line labeled "Test: SVOCs SW 8270C" to indicate that these compounds were included in the sediment sample analysis, but were not detected.

Response to Specific Comment 12: AFBCA does not agree. Each section of the report contains a sample listing table which defines the parameters for which each sample was analyzed. The Positive Hits Tables only present "Positive Hits", therefore, they are correct as is.

Specific Comment 13 Table 4.7-4: Insert a line labeled "Test: SVOCs SW 8270C" to indicate that these compounds were included in the water sample analysis, but were not detected.

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MINUTES OF DECEMBER 6, 2000 GRIFFISS AFB MEETING ESI/SI DRAFT REPORT DISCUSSIONS FORMER GRIFFISS AFB

	Attendees	
Name	Organization	Phone Phone
Jonathan Greco	NYSDEC	518-457-0549
Douglas Pocze	USEPA	212-637-4432
Michael McDermott	AFBCA	315-330-2275
Cathy Jerrard	AFBCA	315-330-2275
Michael Wojnas	AFBCA	315-330-2275
Ron Johnsen	USACE	816-983-3576
Bob Pender	USACE	816-983-3849
Gene Florentino	E&E	716-684-8060
Robert Meyers	E&E	716-684-8060
Jon Sundquist	E & E	716-684-8060

DISCUSSIONS:

Agenda. A PowerPoint presentation was provided for the ESI/SI Draft Report Discussions. Copies of the proposed agenda for the ESI/SI Review meeting, an outline of the AOC 9 presentation and discussion items, and location figures for each site were distributed to all participants.

Facilitator. Cathy Jerrard of the AFBCA acted as facilitator of the meeting.

Meeting Minutes. E & E was identified as responsible for preparation of meeting minutes.

Project Briefing. A meeting was held at the former Griffiss AFB between the AFBCA, USACE, USEPA, NYSDEC, and E & E to discuss the ESI/SI data generated from the field activities of March 6 to May 25, 2000 and the subsequent Draft Reports produced. Personnel attending the meeting are listed above.

The reports discussed included:

- a) AOC 9: Weapons Storage Area (WSA) Landfill Supplemental Investigation Draft Data Summary Report (November 2000);
- b) Draft Addendum to the July 1998 Supplemental Investigations of Areas of Concern, Technical Memorandum No. 1: On-Base Groundwater (October 2000); and
- c) Draft Former Griffiss Air Force Base Year 2000 Expanded Site Investigation Report (November 2000).

The activities conducted at each site and the recommendations made in the Draft Reports for each site were discussed in detail. A summary of this discussion appears below.

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• ERA is required to determine if the probable discharge of COPCs into Six Mile Creek is adversely affecting ecological receptors.

Human Health Risk Assessment - All parties agreed that a HHRA would be required for AOC 9. This document should be prepared in accordance with the USEPA Risk Assessment Guidance for Superfund Sites (RAGS). The following scenarios could be evaluated:

- Residential reuse;
- Occupational reuse(construction worker/landscaper); and
- Public/recreational reuse (not open space).

Prior to performing the HHRA a plan containing the Site Conceptual Model (SCM) will be submitted to NYSDEC and USEPA detailing the potential receptors, exposure scenarios, and methodologies. The plan containing the SCM will then be discussed among all parties, revised, and reissued after all parties have come to an agreement as to what the SCM will contain.

Ecological Risk Assessment - The group agreed an ERA is required to determine if the probable discharge of COPCs into Six Mile Creek is adversely affecting ecological receptors at AOC 9. USACE and AFBCA did express concerns with the timeliness for completing an ERA. NYSDEC stated that they believed this would be a straightforward and timely process. E & E stated that the scope of the ERA would need to be extremely detailed and agreed upon by all parties up front in order for the ERA to be completed in a timely manner. NYSDEC stated that their ecological group would work cooperatively to obtain agreement on species and intake parameters to be evaluated in the ERA. Finally, NYSDEC agreed that the area of evaluation in Six Mile Creek would be the discharge zone of the plume and that areas that have not been impacted by the AOC 9 plume would not be considered in the ERA.

Prior to performing the ERA a plan containing the Site Conceptual Model (SCM) pertaining to the ERA will be submitted to NYSDEC and USEPA detailing the potential receptors, exposure scenarios, and methodologies. The plan containing the SCM will then be discussed among all parties, revised, and reissued after all parties have come to an agreement as to what the SCM will contain.

AOC 9 Potential Additional Field Investigation

The team decided that additional information gathering and/or fieldwork would more logically be conducted in support of the Part II RI Program (i.e., in support of the risk assessments) or Feasibility Study. The following summarizes the potential additional work discussed during the meeting.

- The AFBCA, USACE, and E & E risk assessment team need to confirm that sufficient data has been collected to perform the required ERA and HHRA at AOC 9;
- NYSDEC has requested additional borings and soil sampling be conducted to delineate the potential chlorobenzene source area; and
- NYSDEC has requested additional Geoprobe sampling down gradient of the two test pits outside the plume that exhibited sheens, to ensure that a separate petroleum plume was not missed.

YEAR 2000 EXPANDED SITE INVESTIGATION DISCUSSION

Bob Meyers (E & E) provided an overview of each of the investigations performed under the Year 2000 ESI program and summarized the findings and recommendations for each site. Doug Pocze (USEPA) participated in all of the Year 2000 ESI discussions except for AOI 7, AOI 102 and AOI 431, due to travel delays. Bob Meyers provided a brief review of the AOI 7, AOI 102 and AOI 431 discussions for the USEPA.

NYSDEC and USEPA accepted the No Further Study recommendations made in the Draft Year 2000 ESI Report for: AOI 7, AOI 102, AOI 431, OTH-5485-2, and EOD Range 2 with the following action items:

- AOI 7 AFBCA will confirm that this site was addressed by HFA when the UXO clearance was performed;
- AOI 102 AFBCA will issue a letter to NYSDEC and USEPA requesting closure of this IRP site. The regulators would grant approval and a formal closure document would not be required;
- AOI 431 No action items arose during the meeting;
- OTH-5485-2 No action items arose during the meeting; and
- EOD Range 2 NYSDEC requested a letter from AFBCA to Marsden Chen on this site.

OTH-305

NYSDEC and USEPA accepted the recommendation made for OTH-305. The Draft report recommends cleaning out the floor drain at OTH-305 and filling the drain and associated piping with cement.

AOI 469

The Draft Report recommendation for this site is NFS. NYSDEC and USEPA were concerned with PCB and lead sample results, which slightly exceeded screening criteria. USEPA will provide written comments regarding this site after further review of the data. NYSDEC will review this site with others within NYSDEC.

PCI-20

The Draft Report recommendation for this site is NFS. USEPA was concerned with lead levels at the site, which exceeded screening criteria. Lead exceeded 1,000 ppm in 2 of 5 near surface soil samples collected. The near surface soil data was collected prior to debris removal. USEPA will recommend that this area be re-sampled to determine if lead is still elevated in this area and does not agree with the NFS recommendation. USEPA will provide written comments requesting additional investigation at this site after further review of the data.

001002_UK03_04_03_90-B0492 Final

Former Griffiss Air Force Base Year 2000 Expanded Site Investigation

Volume I

Contract Number: DACW41-99-D-9005 Work Authorization Directive 03

January 2002

Prepared for:

U.S. ARMY CORPS OF ENGINEERS Kansas City District 601 East 12th Street Kansas City, Missouri 64106

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List of Abbreviations and Acronyms

AFB	Air Force Base
AFBCA	Air Force Base Conversion Agency
AOC	Area of Concern
AOI	Area of Interest
ASC	Ecology and Environment Analytical Services Center
AST	above ground storage tank
ATSDR	Agency for Toxic Substance and Disease Registry
BNA	base, neutral, acid
BGS	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COP	covered under other programs
CS	confirmatory sampling
DCE	dichloroethene
DDT	dichlorodiphenyltrichloroethane
DO	dissolved oxygen
DOC	dissolved Organic Carbon
DQO	data quality objective
E & E	Ecology and Environment, Inc.
EBS	Environmental Baseline Survey
EDD	electronic data deliverable

explosive ordnance disposal

EOD

List of Abbreviations and Acronyms (cont.)

ERDC	United States Army Engineer Research and Development Center				
ERPIMS	Environmental Restoration Program Information Management System				
ESI	expanded site investigation				
Fe	Iron				
FEIS	Final Environmental Impact Statement				
FS	Feasibility Study				
FSP	field sampling plan				
GIS	Geographical Information System				
GLDC	Griffiss Local Development Corporation				
GW	groundwater				
HASP	health and safety plan				
HSA	hollow-stem auger				
IAG	Interagency Agreement				
ID	inner diameter				
IDW	investigation-derived waste				
IRP	Installation Restoration Program				
Law	Law Engineering and Environmental Services, Inc.				
LSA	lead-screen auger				
MCL	maximum contaminant level				
µg/Kg	micrograms per kilogram				
µg/L	micrograms per liter				
mg/L	milligrams per liter				
mg/Kg	milligrams per kilogram				
mm	millimeter				
Mn	manganese				
MSL	mean sea level				
NFS	no further study				
NPL	National Priorities List				
NS	near-surface soil				
NTU	nephelometric turbidity units				
NYANG	New York Air National Guard				

List of Abbreviations and Acronyms (cont.)

NYCCR	New York Code of Rules and Regulations				
NYSDEC	New York State Department of Environmental Conservation				
OD	outer diameter				
OE	ordnance and explosives				
ORD	ordnance				
ORP	oxidation-reduction potential				
OSWER	Office of Solid Waste and Emergency Response				
OTH	Other Miscellaneous Environmental Factor Sites				
OVA	organic vapor analyzer				
PAH	polynuclear aromatic hydrocarbon				
PCB	polychlorinated biphenyl				
ppm	parts per million				
ppt	parts per thousand				
PVC	polyvinyl chloride				
QAPjP	quality assurance project plan				
QCSR	quality control summary report				
RADC	Rome Air Development Center				
RBC	risk-based concentration				
RCRA	Resource, Conservation, and Recovery Act				
RI	Remedial Investigation				
RTC	response to Comments				
SVOC	semivolatile organic compound				
SD	sediment				
SS	subsurface soil				
STW	satellite waste accumulation point				
SW	surface water				
TAGM	Technical and Administrative Guidance Memorandum				
TAL	Target Analyte List				
TCL	Target Compound List				
TCLP	Toxicity Characteristic Leaching Procedure				
TOC	total organic carbon				
TRPH	total recoverable petroleum hydrocarbons				

List of Abbreviations and Acronyms (cont.)

USACE	United States Army Corps of Engineers
USAF	United States Air Force
USEPA	United States Environmental Protection Agency
USDOH	United States Department of Health
USGS	United States Geological Survey
UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compound
WAD	Work Authorization Directive

Executive Summary

(additional sectors)

Ecology and Environment, Inc. (E & E), under contract to the United States Army Corps of Engineers (USACE), Kansas City District, Contract DACW41-99-D-9005, performed additional Expanded Site Investigation (Year 2000 ESI) activities at the former Griffiss Air Force Base (Griffiss AFB) in Rome, New York. These activities were performed in four Areas of Interest (AOIs), two Other Miscellaneous Environmental Factors sites (OTHs), the Explosives Ordnance Disposal (EOD) Range 2 (Area 18) – Rocket Range, and the Panamerican Consultants, Inc., (PCI) Site 20.

The Year 2000 investigations were performed to further define environmental contamination at these sites that may pose a threat to public health or the environment.

In 1993, Griffiss AFB was designated for realignment under the federal Base Realignment and Closure (BRAC) Act and has been subsequently deactivated. A Final Environmental Impact Statement (FEIS) has been issued, which specifies plans for disposal and reuse of areas of the base (United States Air Force [USAF] 1995).

The additional investigations are in response to a request by the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA) to continue the process of de-listing sites as AOIs or identifying where remedial action may be needed. The results of this Year 2000 ESI project will be used to determine which, if any, of the sites investigated should be added to the list of sites that require no further study (NFS); whether additional sampling should be performed; or, if significant contamination is found, whether remedial action is needed.

The following sites were included in this investigation (see Figures 1-2A and 1-2B):

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- Southeast Skyline Housing/Former Base Firing Range (AOI 7),
- Lindane Spill Site (AOI 102),
- BIVOUAC Dump Area (AOI 431),
- Building 112-Transformer Oil Spill (AOI 469),
- Building 305 Paint Spray Booth (OTH-305),
- Trash Scatter/Dump (OTH-5485-2),
- EOD Range 2 (Area 18)-Rocket Range, and
- Panamerican Consultants, Inc., Site 20 (PCI Site 20).

This Year 2000 Expanded Site Investigation Report (Year 2000 ESI) describes the sampling methods that were used to investigate the eight sites. All site investigations were performed according to the sampling investigation objectives and procedures (where applicable) outlined in the October 1997 FSP, Health and Safety Plan (HASP), and Quality Assurance Project Plan (QAPjP) for the ESI Program (E & E 1997), and the February 2000 FSP, Health and Safety Plan, and Quality Assurance Project Plan Addendum for the ESI Program.

The Year 2000 ESI program consisted of field and non-field activities. Field activities included reconnaissance-type surveys (i.e., geophysics) where necessary; nearsurface (NS) soil sample collection; soil boring, including collection of subsurface samples (SS); installation of permanent and temporary monitoring wells, including collection of groundwater (GW) samples; surface water/sediment samples (SW/SD); waste samples; a dye trace test; and removal of surface debris. Non-field activities consisted of an inhouse review of historical information, including drawings, aerial photos, and previous sampling data from investigations performed prior to this ESI.

The analytical results from the Year 2000 ESI were assessed with respect to pertinent New York State and federal regulatory criteria. Results of soil analyses were primarily screened against NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 and USEPA Region III risk-based concentrations (RBCs). Results of groundwater analyses were screened against NYSDEC Class GA standards and guidance values, federal maximum contaminant levels (MCLs), and USEPA RBCs for tap water.

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The results for each site were then considered with regard to future land use. The basis for conclusions and recommendations for each of the Year 2000 ESI sites includes consideration of current site conditions and places particular emphasis on the planned reuse strategy for the former Griffiss AFB as outlined in the FEIS. No Further Study (NFS) has been recommended for all of the Year 2000 ESI sites with the exception of OTH-305, where removal of the water and sludge in the paint booth floor drain pit and plugging the floor drain with concrete has been recommended. A summary of these recommendations and actions appears in Table ES-1.

Table ES-1Summary of Scope of Work and Recommendations
for Year 2000 Expanded Site Investigation
Former Griffiss Air Force Base,
Rome, New York

	AOI	EBS ^a Designation				
AOI	Group	Study			Year 2000 ESI	
Number	Number	Area	Item Number	Site Description	Scope of Work Performed	Recommendation
AOI 7	1	37	ORD-725	Southeast Skyline	Historic Document/Groundwater	NFS: Year 2000 ESI sample results indi-
				Housing/Former Base	Data review	cate the presence of copper/lead in the
				Firing Range	Collection / Analysis of:	near-surface soil is isolated and only
					15 soil samples	slightly exceeds respective screening crite-
					3 groundwater samples	ria. No copper or lead was detected above
						screening criteria in the subsurface soil or
						groundwater.
AOI 102	1	20	IRP-SS05	Lindane Spill Site	Historic Document/Groundwater	NFS: Year 2000 ESI sample results indi-
					Data review	cate the presence of dieldrin in the surface
					Collection / Analysis of:	soil is extremely limited and does not pose
					6 near-surface soil samples	a concern based on the current and ex-
						pected use of the site.
4.01.421		+				
A01431	1	4	IRP LF 50	BIVOUAC Dump Area	Historic Document/Groundwater	NFS: Year 2000 ESI sample results indi-
					Data review	cate low levels of metals in the near sur-
					Collection / Analysis of:	face-soil which only slightly exceed re-
					I sample from the contents of a	spective screening criteria. The 5-gallon
					5 gallon bucket	bucket, along with its contents and the sur-
					I near-surface soil sample	rounding soil, has been removed from the
					÷	site. The limited presence of metals in the
						soil does not pose a concern based on the
						planned future use of the site.

Table ES-1Summary of Scope of Work and Recommendations
for Year 2000 Expanded Site Investigation
Former Griffiss Air Force Base,
Rome, New York

	AOI	EBS ^a Designation				
AOI	Group	Study	Item Number	Site Description	Year 2000 ESI Scong of Work Performed	Becommendation
AOI 469	-	16	AST-112-7	Building 112-	Historic Document/Groundwater	NFS: Year 2000 ESI sample results indi-
			AST-112-8,	Transformer Oil Spill	Data review	cate low levels of metals, SVOCs, and
					Collection / Analysis of:	PCBs in the near surface and subsurface
					22 near-surface soil samples	soils which only slightly exceed respective
					31 subsurface soil samples	screening criteria. The limited levels of
						these analytes in the soil does not pose a
		ļ				concern based on the planned future use of
0711 205		20	0711 205	Duilding 205 Daint		the site.
01H-305	-	20	01H-305,	Building 305 Paint	Collection / Analysis of	Further Action: Year 2000 ESI sample re-
			31 W-303-02	spray boom	L grab water sample	analytes of concern in the sludge and water
1					1 sludge sample	within the floor drain nit which exceed the
					Performed dye trace test of floor	respective screening criteria. Recommend
					drain inside paint spray booth.	removal of the water and sludge within the
						floor drain pit, and plugging of the floor
						drain with concrete.
OTH-5485-2	-	7	OTH-5485-2	Trash Scatter/Dump	Historic Document/Groundwater	NFS: Year 2000 ESI sample results indi-
					Data review	cate low levels of analytes of concern in
					Collection / Analysis of:	the soils and groundwater, which only
					6 near-surface soil samples	slightly exceed respective screening crite-
					6 subsurface soil samples	ria. The limited contamination in the soil
					3 groundwater samples	does not pose a concern based on the
					refformed geophysical survey	planned future use of the site.
					and surface debris removal.	

Table ES-1Summary of Scope of Work and Recommendations
for Year 2000 Expanded Site Investigation
Former Griffiss Air Force Base,
Rome, New York

	AOI	EBS ^a Designation				
AOI Number	Group Number	Study Area	Item Number	Site Description	Year 2000 ESI Scope of Work Performed	Recommendation
EOD Range 2 (area 18)	3	4	AOI 171, ORD- 6025-2, IRP DP 59	Small arms burn pit and EOD demolition site	Historic Document review Collection / Analysis of: 4 surface water samples 4 sediment samples 24 near-surface soil samples 10 subsurface soil samples	NFS: Year 2000 ESI sample results indi- cate low levels of analytes of concern on site, which only slightly exceed respective screening criteria. The limited presence of these analytes on site does not pose a con- cern based on the planned future use of the site.
PCI Site 20	-	8	PCI Site 20	Panamerican Consult- ants, Inc. Site 20 – sur- face debris area	Historic Document review Collection / Analysis of: 5 near-surface soil samples Performed geophysical survey and surface debris removal.	Further Sampling: Year 2000 ESI sample results indicate elevated levels of lead in the near-surface soil on site. The presence of lead on site poses a concern based on the potential future utilization of the site for public/recreational use.

^a Environmental Baseline Survey (Tetra Tech 1994).

Key:

AOI = Area of Interest.

AST = Aboveground storage tank.

EOD = Explosive Ordnance Disposal

ESI = Expanded site investigation.

IRP = Installation Restoration Program

ORD = Ordnance

OTH = Other miscellaneous environmental factors

Introduction

1.1 Purpose and Goals

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Griffiss Air Force Base (AFB) is a former United States Air Force (USAF) Air Combat Command installation covering 3,539 acres in the Mohawk River Valley in Rome, New York (see Figure 1-1). In 1993, Griffiss AFB was designated for realignment under the federal Base Realignment and Closure (BRAC) Act and was subsequently deactivated.

Under contract to the United States Army Corps of Engineers (USACE), Kansas City District, Ecology and Environment, Inc. (E & E) conducted the Year 2000 Expanded Site Investigation (Year 2000 ESI) at four Areas of Interest (AOIs), two OTHs, EOD Range 2 (Area 18) – Rocket Range, and PCI Site 20 (see Figures 1-2A and 1-2B). Previous investigations had been conducted at some of these sites during the Group I and III AOI programs. The purpose of this program was to further evaluate whether past activities at certain areas of Griffiss AFB have impacted public health or the environment. The Year 2000 ESI performed at the eight sites consisted of additional site investigation to characterize the areas so that recommendations might be made regarding their future status. The results of this Year 2000 ESI have been used to determine which of these sites should be added to the current list of sites that require no further study (NFS) and which sites require remedial action.

In the evaluation of the Year 2000 ESI results, particular emphasis was placed on providing an assessment that considers human health and any potential impacts to the environment. The recommendations made are consistent with the plans for base redevelop-

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ment in the Master Reuse Strategy for Griffiss AFB developed for the Griffiss Local Development Corporation (GLDC) (1995), and the Final Environmental Impact Statement (FEIS) for the Disposal and Reuse of Griffiss Air Force Base (USAF 1995).

Initially, 464 AOIs were identified by Law Environmental, Inc., (Law 1994). Although the AOIs are numbered consecutively from 1 to 466, AOIs 109 and 184 were eliminated from the draft AOI report when the report was made final. After Law Environmental identified 464 AOIs, two new AOIs (AOI 467 and AOI 469) were added, and one of the original AOIs (AOI 81) was split into two AOIs (AOIs 81 and 468). Therefore, the current number of AOIs at the former Griffiss AFB is 467.

The AOIs have been divided by the Air Force Base Conversion Agency (AFBCA) into three groups: Group I AOIs, which include 15 sites believed to be potentially most contaminated; Group II AOIs, which include all AOIs (183) within GLDC Priority Property Areas I and II, and the Reversion Parcel (Griffiss Management Unit [GMU] K) as of September 27, 1995 (including six Group I AOIs); and Group III AOIs, which include all remaining AOIs (283) in GLDC Priority Property Areas III, IV, and V, and government-retained land as of January 4, 1996 (including nine Group I AOIs). A thorough review of background information, including aerial photos, groundwater data, and personal interviews, was performed for each AOI.

The information available for each AOI was summarized and reviewed further with USEPA Region II and NYSDEC representatives. Sites that did not show a potential for contamination were classified as "NFS." AOIs known to be covered under other programs (COP) were so designated. AOIs that showed the potential for contamination were subjected to further sampling. The Year 2000 ESI was subsequently performed at AOIs where additional site characterization was needed.

Based on the results of the Group I AOI investigation, one of the 15 respective sites was classified as COP, six were classified as NFS, and eight sites were studied further under the original ESI.

Of the 186 AOIs evaluated under the Group II AOI program, including six Group I AOIs actually located within these areas, 78.5 sites (including half of AOI 186) were classified as COP, 100.5 sites (including half of AOI 186) were classified as NFS, and CS was performed at seven sites. Each of these seven sites were CS was performed was subsequently classified as NFS.

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Of the 281 AOIs evaluated under the Group III AOI program (including the nine Group I AOIs actually located within these areas), 184 were classified as COP (AOI 66 was evaluated in both Groups II and III); 86 were classified as NFS; and 11 were investigated with CS. Of these 11 sites where CS was performed, seven were subsequently classified as NFS and four were investigated under the original ESI.

Of the 12 AOIs investigated under the original ESI; nine were recommended for NFS; one (AOI 9) was reclassified as an Area Of Concern (AOC); and two were included in the Year 2000 ESI for further investigation.

Based on a review of previous investigations and negotiations with the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency (USEPA), three Group I AOIs were selected for additional ESIs (Year 2000 ESI). The Year 2000 ESI also included CS at OTH-305, OTH-5485, EOD Range 2, and PCI 20, which had not been sampled previously. In addition, a new AOI (AOI 469) was added after a former GAFB employee reported that transformer oil had been dumped at this location. The locations of the sites included in the Year 2000 ESI program are shown in Figures 1-2A and 1-2B.

Based on results and conclusions of previous AOI investigations, and on a review of existing historical information, as-built drawings, and aerial photographs, Year 2000 ESIs were performed at the following eight sites:

- Group I AOIs
 - AOI 7 Southeast Skyline Housing/Former Base Firing Range;
 - AOI 102 Lindane Spill Site;
 - AOI 431 BIVOUAC Dump Area;
- New AOI
 - AOI 469 North Half of Building 112, this site was designated as an AOI after a former GAFB employee reported that transformer oil had been dumped at this location (See Section 4.4.1);
- Miscellaneous Environmental Factors Sites
 - OTH-305 Building 305-Paint Spray Booth;
 - OTH-5485-2 Trash Scatter/Dump;
- Explosive Ordnance Disposal Site
 - EOD Range 2 (Area 18) Rocket Range.

Panamerican Consultants, Inc., Site

- PCI Site 20.

The Year 2000 ESI program involved both field and non-field activities. Field activities included site reconnaissance; geophysical surveys, collection of near-surface soil, sludge, sediment, surface water, and water-grab samples; soil borings, including collection of subsurface soil samples; drilling permanent and temporary monitoring wells; and collection of groundwater samples. Field methods are detailed in the *Field Sampling Plan (FSP), Health and Safety Plan (HASP), and Quality Assurance Project Plan (QAPjP) for the ESI Program* (E & E 1997), *the Addendum to the FSP, HASP, and QAPjP for the ESI Program* (E & E 1998), and the *FSP, HASP, and QAPjP Addendum for the ESI Program* (E & E 2000). Field methods and results are summarized in Sections 3 and 4 of this report.

The non-field activities included the review of existing historical information and groundwater data. Pertinent documents, records, as-built drawings, and aerial photographs were studied to determine the nature and location of past operations that may have impacted the sites. Groundwater elevation data obtained from permanent wells drilled during the ESI were reviewed to determine the direction of groundwater flow at respective sites. The assumed direction of groundwater flow for sites where temporary wells were drilled was based on E & E's basewide groundwater elevation map for the former Griffiss AFB (E & E 1997).

At each site, an assessment of the analytical results was made with respect to regulatory guidance values, and conclusions were drawn regarding current site conditions. Recommendations for NFS or further remedial action were then made based on these environmental conditions and the planned reuse of the site and surrounding areas.

1.2 Site Description

The former Griffiss AFB is located in Rome, New York (see Figure 1-1). The former base is bordered by the Mohawk River along part of its western boundary and by the New York State Barge Canal along its southern boundary. It consists of 3,539 acres, of which 3,278 acres were fee-purchased by the United States government between 1941 and 1978, 257 acres (currently occupied by the former base golf course) were donated by

Oneida County in 1942 for initial base construction, and 4 acres (along the Barge Canal, south of the railroad tracks) are leased from New York State. In addition, the former base has 345 acres of clearance easements at the ends of its runway, 45 acres of rights-of-way, and 5 acres of restricted easements adjacent to the former weapons storage area (WSA). Most of the former base is designated by the Oneida County Tax Office as Tract 243.000-0001-001 (Tetra Tech 1994).

The former Griffiss AFB was designated for realignment under the Base Realignment and Closure Acts of 1993 and 1995, resulting in the deactivation of the 416th Bombardment Wing in September 1995. Some property has been retained by the government for organizations such as Rome Laboratory, NEADS, and the Defense Finance and Accounting Services, which will continue to operate at their current locations. The New York Air National Guard (NYANG) operated the runway for the 10th Mountain Division deployments until October, 1998, when they were relocated to Fort Drum.

1.3 Previous Studies

In 1981, the Department of Defense (DoD) established the Installation Restoration Program (IRP) to evaluate the environmental impact of operations on its bases. Since that time, Griffiss AFB has been studied by several contractors to determine the extent of site contamination and to prioritize and perform cleanup actions.

USAF and Engineering-Science, Inc., conducted a Phase I records search in 1981. Nineteen sites were studied for potential contamination, and 15 were identified as AOCs. A Phase II study was performed by Roy F. Weston, Inc., in two stages, one in 1982 and one in 1985. During this study, 14 groundwater monitoring wells were installed, four surface water sampling stations were established, and ground-penetrating radar and resistivity surveys were conducted.

Hydro Environmental conducted a study of four AOCs in 1986, and Versar, Inc., reviewed the data of 15 AOCs in 1987 to determine whether sufficient data were available to conduct a feasibility study (FS) for these sites. It was determined that the data generated were insufficient for evaluation. In the summer of 1987, Griffiss AFB was put on the National Priorities List (NPL), federal Superfund program.

In 1995, the Agency for Toxic Substance and Disease Registry (ATSDR) studied five AOCs to determine whether a health assessment could be performed, but again the data were insufficient. In 1988, UNC Geotech was contracted to begin the process of determining which IRP sites could be designated for no further action (NFA) and which should be maintained on an active list of AOCs. Law Environmental, together with the USAF, USACE, and regulatory agency personnel, expanded this process in 1991 and studied 54 sites, determining that 31 of these sites were AOCs. A work plan, FSP, QAPjP, and several technical memoranda were produced by Law to study these 31 AOCs in a Remedial Investigation (RI). Law performed RIs and risk assessments (RAs) at the 31 AOCs in August 1995. The draft final RI report was issued in December 1996.

Quarterly groundwater sampling began in the fall of 1992 at pre-RI well locations across the base.

Law Environmental conducted a second basewide study to identify AOIs. This study resulted in a document listing 466 AOIs (June 1994). Following a review of the final AOI report, the Environmental Baseline Survey (EBS), and other historical documents, CS was performed at 30 of these AOIs to determine whether contamination was present, and if present, whether it posed a potential threat to public health or the environment. E & E investigated Fifteen Group I AOIs, seven Group II AOIs, and Ten Group III AOIs from this list. The Group I AOI fieldwork was performed June through October 1995, and the final report was submitted in November 1996. The Group II and Group III AOI fieldwork was performed in April and August 1996, respectively. The final Group II report was submitted in June 1997 and the final Group III report was submitted in November 1997. The original ESI fieldwork was performed October 1997 through January 1998. The draft ESI report was submitted in July 1998, although it has not yet been finalized. A response to NYSDEC and USEPA comments (RTCs) and report addendum will be submitted in 2000 to finalize the 1998 ESI report.

A basewide EBS for Griffiss AFB, produced for the USAF by Tetra Tech in 1994, was updated in May 1996, March 1997, and December 1997 (Tetra Tech 1994). The EBS, which summarized much of the site work to date, was required for the realignment of the base, which took place on September 30, 1995. On June 19, 1995, an EBS/AOI summary table was also generated by Tetra Tech.

E & E completed development of a geographical information system (GIS) prototype during 1995 to assist base personnel in the transfer of surplus real estate and to serve as a database for the accumulation and management of site-specific information

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(e.g., analytical data, EBS information) by base personnel. Finally, in the summer of 1997, E & E performed supplemental field investigations at 21 of the 31 AOCs studied under the RI program

1.4 Environmental Setting

1.4.1 Local Topography and Geology

The former Griffiss AFB lies within the Mohawk Valley between the Appalachian plateau and the Adirondack Mountains (see Figure 1-1). The topography across the former base is relatively flat, with elevations ranging from 435 to 595 feet above mean sea level (AMSL). The highest elevations are to the northeast. A rolling plateau northeast of the former base reaches an elevation of 1,300 feet. The New York State Barge Canal and the Mohawk River Valley south of the former base lie below 430 feet AMSL.

Unconsolidated sediments at the former Griffiss AFB consist primarily of glacial till with significant quantities of silt and gravel and minor quantities of clay and sand (Tetra Tech 1994). The thickness of these sediments ranges from 0 to 12 feet in the northern portion of the former base to a maximum 130 feet in one area of the south portion. The average thickness of the unconsolidated sediments, however, is 25-50 feet in the central portion, and 100-130 feet in the south and southwest portions of the former base.

Glacial soils within the boundaries of the former Griffiss AFB were deposited during the Wisconsinian glacial stage of the Pleistocene Epoch. Soils of the former Griffiss AFB are derived secondarily from fluvial deposits from the Mohawk River, Six Mile Creek, and other smaller streams (Tetra Tech 1994). The glacial deposits are highly weathered rock and soil left behind by the retreating ice mass. Multiple advancements and withdrawals of the glacial ice during the Wisconsinian glacial period created a complex of soil types in and around the former Griffiss AFB referred to as glacial drift, or till. Glacial drift can include a range of grain sizes from rock flour to large boulders. The grain sizes of the overburden at the former Griffiss AFB range from fine silt to small boulders (E & E 1995). Lacustrine soils within the glacial drift observed at the former Griffiss AFB are derived from the proglacial lakes that formed on the perimeter of the retreating ice mass.

Underlying the surficial deposits at the former Griffiss AFB is the Utica shale, an Ordovician Period black shale deposited in a deep water basin environment. The Utica

Shale overlies the Trenton group, a series of alternating thin limestone and shale beds, and underlies the Whetstone and Frankfort formations of the Lorraine group (State University of New York [SUNY] 1991). The Utica shale has a thickness of up to 900 feet.

The depth from the ground surface to the top of the bedrock ranges from 0 feet on the north side of the former base to as much as 150 feet on the south side. Typical depths to bedrock on the base range from 30 to 50 feet below ground surface (BGS). Areas with the most shallow depth to bedrock, 15 feet or less, are found on the north side of Six Mile Creek (E & E 1995). Bedrock beneath the site generally dips to the southwest and south. The elevation of the bedrock surface changes from 500 feet AMSL northeast of the runway to 350 feet AMSL south of the Skyline Housing Area (Law 1994).

1.4.2 Local Hydrogeology

The aquifer of interest in this study is the shallow water table aquifer within the unconsolidated near-surface sediments. The depth to groundwater in the water table aquifer ranges from the ground surface to about 60 feet BGS (Tetra Tech 1994). Most groundwater in the base area is encountered within 20 feet BGS. The shallow groundwater generally flows across the base from the slight topographic high in the northeast to the Mohawk River and the New York State Barge Canal located southwest and southeast of the former base, respectively. Several small creeks act as discharge areas for shallow groundwater, as well as drainage culverts and sewers that intercept surface water runoff.

This conclusion is supported by an on-base stream mechanics study performed during the RI. This study determined that both Three Mile and Six Mile creeks are gaining streams within the base (Law 1996).

1.5 Report Organization

Section 2 of this report discusses the screening methods used to compare the analytical results for each site with regulatory criteria. Section 3 presents the field methods that were used to collect data. Section 4 presents individual reports for each site (AOI, OTH, EOD, and PCI) studied under this program. Each site-specific report includes background information, details regarding previous investigations (if performed), and a description of the physical and chemical characteristics of the site. Also included is a description of the respective field investigation, a summary of Year 2000 ESI sampling results, conclusions, and recommendations. References are provided in Section 5.

The remainder of the report consists of appendices. Subsurface logs are provided in Appendix A; survey coordinates are provided in Appendix B; complete analytical data summaries by site are provided in Appendix C; well development logs are provided in Appendix D; groundwater sampling logs are provided in Appendix E; field quality summary reports are provided in Appendix F; field adjustment forms are provided in Appendix G; and investigation-derived waste (IDW) inventory is presented in Appendix H. A summary of quality control (QC) concerns, including sample collection, handling, and analytical procedures; any deviations from E & E's FSP; presentation of analytical results; and discussion of the results of data quality evaluations are presented under separate cover in the July 2000 Quality Control Summary Report (QCSR) for the Year 2000 ESI (E & E 2000). 02:001002_UK03_04_03_90-B0492 Fig1-1.CDR-9/19/00-GRA



Figure 1-1 Former Griffiss AFB – Site Location Map



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Figure 1-2B FORMER GRIFFISS AIR FORCE BASE SITES WHERE YEAR 2000 ESI FIELD INVESTIGATIONS WERE PERFORMED (SOUTH AREA)



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SITES WHERE YEAR 2000 ESI FIELD INVESTIGATIONS WERE PERFORMED (NORTH AREA)

Screening Methodology

The screening methods used to compare the analytical results for each site with regulatory criteria are described below.

2.1 Screening Process

The screening process used to review the analytical data of the Year 2000 ESI involved the comparison of all analytical results with pertinent state and federal regulatory guidance values (see Tables 2-1 through 2-4). Additional evaluation was performed by comparing the results to USEPA Region III 2000 risk-based concentrations (RBC).

2.1.1 Screening Against NYSDEC Criteria

The various guidances considered for each medium in the screening of the analytical results against NYSDEC criteria are discussed below.

Soil/Sludge

Organics. NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 (NYSDEC 1994) values were used to screen organic results for soil and sludge samples (see Table 2-1). NYSDEC TAGM 4046 guidance provides compound-specific values for the majority of compounds screened in this report. However, NYSDEC TAGM 4046 specifies values of 1 mg/Kg of total PCBs (the sum of all congeners detected) in surface soils and 10 mg/Kg in subsurface soils.

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Inorganics. NYSDEC TAGM 4046 and base-specific background values were used to screen inorganic results of soil/sludge sample analyses (see Table 2-1).

Groundwater

Organics and Inorganics. Both organic and inorganic analytical results for groundwater were compared with NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards and Guidance Values (NYSDEC 1998) for Class GA waters (Table 2-2). The NYSDEC Class GA groundwater standards and guidance values provide specific screening values for the majority of compounds screened in this report. However, they specify a screening value of 0.09 μ g/L for total PCBs (the sum of all congeners detected) in groundwater.

Inorganic analyses of groundwater screening samples consisted of Target Analyte List (TAL) metals. Both total (unfiltered) and dissolved (filtered) metals analyses were performed on each groundwater sample.

Sediment

The NYSDEC Technical Guidance for Screening Contaminated Sediments (1999), published by the Division of Fish, Wildlife, and Marine Resources, was used for the screening of sediment (Table 2-3). This document provides screening methods for both organic and inorganic compounds in sediments.

Organics. Organics results of sediment analyses were compared to criteria that protect against human and wildlife bioaccumulation and chronic toxicity in benthic aquatic life.

Inorganics. The guidance defines levels of inorganics in sediments as Lowestand Highest-Effect-Level criteria. Both criteria for each metal were compared with the respective concentration in each sediment sample. A sediment is considered contaminated if either the Lowest- or the Highest-Effect-Level criterion is exceeded. If both criteria are exceeded, the sediment is considered to be severely impacted. If only the Lowest-Effect-Level criterion is exceeded, the impact is considered moderate (NYSDEC 1999).

Surface Water

Organics and Inorganics. Analytical results of surface water samples were compared with NYSDEC Division of Water TOGS 1.1.1, Ambient Water Quality Standards and Guidance Values (NYSDEC 1998) for Class C surface water (Table 2-4). Class C surface water values were used because all surface water samples collected during this study were taken from Six Mile Creek or one of its tributaries. Six Mile Creek is classified by NYSDEC as C(t) downstream of the base (ATSDR 1995).

2.1.2 Screening Against Federal Criteria

Federal guidance for lead in soil was used for comparison in this screening process. Federal Maximum Contaminant Levels (MCLs) for organic and inorganic compounds in drinking water were used for comparison with groundwater results.

Soil/Sludge

Organics. NYSDEC TAGM 4046 guidance specifies values of 1 mg/kg of total PCBs (the sum of all congeners detected) in surface soils and 10 mg/kg in subsurface soils. Under 40 Code of Federal Regulations (CFR) Part 761.125(c)(4), soils containing PCBs in areas with unrestricted access are regulated in the same manner. For the purpose of this investigation and consistent with removal projects at Griffiss, surface is defined as 0 to 10 inches BGS, and subsurface is defined as greater than 10 inches BGS.

Inorganics. USEPA OSWER Directive No. 9355.4-12, July 1994, establishes a health-based soil screening value of 400 mg/kg for lead in soils in a residential area. This soil screening value, which was derived using USEPA's Integrated Exposure/Uptake Biokinetic (IEUBK) Model, is considered to be protective of young children, the sub-population most sensitive to the effects of lead. It is recommended as a screening level for residential scenarios at CERCLA and RCRA Corrective Action Sites to determine

whether further study or corrective action is required. According to the directive, residential areas with soil lead levels below 400 ppm generally require no further action.

Groundwater

Organics and Inorganics. Organic and inorganic analytical results for groundwater were compared with federal MCLs presented in the National Primary and Secondary Drinking Water Standards (USEPA 2000). Federal compound-specific MCLs are provided for the majority of the compounds screened in this report. However, the MCL provided for PCBs is for total PCBs (the sum of all congeners detected) in groundwater.

2.1.3 Screening Against Risk-based Screening Criteria

Only compounds that exceeded standards in the preliminary screening were then subjected to a final screening by comparing respective levels with USEPA Region III RBCs for soil ingestion (RBC-si) in a commercial/industrial exposure scenario for soils, and with tap water (RBC-tw) for groundwater (USEPA 2000). The Region III RBCs are not intended for use as strict regulatory criteria, but rather to provide perspective on the significance of the concentrations of the compounds at specific sites in terms of the potential for adverse impact to human health and the environment. The comparisons of the sample results and assessment criteria are tabulated in the analytical results summary tables in each of the AOI reports in Section 4.

The RBCs are based on either a target cancer risk level of 10⁻⁶ or a non-cancer hazard index (HI) of 1.0. The target cancer risk is at the low end of the 10⁻⁶ to 10⁻⁴ risk range regarded as acceptable by USEPA, whereas the target HI is a benchmark below which other adverse health effects would not be expected. With RBCs, the potential cumulative risks from exposure to multiple chemicals are not considered, and it is possible that combined risks from several chemicals present at levels just below their individual RBCs could exceed the target risk level. These combined risks, however, would not greatly exceed the target risk level unless there were many such chemicals.

2.1.4 Conclusions

Conclusions were made regarding the evaluation of the Year 2000 ESI results with respect to established screening standards, site conditions, and the planned future use of the site. Based on the screening results and other scientific considerations made on a site-by-site basis, each AOI, OTH, EOD, or PCI site was recommended for NFS or for additional work. The approximate direction of groundwater flow at each site was determined using E & E's preliminary groundwater potentiometric surface map for the former Griffiss AFB (E & E 1997). This map is a comprehensive interpretation of basewide groundwater flow based on elevations recorded from permanent monitoring wells, surface water (such as creeks, wetlands, ponds, and swamps), and storm drains, as well as climatic and topographic influences. The planned future use of the sites was determined using the *Final Environmental Impact Statement (FEIS) for Disposal and Reuse of Griffiss Air Force Base* (USAF 1995), the *Griffiss Business and Technology Park Industrial Site Development Project Engineer's Report* (Bergmann Associates 1996), and the Master Reuse Strategy for Griffiss Air Force Base (GRPC 1995).

Table 2-1							
SOIL SCREENING CRITERIA FOR THE YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK							
Analyte	NYSDEC Soil CleanupUSEPA Region III RBCsObjective TAGM 4046 afor Industrial Soils b		Background ^c				
TAL Metals - SW6010B/7471A	/7470A (mg/Kg)						
Aluminum	SB	2000000	18306				
Antimony	SB	820	3.4				
Arsenic	7.5 or SB	3.8 ^d	4.9				
Barium	300 or SB	140000	71				
Beryllium	0.16 or SB	4100	0.65				
Cadmium	1 or SB	1000	1.1				
Calcium	SB	-	23821				
Chromium	10 or SB	6100 ^e	22.6				
Cobalt	30 or SB	120000	19				
Copper	25 or SB	82000	43				
Iron	2000 or SB	610000	47350				
Lead	2001	400 ^g	36				
Magnesium	SB		7175				
Manganese	SB	41000	2106				
Mercury	0.1	-	_				
Nickel	13 or SB	41000	46				
Potassium	SB	-	1993				
Selenium	2 or SB	10000	0.34				
Silver	SB	10000	1.1				
Sodium	SB		259				
Thallium	SB	140	0.45				
Vanadium	150 or SB	14000	36				
Zinc	20 or SB	610000	120				
Explosives - SW8330 (mg/Kg)							
2,4,6-Trinitrotoluene	-	190	-				
2,4-Dinitrotoluene	-	4100	_				
2,6-Dinitrotoluene	1	2000	_				
2-Amino-4,6-dinitrotoluene	-	-	-				
2-Nitrotoluene		20000	-				
4-Nitrotoluene	-	20000	-				
HMX		100000	-				
RDX	-	52	-				

Table 2-1							
SOIL SCREENING CRITERIA FOR THE YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK							
Analyte	NYSDEC Soil Cleanup Objective TAGM 4046 ^a	USEPA Region III RBCs for Industrial Soils ^b	Background ^c				
Pesticides - SW 8081A (µg/Kg)						
4,4´-DDD	2900	24000	_				
4,4´-DDE	2100	17000	-				
4,4´-DDT	2100	17000	_				
Aldrin	41	340	_				
alpha-BHC	110	910	-				
beta-BHC	200	3200					
Dieldrin	44	360	_				
Endosulfan I	900	12000000	_				
Endrin	100	610000	_				
Endrin ketone	100	610000 ⁿ	_				
gamma-Chlordane	540	16000	-				
Heptachlor	100	1300	_				
Heptachlor epoxide	20	630					
Methoxychlor	10000 1	1000000	-				
PCBs - SW 8081A (mg/Kg)							
Aroclor 1242	1 or 10 ^J	2.9	_				
Aroclor 1254	1 or 10 ^J	2.9	-				
Aroclor 1260	1 or 10 ³	2.9	-				
Semivolatiles - SW 8270C (µg/	Kg)	· · · · · · · · · · · · · · · · · · ·	_				
2.4-Dimethylphenol		41000000	-				
2-Methylnaphthalene	36400	41000000	-				
Acenaphthene	50000 [*]	12000000	_				
Acenaphthylene	41000	-					
Anthracene	50000 ^K	61000000	-				
Benz(a)anthracene	224	7800	-				
Benzo(a)pyrene	61 or MDL	780					
Benzo(b)fluoranthene	1100	7800	-				
Benzo(g,h,i)perylene	50000	_					
Benzo(k)fluoranthene	1100	78000					
Benzoic acid	2700	820000000	_				
Benzyl alcohol	-	61000000					
Bis(2-ethylhexyl)phthalate	50000 ^k	410000	<u> </u>				
Butyl benzyl phthalate	50000 ^k	41000000	_				
Carbazole	50000 ^ĸ	290000					
Chrysene	400	780000	<u> </u>				
Di-n-butyl phthalate	8100	20000000					
Di-n-octyl phthalate	50000 ^{-J}	41000000	_				
Dibenz(a,h)anthracene	14 or MDL	780	-				

Table 2-1								
SOIL SCREENING CRITERIA FOR THE YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK								
Analyte NYSDEC Soil Cleanup USEPA Region III RBCs Objective TAGM 4046 ^a for Industrial Soils ^b Background ^c								
Dibenzofuran	6200	8200000	_					
Fluoranthene	50000 ^k	82000000	-					
Fluorene	50000 ^k	82000000	-					
Indeno(1,2,3-cd)pyrene	3200	7800	_					
N-Nitrosodiphenylamine	_	1200000	_					
Naphthalene	13000	4100000	_					
Pentachlorophenol	1000 or MDL	48000	_					
Phenanthrene	50000 ^k	-	-					
Pyrene	50000 ^k	61000000	-					
Volatiles - SW 8260B (µg/Kg)								
Ethylbenzene	5500	20000000	-					
m,p-Xylene	1200	410000000	_					
Xylenes, Total	1200	410000000	-					
TRPH - 418.1M (mg/Kg)								
Petroleum Hydrocarbons, TR		-	-					

^a NYSDEC (1994), Technical and Administrative Guidance Memorandum (TAGM 4046), Division of Hazardous Waste ^b USEPA (2000), Risk-Based Concentration Table.

^c Twice the arithmetic mean of eight sample results from off base monitoring well borings OBMW-21 and OBMW-29 (Draft RI, Law, 1995)

^d RBC for arsenic as carcinogen.

^e RBC for hexavalent chromium.

^f Lead background levels reported in TAGM 4046 (4-61 mg/kg [rural] and 200 - 500 mg/kg [suburban and near highways]).

^g Screening criterion recommended for lead in soil in a residential setting (EPA OSWER # 9355.4, 12 July, 1994).

^h RBC for endrin.

ⁱ Per TAGM 4046, total pesticides less than 10000 μ g/Kg.

^j The PCB soil cleanup objective is 1 mg/Kg for surface soils and 10 mg/Kg for subsurface soils, and applies to the sum of

^k Per TAGM 4046, total semivolatiles less than 500000 μ g/Kg.

Key:

mg/Kg =	Milligrams	per kilogram
---------	------------	--------------

- MDL = Method detection limit.
- NYSDEC = New York State Department of Environmental Conservation.
 - RBC = Risk-based Concentration.
 - SB = Site background.
 - TR = Total recoverable.
 - TRPH = Total recoverable petroleum hydrocarbons.
 - USEPA = United States Environmental Protection Agency.
 - $\mu g/Kg = Micrograms per kilogram.$
 - = No criteria available.

	Table 2-2						
GROUNDWATER SCREENING CRITERIA FOR THE YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK							
Analyte	NYSDEC Class GA Groundwater Standards and Guidance Values ^a	USEPA Drinking Water MCLs ^b	USEPA Region III RBCs for Tap Water ^c				
TAL Metals - SW6010B/7471A/7470A (μg/L)							
Aluminum	-	50 to 200 ^d	37000				
Antimony	3	6	15				
Barium	1000	2000	2600				
Cadmium	5	5	18				
Calcium	_	-					
Chromium	50	100 ^e	110 ^f				
Cobalt	_	_	2200				
Copper	200	1300 ^g	1500				
Iron	300 ⁿ	300 ^a	11000				
Lead	25	15 ^g	_				
Magnesium	35000 1	-	_				
Manganese	300 ⁿ	50 °	730				
Nickel	100	-	730				
Potassium	_	-	-				
Selenium	10	50	180				
Sodium	20000	-	-				
Thallium	0.5 ⁱ	2	2.6				
Vanadium		_	260				
Zinc	2000 '	5000 ^a	11000				
PCBs - SW 8081A (µg/L)							
Aroclor 1254	0.09 ¹	0.5 ^j	0.033				
Semivolatiles - SW 8270C (µg/L)	- T						
Bis(2-ethylhexyl)phthalate	5	6	4.8				
Butyl benzyl phthalate	50 ⁱ	-	7300				
Di-n-butyl phthalate	50 ⁱ	3700	3700				
Di-n-octyl phthalate	50 ⁱ	730	730				
Volatiles - SW 8260B (µg/L)							
Acetone	50 ⁱ	_	610				
Ethylbenzene	5 ^k	700	1300				
m,p-Xylene	5 ^{k, 1}	10000	12000				

^a NYSDEC (1998), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Division of Water Technical and Operational Guidance Series (1.1.1).

^b USEPA (2000), Drinking Water Standards and Healthy Advisories, Division of Water (EPA 822-B-00-001).

^c USEPA (2000), Risk-Based Concentration Table.

^d Secondary MCL.

^c Total chromium MCL.

'Hexavalent chromium RBC.

Table 2-2

GROUNDWATER SCREENING CRITERIA FOR THE YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Action level is used in lieu of MCL.

ⁿ The standard for the sum of iron and manganese is 500 μ g/L.

¹ Guidance value.

^J Applies to the sum of all PCB congeners..

^k The principle organic compound standard applies for this substance.

¹ Applies to the sum of m-, p-, and o-xylene.

Key:

MCL = Maximum contaminant level.

NYSDEC = New York State Department of Environmental Conservation. RBC = Risk-based Concentration.

USEPA = United States Environmental Protection Agency.

 $\mu g/L =$ Micrograms per liter.

- = No criteria available.

	Table 2-3							
SEDIMENT SCREENING CRITERIA FOR THE YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK								
Analyte	NYSDEC Sediment Criteria for Organic Contaminants ^{a, b}	NYSDEC Sediment Criteria for Inorganic Contaminants ^{a, c} Lowest Effect Level	NYSDEC Sediment Criteria for Inorganic Contaminants ^{a, c} Highest Effect Level					
Explosives - SW8330 (mg/Kg	<u>1</u>							
2,4-Dinitrotoluene	-	-						
TAL Metals - SW6010B/7471	A/7470A (mg/Kg)							
Aluminum	-	-	-					
Arsenic	-	6	33					
Barium	-	-	-					
Beryllium	-	-	_					
Cadmium	-	0.6	9					
Calcium	-	-	-					
Chromium	- /	26	110					
Cobalt	-	-	_					
Copper	-	16	110					
Iron	-	20000	40000					
Lead	-	31	110					
Magnesium	-	-						
Manganese	-	460	1100					
Mercury	-	0.15	1.3					
Nickel	-	16	50					
Potassium	-	-						
Silver	-	1	2.2					
Sodium	-	-	_					
Vanadium	_	_						
Zinc	-	120	270					

^a NYSDEC (1999), Technical Guidance for Screening Contaminated Sediments, Division of Fish, Wildlife, and Marine Resources.

^b Sediment criteria for organic contaminants are based on water quality criteria and on the total organic carbon of the sediments.

^c Sediment criteria for inorganic contaminants are the lowest of either the Persaud at al. (1992) or the Long and Morgan (1990) effect levels. A sediment is considered contaminated if either the Lowest or the Highest Effect Level criterion is exceeded. If both criteria are exceeded, the sediment is considered to be severely impacted. If only the Lowest Effect Level criterion is exceeded, the impact is considered moderate (NYSDEC 1999).

Key:

mg/Kg = Milligrams per kilogram.
 NYSDEC = New York State Department of Environmental Conservation.
 - = No criteria available or applicable.

Table 2-4 SURFACE WATER SCREENING CRITERIA FOR THE YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Analyte	NYSDEC Class C Surface Water Standards and Guidance Values ^a
TAL Metals - SW6010B/7471A/7470A (μg/L)	
Aluminum	100
Barium	-
Calcium	_
Chromium	17.7-20.81 ^b
Cobalt	5
Iron	300
Magnesium	-
Manganese	_
Potassium	-
Sodium	-
Vanadium	14
Zinc	18.7-22.1 ^b
Explosives - SW8330 (µg/L)	
2,4-Dinitrotoluene	-
RDX	-
Tetryl	_

^a NYSDEC (1998), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Division of Water Technical and Operational Guidance Series (1.1.1).

^b The standards for zinc and chromium are calculated based on the water hardness; therefore surface water sample concentrations are compared to sample specific standards. The values listed represent the range of these sample-specific standards.

Key:

NYSDEC = New York State Department of Environmental Conservation. $\mu g/L =$ Micrograms per liter.

- = No criteria available.

Field Methodology

3.1 Introduction

All field activities for this program were performed according to applicable sections of the ESI FSP, HASP, and QAPjP (E & E 1997), and the modifications and additions described in the Field Sampling Plan, Health and Safety Plan, and Quality Assurance Project Plan Addendum for the Expanded Site Investigation at the AOI/OTH/PCI/EOD Sites (E & E 2000). The field investigation consisted of the following activities: geophysical surveys; soil borings and installation of monitoring wells; collection of near-surface (NS) and subsurface soil (SS) samples, groundwater (GW) samples, and surface water (SW) and sediment (SD) samples; a dye trace test; waste sampling; and surface debris removal. Any variance from approved field methods were detailed in Field Adjustment Forms approved by USACE technical staff, which were sent to USEPA and NYSDEC representatives (see Appendix E). Daily Activity summary reports were prepared by E & E and submitted to USACE and AFBCA. All field activities were carried out according to the approved Quality Control Plan. An E & E QC inspector performed field audits during the field investigation.

3.2 Geophysical Survey

Geophysical surveys performed during the Year 2000 ESI program consisted of an EM-31 and magnetometer survey at OTH-5485-2 and PCI Site 20 to determine whether buried metallic objects were present. The geophysical methods used to survey this area were electromagnetic (EM) ground conductivity and total earth-field magnetic surveys.

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The EM and magnetic survey were performed using an EM31 ground conductivity meter and an EG&G 856 portable proton precession magnetometer, respectively.

The EM31 instrument has an effective penetration depth of 18 feet and an optimal sensitivity depth of 5.4 feet. The EM31 responds to changes in natural ground conductivity, as well as to the presence of buried material that is conductive. The EM31 measures in-phase conductivity in parts per thousand (ppt). A polycorder-type datalogger was used in conjunction with the EM31 to electronically store conductivity measurements.

The magnetometer measures the earth's total magnetic field in gammas. Shortwavelength anomalies in the total field are caused by ferrous metal objects such as steel drums or tanks.

The geophysical survey grids were established using a tape measure and a Brunton compass. Pin flags were placed at the data collection points and permanent wood stakes were driven into the ground at the four outer corners of the grids to facilitate the surveyors' efforts in transferring the grid onto the site map (see Section 4). The OTH-5485-2 grid measured 150 by 200 feet and the PCI 20 grid measured 90 by 90 feet. Both grids had station and line spacing of 10 feet.

3.3 Near-surface Soil Sampling

Near-surface soil samples were collected from the 0- to 2-inch depth interval by directly filling the appropriate sample containers using dedicated, precleaned, stainless-steel spoons or trowels. Near-surface soil collection was performed according to the procedures established in the ESI FSP (E & E 1997) and the FSP Addendum (E & E 2000).

All sampling equipment was decontaminated according to the procedures described in the ESI FSP (E & E 1997) and the FSP Addendum (E & E 2000). The VOC portion of the sample was always collected immediately after the sample was retrieved; the remainder of the soil was homogenized in a clean stainless-steel bowl and placed in appropriate containers. All samples were immediately placed in a cooler with ice and handled as specified in Section 4 of the ESI FSP (E & E 1997) and the FSP Addendum (E & E 2000).

3.4 Surface Water/Sediment Sampling Methods

Four surface water/sediment samples were collected at the EOD Range 2. At each surface water/sediment sampling location, turbidity was minimized by collecting the surface water sample first, followed by the sediment sample. To avoid cross-contamination, sample collection began at downstream locations and proceeded upstream. Dedicated sampling equipment was used at each sampling location. All samples were immediately placed in coolers with ice. The surface water/sediment sample collection, labeling, packaging, and preservation were performed according to the procedures described in Section 4 of the ESI FSP and Sections 5 and 6 of the QAPjP (E & E 1997) and the FSP Addendum (E & E 2000). The samples were tested for the chemical parameters presented in Section 4 of this report

3.5 Drilling and Subsurface Soil Sampling

The Year 2000 ESI drilling was performed by Maxim Technologies, Inc., under the supervision of E & E geologists. All borings, except for one at AOI 469, were drilled using hollow-stem auger (HSA) techniques. One boring (G469-NS06) at AOI 469 was made using a Geoprobe macrocore sampler. Since, however, it proved difficult to obtain sufficient sample volume using this technique, all other borings at AOI 469 were drilled using HSA techniques (see Appendix G). This included the use of a 4¼-inch inner diameter (ID) HSA. Continuous split-spoon samples were collected from each boring until the total depth was achieved. A decontaminated 2-inch outer diameter (OD) carbon steel split-spoon sampler was used to collect each sample. If additional sample volume was required for split or duplicate samples, or poor recovery was achieved with the 2-inch spoons, 3-inch OD carbon steel split-spoons were used. Subsurface soil samples were collected at AOIs 7 and 469, OTH-5485-2, and EOD-2 from the depth intervals specified in the FSP Addendum (E & E 2000). The subsurface soil samples were labeled, packaged, and preserved according to procedures outlined in the ESI FSP and QAPjP (E & E 1997) and the ESI FSP and QAPjP Addenda (E & E 2000).

3.6 Monitoring Well Installation Methodology

3.6.1 Permanent Monitoring Well Installation

Permanent monitoring wells were installed at AOI 7. Standard monitoring well borings were advanced with 4¼-inch ID HSA to 8 feet below the water table, and the wells were installed within them according to the procedures described in USACE Engineer Manual EM 1110-1-4000 (1994). All monitoring wells were constructed using the same materials used for the RI (Law 1996), as described in Section 4.8.1 of the FSP (E & E 1997). All well screens were 10 feet long.

The standard monitoring wells were completed approximately 2 feet above ground surface. The aboveground completion consisted of a 6-inch-diameter, locking, protective steel casing, keyed alike for all wells. All wells were identified by a brass survey disk embedded in the pavement.

The wells were constructed, completed, and developed according to the procedures outlined in the ESI FSP (E & E 1997) and the FSP Addendum (E & E 2000). Permanent wells were developed no sooner than 12 hours after grout placement.

Groundwater samples were not collected until at least 14 days after well development had been completed in the permanent monitoring wells, in accordance with USACE EM 1110-1-4000 (1994). All samples from permanent wells were sent to an off-site laboratory. In addition to laboratory analyses, field measurements were made at the wells.

3.6.2 Temporary Monitoring Well Installation

Three temporary monitoring wells were installed and groundwater samples collected at OTH-5485-2. The borings were advanced to 8 feet below the water table for well installation. A pre-cleaned, temporary 10-foot length of 2-inch ID polyvinyl chloride (PVC) screen (0.010-inch slot), followed by pre-cleaned 2-inch ID PVC casing, was placed inside the augers so that approximately 2 feet of the screen was above the water table. Once the temporary casing and screen were installed through the augers, a sand filter pack was placed around the well screen to facilitate development of the temporary well and minimize turbidity prior to sampling. The augers were then removed from the ground. The sand was placed from 1 foot below the well screen to 2 feet above the well screen. Once the well was sampled, the casing and screen were removed, the sand was left in place, and the borehole was back-filled with soil cuttings. All drilling and sampling equipment was decontaminated between borehole locations according to the procedures outlined in the ESI FSP (E & E 1997) and the FSP Addendum (E & E 2000).

3.7 Low-flow Groundwater Sampling Procedures for Permanent and Temporary Monitoring Wells

Upon completion of monitoring well installation as described above, groundwater inside the monitoring wells was allowed to stabilize. Prior to purging and sampling, wells were developed using low-flow bladder pumps to minimize turbidity. After each purge volume, groundwater was tested for pH, temperature, conductivity, and turbidity. Well development continued until the pH, temperature, and conductivity readings stabilized, as described in the ESI FSP (E & E 1997), and turbidity levels were below 50 nephelometric turbidity units (NTUs). In accordance with EM 1110-1-4000 (1994), groundwater samples were not collected until at least 14 days after well development had been completed.

Samples were collected from both permanent and temporary monitoring wells using dedicated bladder pumps. The objectives and methods for this procedure are included in the USEPA Guidance document titled *Low-flow (Minimal Drawdown) Groundwater Sampling Procedures* (USEPA 1996). The goal of installing and sampling both the permanent and temporary monitoring wells during the Year 2000 ESI was to provide data of groundwater quality that is representative of actual aquifer conditions, with minimal alteration due to inappropriate or variable sampling techniques. Low-flow procedures are specifically designed to achieve this purpose. Flow rates of 0.1 to 0.5 L/min were used for this method of sampling. The equipment and procedures for performing low-flow groundwater sampling of the three permanent wells and three temporary wells installed during the Year 2000 ESI are discussed in Section 4.9 of the FSP (E & E 1997).

DO, redox potential (ORP), pH, temperature, and conductivity were measured throughout the purging of the wells using a QED Environmental System, Inc., Micropurge Flow Cell, Model R-FC4000. This unit automatically corrects for salinity at low

DO readings by estimating salinity from temperature and conductivity measurements, and then internally adjusting the DO reading. The FC4000 contains separate DO, ORP, pH, conductivity, and temperature probes in one unit. Turbidity measurements were also taken at regular intervals during the process. For every well, the field measurement procedure described in Section 4.9 of the ESIFSP (E & E 1997) and the FSP Addendum (E & E 2000) was followed.

All Year 2000 ESI monitoring wells were purged and sampled using the low-flow procedure described above. The VOC portion of the sample was collected first, followed by SVOCs, polychlorinated biphenyls (PCBs)/pesticides, and metals. Both filtered and unfiltered samples were collected for dissolved and total metals analyses, respectively. Filtered samples were collected using an in-line 0.45-micron filter. The samples were then immediately placed in a cooler with ice and properly preserved prior to shipment in ice at 4°C.

3.8 Drilling Water

Water taken from the potable water system at GAFB was used for all drilling operations, including equipment decontamination and hydration of bentonite. No other water was added to the monitoring wells during drilling or well construction. A sample of the potable water was collected on April 3, 2000, shipped to E & E's ASC, and analyzed for the complete set of analyses that were run on samples. The drill water results show low levels of metals, acetone, and trihalomethanes (i.e., bromodichloromethane and chloroform) (see Appendix C). Concentrations of metals and acetone were well below limits for groundwater. No trihalomethanes (associated with the chlorination of potable water) were detected in field samples. Overall, the source of the water used for drilling was acceptable and had no impact on the sample results.

3.9 Disposal of Investigation-derived Waste

Investigation-derived waste (IDW) was handled as described in the original ESI FSP. Uncontaminated groundwater was discharged to the ground surface adjacent to the monitoring well (or at a location approved by USACE), and drill cuttings (based on field screening) were backfilled into the borehole. Based on OVA readings, soil cuttings from soil borings at AOI 469 were contained in one 55-gallon drum, and the 5-gallon bucket of

tar and surrounding soil from AOI 431 was containerized in two 55-gallon drums. In accordance with the Year 2000 ESI FSP Addendum (E & E 2000), the analysis of site samples was determined to be sufficient to characterize drum contents for proper disposal. The drummed IDW was therefore not sampled.

3.10 Site Survey

To establish horizontal and vertical locations of all geophysical survey grids, borings, monitoring wells, and other sampling points, LaFave, White, and McGivern performed a ground survey. The ground survey made use of existing benchmarks. Horizontal measurements were performed to an accuracy of 0.001 foot and vertical measurements to 0.01 foot. Survey results were plotted on appropriate existing base maps and are presented in Appendix B.

3.11 Surface Debris Removal

The purpose of the surface debris removal at OTH-5485-2 and PCI Site 20 was to dispose of non-hazardous waste where surface dumping had occurred. The debris was inspected and any potentially hazardous materials (e.g., chemical bottles, oil cans) were segregated and placed into 55-gallon drums for future evaluation and disposition. The remaining debris (e.g., scrap metal, glass) was removed with a backhoe and placed into a roll-off dumpster for disposal. During the removal of debris, care was taken to remove as little of the surface soil in the area as possible.

3.12 Waste Sampling

Waste and soil sampling was performed at AOI 431. A sample of the tar-like contents of the partially buried 5-gallon bucket was collected using a dedicated, precleaned, stainless-steel ladle to fill the appropriate sample containers. Once the bucket had been sampled and excavated and visibly contaminated soil had been removed, a confirmatory soil sample was collected from the bottom of the excavation. The waste sample from the bucket and the soil sample were immediately placed in a cooler with ice and maintained at 4°C until analysis was performed. The bucket and contaminated soil were placed in two 55-gallon drums and staged for disposal with the other IDW drums.

3.13 Dye Trace Test Procedure

A non-hazardous concentrated dye (Sodium Fluorescein CAS# 518-47-8) was placed in the floor drain of the paint spray booth inside Building 305. Clean water from a spigot inside the building was used to flush the dye through the drainage system. All available storm sewer and sanitary sewer manholes adjacent to Building 305 and floor drains inside Building 305 were visually monitored for the dye with high-intensity flashlights. When the dye was observed inside the storm sewer manholes adjacent to March St., a glass container was lowered into each manhole to obtain a water sample for visual confirmation.

AOI Reports

The following subsections in this Year 2000 ESI report describe the site background, physical characteristics, field investigations, interpretations, and conclusions and recommendations for each individual site investigated. Subsurface boring logs are provided in Appendix A; survey coordinates are provided in Appendix B; complete analytical data summaries are provided in Appendix C; well development logs are provided in Appendix D; groundwater sampling logs are provided in Appendix E; daily activity summaries are provided in Appendix F; Field Adjustment Forms are provided in Appendix G; and investigation-derived waste (IDW) inventory is provided in Appendix H.

4.1 AOI 7: Southeast Skyline Housing/Former Base Firing Range

The objective of the Year 2000 ESI at AOI 7 was to further delineate the levels of lead and copper detected in the near-surface soils, subsurface soils, and groundwater samples originally collected during the ESI confirmatory sampling (CS). This work was performed at the request of NYSDEC.

4.1.1 Site Background

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Based on reports from Griffiss AFB personnel regarding the existence of a landfill on the site in the 1950s, this area was identified as an AOI in 1994 (Law 1994a). Review of 1943 aerial photograph No. 64-824-433, however, indicates that the base firing range was located on the same site as the suspected Skyline Housing Landfill. No refuse or waste in the area is visible in this or subsequent aerial photographs. According to a records search conducted by Tetra Tech for the Environmental Baseline Survey (EBS), the general area (EBS Study Area 37/Item No. ORD-725) served as the base firing range from 1943 until it was torn down in the late 1950s to facilitate the construction of the Skyline Housing Area (Tetra Tech 1995).

A 1943 photograph shows three buildings along the southwestern border of the firing range and an excavated slope on the northeastern border of the range. Uncovered partitions for firing are also seen facing the excavated slope, which was probably used as a backstop for projectiles. This aerial photograph does not show any impact features. It appears that the range was used for practice with small arms only. A 1960 aerial photograph shows that these structures were removed when the firing range was torn down, and that after the construction of the Skyline Housing Area, the area remained partially devegetated with no signs of debris or refuse. This area was visited in May 1994 as part of a preliminary environmental site characterization during the initial AOI identification program (Law 1994a). Several areas of stressed vegetation were noted in the northwestern hill area that serves as a boundary for the site, but the stressed areas were attributed to stormwater drainage. An isolated area of stressed vegetation was noted at the southwestern corner of the site where neither surface drainage nor standing water was observed. No specific evidence of environmental release or landfilling was noted. The site is estimated to be approximately 9.5 acres in area (see Figure 4.1-1).

4.1.2 Physical Characteristics of the Site

In April 1995, this area was revisited during the reconnaissance survey of the Group I AOIs. The site was observed to be well vegetated with grass and sparsely distributed small trees. These trees were noticeably younger than those that border the site to the north, east, and west. No signs of exposed refuse, seepage, or stressed vegetation were observed at the site. The area is a depression with no natural drainage. The hill-sides behind the Skyline Housing Area, west and north of the site, contained assorted litter and household debris. The area may have been a "borrow area" rather than a landfill. Evidently, families who lived in the adjacent housing units used the area for recreational purposes. Based on the borings drilled for the original ESI and the Year 2000 ESI, the subsurface soil consists of mainly very fine to medium-grained, uniform brown sand.

During the Year 2000 ESI, the depth at which the soils in the borings at the site were saturated ranged between 8 and 15.5 feet BGS.

4.1.3 Description of Previous Studies

During the Group I AOI investigation, a background review, site reconnaissance, and geophysical survey were performed at this site. The results of the investigation indicated that this area was not used as a landfill. No steep geophysical gradients that would be representative of buried metal debris or objects were noted in the EM31 or magnetometer data (E & E 1996). However, due to the area's former use as a base firing range, CS was recommended to investigate the presence of elevated lead levels.

The original ESI CS consisted of the collection of near-surface soil samples, subsurface soil samples, and groundwater samples. Fifty-two near-surface (0 to 3 inches BGS) soil samples were collected from within a coarse grid (75-foot spacing) across the former range, and a finer grid (50-foot spacing) over the area where the backstop was located. In addition, two background soil samples were collected to the east and west of the site. The soil samples were analyzed for total lead and percent solids. At the recommendation of NYSDEC, copper and phosphorus were also included in the analysis of half of the samples because these metals have been identified as potential contaminants at other firing ranges.

Four soil borings were also installed and completed as temporary monitoring wells (G007-SS01, G007-SS02, G007-SS03, and G007-SS04). These borings were drilled to a depth of approximately 8 feet below the water table. Soil samples were collected near the ground surface and directly above the water table. The subsurface soil was analyzed for the same parameters listed above, and the groundwater samples were analyzed for total (unfiltered) and dissolved (filtered) lead, copper, and phosphorus. All soil boring locations and sample locations where concentrations of analytes exceeded screening criteria are shown on Figure 4.1-1.

The original ESI CS found that only one near-surface soil sample (G007-NS25) exceeded the low end of the typical range for lead in suburban soils, 200 mg/kg, specified in the NYSDEC TAGM 4046 screening criteria. Sample G007-NS25, which was collected from the north end of the former firing range backstop area, contained lead at 270 mg/kg. None of the near-surface soil samples exceeded the USEPA OSWER

screening criterion of 400 mg/kg. Copper was detected in concentrations exceeding the NYSDEC screening criterion of 43 mg/kg in only one near-surface soil sample (G007-NS04); however, the level did not exceed the OSWER screening criterion of 82,000 mg/kg. Near-surface soil sample G007-NS04 contained copper at a concentration of 44 mg/kg. In subsurface soils, copper and lead concentrations exceeded NYSDEC criteria values in one sample (G007-SS02-Z1 and Z1/D), but did not exceed USEPA criteria values. Subsurface soil sample G007-SS02-Z1 contained copper at a concentration of 90 mg/kg, and lead at 210 mg/kg. In duplicate subsurface soil sample G007-SS02-Z1/D, the concentration of copper was 160 mg/kg and lead was 390 mg/kg. Neither copper nor lead were detected in the filtered groundwater samples.

This site has been designated as vacant land, with development reserved for future use (USAF 1995). The existing facilities and surrounding acreage in this area are assumed to be available for commercial/industrial development.

Based on the soil and groundwater investigation, which determined that the presence of lead and copper at the site was minimal, and on the future use of this site, NFS was recommended in the original ESI report (E & E 1998). Additional sampling was performed during the Year 2000 ESI at the request of NYSDEC.

4.1.4 Description of Year 2000 ESI Field Investigations

The objective of this Year 2000 ESI is, at the request of NYSDEC, to further delineate the levels of lead and copper detected in the near-surface soils, subsurface soils, and groundwater samples collected during the ESI CS. To achieve this objective, three permanent monitoring wells were installed. One well was installed upgradient (G007-MW01) and two were installed downgradient of the former firing range (G007-MW02 and G007-MW03). These wells were drilled to a depth of 8 feet below the water table. Groundwater samples were analyzed for total (unfiltered) and dissolved (filtered) lead and copper. In addition, five soil borings were drilled in the backstop area to determine whether elevated levels of lead or copper were present in the subsurface soils. Subsurface soil samples were collected from approximately 6 inches to 1 foot BGS, 2 to 4 feet BGS, and directly above the water table. The subsurface soil samples were analyzed for total lead, copper, and percent solids. The Year 2000 ESI sampling locations for AOI 7 are shown in Figure 4.1-1. A list of sample identifications and analyses is presented on Table 4.1-1.

Year 2000 ESI Results and Interpretation

All samples were subjected to a screening, which is described in Section 2. Tables 4.1-2 and 4.1-3 summarize the positive analytical results and applicable USEPA and NYSDEC screening criteria for soil and groundwater samples, respectively. Figure 4.1-1 shows sample locations and analytical results of samples that exceeded screening criteria. A complete analytical data summary for each sample is presented in Appendix C. QC evaluations are presented in the QCSR for the Year 2000 ESI (E & E 2000). A summary of analytical results for this site is presented below.

Subsurface Soil

Inorganics. Fifteen subsurface soil samples (plus duplicates) were collected from the five soil borings. Subsurface soil samples were analyzed for total lead and copper (see Table 4.1-1). Positive analytical results and screening are summarized in Table 4.1-2. Lead was detected in all subsurface soil samples. Concentrations ranged from 1.31 mg/kg in SS09-Z2 to 46.7 mg/kg in SS06-Z3. Copper was also detected in all subsurface soil samples collected. Concentrations of copper ranged from 7.37 mg/kg in SS09-Z2 to 36.1 mg/kg in SS05-Z1. No subsurface soil sample analyte concentrations exceeded NYSDEC or USEPA RBC screening criteria.

Groundwater

Inorganics. Three groundwater samples were collected, one from each of the three permanent wells installed. All three samples were analyzed for total lead and copper. Three subsamples were filtered and analyzed for dissolved lead and copper (see Table 4.1-1). Results are shown in Table 4.1-3. Concentrations of copper ranged from a ND in four of the samples to 55.0 μ g/l in G007-MW02-GW-F. Lead was not detected in any of the groundwater samples. No groundwater sample concentrations of analytes exceeded NYSDEC screening criteria, USEPA RBCs, or federal MCLs.

Conclusions and Recommendations

The potential contaminants at this former base firing range were copper and lead. None of the detected concentrations of copper and lead exceeded screening criteria. Based on these findings and on the potential future use of this site for commercial/industrial development, NFS is recommended.

TABLE 4.1-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR SOUTHEAST SKYLINE HOUSING/FORMER BASE FIRING RANGE FORMER GRIFFISS AIR FORCE BASE

									al Lead SW6010B al Copper SW6010B solved Lead SW6010B solved Copper SW6010E solved SSTM_D2216
Location	Date	Sample Number	Lab	Matrix	Depth	WP	Status	Туре	Tota Diss Diss
AOI 7	03/27/00	G007-SS05-Z1	ASC	Subsurface Soil	0.50-1.00	Y	т	N1	X X X
	03/27/00	G007-SS05-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Т	N1	X X X
	03/27/00	G007-SS05-Z3	ASC	Subsurface Soil	14.00-15.00	Y	T	N1	X X X
	03/27/00	G007-SS06-Z1	ASC	Subsurface Soil	0.50-1.00	Y	Т	N1	XXXX
	03/27/00	G007-SS06-Z2	ASC	Subsurface Soil	2.00-4.00	Y	T	N1	XXXX
	03/27/00	G007-SS06-Z2/D	ASC	Subsurface Soil	2.00-4.00	N	Т	FD1	XXXX
	03/27/00	G007-SS06-Z2/S	ERDC	Subsurface Soil	2.00-4.00	N	Т	FR1	XXXX
	03/27/00	G007-SS06-Z3	ASC	Subsurface Soil	13.00-14.00	Y	Т	N1	XXXX
	03/27/00	G007-SS06-Z3/D	ASC	Subsurface Soil	13.00-14.00	Y	S	FD1	X X X
	03/27/00	G007-SS06-Z3/S	ERDC	Subsurface Soil	13.00-14.00	Y	S	FR1	X X X
	03/27/00	G007-SS07-Z1	ASC	Subsurface Soil	0.50-1.00	Y	Ť	N1	X X X
	03/27/00	G007-SS07-Z1 (extra volume)	ASC	Subsurface Soil (MS/MSD)	0.50-1.00	Y	T	MS1	XX
	03/27/00	G007-SS07-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Т	N1	XXXX
	03/27/00	G007-SS07-Z2 (extra volume)	ASC	Subsurface Soil (MS/MSD)	2.00-4.00	Ň	Т	MS1	XX
	03/27/00	G007-SS07-Z3	ASC	Subsurface Soil	8.40-9.40	Y	Т	N1	X X X
	03/31/00	G007-SS08-Z1	ASC	Subsurface Soil	0.50-0.80	Y	т	N1	XXXX
	03/31/00	G007-SS08-Z2	ASC	Subsurface Soil	2.00-4.00	Y	T	N1	XXXX
	03/31/00	G007-SS08-Z3	ASC	Subsurface Soil	10.00-10.50	Y	T	N1	XXXX
	03/31/00	G007-SS09-Z1	ASC	Subsurface Soil	0.50-1.00	Y	Т	N1	XXXX
	03/31/00	G007-SS09-Z1/D	ASC	Subsurface Soil	0.50-1.00	Y	T	FD1	XXXX
	03/31/00	G007-SS09-Z1/S	ERDC	Subsurface Soil	0.50-1.00	Y	Т	FR1	XXXX
	03/31/00	G007-SS09-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Т	N1	X X X
	03/31/00	G007-SS09-Z3	ASC	Subsurface Soil	10.00-11.50	Y	Т	N1	X X X
	05/05/00	G007-MW01-GW	ASC	Groundwater	10.50-20.50	Y	T	N1	X X
	05/05/00	G007-MW01-GW-F	ASC	Groundwater	10.50-20.50	Y	Т	N1	XX
	05/04/00	G007-MW02-GW	ASC	Groundwater	9.00-19.00	Y	Т	N1	XX
	05/04/00	G007-MW02-GW (extra volume)	ASC	Groundwater (MS/MSD)	9.00-19.00	N	Т	MS1	XX
	05/04/00	G007-MW02-GW-F	ASC	Groundwater	9.00-19.00	Y	Т	N1	XX
	05/04/00	G007-MW03-GW	ASC	Groundwater	6.00-16.00	Y	Т	N1	XX
	05/04/00	G007-MW03-GW-F	ASC	Groundwater	6.00-16.00	Y	т	N1	XX

TABLE 4.1-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR SOUTHEAST SKYLINE HOUSING/FORMER BASE FIRING RANGE FORMER GRIFFISS AIR FORCE BASE

Location	Date	Sample Number	Lab	Matrix	Depth	WP	Status	Туре	Total Lead SW6010B	Total Copper SW6010B Discolved Lead SW6010B	Dissolved Copper SW6010E % Solids ASTM_D2216
	05/04/00	G007-MW03-GW/D	ASC	Groundwater	6.00-16.00	Y	Т	FD1	X	X	
	05/04/00	G007-MW03-GW-F/D	ASC	Groundwater	6.00-16.00	Y	Т	FD1		X	X
	05/04/00	G007-MW03-GW/S	ERDC	Groundwater	6.00-16.00	Y	Т	FR1	X	X	
	05/04/00	G007-MW03-GW-F/S	ERDC	Groundwater	6.00-16.00	Y	Т	FR1		X	X
	05/04/00	G007-MW03-GW (extra volume)	ASC	Groundwater (MS/MSD)	6.00-16.00	Y	Т	MS1	X	X	
	03/27/00	FIELDQC-RB07-SS01	ASC	Eqpt. Wastewater	0.00-0.00	Y	Т	RB1	X	X	-

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Key:

- AOI = Area of Interest.
- ASC = E & E's Analytical Services Center.
 - /D = Duplicate sample.
- Depth = Depth interval at which sample was collected.
- ERDC = U.S. Army Engineer Research and Development
 - Center Quality Assurance Laboratory.
- eqpt = Equipment.
 - F= Filtered.
- FD = Field duplicate.
- FR = Field split/replicate.

- GW = groundwater sample.
- MS/MSD = Matrix spike/matrix spike duplicate.
 - N = Original.
 - QC = Quality control.
 - RB = Rinsate blank.
 - /S = Split sample.
 - SS = Subsurface soil sample.
 - Stat = Status (T = Taken, S = Skipped).
 - WP = Sample in the work plan (Y = Yes, N = No).

ANALYSES

% = Percent.



Table 4.1-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM AOI 7: SOUTHEAST SKYLINE HOUSING/FORMER BASE FIRING RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	G007-SS05-Z1 3/27/00 0.5 - 1	G007-SS05-Z2 3/27/00 2 - 4	G007-SS05-Z3 3/27/00 14 - 15	G007-SS06-Z1 3/27/00 0.5 - 1	G007-SS06-Z2 3/27/00 2 - 4	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Test : TAL Metals - SW6010B/7471A/7470A Units: mg/kg							energia de la composición de la composi En esta de la composición	
Copper		36.1	7.82	8.70	8.07	8.32	43	82000
Lead		26.9	1.78	1.92	2.62	3.14	200	400

For more details on the screening criteria see Table 2-1.

Table 4.1-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM AOI 7: SOUTHEAST SKYLINE HOUSING/FORMER BASE FIRING RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	G007-SS06-Z2/D 3/27/00 2 - 4	G007-SS06-Z3 3/27/00 13 - 14	G007-SS07-Z1 3/27/00 0.5 - 1	G007-SS07-Z2 3/27/00 2 - 4	G007-SS07-Z3 3/27/00 8.4 - 9.4	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Test: TAL M	etals - SW6010	B/7471A/7470A		Units:	mg/kg			
Copper		11.3	12.8	10.6	8.31	8.56	43	82000
Lead		3.82	46.7	4.29	1.68	2.03	200	400

For more details on the screening criteria see Table 2-1.
Table 4.1-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM AOI 7: SOUTHEAST SKYLINE HOUSING/FORMER BASE FIRING RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	G007-SS08-Z1 3/31/00 0.5 - 0.8	G007-SS08-Z2 3/31/00 2 - 4	G007-SS08-Z3 3/31/00 10 - 10.5	G007-SS09-Z1 3/31/00 0.5 - 1	G007-SS09-Z1/D 3/31/00 0.5 - 1	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Test : TAL	Metals - SW6010	B/7471A/7470A		Units: 1	mg/kg			
Copper		14.0	9.59	8.21	8.77	8.06	43	82000
Lead		12.3	3.64	2.05	2.83	3.43	200	400

For more details on the screening criteria see Table 2-1.

Table 4.1-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM AOI 7: SOUTHEAST SKYLINE HOUSING/FORMER BASE FIRING RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (fl):	G007-SS09-Z2 3/31/00 2 - 4	G007-SS09-Z3 3/31/00 10 - 11.5			NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Test : TAL Metals - SW6010B/7471A/7470A				Units: 1	ng/kg		
Copper		7.37	7.94			43	82000
Lead		1.31	2.18			200	400

For more details on the screening criteria see Table 2-1.

Table 4.1-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM AOI 7: SOUTHEAST SKYLINE HOUSING/FORMER BASE FIRING RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:						
Qualifiers:						
Units:	Test and Sample Information:					
mg/kg = milligrams per kilogram	PCBs = polychlorinated biphenyls					
µg/kg ≈ micrograms per kilogram	TAL = Target Analyte List					
	TRPH = total recoverable petroleum hydrcarbons					
	/D = duplicate sample					
	NA = not analyzed					
a .						

Screening:



Result above NYSDEC recommended soil cleanup objectives, Technical and Administrative Guidance Memorandum (TAGM) 4046, (NYSDEC 1994).



Result above industrial EPA Region III Risk-Based Concentration (RBC), for soil, (EPA 2000).

* The EPA OSWER (Directive No. 9355.4-12, July 1994) health-based screening value for lead in soil in a residential area with children was used in lieu of an RBC.

Table 4.1-3SUMMARY OF POSITIVE HITS AND SCREENING FOR THE GROUNDWATER SAMPLES FROMAOI 7: SOUTHEAST SKYLINE HOUSING/FORMER BASE FIRING RANGE,
YEAR 2000 EXPANDED SITE INVESTIGATIONFORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

	Sample ID:	G007-MW01-GW	G007-MW01-GW-F	G007-MW02-GW	G007-MW02-GW-F	G007-MW03-GW	NYSDEC		ЕРА
. s PARAMETER	Sample Date: Depth (ft):	5/5/00 10.5 - 20.5	5/5/00 10.5 - 20.5	5/4/00 9 - 19	5/4/00 9 - 19	5/4/00 6 - 16	Class GA Standard	Federal MCL *	Region III RBCs for Tap Water

Test :	TAL Metals - SW6010	B/7471A/7470A		Units: µ	ıg/L				
Copper		44.3	20 U	20 U	55.0	20 U	200	1300	1500

For more details on the screening criteria see Table 2-2.

Table 4.1-3SUMMARY OF POSITIVE HITS AND SCREENING FOR THE GROUNDWATER SAMPLES FROMAOI 7: SOUTHEAST SKYLINE HOUSING/FORMER BASE FIRING RANGE,
YEAR 2000 EXPANDED SITE INVESTIGATION
FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

	Sample ID:	G007-MW03-GW-F	G007-MW03-GW-F/D	G007-MW03-GW/D	NYSDEC		EPA
	Sample Date:	5/4/00	5/4/00	5/4/00	Class GA	Federal	Region III RRCs for
PARAMETER	Depth (ft):	6 - 16	6 - 16	6 - 16	Standard	MCL *	Tap Water

Test :	TAL. Metals - SW6010B/7471A/7470A		Units: 1	ıg/L			
Copper	20 U	20 U 2	20 U		200	1300	1500

For more details on the screening criteria see Table 2-2.

Table 4.1-3 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE GROUNDWATER SAMPLES FROM AOI 7: SOUTHEAST SKYLINE HOUSING/FORMER BASE FIRING RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:		
Qualifiers:		
U	not detected	
Units:		Test and Sample Information:
mg/L ≕ milligrams per li µg/L = micrograms per	ter liter	PCBs = polychlorinated biphenyls TAL = Target Analyte List TRPH = total recoverable petroleum hydrcarbons /D = duplicate sample NA = not analyzed
Screening:		

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Result above NYSDEC Ambient Water Quality Standards and Guidance Values for Class GA (groundwater) source of drinking water (NYSDEC 1998).

_	 	

Result above EPA Region III Risk-Based Concentration (RBC) for tap water (EPA 2000).

Result above Federal Maximum Contaminant Level (MCL), Drinking Water Regulations and Health Advisories (EPA 2000).

* MCLs for aluminum, iron, manganese, and zinc are secondary MCLs based on aesthetics. In lieu of an MCL for copper and lead, action levels are used.



CK1S008B

	LEGEND
↔	YEAR 2000 ESI, MONITORING WELL
\$	YEAR 2000 ESI, SOIL BORING
•	ESI NEAR-SURFACE SOIL SAMPLE
\$	ESI SOIL BORING/TEMPORARY WELL
$\sim\sim$	APPROXIMATE BOUNDARY OF WOODED AREA
470	TOPOGRAPHICAL CONTOUR (5-FOOT INTERVALS)
	APPROXIMATE BOUNDARY OF FORMER BASE FIRING RANGE (DERIVED FROM 1943 AERIAL PHOTO)
0F	APPROXIMATE DIRECTION OF GROUNDWATER FLOW (E & E 1997) OVERHEAD ELECTRIC LINE
w	WATER LINE
s	SANITARY SEWER
×	FENCE
01	AREA OF INTEREST
GS	BELOW GROUND SURFACE
s	CONFIRMATORY SAMPLING
SI	EXPANDED SITE INVESTIGATION
SDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
IES: NO A EXCEI	NALYTICAL DATA FROM THE YEAR 2000 EDED SCREENING CRITERIA.
ONLY 97 ES TERIA	ANALYTICAL DATA I) THAT EXCEEDED SCREENING ARE SHOWN.
ALL DA	ATA EXCEEDED NYSDEC CRITERIA DTHERWISE NOTED.
	N
	SCALE IN FEET
	100 200 300

YEAR 2000 ESI RESULTS SOUTHEAST SKYLINE HOUSING/ FORMER BASE FIRING RANGE (AOI 7)

4.2 AOI 102: Lindane Spill Site

The objective of the Year 2000 ESI at AOI 102 was to determine the extent of dieldrin west of the former entomology shed.

4.2.1 Site Background

AOI 102 is the former location of Building 331, an entomology shop/pesticide storage shed. This building has since been removed from the site. An outline of the former building site is presented in Figure 4.2-1. The site was initially identified by Engineering-Science in a Phase I IRP study conducted for USAF in 1981 (Engineering-Science 1981). A subsequent investigation by Law Environmental in 1994 reported that a lindane spill occurred in this area during the summer of 1957 or 1958 (Law 1994b). The volume of the spill is reported to have been approximately 55 gallons of a 46% solution of lindane. The spill occurred inside the storage shed over a three-day period due to a pinhole leak in a 55-gallon drum (Law 1994b). The drum's entire contents was reported to have spilled through the building's wooden floor into the underlying soils. The area of the spill was reportedly localized beneath the building (Law 1994b).

As part of the site investigation for Interagency Agreement (IAG) Regulator chosen sites, Law Environmental personnel advanced four shallow soil borings, to a depth of 2 feet BGS in proximity to the spill site. Soil samples were collected from 0 to 1 feet and 1 to 2 feet BGS in each of the borings. Analysis of the soil samples revealed no evidence of lindane, although concentrations of the pesticides chlordane, 4,4'-DDE, and 4,4'-DDT exceeded NYSDEC guidance values for soil (Law 1994a).

4.2.2 Physical Characteristics of the Site

The site is currently a grass-covered lot at the northwestern corner of the intersection of Chanute Street and the driveway for Building 301. A row of trees, terminating within 30 feet of Chanute Street, lines each side of the Building 301 driveway. The remainder of the site is an open, flat, grassy area. A new drain line to Building 321 was recently installed through part of this area. No evidence of chemical stains or stressed vegetation was observed during site reconnaissance. Based on this and on previous investigations, the soils at AOI 102 consist of varying percentages of gravel/sand with minor amounts of silt. The dominant soil component is rounded, coarse- to cobble-sized gravel. The sand is well rounded and fine- to medium-grained. The soils consist generally of poorly graded and moderately sorted glacial outwash. During the original ESI, the depth at which the soils in the borings at the site were saturated ranged from 16 to 18 feet BGS.

4.2.3 Description of Previous Studies

CS, consisting of the drilling of one soil boring and one LSA boring, was performed at this site during the Group I AOI investigation in 1995. Two subsurface soil samples were collected from each boring and one groundwater-screening sample was collected from the LSA boring for pesticides analysis. Although no lindane was found, chlordane, 4,4'-DDE, and 4,4'-DDT were detected in concentrations exceeding NYSDEC screening criteria in the soil and exceeding USEPA RBCs in the groundwater (see Figure 4.2-1). As a result, further sampling was recommended to assess pesticide presence in the groundwater.

To further define the extent of pesticide contamination, an ESI was conducted in 1997. It consisted of the collection and analysis of four near-surface (0 to 2 feet BGS) soil samples, the installation and sampling of permanent monitoring wells G102-MW01, G102-MW02, and G102-MW03 (see Figure 4.2-1), and the preparation of a screeninglevel risk assessment. The depth to groundwater in these wells was approximately 16 feet BGS. All samples collected during the ESI were analyzed for pesticides. Three soil samples were collected from each well boring to investigate the potential source area of the pesticides in groundwater. One sample was taken from near the surface; one from an intermediate depth (8 to 10 feet BGS); and one from the water table. The three permanent wells were installed to a depth of approximately 8 feet below the water table. Existing well LAWMW-14 was also sampled and analyzed for pesticides.

No pesticide compounds were detected in any groundwater samples collected from the permanent wells during the original ESI. However, dieldrin was detected in concentrations above the USEPA RBC in one of the soil samples (0 to 2 feet BGS) collected from well boring G102- MW01 on the southwest side of the site. The results of the screening-level risk assessment performed for this site indicate that the estimated upperbound cancer risks posed to current groundskeepers and future commercial workers

are 4.5 x 10^{-6} and 1.1 x 10^{-5} , respectively, within the 10^{-6} to 10^{-4} risk range considered acceptable under current USEPA policy (E & E 1998).

The planned future use of this site is for commercial development (USAF 1995). Because of the unknown extent of dieldrin in near-surface soils, additional sampling was recommended in the original ESI report.

4.2.4 Description of Year 2000 ESI Field Investigations

To determine the extent of dieldrin in the near-surface soils at AOI 102, six nearsurface soil samples (0 to 2 inches BGS) were collected and analyzed for dieldrin.

The Year 2000 ESI sampling locations for AOI 102 are shown in Figure 4.2-1. A list of sample identifications and analyses performed is presented on Table 4.2-1.

Year 2000 ESI Results and Interpretation

All samples were subjected to a detailed screening, described in Section 2. Table 4.2-2 summarizes the positive analytical results and applicable NYSDEC and USEPA soil screening criteria. A complete analytical data summary for each sample is presented in Appendix C, and QC evaluations are included in the QCSR for the Year 2000 ESI (E & E 2000). A summary of analytical results is presented below.

Near-surface soil

Organics. Six near-surface soil samples were collected (plus duplicates) and analyzed for pesticides (see Table 4.2-1). Positive analytical results and screening criteria are summarized in Table 4.2-2. Dieldrin was detected in all soil samples, ranging in concentration from 2.42 μ g/kg in G102-NS08 to 21.1 μ g/kg in G102-NS07. No soil samples contained pesticides in concentrations that exceeded NYSDEC screening criteria or USEPA RBCs.

Conclusions and Recommendations

The purpose of this investigation was to determine the extent of dieldrin present in near-surface soil. None of the detected concentrations of dieldrin exceeded screening

criteria. Based on these findings and on the potential future use of this site for commercial development (USAF 1995), NFS is recommended.

TABLE 4.2-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR LINDANE SPILL SITE AOI 102 FORMER GRIFFISS AIR FORCE BASE

Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	Dieldrin 8081 A	% Solids
AOI 102	03/13/00	G102-NS05	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	X	X
	03/13/00	G102-NS06	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	X	X
	03/13/00	G102-NS07	ASC	Near-surface Soil	0.00-0.17	Ŷ	Ť	N1	X	X
	03/13/00	G102-NS08	ASC	Near-surface Soil	0.00-0.17	Ŷ	T	N1	X	X
	03/13/00	G102-NS09	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	X	X
	03/13/00	G102-NS09 (extra volume)	ASC	Near-surface Soil (MS/MSD)	0.00-0.17	Y	Т	MS1	X	1495
	03/13/00	G102-NS10	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	X	X
	03/13/00	G102-NS10/D	ASC	Near-surface Soil	0.00-0.17	Y	Т	FD1	X	X
	03/13/00	G102-NS10/S	ERDC	Near-surface Soil	0.00-0.17	Y	T	FR1	X	X
	03/13/00	FIELDQC-RB102-NS1	ASC	Eqpt. Washwater	0.00-0.00	<u>Y</u>	S	RB1	X	

Key:

- .
 - AOI = Area of Interest.
 - ASC = E & E's Analytical Services Center.
 - /D = Duplicate sample.
 - Depth = Depth interval at which sample was collected.
 - Eqpt. = Equipment.
 - ERDC = U.S. Army Engineer Research and Development Center Quality Assurance Laboratory.
 - FD = Field duplicate.

- FR = Field split/replicate.
- MS/MSD = Matrix spike/matrix spike duplicate.
 - NS = Near-surface soil sample.
 - QC = Quality control.
 - RB = Rinsate blank sample.
 - /S = Split sample.
 - Stat = Status (T = Taken, S = Skipped).
 - WP = Sample in work plan (Y = Yes, N = No).

ANALYSES

Table 4.2-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM AOI 102: LINDANE SPILL SITE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	G102-NS05 3/13/00 0 - 0.17	G102-NS06 3/13/00 0 - 0.17	G102-NS07 3/13/00 0 - 0.17	G102-NS08 3/13/00 0 - 0.17	G102-NS09 3/13/00 0 - 0.17	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Test : Pesticid	les - SW 8081A			Units: p	ıg/kg			
Dieldrin		10.1	13.9	21.1	2.42	24.5	44	360

For more details on the screening criteria see Table 2-1.

Table 4.2-2SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROMAOI 102: LINDANE SPILL SITE,YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAME	Sample ID: Sample Date: TER Depth (ft):	G102-NS10 3/13/00 0 - 0.17	G102-NS10/D 3/13/00 0 - 0.17			NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Test :	Pesticides - SW 8081A	in the second		Units: µg/kg			
Dieldrin		6.72	5.39			44	360

For more details on the screening criteria see Table 2-1.

Table 4.2-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM **AOI 102: LINDANE SPILL SITE,** YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:	
Qualifiers:	
Units:	Test and Sample Information:
mg/kg = milligrams per kilogram	PCBs = polychlorinated biphenyls
µg/kg = micrograms per kilogram	TAL = Target Analyte List
	TRPH = total recoverable petroleum hydrcarbons
	$D \approx duplicate sample$
	NA = not analyzed
Screening:	
Result above NYSDEC recommended soil cleanup objectives, Techni Administrative Guidance Memorandum (TAGM) 4046, (NYSDEC 1	ical and 994).



Result above industrial EPA Region III Risk-Based Concentration (RBC), for soil, (EPA 2000).

*

The EPA OSWER (Directive No. 9355.4-12, July 1994) health-based screening value for lead in soil in a residential area with children was used in lieu of an RBC.



BUFF plotted: 8/11/00 DDL

	LEGEND
,	YEAR 2000 ESI, NEAR-SURFACE SOIL SAMPLE LOCATION
2	YEAR 1997 ESI NEAR-SURFACE BORING
र च	YEAR 1997 ESI MONITORING WELL
Þ	GROUP I AOI CS SUBSURFACE SOIL BORING
┢	GROUP I AOI CS LEAD-SCREEN AUGER BORING (SOIL AND GROUNDWATER SAMPLES)
)	IAG SOIL BORING
	RI MONITORING WELL
-	DRYWELL
	EXCEEDS RISK-BASED SCREENING CRITERIA
-	DIRECTION OF GROUNDWATER FLOW
	OVERHEAD ELECTRIC LINE
	SEWER LINE
	WATER LINE
	AREA OF INTEREST
	BELOW GROUND SURFACE
	CONFIRMATORY SAMPLING
	EXPANDED SITE INVESTIGATION
	INTERAGENCY AGREEMENT
	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
	REMEDIAL INVESTIGATION
S: IO A XCEE EXC EXC L DA	NALYTICAL DATA FROM THE YEAR 2000 EDED SCREENING CRITERIA. ANALYTICAL DATA (1997 ESI AND 1995 CS) EEDED SCREENING CRITERIA ARE SHOWN. ATA EXCEEDED NYSDEC CRITERIA OTHERWISE NOTED.

Figure 4.2-1 YEAR 2000 ESI RESULTS LINDANE SPILL SITE (AOI 102)

4.3 AOI 431: BIVOUAC Dump Area

The objective of the Year 2000 ESI at AOI 431 was to determine the nature of a tar-like substance contained in a partially buried 5-gallon bucket discovered on site in 1998 by Human Factors Applications, Inc., (HFA) personnel performing an Ordnance and Explosives (OE) Removal Action at AOI 431; to remove and properly dispose of the bucket and any contaminated soil; and to determine any potential impact on the environment. E & E confirmed the presence of the 5-gallon bucket during a site reconnaissance in May 1999.

4.3.1 Site Background

Based on its inspection of a 1973 aerial photograph (No. 2176), Law identified AOI 431 as a potential landfill (Law 1994a). The suspected contents of the landfill were identified as debris, gravel, and fill. The EBS document also suggests that gravel may have been placed on the site for distribution on the gravel roads in the northeastern section of the base (Tetra Tech 1995a). IRP site code LF 56 is associated with this site.

4.3.2 Physical Characteristics of the Site

AOI 431 is located on the northern portion of Griffiss AFB, east of the main runway. Perimeter Road runs diagonally from the northwest to the southeast on the south side of AOI 431. West of the site, Perimeter Road intersects a gravel road. The overall site covers approximately 3 acres, measuring about 700 feet north to south and 250 feet east to west. Site relief varies up to 6 feet, with the highest elevation at the southwest corner along the fence. A chain-link fence runs along the west border and through the southern portion of the site. Access from the main base is provided by a gate (Gate 14) from the gravel road. Gate 14 is at the northwest corner of the base. AOI 431 is well vegetated, with grass and tall weeds and a few mature softwoods. Some lumber, rebar, asphalt, and concrete debris are still visible on the surface of the site, presumably remaining from bivouac and landfilling activities. A 3-foot-high mound marks the fill area at this site. Beneath the fill material, the subsurface consists of a series of alternating layers of gravel, sand, and silt mixtures with interbedded silt, clay, and silty clay. Depth to bedrock ranges from 18 to 25 feet BGS.

4.3.3 Description of Previous Studies

The Group I CS investigation at AOI 431 included a geophysical survey and three LSA borings. The geophysical survey was performed over this entire AOI (see Figure 4.3-1), and, to determine whether the site extends to this area, was extended south of AOI 431 across Perimeter Road to the grass-covered portion of the runway apron. The purpose of the survey was to determine whether there were any significant geophysical anomalies present at the site, which may represent buried metal drums or other metallic objects, and debris associated with potential landfill operations.

Review of the geophysical contour maps of the results of the survey performed at this AOI indicate the existence of no strong electromagnetic or total magnetic field gradients other than those caused by the chain-link fence along the west and southwest portions of the site. Although a pronounced magnetic anomaly was observed in the magnetometer data at the northwest edge of the fill area, it was isolated and was not observed in the EM31 survey. The source of this magnetic anomaly is probably a small metal object close to the ground surface. The geophysical data for the runway apron area south of Perimeter Road are virtually free of even small anomalies; therefore it is unlikely that any fill was deposited there.

Three LSA borings (LSA-18, LSA-19, and LSA-20) were completed during the Group I CS investigation. From each LSA boring, a soil sample was collected immediately above the water table and a groundwater sample was collected at the water table. These samples were collected to determine whether subsurface soil and groundwater was impacted by landfill activities. Soil samples were analyzed for TCL VOCs, SVOCs, and PCBs, and TAL metals. Groundwater samples were analyzed for TCL VOCs, SVOCs (including PAHs), PCBs, and TAL metals.

Organic compounds detected in the soil and groundwater did not exceed NYSDEC screening criteria; only silver was detected (in soil) at levels slightly exceeding the NYSDEC screening criteria (E & E 1996).

This site has been designated for Public/Recreational/Open Space future use, and all of the areas designated with this future land use will be maintained as open space (USAF 1999). The Group I CS demonstrated that there are no significant environmental impacts at AOI 431. All concentrations of analytes detected at this AOI fall below applicable RBCs. Although no environmental hazards have been detected in this area, an

abundance of potential physical hazards have been observed at the surface of the site, such as concrete/rebar and asphalt rubble. No further study was designated for AOI 431 in the Group I CS Report (E & E 1996).

In 1998 a tar-like substance contained in a partially buried 5-gallon bucket was discovered on the site by Human Factors Applications, Inc., (HFA) personnel performing an Ordnance and Explosives (OE) Removal Action at AOI 431. The bucket was not recognized during the initial geophysical survey because it was too small. The geophysical surveys at AOI 431 were designed to recognize more significant anomalies (e.g., 55-gallon drums) that may have been indicative of a significant release.

4.3.4 Description of Year 2000 ESI Field Investigations

To characterize the contents of the 5-gallon bucket for disposal, a sample was collected and analyzed for TCLP VOCs, SVOCs, herbicides, pesticides, and metals, TCL PCBs, reactive cyanide, reactive sulfide, pH, ignitability, and percent solids. Once the bucket contents were sampled, the bucket and all visibly contaminated soil surrounding or beneath the bucket were excavated by hand and placed into two 55-gallon drums for disposal. To confirm that no contamination remained after removal of the drum and surrounding soil, a near-surface soil sample was collected from the excavation and analyzed for TCL VOCs, SVOCs, and pesticides/PCBs, TAL metals, and percent solids.

The Year 2000 ESI sampling locations for AOI 431 are provided on Figure 4.3-1. A list of sample identifications and analyses is presented on Table 4.3-1.

4.3.5 Year 2000 ESI Results and Interpretation

All samples were subjected to a detailed screening, described in Section 2. Tables 4.3.2 and 4.3.3 summarize the positive analytical results and applicable USEPA and NYSDEC screening criteria for soils. Figure 4.3-1 shows sample locations and analytical results that exceeded screening criteria. A complete analytical data summary for each sample is presented in Appendix C, and QC evaluations are included in the QCSR for the Year 2000 ESI (E & E 2000). A summary of the analytical results for this site is presented below.

Bucket Sample

A sample was collected from the 5-gallon bucket and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, SVOCs, herbicides, pesticides, metals, TCL PCBs, reactive cyanide, reactive sulfide, pH, ignitability, and percent solids (see Table 4.3-1). All positive analytical results and screening criteria are shown in Table 4.3-2. Positive hits were only made by reactive cyanide at a concentration of 3.69 mg/kg and benzene at a concentration of 0.240 mg/L. No positive hits occurred for SVOCs, herbicides, pesticides, PCBs, metals, or reactive sulfide. No bucket sample constituents were detected at levels exceeding 6 NYCRR 371 identification criteria values for listing hazardous waste.

Near-surface soil

Organics. One near-surface soil sample (and a duplicate) was collected and analyzed for VOCs, SVOCs, pesticides/PCBs, metals, and percent solids. All positive analytical results and screening criteria are shown in Table 4.3-3. One pesticide, dieldrin, was found in the sample with a concentration range of $35.1 \ \mu g/kg$ to $38.1 \ \mu g/kg$. None of these concentrations exceeded NYSDEC screening criteria or USEPA RBCs. Three SVOCs were detected, including chrysene, fluoranthene, and pyrene. Concentrations of chrysene ranged from non-detected to $36.0 \ \mu g/kg$ in NS01/D. Concentrations of fluoranthene ranged from $33.0 \ \mu g/kg$ to $34.1 \ \mu g/kg$. Lastly, concentrations of pyrene ranged from $37.3 \ \mu g/kg$ to $64.1 \ \mu g/kg$ in NS01/D. Although SVOCs were detected, no detected concentrations of SVOCs exceeded NYSDEC screening criteria or USEPA RBCs.

Inorganics. Twenty-one metals were detected in the near-surface soil sample (see Table 4.3-3). Of those detected, three occurred at concentrations above NYSDEC TAGM 4046 screening criteria. Those detected at levels above NYSDEC screening criteria were arsenic at 8.15 mg/kg in NS01, cadmium at 2.51 mg/kg and 1.89 mg/kg in NS01 and NS01/D, respectively, and selenium at 6.69 mg/kg and 4.60 mg/kg in NS01 and NS01/D, respectively.

The concentration of arsenic at 8.15 mg/kg in NS01 also exceeded USEPA RBC, but did not exceed the regional background (16.0 mg/kg) for the 90th percentile for soils from the eastern United States (Shacklette and Boerngen 1984).

4.3.6 Conclusions and Recommendations

Petroleum-related compounds and PCBs that might have been released from the 5-gallon bucket were the primary compounds of interest at this site. No bucket sample constituents were detected at levels exceeding 6 NYCRR 371 identification criteria for listing hazardous waste. The 5-gallon bucket, along with its contents and the surrounding soil, has been removed from the site.

No VOCs were detected in the soil sample at this site. Although one pesticide and three SVOCs were detected in the soil sample, none were detected at levels exceeding NYSDEC screening criteria or USEPA RBCs. Cadmium and selenium were detected at concentrations exceeding NYSDEC screening criteria, but not the USEPA RBCs. Arsenic levels marginally exceeded both the NYSDEC screening criteria (7.5 mg/kg) and USEPA RBC (3.8 mg/kg), but did not exceed the regional background (16 mg/kg) for the 90th percentile for soils from the eastern United States (Shacklette and Boerngen 1984).

This site has been designated for Public/Recreational/Open Space future use, and all of the areas designated with this future land use will be maintained as open space (USAF 1999). Based on this planned future use, on the fact that the 5-gallon bucket (along with its contents and surrounding soil) has been removed from the site, and on the low levels of analytes of interest detected in the remaining soil, NFS is recommended. However, as a followup to the investigation performed under the Group I AOI Program, the AFBCA will inform the NYSDEC Division of Solid Waste of the current site status. The NYSDEC Division of Solid Waste and the AFBCA will then determine if additional work, such as addition of a soil cover, is required.

			SA	YEAR 2000 EXF MPLE LISTING F FORMER G	PANDED SITE IN OR BIVOUAC DU RIFFISS AIR FOI	VESTIGA JMP ARE RCE BAS	ATION EA AOI 4 Se	31							_					
											4)	4	ANA		>					į
Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	TCL PCBs SW8082	TCLP Pesticides SW1311/8081A TCLP VOCs 1311/8260B	TCLP Herbicides SW1311/8151A	ICLP Metals SW1311/60105/14/0A Reactive Cyanide SW7.3.3.2	Reactive Sulfide SW7.3.4.2	pH SW9045 Ignitability SW1030	TCLP SVOCs 1311/8270C	% Solids ASTM_D2216	TCL VOCs 8260B	I CL Pesticides 8081A	TAL Metals 6010B/7471A	TCL PCBs SW8082
AOI 431	04/05/00	G431-DR01	ASC	Drum Sample	0.00-0.00	Y	Т	N1	X	XX	X	XX	X	XX	X	X				
) La	05/16/00	G431-NS01	ASC	Soil	1.50-1.67	Y	T	N1		1000 1000						X	X	X	X	X
4	05/16/00	G431-NS01/D	ASC	Soil	1.50-1.67	Y	Т	FD1		<u> </u>			i a si c		l.	X	XX	(X	X	X
<u></u>	05/16/00	G431-NS01/S	ERDC	Soil	1.50-1.67	Y	Т	FR1								X	X	(X	X	X

TABLE 4.3-1

Key:

AOI = Area of Interest.

ASC = Analytical Services Center.

/D = Duplicate sample.

Depth = Depth interval at which sample was collected.

DR = Drum sample.

ERDC = U.S. Army Engineer Research and Development Center Quality Assurance Laboratory.

FD = Field duplicate.

FR = Field split/replicate.

N = Original.

- NS = Near-surface soil sample.
- PCB = Polychlorinated biphenyls.
 - /S= Split sample.

Stat = Status (T = Taken, S = Skipped).

- SVOC = Semivolatile organic compounds.
 - TAL = Target Analyte List.
 - TCL = Target Compound List.
- TCLP = Toxicity Characteristic Leaching Procedure.
- WP = Sample in work plan (Y = Yes, N = No).

Table 4.3-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE DRUM SAMPLE FROM AOI 431: BIVOUAC DUMP AREA, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

	Sample ID:	G431-DR01	6 NYCRR 371
	Sample Date:	4/5/00	Identification Criteria
PARAMETER	Depth (ft):	-	For Listing Hazardous Waste
Test: Ignitability - 1030		Units: °F	
Ignitability		Did Not Ignite	140
Test: Percent Moisture - D2216		Units: %	
Percent Moisture		14.8	-
Test: pH by Method EPA 9045C		Units: S.U.	
рН		12	\geq 2 or \leq 12.5 and aqueous
Test: Reactive Cyanide - 9012A-7.3.3		Units: mg/kg	
Reactive Cyanide		3.69 J	250
Test: TCLP Volatiles - SW8260B		Units: mg/L	
Benzene		0.240 J	0.5

Qualifiers:

Key:

J = Estimated.

Units:

mg/L = Milligrams per liter. mg/kg = Milligrams per kilogram. mm/sec = Millimeters per second. S.U. = Standard units.

Screening:

Test and Sample Information:

TCLP = Toxicity characteristic leaching procedure.

Sample exhibits characteristics of Hazardous Waste (6 NYCCR Part 371 1998).

XEVE 3000 EXEVIDED SILE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK VOI 431: BIVOUAC DUMP AREA, SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM Table 4.3-3

September 2000	and Environment, Inc		5-1.	criteria see Table:	or more details on the screening
00001	Z		† '90	69.9	muinələS
-	£661		765	\$£9	Potassium
41000	97		1.41	£'81	Nickel
-	l.0		r s690.0	0.0704 J	Μειςμιγ
41000	5106		806	986	anganese
-	<u>SLIL</u>		0/28	0678	muisəngeM
400	500		£.11	14.9	peəd
000019	05874		00861	00827	lton
82000	43		I'SZ	40.2	Copper
120000	06		57.9	L'01	Cobalt
0019	55.6		£'11	L.21	Chromimord
-	53821		0511	0121	muioleO
0001	1.1	· · ·	68.1	15.2	muimbeO
4100	\$9.0		L05 [.] 0	L6S:0	Beryllium
140000	300		4.14	L.44	ពារាធា
8.6	S'L		٤ ۲۷ ۱	r st . 8	Arsenic
820	4.E		r 0//.0	1.14	ynomijaA
000000Z	90881		0656	00201	munimulA
. 35.4		B _X /Riu	ssimU	¥01#1/V11#1/8	Test : TAL Metals - SW60101
00000019	00005		64.1 J	l E.7E	Pyrene
82000000	00005		34.1 J	10.EE	ក្រាបនាវេពិទេកទ
00008L	400		36.0 J	U 215 U	Chrysene
		8ҳ/8π	:stinU) (Test : Semirolatiles - SW 827
09£	44		1.85	t-se	Dieldrin
		ठिभू/8 ग	istinU	"·····································	Test : Pesticides · SVV 8081A
III noig9A ATJ *lairteubal- 2DBA	LVGW 4046 AX2DEC		L9`I - S`I 00/91/5 Cl/I0SN-IEPD	L9:1 - 5:1 00/91/5 IOSN-IEPD	Sample ID: Sample Date: (f): PARAMETER Depth (f):

Page 1 of 2

Table 4.3-3	SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM	AOI 431: BIVOUAC DUMP AREA,	YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK
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EC EPA Region III 4046 RBCs -Industrial*	10000	14000	610000
NYSD TAGM	1.1	150	120
G431-NS01/D 5/16/00 1.5 - 1.67	0.137 J	17.6	51.6
G431-NS01 5/16/00 1.5 - 1.67	0.703 U	20.7	58.7
Sample ID: Sample Date: Depth (ft):			
PARAMETER	Silver	Vanadium	Zinc

For more details on the screening criteria see Table 2-1.

Source: Ecology and Environment, Inc., September 2000 Page 2 of 2

Table 4.3-3 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM AOI 431: BIVOUAC DUMP AREA, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:				
Qualifiers:				÷
	J	estimated		
	U	not detected		
Units:			Test and Sample Information:	
mg/kg = milligrar	ns per kilograı	m	PCBs = polychlorinated biphenyls	
µg/kg = microgra	ms per kilogra	am	TAL = Target Analyte List	
			TRPH = total recoverable petroleum hydrcarbons	
			/D = duplicate sample	
			NA = not analyzed	

Screening:



Result above NYSDEC recommended soil cleanup objectives, Technical and Administrative Guidance Memorandum (TAGM) 4046, (NYSDEC 1994).



Result above industrial EPA Region III Risk-Based Concentration (RBC), for soil, (EPA 2000).

* The EPA OSWER (Directive No. 9355.4-12, July 1994) health-based screening value for lead in soil in a residential area with children was used in lieu of an RBC.



	LEGEND
•	YEAR 2000 ESI, NEAR-SURFACE SOIL AND WASTE SAMPLE LOCATION
0	GROUP I AOI CS GEOPHYSICAL GRID DATA NODE
-	GROUP I AOI CS LEAD-SCREEN AUGER BORING (SOIL AND GROUNDWATER SAMPLES)
¢	
	APPROXIMATE DIRECTION OF GROUNDWATER FLOW CHAIN-LINK FENCE
\oslash	MAGNETOMETER ANOMALY
	EXCEEDS RISK BASED SCREENING CRITERIA
AOI	AREA OF INTEREST
BGS	
J	ESTIMATED VALUE
NYSDEC	NEW YORK STATE DEPARTMENT OF
: LY ANALY EXCEEDEE HOWN.	TICAL DATA FROM THE YEAR 2000 ESI SCREENING CRITERIA
DATA E WISE NOT	XCEEDED NYSDEC CRITERIA UNLESS TED.
	MIN NO
	SCALE IN FEET
	150 300 450

FIGURE 4.3-1 YEAR 2000 ESI RESULTS BIVOUAC DUMP AREA (AOI 431)

4.4 AOI 469: Building 112 - Transformer Oil Spill

The objective of the Year 2000 ESI at AOI 469 was to determine the nature and extent of PCB and oil presence in the near-surface and subsurface soil adjacent to the north end of Building 112.

4.4.1 Site Background

Building 112, formerly a High Power Laboratory, is located in the central industrialized area of Griffiss AFB. Two aboveground storage tanks (ASTs) and one underground storage tank (UST) were located near the northeast corner of Building 112 and were removed prior to 1994. The loading dock area was used for the storage of PCB containers, which resulted in PCB soil contamination. A PCB Dump Area south of Building 112, comprising a 16- by 44-foot fenced-in gravel area, was used to store PCB transformers until they were removed in 1994.

In spring 1999, a former Griffiss AFB employee reported to AFBCA that he had dumped transformer oil along the northern wall of the building and the northern section of the east and west walls. According to this employee, the soil along the northeast corner of the building could not support grass growth until topsoil was placed over the spill area. In addition to the surface dumping, oil was also reportedly dumped into a concrete pit (terra-cotta sump) in the northernmost cell of the basement floor.

4.4.2 Physical Characteristics of the Site

AOI 469 is located in the central industrial area of the base. The site is generally flat, with less than 5 feet of topographic relief across the site. The area surrounding Building 112 is grassed to the north and east and predominantly paved to the west. A roofed concrete pad is also located approximately ten feet east of Building 112. According to USACE drawing number 112-A-45, dated December 1, 1976, this pad was actually an electrical transformer pad. No transformers are currently located on the pad, and there is no visible evidence (e.g., staining) of spills or leakage from the transformers. A substation is located on the south side of Building 112.

Building 112 is not located near any major surface water drainage features. Runoff from the site is channeled to the base stormwater drainage system, which drains into Six Mile Creek. Six Mile Creek drains to the New York State Barge Canal, approximately 1.5 miles south of the base.

A number of soil borings have been drilled in the vicinity of Building 112, including 74 borings during the RI and 11 borings during the year 2000 ESI. Based on a review of these borings, the upper 10 feet of soil at Building 112 consists of predominantly brown, silty, fine to coarse sand and gravel. Soils encountered from 10 to 20 feet BGS predominantly consist of brown, silty, fine to coarse sand.

The groundwater zone investigated at Building 112 exists under unconfined conditions within the unconsolidated aquifer. During the RI, the saturated zone in the vicinity of Building 112 was encountered at depths ranging from 4 feet BGS in well TF3MW-1 east of Building 112 to 16 feet BGS in boring 112SB-57 south of Building 112. During the Year 2000 ESI investigation, the saturated zone immediately adjacent to Building 112 was encountered at depths ranging from 12 feet BGS in borings G469-NS17 and NS20 on the east side of the building to 14.1 feet BGS in boring G469-NS01 on the west side of the building.

4.4.3 Description of Previous Studies

In 1981, Griffiss AFB bioenvironmental engineers sampled site soils to determine whether PCBs were present. In 1982, soils were collected from areas adjacent to the building and were analyzed for PCBs. PCBs were detected on the west and south sides of Building 112 and on a transformer pad on the roof. A limited groundwater investigation in the vicinity of Building 112 also identified inorganic compounds in groundwater. In 1984, a leaking transformer on the roof of Building 112 and roof materials impacted by the leak were removed. In 1994 and early 1995, in accordance with a Federal Facility Agreement, Law Environmental performed a Remedial Investigation (RI) for the Building 112 Area of Concern (AOC) (Law 1996). The RI for the Building 112 AOC included the investigation of four areas, a drywell located on the east side of Building 112 (Building 112 drywell); the location on the southwest roof where a transformer dielectric fluid spill occurred in the 1980s (Rooftop Transformer Area); the area by the loading dock at the southwest corner of the building where PCBs had previously been detected (Loading Dock Area); and the area of previously reported PCB dumping south of the building (PCB Dump Area). As part of the investigation, surface soils, subsurface soils, catch ba-

sin sediment, groundwater, wipes, and bulk materials (concrete and brick) were tested, and a baseline risk assessment was performed. Although PCBs were detected in the various media, the risk assessment determined that PCBs present in the soil did not pose an unacceptable risk to human health or the environment. However, the RI did recommend a removal action to address the soil and structural PCB contamination located south of Building 112 and west of the Loading Dock ramp near Moody Street (LAW 1996).

In 1996, E & E prepared a design analysis report to address remediation of Building 112 AOC. A drywell investigation for Building 112 was conducted by OHM Remediation Services Corp. in January 1997. Two presumed drywells were investigated. Drywell No. 1 was recommended for closure. Based on a smoke trace test, it was concluded that there was no second drywell, and therefore, no further study was recommended for what had initially been identified as Drywell No. 2.

In 1999, a removal action was performed to remove PCB-contaminated materials at the Building 112 AOC. The action included removal of a transformer pad from the roof, soil and a concrete retaining wall from the south side of the building, and soil from the southwest side of the building. The action was documented in the Building 112 Area of Concern Record of Decision, executed September 2001.

During the RI, extensive sampling for PCBs was performed at the south side of the building (dump area). However, there was no sampling performed at the north side, except for a three-point composite sample collected from Drywell No. 1.

During a site visit in May 1999, E & E inspected Building 112 both inside and outside. A terracotta sump approximately 2 feet in diameter and 2 feet deep was discovered beneath the tile floor in the northwest corner of the basement beneath the stairway access. The terracotta sump had a concrete bottom with no drain. Since the sides and bottom of the sump appeared clean and intact, samples were not collected from the sump. There were no signs of stressed vegetation outside of the building.

4.4.4 Description of Year 2000 ESI Field Investigations

The objective of this Year 2000 ESI was to determine the nature and extent of PCB and oil presence in the near-surface and subsurface soil around the north end of Building 112. A grid with 25-foot sample spacing, covering the area where PCBs were reportedly dumped, was used to collect 22 near-surface soil samples at 0 to 2 inches BGS.

All samples were analyzed for TCL SVOCs and PCBs, total recoverable petroleum hydrocarbons (TRPH), TAL metals, and percent solids. Also, based on the analytical results of the 22 near-surface soil samples, soil borings were drilled at 11 near-surface locations with elevated PCB concentrations. Two soil samples were collected at nine of these borings, an intermediate-depth soil sample (approximately 5 to 7 feet BGS), and a deeper soil sample (immediately above the water table [approximately 10 to 14 foot BGS]). Continuous soil samples were collected from ground surface to the water table at the remaining two borings, G469-NS01 and G469-NS20. All soil boring samples were analyzed with the same parameters specified for the near-surface soil samples.

The Year 2000 ESI sampling locations for AOI 469 are provided in Figure 4.4-1. A list of sample identifications and analyses is presented in Table 4.4-1.

4.4.5 Year 2000 ESI Results and Interpretation

A listing of samples collected and analyses run is presented in Table 4.4-1. All samples were subjected to a detailed screening, which is described in Section 2. Table 4.4-2 summarizes positive analytical results and applicable NYSDEC and USEPA RBC criteria for soils. A complete analytical data summary for each sample is presented in Appendix C, and QC evaluations are included in the QCSR for the Year 2000 ESI (E & E 2000). Analytical results are discussed below.

Near-surface Soil

Organics. All near-surface soil samples were analyzed for TCL SVOCs, TCL PCBs, TRPH, TAL metals, and percent solids (see Table 4.4-1). PCBs were detected at concentrations below NYSDEC screening criteria (below 1 mg/kg) in 13 samples. Total PCBs only exceeded NYSDEC screening criteria in near-surface soil samples NS01/NS01/D (1.02 mg/Kg/1.04 mg/Kg) and NS20 (7.12 mg/Kg). Positive results and screening are summarized in Table 4.4-2.

Three PCBs were detected in the near-surface soil samples, including Aroclor 1242, Aroclor 1254, and Aroclor 1260. Aroclor 1242 was detected in 6 of 22 near-surface samples, and concentrations ranged from 0.057 mg/kg in NS12 to 0.495 mg/kg in NS01. Aroclor 1254 was detected in 5 of the 22 near-surface samples, in concentrations

ranging from 0.110 mg/kg in NS11/D to 1.04 mg/kg in NS01/D. Aroclor 1260 was detected in all near-surface samples, in concentrations ranging from 0.0206 mg/kg in NS02 to 7.12 mg/kg in NS20. The concentrations of Aroclor 1260 exceeded the EPA RBC for Aroclor 1260 only in NS20 (7.12 mg/kg). No other EPA RBCs for PCBs were exceeded.

Twenty-two SVOCs were detected in the near-surface soil samples. Only polynuclear aromatic hydrocarbons (PAHs) were detected in concentrations above NYSDEC screening criteria prize screening criteria. PAHs detected in concentrations above NYSDEC screening criteria were benzo(a)anthracene in all samples except NS10, NS11, NS11/D, NS13, NS15, NS19, and NS21; benzo(a)pyrene, in all samples; benzo(b)fluoranthene in NS01/D, NS02, and NS07; benzo(k)fluoranthene in NS01, NS01/D, NS02, and NS07; and chrysene in NS01, NS01/D, NS02, NS06, NS07, NS08, NS12, NS14, NS20, NS22, and NS22/D. Only the concentration of benzo(a)pyrene in NS01, NS01/D, NS02, NS07 exceeded both the NYSDEC screening criteria and USEPA RBC. These concentrations ranged from 1,040 μ g/kg in NS01 to 2,350 μ g/kg in NS07 (see Figure 4.4-1A and Table 4.4-2). Overall, the concentrations of PAH found in the soil were similar to those in urban areas near traffic or other fossil-fuel combustion sources (USDOH&HS 1993), and are also similar to those commonly found in surface soils at Griffiss AFB.

Inorganics. Twenty-three metals were detected in the near-surface soil samples. Eleven metals were detected in concentrations above NYSDEC screening criteria. Of these results, the most significant detection was lead, which was detected in four samples, NS10, NS14, NS16 and NS21, at concentrations exceeding both state and federal criteria. Lead was detected in near-surface soil samples NS10 at 1,990 mg/kg, NS14 at 734 mg/kg, NS16 at 1,390 mg/kg, and NS21 at 572 mg/kg. These elevated levels of lead were only detected at the northeast corner of Building 112 (NS10, NS14, and NS16), and along the northern portion of the east wall of the building (NS21). Excluding lead, there were no other exceedences of federal criteria, although a number of other metals were detected at levels exceeding NYSDEC screening criteria, including beryllium, cadmium, calcium, chromium, copper, iron, mercury, selenium, silver, and zinc (see Figures 4.4-1A, -1B and Table 4.4-2). Several examples are concentrations of cadmium, which ranged from 1.38 mg/kg in NS14 to 109 mg/kg in NS16; concentrations of copper, which

ranged from 43.3 mg/kg in NS14 to 132 mg/kg in NS01/D; and concentrations of mercury, which ranged from 0.181 mg/kg in NS10 to 2.03 mg/kg in NS21. With the exception of lead and mercury, most of these exceedences are within the range of site background levels. Significant lead and mercury detections are infrequent (four above both criteria for lead and eight [including one duplicate] above the NYSDEC criterion for mercury) and do not represent a threat to public health for the following reasons: of the 22 lead detections, only four were above both state and federal standards, and the area of significant lead presence is minimal. Mercury was slightly more common than lead, with eight (including one duplicate) out of 22 detections above the state standard. While there is no RBC for elemental mercury, the RBC for mercuric chloride is generally used in its place for risk assessment purposes. The RBC for mercuric chloride is 610 mg/kg, which is higher than the highest concentration of mercury (1.02J mg/kg) detected.

Petroleum Hydrocarbons. No petroleum hydrocarbons were detected in the near-surface soil samples.

Subsurface Soil

Organics. Thirty-one subsurface soil samples were collected at AOI 469 and analyzed for TCL SVOCs and PCBs, TRPH, TAL metals, and percent solids (see Table 4.4-1). Positive results and screening are summarized on Table 4.4-2.

Two PCBs were detected in the subsurface soil samples, Aroclor 1254 and Aroclor 1260 (see Figure 4.4-1 and Table 4.4-2). Aroclor 1254 was detected in three of 31 subsurface soil samples, in concentrations ranging from 0.0159J mg/kg in SS01-Z2 (2 feet to 4 feet BGS) to 0.684 mg/kg in SS01-Z1 (0.17 foot to 2 feet BGS). Aroclor 1260 was detected in 17 of 31 subsurface soil samples, in concentrations ranging from 0.00415J mg/kg in SS11-Z1 (6 feet to 7 feet BGS) to 12.40 mg/kg in SS20-Z1 (0.17 foot to 2 feet BGS). Concentrations of total PCBs exceeded NYSDEC screening criteria in shallow subsurface soil sample SS20-Z1 (0.17 foot to 2 feet BGS), which contained 12.40 mg/kg. All shallow subsurface soil samples collected from 0.14 foot to 2 feet BGS were screened against the more conservative NYSDEC standard (1 mg/kg) for total PCBs in soil between ground surface and 10 inches BGS. The concentration of Aroclor 1260 detected in SS20-Z1 (12.40 mg/kg) exceeded both NYSDEC screening criteria for total PCBs and the USEPA RBC. The concentration of Aroclor 1260 in SS20-Z2 (3.88 mg/kg), which was collected from 2 feet to 4 feet BGS, exceeded the USEPA RBC but not the NYSDEC screening criteria. No other PCBs were detected in the subsurface soil samples above NYSDEC screening criteria or USEPA RBCs. The relatively low levels of PCBs detected in the subsurface soil only marginally exceed NYSDEC screening criteria ria and USEPA RBCs, and PCB presence appears to be limited to one small area east of the former transformer pad.

Twenty-two SVOCs were detected in the subsurface soil samples (see Figures 4.4-1A, 4.4-1B, and Table 4.4-2). Only PAHs were detected above NYSDEC screening criteria. PAHs that were detected above NYSDEC screening criteria included benz(a)anthracene, benzo(a)pyrene, chrysene, and dibenz(a,h)anthracene. Four PAH concentrations exceeded NYSDEC screening criteria: benz(a)anthracene, which ranged from 266 µg/kg in SS19-Z2 to 587 µg/kg in SS22-Z2; benzo(a)pyrene, which ranged from 74.6 µg/kg in SS20-Z4 to 477 µg/kg in SS22-Z2; chrysene, which ranged from 409 µg/kg in SS01-Z1 to 723 µg/kg in SS22-Z2; and dibenz(a,h)anthracene, which ranged from 73.5 µg/kg in SS20-Z1 to 90.2 µg/kg in SS22-Z2. None of the detected concentrations of PAH exceeded USEPA RBCs.

Overall, the concentrations of PAH found in the soil were similar to those in urban areas near traffic or other fossil-fuel combustion sources (USDOH&HS 1993), and are also similar to concentrations found in subsurface soils in other areas of Griffiss AFB. The site is adjacent to March Street, which may account for the presence of PAHs here.

Inorganics. Twenty-three metals were detected in the subsurface soil samples (see Figures 4.4-1A, 4.4-1B, and Table 4.4-2). Nine of these were detected at concentrations above NYSDEC screening criteria. These included beryllium, cadmium, calcium, chromium, copper, lead, mercury, thallium, and zinc. Nine of these metals were detected in concentrations exceeding NYSDEC screening criteria: beryllium in SS20-Z1 at 0.966 mg/kg; cadmium, which ranged from 1.12 mg/kg in SS17-Z1 to 4.37 mg/kg in SS01-Z1; calcium in SS01-Z2 at 27,600 mg/kg ; chromium, which ranged from 23.0 mg/kg in SS20-Z1 to 32.5 mg/kg in SS01-Z1; copper, which ranged from 45.9 mg/kg in SS15-Z1/D to 53.2 mg/kg in SS22-Z1; lead in SS01-Z1 at 252 mg/kg;

mercury, which ranged from 0.107 mg/kg in SS20-Z1 to 0.388 mg/kg in SS01-Z1; thallium, which ranged from 0.813 mg/kg in SS21-Z1 to 1.63 mg/kg in SS13-Z2; and zinc in SS01-Z1 at 459 mg/kg. Arsenic was detected in concentrations exceeding the USEPA RBC, but not above NYSDEC screening criteria, in SS13-Z1, SS13-Z2, SS21-Z1, SS21-Z2, and SS22-Z1, at concentrations ranging from 4.72 mg/kg to 6.91 mg/kg.

Petroleum Hydrocarbons. TRPH was detected in only one subsurface soil sample. A lab-estimated concentration of 374 mg/kg was detected in subsurface sample SS20-Z2V (see Table 4.4-2).

4.4.6 Conclusions and Recommendations

Twenty-two near-surface soil samples and 31 subsurface soil samples (collected from 11 borings) were analyzed for TCL SVOCs and PCBs, TRPH, TAL metals, and percent solids.

Three PCBs were detected in either the near-surface or subsurface soil samples: Aroclor 1242, Aroclor 1254, and Aroclor 1260. Total PCBs exceeded NYSDEC screening criteria in near-surface soil samples NS01/NS01D (1.02 mg/kg, 1.04 mg/kg), NS20 (7.12 mg/kg), and in soil sample SS20-Z1 (12.40 mg/kg).

Soil sample SS20-Z1 was collected from 2 inches to 2 feet BGS and contained total PCBs in excess of the NYSDEC soil cleanup levels for both the surface (0 to 10 inches BGS) and subsurface (greater than 10 inches BGS). No other subsurface soil samples contained PCBs in excess of NYSDEC soil clean up levels.

Aroclor 1260 was the only PCB congener detected at a concentration that exceeded the EPA RBC. Aroclor 1260 only marginally exceeded the USEPA RBC, and in only one soil boring (SS20). No other PCBs were detected in the near-surface or subsurface soil samples above NYSDEC screening criteria or the USEPA RBC.

In summary, PCBs were detected in the near-surface and subsurface soils in two small areas at concentrations that marginally exceeded NYSDEC screening criteria and USEPA RBCs. Based on the low levels and extremely limited extent of PCBs detected in the soils, this does not represent a significant release.

Twenty-two SVOCs were detected in the near-surface and subsurface soil samples. However, only PAHs were detected above NYSDEC screening criteria or USEPA

RBCs. The six PAHs detected above NYSDEC screening criteria were benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and dibenz(a,h)anthracene. The levels of PAHs detected in the near-surface and subsurface soils are low, however, and typical of those found throughout the base. They are believed to be the result of incomplete combustion of vehicular and airplane fuels.

A review of the Tentatively Identified Compounds (TICs) associated with PCBs and hydrocarbons detected at AOI 469 was requested by NYSDEC. The TIC reviews were provided in memorandum to the NYSDEC and USEPA and do not adversely affect any of the conclusions or recommendations made in this report.

Eleven metals were detected above NYSDEC screening criteria in the nearsurface soil. These were beryllium, cadmium, calcium, chromium, copper, iron, lead, mercury, selenium, silver, and zinc. The most significant exceedances were for lead. Lead exceeded both the NYSDEC screening criteria and the USEPA RBC in NS10, NS14, NS16, and NS21. Lead was detected in near-surface soil samples NS10 (1,880 mg/kg), NS14 (734 mg/kg), NS16 (1,390 mg/kg), and NS21 (572 mg/kg). These elevated levels of lead were only detected at the northeast corner of Building 112 (NS10, NS14, and NS16) and along the northern portion of the east wall of the building (NS21). No other metals were detected at levels exceeding USEPA RBCs. At the request of NYSDEC and USEPA, an Assessment of Adult Exposure to Lead in Soil at AOI 469 was performed and is included as Appendix I of this report. Overall, the results of the assessment indicate that the lead contamination at AOI 469 is unlikely to pose any significant health risk to workers.

Nine metals were detected at concentrations above NYSDEC screening criteria in the shallow subsurface soil. These included beryllium, cadmium, calcium, chromium, copper, lead, mercury, thallium, and zinc. Only cadmium was detected in the deeper (> 4 feet BGS) subsurface soil samples. Arsenic was detected in concentrations exceeding the USEPA RBC, but not the NYSDEC screening criteria, in shallow subsurface soil samples SS13-Z1, SS13-Z2, SS21-Z1, SS21-Z2, and SS22-Z1 at concentrations ranging from 4.72 mg/kg to 6.91 mg/kg. However, arsenic was not detected above the regional background concentration (16.0 mg/kg) for the 90th percentile of soils of the eastern United States (Shacklette and Boerngen 1984).
No further study is recommended for this site, which consists of the area as well as the terracotta sump shown on Figure 4.4-1. This is based on the low frequency of detections, primarily marginal screening criteria exceedances for PCBs, PAHs, and metals, and the planned future use of the site. This investigation was a comprehensive sampling effort and the significance of exceedances is limited. AOI 469 is located within the industrialized portion of the former Griffiss Air Force Base, south of the runways. The future use of this area, which includes AOI 469, is restricted to industrial/commercial use. The Assessment of Adult Exposure to Lead in Soil performed for this site (see Appendix I) indicates that the levels of lead present are unlikely to pose any significant health risk to future industrial/commercial workers.

Following completion of this Year 2000 ESI, a former base employee reported dumping waste oil into an additional sump located in the basement of Building 112. This additional sump will be investigated separately, and the site will be designated as AOI 469-Sump.

The original AOI 469 as described above will then be closed as no further study.

TABLE 4.4-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR BUILDING 112 AOI 469 FORMER GRIFFISS AIR FORCE BASE

ANALYSES

VOC SW8270C

etals SW6010B/7

ds ASTM_D2216

Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	TCL PCBs 8082 % Solids ASTM_D	TCL SVOC SW82	TRPH 418.1M TAL Metals SW60
AOI 469	03/09/00	G469-NS01	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	ХX	X	X X
	03/09/00	G469-NS01/D	ASC	Near-surface Soil	0.00-0.17	Y	T	FD1	XX	X	XX
	03/09/00	G469-NS01/S	ERDC	Near-surface Soil	0.00-0.17	Y	Т	FR1	XX	X	XX
	03/09/00	G469-NS02	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	XX
	03/09/00	G469-NS03	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	XX
	03/09/00	G469-NS04	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	XX
	03/09/00	G469-NS05	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	XX
	03/09/00	G469-NS06	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	X X
	03/09/00	G469-NS07	ASC	Near-surface Soil	0.00-0.17	Y	T	<u>N1</u>	XX	X	<u>X X</u>
	03/09/00	G469-NS08	ASC	Near-surface Soil	0.00-0.17	Y	<u> </u>	<u>N1</u>	XX	X	<u>X X</u>
	03/09/00	G469-NS09	ASC	Near-surface Soil	0.00-0.17	<u>Y</u>	<u> </u>	<u>N1</u>	<u>X X</u>	X	<u>X X</u>
	03/09/00	G469-NS10	ASC	Near-surface Soil	0.00-0.17	Y	T	<u>N1</u>	XX	X	XX
	03/09/00	G469-NS10 (extra volume)	ASC	Near-surface Soil (MS/MSD)	0.00-0.17	Y	<u> </u>	MS1	X	X	XX
	03/09/00	G469-NS11	ASC	Near-surface Soil	0.00-0.17	Y	<u> </u>	<u>N1</u>	XX	X	XX
	03/09/00	G469-NS11/D	ASC	Near-surface Soil	0.00-0.17	<u>N</u>	<u> </u>	FD1	XX	X	XX
	03/09/00	G469-NS11/S	ERDC	Near-surface Soil	0.00-0.17	N	Т	FR1	XX	X	XX
	03/09/00	G469-NS12	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	XX
	03/09/00	G469-NS13	ASC	Near-surface Soil	0.00-0.17	Y	T	N1	XX	X	XX
	03/09/00	G469-NS14	ASC	Near-surface Soil	0.00-0.17	Y	T	N1	XX	X	XX
	03/09/00	G469-NS15	ASC	Near-surface Soil	0.00-0.17	Y	<u> </u>	N1	XX	X	XX
	03/09/00	G469-NS16	ASC	Near-surface Soil	0.00-0.17	Y	<u>T</u>	N1	XX	X	XX
	03/09/00	G469-NS17	ASC	Near-surface Soil	0.00-0.17	Y	T	N1	<u>х</u> х	X	XX
	03/09/00	G469-NS18	ASC	Near-surface Soil	0.00-0.17	Y	<u> </u>	N1	XX	X	XX
	03/09/00	G469-NS19	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	XX

TABLE 4.4-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR BUILDING 112 AOI 469 FORMER GRIFFISS AIR FORCE BASE

ANALYSES

letals SW6010B/7471A

Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	TCL PCBs 8082 % Solids ASTM_D2216 TCL SVOC SW8270C TRPH 418.1M	TAL Metals SW6010B/7
	03/09/00	G469-NS20	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XXXX	X
	03/09/00	G469-NS21	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XXXX	X
	03/09/00	G469-NS22	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XXXX	X
	03/09/00	G469-NS22/D	ASC	Near-surface Soil	0.00-0.17	<u>N</u>	T	FD1	XXXX	<u> </u>
	03/09/00	G469-NS22/S	ERDC	Near-surface Soil	0.00-0.17	N	<u> </u>	FR1	XXXX	<u> </u>
	04/18/00	G469-SS01-Z1	ASC	Subsurface Soil	0.17-2.00	<u>Y</u>	<u> </u>	N1	<u>X X X X</u>	<u>X</u>
	04/18/00	G469-SS01-Z2	ASC	Subsurface Soil	2.00-4.00	<u>Y</u>	Ť	N1	XXXX	X
	04/18/00	G469-SS01-Z3	ASC	Subsurface Soil	4.00-6.00	<u>N</u>	Т	N1	XXXX	X
	04/18/00	G469-SS01-Z4	ASC	Subsurface Soil	6.00-8.00	N	Т	N1	<u> </u>	X
	04/18/00	G469-SS01-Z5	ASC	Subsurface Soil	8.00-10.00	N	T	N1	XXXX	X
	04/18/00	G469-SS01-Z6	ASC	Subsurface Soil	10.00-12.00	Ν	Т	N1	XXXX	X
	04/18/00	G469-SS01-Z6 (extra volume)	ASC	Subsurface Soil (MS/MSD)	10.00-12.00	N	Т	MS1	XXXX	X
	04/18/00	G469-SS01-Z7	ASC	Subsurface Soil	12.00-14.00	N	Т	N1	XXXX	X
	04/18/00	G469-SS03-Z1	ASC	Subsurface Soil	5.00-7.00	N	Т	N1	XXXX	X
	04/18/00	G469-SS03-Z2	ASC	Subsurface Soil	10.50-12.50	Y	Т	N1	XXXX	X
	03/21/00	G469-SS06-Z1	ASC	Subsurface Soil	4.00-5.00	Y	Т	N1	XXXX	X
	03/21/00	G469-SS06-Z1/D	ASC	Subsurface Soil	4.00-5.00	Y	Т	FD1	XXXX	X
	03/21/00	G469-SS06-Z1/S	ERDC	Subsurface Soil	4.00-5.00	Ŷ	T	FR1	XXXX	X
	03/21/00	G469-SS06-Z2	ASC	Subsurface Soil	12.00-13.00	Y	Т	N1	XXXX	X
	04/18/00	G469-SS11-Z1	ASC	Subsurface Soil	6.00-7.00	Y	Ť	N1	XXXX	X
	04/18/00	G469-SS11-Z1/D	ASC	Subsurface Soil	6.00-7.00	N	Т	FD1	XXXX	X
	04/18/00	G469-SS11-Z1/S	ERDC	Subsurface Soil	6.00-7.00	N	Т	FR1	XXXX	X
	04/18/00	G469-SS11-Z2	ASC	Subsurface Soil	10.00-12.00	Y	Т	N1	XXXX	X
	04/21/00	G469-SS13-Z1	ASC	Subsurface Soil	6.00-7.00	Y	T	N1	X X X X	X

03_90-B0492	
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TABLE 4.4-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR BUILDING 112 AOI 469 FORMER GRIFFISS AIR FORCE BASE	

ANALYSES

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AT 14/10100WS SISTEM JAT	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	X	×	×	×	
M1.814 H9AT	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	X	×	X	X	×	
TCL SVOC SW8270C	X	×	×	×	×	×	×	×	×	X	X	×	×	×	×	×	×	X	×	X		X	X in N		
81220_MT2A sbilo2 %	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	C	$\hat{\mathbf{S}}$		
ICL PCBs 8082	X	×	X	×	×	×	X	X	×	×	X	×	×	×	×	X	×	X			9				
Type	ź	۶	FD1	FR1	Ĩ	L1	FD1	FR1	۲	ī	Ē	FD1	FR1	ź	N	LN 1	۶	Ň	MS1	۶	ī	ž	ž	Ę	
Stat	⊢	┝	F	F	F	⊢	⊢	⊢	⊢	⊢	┝	.	.		⊢	⊢	F	┝	┝		F				
	>	z	z	z	z	z	z	z	z	: >	- >	z	z	z	z	z	z	z	z	z	z	z	z	>	
troo	10.00-12 50	6 00 7 00	6.00-7.00	6 00-7 00	10.00-11.00	6 00-7 00	6 00-7 00	6.00-7.00	10.00-11.00	6 00-7 00	0.100.01	12.00-13.00	12.00-13.00	0.00-012	2 00-4 00	4 00-6 00	6 00-8 00	8 00-10 00	0.00-10.00	10.00-10.00		10.00-3.00	200-2-00-2	3.00-12 00	00.1
		ace Soll		ace Soll		tace Soll	Tace Soll	tace Soll	Tace Soll	face Soll	rface Soll	rface Soil	rface Soil	rface Soll				Irtace Soll		Irface Soil (MS/MSU)	Irface Soll	urface Soll	urface Soil	urtace Soll	urtace Soll
	Matrix	Subsur	Subsurt	Subsur	unsans	Subsur	Subsur	Subsur	Subsur	Subsur	Subsur	Subsul	Subsul	Subsu	Subsu	Subsu	Subsu	Subsu	Subsu	Subsu	Subst	Subst	Subsi	Subsi	Subsi
	Lab	ASC	ASC	ASC	ERDC	ASC	ASC	ASC	ERDC	ASC	ASC	ASC	ASC	ERDC	ASC	ASC	ASC	ASC	ASC	ASC	ASC	ASC	ASC	ASC	ASC
	Sample Number	G469-SS13-Z2	G469-SS15-Z1	G469-SS15-Z1/D	G469-SS15-Z1/S	G469-SS15-Z2	G469-SS17-Z1	G469-SS17-Z1/D	G469-SS17-Z1/S	G469-SS17-Z2	G469-SS19-Z1	G469-SS19-Z2	G469-SS19-Z2/D	G469-SS19-Z2/S	G469-SS20-Z1	G469-SS20-Z2	G469-SS20-Z3	G469-SS20-Z4	G469-SS20-Z5	G469-SS20-Z5 (extra volume)	G469-SS20-Z6	G469-SS21-Z1	G469-SS21-Z2	G469-SS22-Z1	G469-SS22-Z2
	Date	00/16/100	03/15/00	00/19/00	04/19/00	04/19/00	04/19/00	04/10/00	04/19/00	04/19/00	04/10/00	04/13/00	04/13/00	04/13/00	04/19/00	04/19/00	04/19/00	00/10/00	04/10/00	04/13/00	04/10/00	04/00/00	04/20/00	00/00/00	04/20/00
	l ocation	LUCATION																							

TABLE 4.4-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR BUILDING 112 AOI 469 FORMER GRIFFISS AIR FORCE BASE

									ANA	ALYSE	S
Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	TCL PCBs 8082 % Solids ASTM_D2216	TCL SVOC SW8270C TRPH 418 1M	TAL Metals SW6010B/7471A
	04/20/00	FIELDQC-RB469-SS1	ASC	Eqpt. Washwater	0.00-0.00	N	Т	RB1	X	XX	X
	04/20/00	FIELDQC-RB469-SS2	ASC	Eqpt. Washwater	0.00-0.00	N	Т	RB2	X	XX	X

Key:

- AOI = Area of Interest.
- ASC = E & E's Analytical Services Center.

Eqpt.= Equipment Washwater.

- ERDC = U.S. Army Engineer Research and Development Center Quality Assurance Laboratory.
 - /D = Duplicate sample.

Depth = Sample depth interval.

DI = Deionized water.

- F = Sample tested in the field.
- FD = Field duplicate.
- FR = Field split/replicate.
- IS/MSD = Matrix spike/matrix spike duplicate.
 - N = Original.
 - NS = Near-surface soil sample.
 - PCB = Polychlorinated biphenyls.
 - QC = Quality control.
 - RB = Rinsate blank sample.

- /S = Split sample.
- SD = Sediment sample.
- Stat = Status (T = Taken, S = Skipped).
- SVOC = Semivolatile organic compounds.
 - SW = Surface water sample.
 - TAL = Target Analyte List.
 - TCL = Target Compound List.
- TOC = Total organic carbon.
- WP = Sample in work plan (Y = Yes, N = No).

Table 4.4-2	
SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM	
AOI 469: NORTH HALF OF BUILDING 112,	
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW Y	'ORK

Sam Samph PARAMETER Dep	ple 1D: G469-NS01 e Date: 3/9/00 th (ft): 0 - 0.17	G469-NS01/D 3/9/00 0 - 0.17	G469-NS02 3/9/00 0 - 0.17	G469-NS03 3/9/00 0 - 0.17	G469-NS04 3/9/00 0 - 0.17	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Test : PCBs - SW 808	2		Units: 1	mg/kg			
Aroclor 1242	0.495	0.479	0.0249 U	0.0263 U	0.0241 U	1	2.9
Aroclor 1254	1.020	1.040	0.0249 U	0.0263 U	0.0241 U	1	2.9
Aroclor 1260	0.0506	0.535	0.0206 J	0.885	0.143	1	2.9
Total PCBs	1.5656	2.054	0.0206 J	0.885	0.143	1	-
Test : Semivolatiles - S	SW 8270C	< ···· 3 ····· 2.2	Units:	ug/kg			
Acenaphthene	77.7 J	90.0 J	171 J	437 U	396 U	50000	120000000
Acenaphthylene	278 J	274 J	144 J	56.1 J	62.4 J	41000	-
Anthracene	226 J	311 J	430	98.7 J	58.8 J	50000	61000000
Benz(a)anthracene	936 J	1110 1	1230	294]	243 J	224	7800
Benzo(a)pyrene	1110 J	1240 J	1040 J	322 J	270 J	61	780
Benzo(b)fluoranthene	1000 J	1330 J	1340 J	337 J	327 J	1100	7800
Benzo(g,h,i)perylene	400 J	495 J	428 J	124 J	173 J	50000	-
Benzo(k)fluoranthene	1230 J	1280 J	1150 J	354 J	342 J	1100	78000
Bis(2-ethylhexyl)phthalate	9040	8590	266 J	437 U	426 J	50000	410000
Butyl benzyl phthalate	6160	5780	404 U	437 U	152 J	50000	41000000
Carbazole	418 U	72.2 J	223 J	437 U	396 U	50000	290000
Chrysene	1090 J	1290 J	1340	356 J	294 J	400	780000
Di-n-butyl phthalate	354 J	329 J	404 U	437 U	396 U	8100	20000000
Di-n-octyl phthalate	340 J	270 J	404 U	437 U	396 UJ	50000	41000000
Dibenz(a,h)anthracene	418 UJ	422 U	404 UJ	437 UJ	396 UJ	14	780
Dibenzofuran	418 U	422 U	100 J	437 U	396 U	6200	8200000
Fluoranthene	1010	1120	1800	529	343 J	50000	82000000
Fluorene	77.5 J	75.8 J	255 J	67.4 J	396 U	50000	82000000
Indeno(1,2,3-cd)pyrene	215 J	235 J	270 J	79.5 J	95.9 J	3200	7800

PARAMETER	Sample ID: Sample Date: Depth (ft):	G469-NS01 3/9/00 0 - 0.17	G469-NS01/D 3/9/00 0 - 0.17	G469-NS02 3/9/00 0 - 0.17	G469-NS03 3/9/00 0 - 0.17	G469-NS04 3/9/00 0 - 0.17	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Naphthalene		193 J	175 J	55.3 J	437 U	396 U	13000	4100000
Phenanthrene		672	797	2000	462	257 J	50000	-
Pyrene	****	1890 J	2690	3540 J	737	717 J	50000	6100000
Test : TAL Me	táls - SW6010	B/7471A/7470A		Units: 1	ng/kg			1.
Aluminum		6220	6270	8470	6820	7560	18306	2000000
Antimony		2.25	1.78	0.892	0.664 J	1.03 J	3.4	820
Arsenic		1.20	1.01	2.73	1.95	1.70	7.5	3.8
Barium		91.7	98.7	53.0	146	52.6	300	140000
Beryllium		0.356 J	0.391	0.420	0.339 J	0.454 J	0.65	4100
Cadmium		5.03	5.25	2.02	1.55	2.85	1.1	1000
Calcium		7250	6590	4390	7100	3140	23821	-
Chromium		32.3 J	31.6 J	13.3 J	11.2 J	17.8 J	22.6	6100
Cobalt		6.03	6.23	5.89	4.61	6.01	30	120000
Copper	-	118	132	31.3	24.3	32.9	43	82000
Iron		15500	15300	18500	13100	17000	47350	610000
Lead		272	226	51.3	50.7	206	200	400
Magnesium		3410	3570	2670	2090	2760	7175	-
Manganese		528	518	507	359	668	2106	41000
Мегсигу		0.637 J	0.581 J	0.0681 J	0.0685 J	0.0941 J	0.1	-
Nickel		16.3	16.7	12.5	10.0	14.5	46	41000
Potassium		761	773	702	646	679	1993	-
Selenium		1.88 J	2.09 J	1.53 J	2.24 J	1.68 J	2	10000
Silver		0.222 J	0.630 J	0.272 J	1.04 U	1.06 U	1.1	10000
Sodium		42.7 J	50.0 J	31.8 J	39.5 J	44.0 J	259	-
Vanadium		14.3	14.6	17.5	15.3	19.7	150	14000

For more details on the screening criteria see Table 2-1.

PARAMETER	Sample ID: Sample Date: Depth (ft):	G469-NS01 3/9/00 0 - 0.17	G469-NS01/D 3/9/00 0 - 0.17	G469-NS02 3/9/00 0 - 0.17	G469-NS03 3/9/00 0 - 0.17	G469-NS04 3/9/00 0 - 0.17	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Zinc		748	432	87.6	95.9	241	120	610000

For more details on the screening criteria see Table 2-1.

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Sample ID: Sample Date: PARAMETER Depth (ft):	G469-NS05 3/9/00 0 - 0.17	G469-NS06 3/9/00 0 - 0.17	G469-NS07 3/9/00 0 - 0.17	G469-NS08 3/9/00 0 - 0.17	G469-NS09 3/9/00 0 - 0.17	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Test : PCBs - SW 8082	····•	annen dan under einen	Units:	mg/kg		*** *	
Aroclor 1242	0.0274 U	0.0272 U	0.0246 U	0.0245 U	0.0305	1	2.9
Aroclor 1254	0.0274 U	0.0272 U	0.0246 U	0.0245 U	0.134	1	2.9
Aroclor 1260	0.0330	0.0610	0.0730	0.0624	0.106	1	2.9
Fotal PCBs	0.0330	0.0610	0.0730	0.0624	0.2705	1	-
Test : Semivolatiles - SW 82	70C		Units:	µg/kg			
Acenaphthene	459 U	73.4 J	280 J	63.6 J	385 U	50000	12000000
Acenaphthylene	459 U	443 U	687 J	55.1 J	385 U	41000	-
Anthracene	459 U	197 J	1360 J	227 J	57.7 J	50000	61000000
Benz(a)anthracene	155 J	712	2920 J	610	297 J	224	7800
Benzo(a)pyrene	181 J	603 J	2350 J	576 J	307 J	61	780
Benzo(b)fluoranthene	238 J	704 J	2420 J	698 J	385 J	1100	7800
Benzo(g,h,i)perylene	459 UJ	181 J	753 J	215 J	111 J	50000	-
Benzo(k)fluoranthene	272 J	809 J	3380 J	838 J	417 J	1100	78000
Bis(2-ethylhexyl)phthalate	459 U	144 J	2080 UJ	83.6 J	385 U	50000	410000
Butyl benzyl phthalate	459 U	443 U	2080 UJ	409 U	385 U	50000	41000000
Carbazole	459 U	144 J	2080 U	119 J	385 U	50000	290000
Chrysene	212 J	784	2930 J	677	365 J	400	780000
Di-n-butyl phthalate	459 U	443 U	2080 U	409 U	385 U	8100	20000000
Di-n-octyl phthalate	459 U	443 U	2080 UJ	409 U	385 U	50000	41000000
Dibenz(a,h)anthracene	459 UJ	443 UJ	2080 UJ	409 UJ	385 UJ	14	780
Dibenzofuran	459 U	443 U	2080 U	409 U	385 U	6200	8200000
Fluoranthene	336 J	1390	7040	1190	498	50000	82000000
Fluorene	459 U	58.9 J	1 140 J	75.0 Ј	385 U	50000	82000000
ndeno(1,2,3-cd)pyrene	459 U	104 J	444 J	131 J	61.1 J	3200	7800

For more details on the screening criteria see Table 2-1.

AEVE 5000 EXEVIDED SILE INVESTIGATION, FORMER CRIFFISS AIR FORCE BASE, ROME, NEW YOR VOR THALF OF BUILDING 112, AOI 469: NORTH HALF OF BUILDING 112, SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM Dable 4.4-2

III noise ATE	ASDEC	60SN-69#5)	80SN-69ÞD	LOSN-6975)	90SN-69#D	\$0\$N-69#5	Sample ID:	
RBCs -	TAGM 4046 *	00/6/E	00/6/E	00/6/8	00/6/£	00/6/8	sənple Date:	
		L1.0 - 0	L1'0 - 0	L1.0 - 0	L1'0 - 0	L1.0 - 0	LEK Debty (U):	PARAMET
4100000	13000	U 285 U	П 60 1	U 0802	443 N	U 924		Aaphthalene
-	00005	585 J	868	0859	L06	٢ ٤٦ ١		henanthrene
00000019	00005	† 0L	0861	1 0 <i>1</i> 86	0821	444 J		λιευε
			ສິ ໗/ສີເ	n :ziinU		VOLTLIVILTLI	TAL Merals - SVV6010E	: tesT
0000007	90£81	† 350	9950	1330	018/	0259		munimulA
820	3.4	l 742.0	£ 192.0	0.944	l 878.0	0.832		Ynomiany
8.5	S'L	0.326 J	67.1	07.1	E9 I	5.23		Arsenic
140000	300	1 .01	٤.74	0.65	¢7.7	1.94		muinst
4100	\$9.0	0.212 J	0.329 J	\$74 0.374	657.0	0.300 J		ແມ່ນເບັນ
0001	L.I	¢26.0	<u> 46</u> 1	79 1	51.5	86.1		muimbeC
-	12862	00161	0/97	0/88	5140	07,57		muioleC
0019	55.6	e 12 1	12.8 J	15.7 J	1 I'EI	ſ <i>L</i> 9 [.] 8		muimord.
000071	96	3.04	05.2	04.2	\$. 55	0S.E		Cobalt
00078	43	8.11	6.52	9.92	6.82	52.4		Copper
000019	05£74	0068	006£1	00091	000/1	00511		uo.ı
007	007	67.8	0.28	\$'\$7	0.26	E'SE		peər
-	SLIL	006€	0552	0/82	0757	06£1		muisangeM
00017	9017	SSZ	20000	\$67	295	240		SenegreN
-	1.0	<u>ا 20 ت</u> 1 روحت ا	0.0620 J	r : 0	(1/60.0	0.0622 J	· · · · · · · · · · · · · · · · · · ·	Mercury
0001#	01	50.7	/ 71	8.11	5:51 5:51	<u> </u>		Aickel
-	C 661	C+C	+05	990	070			mnissenod
00001	7	11 69 0	11 928 0	11 269 0	11 588 U	11 LSL 0		
00001	USL I'I	0.00	1810	1500	1 2 20	1900		
	667	LV 8	091 [0]	14.0	981	f 0.77	······································	
00051	001	(+:0	(:01	Chi	0.01	1.41		א שווקחותא

For more details on the screening criteria see Table 2-1.

	Samule ID:	G469-NS05	G469-NS06	G469-NS07	G469-NS08	-G469-NS09	NVCDEC	EPA Region III
	Sample Date:	3/9/00	3/9/00	3/9/00	3/9/00	3/9/00	TAGM 4046 *	RBCs - Inductrial**
	Denth (ft):	0 - 0.17	0 - 0.17	0 - 0.17	0 - 0.17	0 - 0.17		
FARAMELEN	(a) and ar						120	610000
Zinc		55.1	93.6	58.6	91.3	7.67	170	000010

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AEVE 5000 EXEVADED SILE INAESLICVLION' EOBMEE CERELISS VIE FORCE BVSE' BOWE' NEM AOEK VOI 469: NOELH HVLE OF BUILDING 112, 2000 EXEVADED SILE INAESLICVLIAE HILS AND SCREENING FOR THE SOIL SAMPLES FROM 78ble 4.4-2

					`L-i	criteria see Table 2	For more details on the screening
0082	3200	0 08E	63.4 J	84.0 J	U 18E	∩ 80 7	Indeno(1,2,3-cd)pyrene
00000028	20000	U 085	185 N	∩ 96E	0 18E	∩ 80 †	Fluorene
00000028	20000	540 J	3141	٢ ١٥٦	516 J	443	Fluoranthene
0000078	0079	U 085	185 N	በ 96ዩ	U 18E	U 804	Dibenzofuran
08/	14	10 085 UI	185 N	በ 96ዩ	tu 185	408 N1	ənəəsithns(d,s)znədiO
41000000	00005	U 08£	0 28E	በ 96ይ	U 185	U 804	Di-n-octyl phthalate
200000000	0018	U 085	n 285	N 96E	U 18E	U 804	əյելեղիզ լүյով-ո-iQ
00008L	400	1 807 J	104	546]	1881	306 1	Chrysene
000067	00005	U 08£	185 N	n 96£	U 185	U 804	Sathazole
¢10000000	0000\$	በ 08ይ	U 282 U	በ 96ይ	U 18E	U 804	Butyl benzyl phthalate
410000	00005	l 0.87	185 N	በ 96ይ	U 18£	U 804	936164747474747474747474747474747474747474
00082	0011	564 J	1 555	r 752	1 891	356 I	Benzo(k)fluoranthene
-	00005	f 1.69	150 1	f 1.26	181 NI	l E.98	Benzo(g,ħ,i)perylene
008L	0011	۶61 ا	240	545]	1 e 2 1	r <i>L</i> sz	Benzo(b)fluoranthene
082	19	E \$61	354 1	[76]	143.1	555)	Benzo(a)pyrene
0082	554	٢ ٤/ ١	305 1	1861	٢ ٦٤ ٢	510 J	Benz(a)anthracene
00000019	00005	U 086	t 6.88	N 96E	U 185	408 N	Anthracene
-	41000	U 085	ſ <i>L</i> 79	n 96E	U 185	1 80 1	ycenaphthylene
1 2000000	0000\$	U 085	U 282 U	በ 96£	U 185	U 804	anahithene
			84/31	ų :stinU		06	Test : Semivolatiles · SW 827
-	F	0.244	<i>LL</i> EI'0	775270	1980.0	8481.0	Lotal PCBs
5.9	I	6113	0.112	<i>L</i> 01'0	1980.0	8250.0	troclor 1260
5.9	I	161.0	U 8220.0	0110	U 2520.0	0.0247 U	troclor 1254
6.2	1	U 2520.0	L\$70 [.] 0	0.0352	U 2520.0	L21.0	frocior 1242
			ទី អ្/តិព	n :stinU			Test : PCBs · SVV 8082
EPA Region III RBCs - Industrial**	LVGW 4046 * NASDEC	L1 0 - 0 00/6/E EISN-69ÞD	LTO - 0 00/6/E ZISN-69ÞD	L110 - 0 00/6/E (1/11SN-69ÞD	L1 0 - 0 00/6/E 11SN-69ÞD	L1 0 - 0 00/6/E 01SN-69ÞD	Sample ID: Sample Date: PARAMETER Depth ((1):

LEVER 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YOR YOR SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM ALM 44.2 ADI 469: NORTH HALF OF BUILDING 112, ADI 469: NORTH ADI 469: NORTH ADI 469; NORTH ADI 469

						0 -14-X141	
14000	0\$1	0.41	14.2	14.9	6.21	8.91	muibeneV
-	657	t 6.14	1 9 [.] 6E	f 6'0S	44 [.] 4 J	N 971	muipos
00001	I.I	U 828.0	U 727.0	0.146 1	0.214 J	U 92.1	Silver
00001	2	1°34)	l 68.1	1.53 J	ſ 1 <i>Ľ</i> 1	1.84 J	Selenium
-	£66I	295	085	919	099	76L	Potassim
41000	97	5.01	5.11	٤.11	11.4	5.61	Nickel
-	1.0	f 6/80.0	0.0743 J	0.0841 J	r 0720.0	0.181.0	Μειςαιζ
41000	9017	458	515	105	SL#	865	จรอนธรินยุฟ
-	SLIL	01/2	0/82	0997	9520	08/2	muisəngaM
400	500	6'81	9.71	52.4	۲.۲۱	1880	Lead
000019	0586	13100	14700	006£1	00161	007/1	цол
82000	43	9.52	52.2	51.4	6'67	9.25	Copper
120000	30	¢.74	75.34	96.2	87.2	\$7.9	Cobalt
0019	52.6	t s.o1	l 0.01	1 5.41	1 6 O I	58.81	Chromium
-	12852	0866	00511	10200	0226	3300	muiəleO
0001	1.1	94.1	1'97	29.1	08.1	97.6	muimbsD
4100	\$9.0	0:330	6LE'0	86£.0	099'0	0.488 1	Beryllium
140000	300	5.15	6.25	0/1	0.9£	٤.82	muinsa
8.6	S'L	00.1	I S'I	L0' I	\$82.0	S6 ⁻ 1	Arsenic
820	3.4	288.0	078.0	SE7.0	9/8.0	69'1	ynomijnA
5000000	90681	9440	0/1/	090L	0152	076L	munimulA
			3 4/80	n :ztinU		VOLTL/VILTL/E	Test : TAL Metals - SW60101
00000019	00005	265	· LSÞ	11LE	۲۵۵ ا	254	Pyrene
-	00005	11 † 1	r 701	1551	88 [.] 2 J	[16I]	Рһепанілтеле
4100000	13000	U 085	J 85 N	U 96E	U 185	∩ 80 1	Naphthalene
EPA Region III RBCs - Matustrial**	LVCW 4040 * NASDEC	LTO - 0 00/6/E EISN-69ÞD	0 - 0'1] 3\6\00 C498-NRIS	0 - 0 1 J 3/6/00 0/11SN-699D	L1:0 - 0 00/6/E ITSN-69PD	0 - 0 1 J 3/6/00 01SN-697D	Sample ID: Sample Date: PARAMETER Depth (II):

PARAMETER	Sample ID: Sample Date: Depth (ft):	G469-NS10 3/9/00 0 - 0.17	G469-NS11 3/9/00 0 - 0.17	G469-NS11/D 3/9/00 0 - 0.17	G469-NS12 3/9/00 0 - 0.17	G469-NS13 3/9/00 0 - 0.17	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Zinc		422	59.3	60.5	55.2	51.2	120	610000

	C469-NS14	C469-NS15	C469-NS16	C469-NS17	C469-NS18		
Sample ID:	3/0/00	3/0/00	3/0/00	3/0/00	3/0/00	NYSDEC	EPA Region III RBCs -
DADAMETED Depth (ft):	0 - 0 17	0 - 0.17	0 - 0.17	0 - 0.17	0 - 0.17	TAGM 4046 *	Industrial**
TARAMETER Separation		······································					
Test : PCBs - SW 8082			Units:	mg/kg	· · · · · · · · · · · · · · · · · · ·		
Aroclor 1242	0.0251 U	0.0252 U	0.123 U	0.125 U	0.0249 U	1	2.9
Aroclor 1254	0.0251 U	0.0252 U	0.123 U	0.125 U	0.0249 U	1	2.9
Aroclor 1260	0.222	0.296	0.248	0.659	0.107	1	2.9
Fotal PCBs	0.222	0.296	0.248	0.659	0.107	1	-
Test : Semivolatiles - SW 82	70C		Units:	µg/kg			
Acenaphthene	414 U	414 U	401 U	420 U	420 U	50000	120000000
Acenaphthylene	414 U	414 U	401 U	420 U	420 U	41000	-
Anthracene	96.1 J	414 U	48.6 J	420 U	420 U	50000	61000000
Benz(a)anthracene	735 J	145 J	343 J	276 J	320 J	224	7800
Benzo(a)pyrene	659 J	141 J	297 J	252 J	288 J	61	780
Benzo(b)fluoranthene	1010 J	193 J	326 J	370 J	428 J	1100	7800
Benzo(g,h,i)perylene	157 J	414 UJ	77.3 J	83.9 J	420 UJ	50000	-
Benzo(k)fluoranthene	826 J	205 J	382 J	340 J	331 J	1100	78000
Bis(2-ethylhexyl)phthalate	414 UJ	414 UJ	401 U	242 J	72.7 J	50000	410000
Butyl benzyl phthalate	414 UJ	414 UJ	401 U	420 UJ	420 UJ	50000	410000000
Carbazole	85.7 J	414 U	401 U	420 U	420 U	50000	290000
Chrysene	952 J	180 J	388 J	339 J	366 J	400	780000
Di-n-butyl phthalate	414 U	414 U	401 U	420 U	420 U	8100	20000000
Di-n-octyl phthalate	414 UJ	414 UJ	401 U	420 UJ	420 UJ	50000	41000000
Dibenz(a,h)anthracene	414 UJ	414 UJ	401 UJ	420 UJ	420 UJ	14	7,80
Dibenzofuran	414 U	414 U	401 U	420 U	420 U	6200	8200000
Fluoranthene	1520	241 J	542	441	490	50000	82000000
Fluorene	414 U	414 U	401 U	420 U	420 U	50000	82000000
Indeno(1,2,3-cd)pyrene	77.2 J	414 U	401 U	420 UJ	420 UJ	3200	7800

For more details on the screening criteria see Table 2-1.

Table 4.4-2	
SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM	
AOI 469: NORTH HALF OF BUILDING 112,	
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW	V YORK

PARAMETER Naphthalene	Sample 1D: Sample Date: Depth (ft):	G469-NS14 3/9/00 0 - 0.17 414 U	G469-NS15 3/9/00 0 - 0.17 414 U	G469-NS16 3/9/00 0 - 0.17 401 U	G469-NS17 3/9/00 0 - 0.17 420 U	G469-NS18 3/9/00 0 - 0.17 420 U	NYSDEC TAGM 4046 * 13000	EPA Region III RBCs - Industrial** 41000000
Phenanthrene		606	103 J	249 J	160 J	135 J	50000	-
Pyrene		1780	470 J	841	887 J	1070 J	50000	61000000
Test : TAL M	etals - SW6010	B/7471A/7470A	•••••••	Units: 1	mg/kg	·		·
Aluminum		9440	6160	8940	9650	6490	18306	2000000
Antimony		1.77	0.610 J	2.89	0.994	0.827 J	3.4	820
Arsenic		1.70	1.79	1.38	2.08	1.20 J	7.5	3.8
Barium	· · · ·	64.8	41.2	72.2	53.1	37.6	300	140000
Beryllium		0.588 J	0.302 J	0.575	0.589	0.397 J	0.65	4100
Cadmium		11.1	1.4t	10.7	5.21	1.84	1.1	1000
Calcium		3020	3360	4670	2740	2600	23821	-
Chromium		23.2 J	9.41 J .	109 J	18.0 J	11.8 J	22.6	6100
Cobalt		8.74	4.10	8.96	7.85	5.62	30	120000
Соррег		43.3	31.6	45.0	39.3	34.9	43	82000
Iron		22700	12400	21400	22900	16500	47350	610000
Læad		734	31.1	1390	126	52.2	200	400
Magnesium		3650	1890	3850	3630	2430	7175	-
Manganese		759	293	713	857	422	2106	41000
Mercury		0.305 J	0.0586 J	1.02 J	0.648 J	0.0902 J	0.1	-
Nickel		19.1	9.39	18.3	17.5	12.8	46	41000
Potassium		1010	611	970	835	800	1993	-
Selenium		2.59 J	2.48 J	1.68 J	2.03 J	2.32 J	2	10000
Silver		1.22 U	1.07 U	0.949 U	0.884 U	1.25 U	1.1	10000
Sodium		122 U	107 U	31.6 J	31.1 J	125 U	259	-
Vanadium		21.3	14.2	19.7	22.0	16.3	150	14000

For more details on the screening criteria see Table 2-1.

Source: Ecology and Environment, Inc., November 2000

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PARAMETER	Sample ID: Sample Date: Depth (ft):	G469-NS14 3/9/00 0 - 0.17	G469-NS15 3/9/00 0 - 0.17	G469-NS16 3/9/00 0 - 0.17	G469-NS17 3/9/00 0 - 0.17	G469-NS18 3/9/00 0 - 0.17	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Zinc		360	52.4	597	103	64.8	120	610000

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AEVE 5000 EXEVENDED SILE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YOR YEAR SOME ALL OF BUILDING 112, AOI 469: NORTH HALF OF BUILDING 112, SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM Table 4.4-2

or more details on the screening	criteria see Table	2-1.					
anaryq(bo-£,2,1)onabn	¢1¢ N1	366 M	U 89E	U 828	842 NI	3200	0082
Fluorene	41 4 N	1 66E	N 89E	U 828	842 N	00005	8200000
Fluoranthene	569 1	1580	۲ <i>L</i> 67 آ	1200	9¢6	00005	00000078
Dibenzofuran	414 N	1 66E	U 89£	U 828	U 245 U	9500	0000078
enscenthans(d,s)snedi	414 NJ	10 66E	10 89E	10 828 NI	10 S48	14	08 <i>L</i>
əteledind lyto-n-iU	414 M	10 66E	U 89E	U 828	842 NI	00005	4100000
Di-n-butyl phthalate	414 N	N 66E	U 89E	U 828	n \$ 7 8	0018	00000002
Chrysene	509 1	r 659	r 261	1020	1251	400	000082
Sarbazole	414 A	f 6 [.] 89	U 89E	U 828 U	U 245 U	00005	000067
Butyl benzyl phthalate	414 M	10 995 UJ	£73	U 828	r E16	00005	41000000
sis(2-ethylhexyl)phthalate	1 5 62	1 00501	669	ſ 66 <i>L</i>	842 NI	00005	410000
3enzo(k)fluoranthene	540 1	r 7 <i>L</i> S	185 1	1 1 68	1 1 5 5	0011	0008L
3enzo(g,ħ,i)perylene	414 M	135 1	368 NI	161		00005	-
3enzo(b)fluoranthene	5181	995 1	182 1	825 1	ſ 66 <i>L</i>	0011	0082
3enzo(a)pyrene	500 1	1 697	1431	t sel	r 1 <i>L</i> S	19	08/
Senz(a)anthracene	ſ /61	6101	1651	156	C 679	524	0087
Anthracene	43.2 J	0°£6	U 89E	1561	ſ ζ <i>`L</i> 6	0000\$	00000019
anghuhhlene	ſ 1 <i>.</i> ∠S	N 66E	U 895	N 858	842 N	41000	-
ycenaphthene	414 N	n 66£	n 89£	N 858	0 S45 U	00005	1 2000000
Test: Semirolatiles - 5W 827	00		4 :stinU	\$ % /3			
Otal PCBs	986.0	021.7	0.241	099.0	619.0	I	~
roclor 1260	0580.0	7.120	0.241	099'0	619'0	I	6.2
krocior 1254	\$91.0	U 012.1	U 2220.0	U 151.0	U 721.0	I	6.2
100000 1242	961.0	U 012.1	U 2220.0	U 151.0	U 721.0	I	6.2
Test : PCBs · SW 8082			n :zinU	ชีฦ/ฮิเ			
BARAMETER Depth ((t): Sample Date: Sample U:	0 - 0 1/2 00/6/E 61SN=69PD	0 - 0 1 1 3/3/00 Ct69-N250	0 - 0 1.1 3/6/00 Ct695-N251	0 - 011 3/6/00 C+466-N833	0 - 0 1.1 3/6/00 0/275N-69PD	LVGW 4046 * Nasdec	EPA Region III RBCs - Industrial**

Sa PARAMETER Naphthalene	Sample 1D: ample Date: Depth (ft):	G469-NS19 3/9/00 0 - 0.17 414 U	G469-NS20 3/9/00 0 - 0.17 399 U	G469-NS21 3/9/00 0 - 0.17 368 U	G469-NS22 3/9/00 0 - 0.17 858 U	G469-NS22/D 3/9/00 0 - 0.17 845 U	NYSDEC TAGM 4046 * 13000	EPA Region III RBCs - Industrial** 41000000
Phenanthrene		155 J	556	118 J	638 J	347 J	50000	-
Pyrene		541 J	1610 J	369	2800	1860 J	50000	61000000
Test : TAL Metals	s - SW6010	B/7471A/7470A	in Net⊛in systematic	Units: 1	ng/kg			
Aluminum		5940	8450	6610	9920	9770	18306	2000000
Antimony		1.01	1.22	1.95	1.86	1.62	3.4	820
Arsenic		0.810	1.06 U	1.57	2.14	1.54	7.5	3.8
Barium		27.3	50.8	51.3	56.7	54.7	300	140000
Beryllium		0.413	0.580	0.401 J	0.498	0.473 J	0.65	4100
Cadmium		1.63	5.99	3.59	2.82	2.81	1.1	1000
Calcium		9780	19800	114000	3650	3090	23821	-
Chromium		15.4 J	33.0 J	28.6 J	18.9 J	16.0 J	22.6	6100
Cobalt		6.50	7.62	5.29	6.55	6.33	30	120000
Copper		69.5	50.4	40.1	36.5	35.1	43	82000
lron		16100	54700	13900	20500	17800	47350	610000
Lead		54.8	179	572	141	125	200	400
Magnesium		4350	3020	4810	2960	2920	7175	•
Manganese		337	735	364	474	455	2106	41000
Mercury		0.042 U	0.822 J	2.03 J	0.0434 U	0.0885 J	0.1	-
Nickel		16.3	16.5	11.0	15.2	13.7	46	41000
Potassium		1170	1130	1090	1110	1150	1993	-
Selenium		1.52 J	7.78 J	0.906 UJ	1.95 J	1.86 J	2	10000
Silver		0.776 U	1.06 U	4.42	0.723 U	1. 19 U	1.1	10000
Sodium		43.9 J	59.6 J	109	29.8 J	119 U	259	-
Vanadium		13.8	20.8	13.6	21.5	21.0	150	14000

For more details on the screening criteria see Table 2-1.

PARAMETER	Sample ID: Sample Date: Depth (ft):	G469-NS19 3/9/00 0 - 0.17	G469-NS20 3/9/00 0 - 0.17	G469-NS21 3/9/00 0 - 0.17	G469-NS22 3/9/00 0 - 0.17	G469-NS22/D 3/9/00 0 - 0.17	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Zinc		96.9	206	521	130	114	120	610000

L⁸PIF 7000 EXFANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YOR YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, VORK YOR YOR YOU HALF OF BUILDING 112,

or more details on the screening	criteria see Table	5-1'			
ndeno(1,2,3-cd)pyrene	88.9 ا	1581		3200	008L
Juorene	401 N	46.21		00005	00000078
Juoranthene	200	929 1		00005	8200000
nsuloznədi	401 N	413 N		0079	0000078
jibenz(a,h)anthracene	401 M	ISEL		ÞI	082
ic-n-octyl phthalate	n 10 1	413 N	······································	00005	1000000
othalate	401 N	tu 514		0018	50000000
;jıı.λacııc	60Þ	ZLS		400	000082
arbazole	U 104	r 0/1		0000\$	000067
atyl benzyl phthalate	LES	413 N		00005	00000017
is(2-ethylhexyl)phthalate	527	413 N		00005	410000
euso(k)Unoranthene	454 1	488 1		1100	00082
enzo(g,h,i)perylene	ſ <i>L</i> 91	1311		00005	-
enzo(b)fluoranthene	402 1	405 1		0011	0082
enzo(a)pyrene	324]	304 1		19	08 <i>L</i>
ອມອວຍາປາກຄ(ຄ)ວິດອີ	1815	424		554	008 <i>L</i>
ມໄກເສດຕາດ	r e:95	ا ٤٤ ١		00005	00000019
susity yithy lene	10 1 0	¢13 N		41000	-
cenaphthene	0 10 1	66'¢ ۱		00005	12000000
Test : Semivolatiles - SV 827	96		Balage Salar		
oral PCBs	046.0	15.400		E	-
roclor 1260	987.0	15.400		l I	6.2
rtoclor 1254	¢89`0	5 [.] 450 N		I. I.	6'7
rocior 1242	U 221.0	5.450 N		I	5.5
Lest : FCBs - SW 8082			Balam :etinU		
Sample ID: Sample Date: C(1): Depth ((1): Depth (1):	7 - 11 0 00/81/t 12-105S-69t-9	0112 - 2 4/10/00 5469-5250-51		LVGW 4046 * NASDEC	EPA Region I - sOUA **lsiyayay

Sample II Sample Date PARAMETER Depth (ft Naphthalene	G469-SS01-Z1 4/18/00 0.17 - 2 401 U	G469-SS20-Z1 4/19/00 0.17 - 2 413 U		NYSDEC TAGM 4046 * 13000	EPA Region III RBCs - Industrial** 41000000
Phenanthrene	293 J	844 J		 50000	-
Pyreņe	928	441		 50000	61000000
Test : TAL Metals - SW60	LOB/7471Å/7470A		Units: mg/kg		
Aluminum	6630	15800		18306	2000000
Antimony	1.01 U	0.951 U		3.4	820
Arsenic	0.667 J	0.951 U		7.5	3.8
Barium	86.5	67.3		300	140000
Beryllium	0.425 J	0.966		0.65	4100
Cadmium	4.37	3.39		1.1	1000
Calcium	8860	2940		23821	-
Chromium	32.5	23.0		22.6	6100
Cobalt	6.09	14.2		30	120000
Copper	127 UJ	50.8		43	82000
Iron	16400	31700		47350	610000
Lead	252	82.4		200	400
Magnesium	3780	6040		7175	-
Manganese	528	1040		2106	41000
Mercury	0.388	0.107		0.1	-
Nickel	15.8	27.9		46	41000
Potassium	639	1140		1993	-
Selenium	1.56 J	0.951 U		2	10000
Silver	0.899 J	0.951 U		1.1	10000
Sodium	40.7 J	34.6 J		259	-
Vanadium	16.0	30.0		150	14000

For more details on the screening criteria see Table 2-1.

PARAMETER	Sample ID: Sample Date: Depth (ft):	G469-SS01-Z1 4/18/00 0.17 - 2	G469-SS20-Z1 4/19/00 0.17 - 2		NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Zinc		459	92.5		120	610000

AEVE 5000 EXEVENDED SILE INAESLICETION' EORMEE CEREERS VIE EOECE BVSE' EOWE' NEM AOEK VOI 469: NOELH HVLE OF BUILDING 112, 2000 EXEVENDED SILE INAESLICETION EOE HILS AND SCREENING EOE THE SOIL SAMELES FROM Japle 4:4-5

					F-1	C aldeT aas claating	numeror and no elleteb arom ro-
820	\$°£	ו ז ט	U 76.0	∩ <i>L</i> 86 [.] 0	U 708.0	U 90.1	Ynomitn A
0000007	90681	00801	8430	6440	0529	0176	munimulA
			ริง/ชิน	ı səlinU		¥01471417474	Test : TAL Metals - SW6010
00000019	0000\$	346 N	N 955	40.8 J	1 SS 1	U 878	pyrene
-	00005	349 N	U 926 U	n słe	¢8'I 1	U 87E	Phenanthrene
0082	9200	349 N	0 9 5 6	n słe	U E8E	U 87E	ndeno(1,2,3-cd)pyrene
00000078	0000\$	340 N	0 95E	n s <i>L</i> s	N 585	U 875	ມູກດາຣຸມຣ
8200000	00005	346 N	∩ 9 \$€	۲۱٬۶۶	19I 1	¢6.9 J	ไนอเลกไก้ธนะ
08L	14	349 N	0 9SE	n s <i>l</i> s	U 585 U	U 875	ənəəsrthns(d,s)znədiC
000082	400	340 N	U 926 U	n s <i>L</i> s	152 1	U 875	Chrysene
000067	00005	U 645	U 926 U	n słe	183 N	U 87E	Carbazole
41000000	00005	0 645 U	U 926 U	n s <i>L</i> s	156 1	U 876	Butyl benzyl phthalate
000017	00005	340 N	f <i>L</i> 'E8	۲۱٫۲ ا	۲ <i>۲</i> ۲ آ	164 J	bis(2-ethylhexyl)phthalate
00082	0011	1 67E	n 95E	n s <i>l</i> e	133 1	U 875	Benzo(k)fluoranthene
-	00005	0 67E	N 95E	n s <i>l</i> e	U 585 U	U 875	Benzo(g,ħ,i)perylene
0082	0011	349 N	U 926 U	n s <i>L</i> s	1 6 [.] 79	U 875	Benzo(b)fluoranthene
08 <i>L</i>	19	0 645 D	N 95E	U 275 U	81.91	U 876	genzo(a)pyrene
0082	554	349 N	N 95E	n s <i>l</i> e	1911	U 875	Benz(a)anthracene
00000019	00005	349 N	N 95E	n s <i>l</i> e	U 585 U	U 875	Anthracene
1 2000000	00005	349 N	U 926 U	n s <i>l</i> e	U 585	በ 8/ር	₹ceusphthene
			រសុវុន	4 :stinU		00	728 WZ - zelitslovimez : 129T
-	01	U 9120.0	U 120.0	U 8220.0	0'05 <i>1</i> آ آ	0.0283 J	Lotal PCBs
6.2	01	U 9120.0	U 120.0	U 8220.0	0.0102 J	0.0124 J	410cfor 1260
6.2	01	U 9120.0	0.021 U	U 8220.0	0.0169 J	0.0159 J	froctor 1254
			่8ี≯ุ∕ฮิแ	r :stinU			Test: PCBs - SW 8082
EPA Region III RBCs - Industrial**	LVGW 4046 * NASDEC	0-15 15 15 15 10 10 10 10 10 10 10 10 10 10 10 10 10	01 - 8 00/81/7 5Z-1055-6995	8 - 9 00/81/b bZ-1088-69bD	9 - Þ 00/81/Þ £Z-1055-69ÞD	5 - 4 00/81/7 CZ-10SS-69PD	Sample ID: Sample ID:
		· · · · · · · · · · · · · · · · · · ·			,	1	

or more details on the screening criterla see Table 2-1.

PARAMETER	Sample ID: Sample Date: Depth (ft):	G469-SS01-Z2 4/18/00 2 - 4	G469-SS01-Z3 4/18/00 4 - 6	G469-SS01-Z4 4/18/00 6 - 8	G469-SS01-Z5 4/18/00 8 - 10	G469-SS01-Z6 4/18/00 10 - 12	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Arsenic		1.06 U	0.807 U	0.987 U	0.67 U	1.1 U	7.5	3.8
Barium		60.0	26.0	29.6	27.9	27.4	300	140000
Beryllium		0.564	0.380 J	0.477 J	0.419	0.577	0.65	4100
Cadmium		2.36	1.22	1.77	1.65	2.07	1.1	1000
Calcium		27600	2310	1920	2490	2250	23821	-
Chromium		12.6	8.82	12.7	12.2	17.8	22.6	6100
Cobalt		6.65	5.44	7.26	7.21	9.81	30	120000
Copper		31.0 UJ	24.1 UJ	34.7 UJ	31.5 UJ	41.0 UJ	43	82000
Iron		26400	15400	22600	21900	26900	47350	610000
Lead		40.9	11.5	7.42	8.50	11.8	200	400
Magnesium		4110	2680	3980	4050	5750	7175	-
Manganese		671	605	979	885	601	2106	41000
Mercury		0.0403	0.0385	0.0468	0.0292 J	0.0160 J	0.1	-
Nickel		14.6	13.1	17.5	16.9	22.1	46	41000
Potassium		750	535	688	597	1020	1993	-
Silver		1.06 UR	0.807 UR	0.987 UR	0.67 UR	1.1 UR	1.1	10000
Sodium		79.0 J	62.8 J	97.9 J	115	150	259	-
Thallium		1.06 UR	0.807 UR	0.987 UR	0.67 UR	1.1 UR	0.45	140
Vanadium		22.6	13.7	20.2	18.7	24.7	150	14000
Zinc		75.9	52.0	61.8	59.7	72.3	120	610000
Test : TRPII -	418.1M			Units:	mg/kg	·····		
Petroleum Hydrocarbons	, TR	467 UJ	465 UJ	458 UJ	434 UJ	441 UJ	-	-

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Sample ID: Sample Date: PARAMETER Depth (ft):	G469-SS01-Z7 4/18/00 12 - 14	G469-SS03-Z1 4/18/00 5 - 7	G469-SS03-Z2 4/18/00 10.5 - 12.5	G469-SS06-Z1 3/21/00 4 - 5	G469-SS06-Z2 3/21/00 12 - 13	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**		
Test : PCBs - SW 8082			Units:	mg/kg					
Aroclor 1254	0.0214 U	0.0229 U	0.0226 U	0.0211 U	0.0244 U	10	2.9		
Aroclor 1260	0.0214 U	0.0229 U	0.0226 U	0.0211 U	0.0244 U	10	2.9		
Total PCBs	0.0214 U	0.0229 U	0.0226 U	0.0211 U	0.0244 U	10	-		
Test : Semivolatiles - SW 8270C Units: µg/kg									
Acenaphthene	351 U	372 U	370 U	340 U	359 U	50000	120000000		
Anthracene	351 U	372 U	370 U	340 U	359 U	50000	61000000		
Benz(a)anthracene	351 U	372 U	370 U	340 U	359 U	224	7800		
Benzo(a)pyrene	351 U	372 U	370 U	340 U	359 U	61	780		
Benzo(b)fluoranthene	351 U	372 U	370 U	340 U	359 U	1100	7800		
Benzo(g,h,i)perylene	351 U	372 U	370 U	340 U	359 U	50000	-		
Benzo(k)fluoranthene	351 U	372 U	370 U	340 U	359 U	1100	78000		
Bis(2-ethylhexyl)phthalate	78.3 J	372 U	370 U	340 U	359 U	50000	410000		
Butyl benzyl phthalate	351 U	372 U	370 U	340 U	359 U	50000	41000000		
Carbazole	351 U	372 U	370 U	340 U	359 U	50000	290000		
Chrysene	351 U	372 U	370 U	340 U	359 U	400	780000		
Dibenz(a,h)anthracene	351 U	372 U	370 U	340 U	359 U	14	780		
Fluoranthene	351 U	372 U	370 U	340 U	359 U	50000	82000000		
Fluorene	351 U	372 U	370 U	340 U	359 U	50000	82000000		
Indeno(1,2,3-cd)pyrene	351 U	372 U	370 U	340 U	359 U	3200	7800		
Phenanthrene	351 U	372 U	370 U	340 U	359 U	50000	-		
Pyrene	351 U	372 U	370 U	340 U	359 U	50000	61000000		
Test : TAL Metals - SW6010	B/7471A/7470A		Units:	mg/kg			· · · · · · · · · · · · · · · · · · ·		
Aluminum	8550	10200	8300	9750	5890	18306	2000000		
Antimony	0.663 U	1.05 U	0.757 U	0.798 U	1.01 U	3.4	820		

For more details on the screening criteria see Table 2-1.

Petroleum Hydrocarbons, TR	fO 154	463 NI	424 NI	44'I N	U 5.02	-	•
MI.814 - HYAT : 129 T			ı :əlinU	ฮิสุ/ฮิน			
Sinc	7.18	L'ES	0.23	64.2	L'LE	150	000019
muibeneV	0.12	5.02	0.81	<i>L</i> '91	£'01	051	14000
muilledT	0 [.] 663 ∪R	1.05 UR	0 <i>.757 ט</i> וג	U 867.0	U 10.1	57.0	140
muiboS	751	N 501	1 4 [.] 67	ſ 9 [.] S†	N 101	657	-
Silver	0 [.] 663 ∪R	1.05 UR	0 <i>.757</i> ∪R	U 867.0	U 10.1	1.1	00001
Potassium	L89	665	L89	0501	416	£661	-
Nickel	9.71	8.21	5.91	£' <i>L</i> I	5.51	97	41000
Mercury	0 [.] 0190 J	68£0.0	l 7120.0	U ££0.0	U 550.0	1.0	-
อะวาธฐณรM	1330	† 69	189	823	0501	9017	41000
muisəngeM	4540	07/5	0057	0565	0£8Z	SL1L	-
beal	<i>9L</i> .8	08.8	00'6	5.23	LE'E	500	400
lron	54100	00117	50400	00 <i>LL</i> Z	00/61	05874	000019
Copper	(N 8 [.] 87	tu <i>t</i> .ee	45'9 M	1.25	8 [.] /I	43	00078
JbbdoD	6 <i>L</i> °L	96'9	10.7	77 [.] L	4.32	30	120000
muimord)	15.8	15'0	6.21	14.2	\$8 [.] L	9'77	0019
muialeO	5400	0061	0181	0158	0201	12852	-
muimbeO	5.03	\$9 '1	£9°1	5.13	2.27	1.1	0001
Beryllium	0'465	1012.0	0.462	\$97.0	0.335 J	\$9.0	4100
muinsB	L [.] LE	9.82	6'57	9*76	35.4	00£	140000
Arsenic	0 [.] 374 J	U 20.1	L 985.0	15.2	0.582 J	S'L	8.6
Sample Date: Sample Date: Depth (fl):	15 - 14 4/18/00	L - S 00/81/Þ	5.21 - 2.01 4/18/00	5 - 4 3/21/00	15 - 13 3/51/00	LVCW 4049 * NASDEC	Industrial** RBCs - RPACs -

Table 4.4-2										
SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM										
AOI 469: NORTH HALF OF BUILDING 112,										
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK										

Sample ID: Sample Date: PARAMETER Depth (ft):	G469-SS11-Z1 4/18/00 6 - 7	G469-SS11-Z1/I) 4/18/00 6 - 7	G469-SS11-Z2 4/18/00 10 - 12	G469-SS13-Z1 4/21/00 6 - 7	G469-SS13-Z2 4/21/00 10 - 12.5	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Test : PCBs - SW 8082	·		Units:	mg/kg			
Aroctor 1254	0.0221 U	0.0224 U	0.0217 U	0.0226 U	0.0224 U	10	2.9
Aroclor 1260	0.00415 J	0.00450 J	0.0217 U	0.0226 U	0.226	10	2.9
Total PCBs	0.00415 J	0.00450 J	0.0217 U	0.0226 U	0.226	10	-
Test : Semivolatiles - SW 827	0C		Units:	µg/kg			
Acenaphthene	363 U	353 U · ·	358 U	374 U	374 U	50000	120000000
Anthracene	363 U	353 U	358 U	374 U	374 U	50000	610000000
Benz(a)anthracene	363 U	44.3 J	358 U	374 U	374 U	224	7800
Benzo(a)pyrene	363 U	353 U	358 U	374 U	374 U	61	780
Benzo(b)fluoranthene	363 U	353 U	358 U	374 U	374 U	1100	7800
Benzo(g,h,i)perylene	363 U	353 U	358 U	374 U	374 U	50000	-
Benzo(k)fluoranthene	363 U	353 U	358 U	374 U	374 U	1100	78000
Bis(2-ethylhexyl)phthalate	363 U	353 U	358 U	374 U	374 U	50000	410000
Butyl benzyl phthalate	363 U	353 U	358 U	374 U	374 U	50000	41000000
Carbazole	363 U	353 U	358 U	374 U	374 U	50000	290000
Chrysene	363 U	47.6 J	358 U	374 U	374 U	400	780000
Dibenz(a,h)anthracene	363 U	353 U	358 U	374 U	374 U	14	780
Fluoranthene	363 U	119 J	358 U	374 U	374 U	50000	82000000
Fluorene	363 U	353 U	358 U	374 U	374 U	50000	82000000
Indeno(1,2,3-cd)pyrene	363 U	353 U	358 U	374 U	374 U	3200	7800
Phenanthrene	363 U	65.5 J	358 U	374 U	374 U	50000	
Pyrene	363 U	99.9 J	358 U	374 U	374 U	50000	61000000
Test : TAL Metals - SW6010	B/7471A/7470A		Units:	mg/kg		•	
Aluminum	9570	9550	9570	7890	9270	18306	2000000
Antimony	0.595 U	0.928 U	0.776 U	1.28	1.64	3.4	820

For more details on the screening criteria see Table 2-1.

Source: Ecology and Environment, Inc., November 2000

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s Parameter	Sample ID: Sample Date: Depth (ft):	G469-SS11-Z1 4/18/00 6 - 7	G469-SS11-Z1/D 4/18/00 6 - 7	G469-SS11-Z2 4/18/00 10 - 12	G469-SS13-Z1 4/21/00 6 - 7	G469-SS13-Z2 4/21/00 10 - 12.5	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industria!**
Arsenic		0.595 U	0.928 U	0.776 U	4.72	5.93	7.5	3.8
Barium		46.5	31.1	31.8	32.7	34.1	300	140000
Beryllium		0.525	0.481	0.424	0.337 J	0.354 J	0.65	4100
Cadmium		1.66	1.67	2.56	0.419 U	0.395 U	1.1	1000
Calcium		4270	3250	2000	2530	2510	23821	-
Chromium		13.0	12.4	17.0	10.9	13.8	22.6	6100
Cobalt		7.15	7.26	8.07	5.46	6.68	30	120000
Copper		30.9 UJ	30.5 UJ	34.7 UJ	28.7	37.1	43	82000
Iron		20500	20200	32300	20300	25300	47350	610000
Lead		13.6	11.0	6.75	11.0	10.0	200	400
Magnesium		3770	3800	4030	3240	4580	7175	-
Manganese		809	823	848	1030	1240	2106	41000
Mercury		0.0590	0.0363	0.041 J	0.0168 J	0.0288 U	0.1	-
Nickel		15.6	15.3	18.1	14.3	18.3	46	41000
Potassium		525	575	649	882	1160	1993	-
Silver		0.595 UR	0.928 UR	0.776 UR	0.838 U	0.789 U	1.1	10000
Sodium		36.4 J	92.8 U	27.2 J	83.8 U	78.9 U	259	-
Thallium		0.595 UR	0.928 UR	0.776 UR	1.17	1.63	0.45	140
Vanadium		19.5	20.5	22.6	18.5	21.7	150	14000
Zinc		59.9	57.1	84.3	47.3	64.6	120	610000
Test : TRPII - 41	8.1M			Units:	mg/kg			e de la companya de En esta de la companya
Petroleum Hydrocarbons, T	ſR	452 UJ	453 UJ	434 UJ	456 U	455 U	-	-

Sample ID: Sample Date: PARAMETER Depth (ft):	G469-SS15-Z1 4/19/00 6 - 7	G469-SS15-Z1/D 4/19/00 6 - 7	G469-SS15-Z2 4/19/00 10 - 11	G469-SS17-Z1 4/19/00 6 - 7	G469-SS17-Z1/D 4/19/00 6 - 7	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**			
Test : PCBs - SW 8082			Units:	mg/kg						
Aroclor 1254	0.0208 U	0.0214 U	0.0219 U	0.0215 U	0.0214 U	10	2.9			
Aroclor 1260	0.0208 U	0.0214 U	0.0280	0.0215 U	0.0214 U	10	2.9			
Total PCBs	0.0208 U	0.0214 U	0.0280	0.0215 U	0.0214 U	10	-			
Test : Semivolatiles - SW 8270C Units: µg/kg										
Acenaphthene	357 U	360 U	363 U	348 U	351 U	50000	120000000			
Anthracene	357 U	360 U	363 U	348 U	351 U	50000	61000000			
Benz(a)anthracene	357 U	360 U	363 U	348 U	351 U	224	7800			
Benzo(a)pyrene	357 U	360 U	363 U	348 U	351 U	61	780			
Benzo(b)fluoranthene	357 U	360 U	363 U	348 U	351 U	1100	7800			
Benzo(g,h,i)perylene	357 U	360 U	363 U	348 U	351 U	50000	-			
Benzo(k)fluoranthene	357 U	360 U	363 U	348 U	351 U	1100	78000			
Bis(2-ethylhexyl)phthalate	357 U	128 J	87.5 J	309 J	287 J	50000	410000			
Butyl benzyl phthalate	122 J	360 U	363 U	348 U	351 U	50000	410000000			
Carbazole	357 U	360 U	363 U	348 U	351 U	50000	290000			
Chrysene	46.0 J	360 U	363 U	348 U	351 U	400	780000			
Dibenz(a,h)anthracene	357 U	360 U	363 U	348 U	351 U	14	780			
Fluoranthene	65.7 J	360 U	363 U	348 U	351 U	50000	82000000			
Fluorene	357 U	360 U	363 U	348 U	351 U	50000	82000000			
Indeno(1,2,3-cd)pyrene	357 U	360 U	363 U	348 U	351 U	3200	7800			
Phenanthrene	44.9 J	360 U	363 U	348 U	351 U	50000	-			
Pyrene	67.9 J	360 U	363 U	348 U	351 U	50000	61000000			
Test : TAL Metals - SW6010	B/7471A/7470A		Units:	mg/kg			· · ·			
Aluminum	9700	9730	7450	8880	9310	18306	2000000			
Antimony	0.969 U	0.786 U	0.958 U	0.738 U	0.571 U	3.4	820			

For more details on the screening criteria see Table 2-1.

PARAMETER	Sample ID: Sample Date: Depth (ft):	G469-SS15-Z1 4/19/00 6 - 7	G469-SS15-Z1/D 4/19/00 6 - 7	G469-SS15-Z2 4/19/00 10 - 11	G469-SS17-Z1 4/19/00 6 - 7	G469-SS17-Z1/D 4/19/00 6 - 7	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Arsenic		0.969 U	0.879	0.958 U	0.418 J	0.351 J	7.5	3.8
Barium		43.7	35.7	20.5	22.3	23.7	300	140000
Beryllium		0.549	0.505	0.459 J	0.455	0.490	0.65	4100
Cadmium		2.30	1.95	1.51	1.63	1.76	1.1	1000
Calcium		1650	1950	1720	1400	1190	23821	-
Chromium		13.6	12.6	10.2	11.1	11.1	22.6	6100
Cobalt		7.82	7.75	6.15	6.44	6.53	30	120000
Copper		50.2	45.9	28.7	25.3	34.9	43	82000
Iron		27100	23200	18500	19300	21100	47350	610000
Lead		7.14	7.75	6.09	7.23	6.48	200	400
Magnesium		4450	4190	3650	3550	3640	7175	-
Manganese		1400	1030	516	724	1020	2106	41000
Mercury		0.0403	0.0304 J	0.0155 J	0.0465	0.0265 J	0.1	-
Nickel		19.1	17.1	14.4	13.9	14.8	46	41000
Potassium		959	812	908	681	634	1993	-
Silver		0.969 U	0.786 U	0.958 U	0.738 U	0.571 U	1.1	10000
Sodium	· · · ·	28.6 J	29.0 J	35.2 J	25.8 J	27.9 J	259	-
Thallium		0.969 U	0.786 U	0.958 U	0.738 U	0.571 U	0.45	140
Vanadium		20.5	19.2	15.0	16.8	17.5	150	14000
Zinc		99.6	76.5	50.6	49.9	54.7	120	610000
Test : TRPH -	418.1M			Units:	mg/kg			
Petroleum Hydrocarbon	s, TR	442 U	440 U	444 U	431 U	434 U	-	-

For more details on the screening criteria see Table 2-1.

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AEVE 5000 EXDEVIDED SILE INAESLIGETION' FORMER CRIFFISS AIR FORCE BASE, ROME, NEW YOR SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM Table 4.4-2

					1-0	, aldeT aas civativo	Pullage and the elister around
820	3.4	U 200.0	∩ <i>†L</i> '0	U £62.0	0.844 U	U 916.0	ynomitnA
0000007	90681	0786	0956	0571	00601	0585	munimulA
			ริม/ชิน	:səlnU		VOLPLIVILPL/B	TAL Metals · 2010
00000019	00005	U 07E	n 59E	484	t t t 1	U 525 U	Pyrene
-	00005	U 076	n 59E	413	∩ 99 €	U 525 U	Phenanthrene
0082	007E	U 075	3 65 U	64 .3 J	N 99E	U 525 U	nərvq(bə-£,2,1)onəbrl
8200000	00005	U 075	n 59E	U 225 U	n 99E	U 525 U	Fluorene
8200000	00005	U 07E	0 5 9£	¢L9	62.6 J	U 525 U	Fluoranthene
082	14	1U 07E	J 59E	U 225 U	n 99e	N ESE	Dibenz(a,h)anthracene
00008 <i>L</i>	400	U 075	J 59E	582 J	n 99E	N ESE	Chrysene
50000	00005	U 075	n 59E	84.5 J	U 995 U	U ESE	Carbazole
41000000	00005	U 07E	n 59E	U 225	n 99E	U 525 U	Butyl benzyl phihalate
410000	00005	U 075	ſ <i>L</i> 89	U 255	n 99e	550 1	Bis(2-ethylhexyl)phthalate
0008L	0011	በ	n 59E	1 981	∩ 99£	n es e	Benzo(k)fluoranthene
-	00005	tu 075	n 59E	U 255	A 99E	n ese	Benzo(g,h,i)perylene
0082	0011	1U 07E	n 59E	ſ <i>L</i> 61	n 99E	n ese	Benzo(b)fluoranthene
08/	19	tU 07E	n \$9E	1981	n 99e	U 525 U	Benzo(a)pyrene
0082	554	U 07E	n 59E	566 J	n 99e	n es e	ອມອວຮາປາກສຸດຄາຍ
000000019	00005	∩ 0 <i>L</i> €	n \$9E	1 SO I	n 99e	n ese	อกจวยาศาตล
1 20000000	0000\$	N 0/E	n 59E	l 0.68	N 99E	n ese	รกรกับการกระด
			និង/ភិព	t :stinU		00	Test : Semivolatiles - SVV 8270
-	01	088.£	0.0162 J	t 0910.0	U 7220.0	U 7120.0	Total PCBs
5.0	01	088.£	0.0162 J	0.0160 J	U 7220.0	U 7120.0	0921 1260
5'7	01	U 011.1	U 7120.0	U 220.0	U 7220.0	U 7120.0	4200101 1254
			ฮิฦ/ฮิน	r :stinU			Lest : PCBs - SW 8082
EPA Region III RUCs - Industrial**	LVGW 4049 * Nasdec	5 - 7 7/10/00 7Z-07255-694:3	15 - 13 4/13/00 C469-2219-27/D	15 - 13 4/13/00 C463-2213-25	L - 9 00/61/7 1Z-6155-6975	11 - 01 11-01 71/10/00 72-1155-699D	Sample ID: Sample Date: C(f): C(f): Copple Date: C(f): Copple Copple Cop

or more details on the screening criteria see Table 2

Source: Ecology and Environment, Inc., November 2000

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PARAMETER	Sample ID: Sample Date: Depth (ft):	G469-SS17-Z2 4/19/00 10 - 11	G469-SS19-Z1 4/19/00 6 - 7	G469-SS19-Z2 4/19/00 12 - 13	G469-SS19-Z2/D 4/19/00 12 - 13	G469-SS20-Z2 4/19/00 2 - 4	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Arsenic		0.616 U	0.844 U	0.593 U	0.74 U	0.665 U	7.5	3.8
Barium		16.0	31.3	19.4	20.4	26.2	300	140000
Beryllium		0.316	0.552	0.410	0.423	0.532	0.65	4100
Cadmium		1.12	1.85	1.52	1.60	1.87	1.1	1000
Calcium		1070	1680	2050	2000	1580	23821	-
Chromium		7.89	12.4	10.2	10.6	11.9	22.6	6100
Cobalt		4.70	6.46	6.14	6.36	6.44	30	120000
Copper		18.6	29.1	28.3	28.5	30.0	43	82000
Iron		13900	22100	18200	19800	21100	47350	610000
Lead		4.94	6.74	6.89	6.81	7.44	200	400
Magnesium		2340	3440	3640	3840	3770	7175	-
Manganese	···· · · · · · · · · · · · · · · · · ·	334	620	472	496	973	2106	41000
Mercury		0.0111 J	0.0289 J	0.0116 J	0.00878 J	0.0364	0.1	-
Nickel		11.1	15.4	14.5	15.0	13.7	46	41000
Potassium		661	713	767	854	623	1993	
Silver		0.616 U	0.844 U	0.593 U	0.74 U	0.665 U	1.1	10000
Sodium		22.0 J	29.9 J	33.2 J	37.5 J	29.1 J	259	-
Thallium		0.616 U	0.844 U	0.593 U	0.74 U	0.665 U	0.45	140
Vanadium		11.6	22.0	15.8	15.9	18.8	150	14000
Zinc		35.0	56.5	52.2	52.1	53.2	120	610000
Test: TRPH -	418.1M			Units:	mg/kg			
Petroleum Hydrocarbon	s, TR	438 U	459 U	442 U	450 U	374 J	-	-

AEVE 5000 EXDEVIDED SILE INDEZLICETION' EORMEE CERELISS VIE EOECE BESE' BOWE' NEM AOEK VOI 469: NOELH HELE OF BUILDING 112, VOI 469: NOELH HELE OF BUILDING 112, Lable 4:4-2

For more details on the screening	criteria see Table:	5-1"					
ynomijnA	0.92 U	∩ <i>Ł</i> 0 <i>Ľ</i> `0	U 60.1	U £68.0	1.12	3.4	820
munimutA	00911	0826	0679	0/42	0796	90681	000000Z
Test : TAL Metals - SW6010	VOLPLIVILPL/A		ı :əlinU	ชิรุ/ฮิน		· .	
Бугеле	1 9SE	25.3 J	U 825	N 19E	U 265 U	0000\$	00000019
Phenanthrene	0 9 56 U		U 825	U 19E	n 59E	00005	-
Indeno(1,2,3-cd)pyrene	329 N		U 825	N 19E	U 265 U	3200	0082
Fluorene	U 926 U	0 † 9£	U 825	D 19E	U 265 U	00005	8200000
Fluoranthene	U 926 U	۶۹.9 ا	U 825	n 19E	U 265 U	00005	8200000
Dibenz(a,h)anthracene	U 926 U	∩ †9 €	U 825 U	N 19E	U 265 U	14	082
Chrysene	1 9SE	ſ 9 [.] /9	0 85E	n 19E	n 59E	400	000082
Carbazole	0 9SE	∩ † 9€	U 825 U	U 19E	n 59E	00005	000067
B utyl benzyl phthalate	U 926 U	0 † 98	U 825	N 19E	n 59E	00005	41000000
Bis(2-ethylhexyl)phthalate	N 95E	∩ † 9€	U 826	n 19e	ſ <i>L</i> 86	0000\$	410000
Benzo(k)fluoranthene	N 95E	٦6.0 ا	U 825	n 19e	n 59E	0011	00082
Benzo(g,ħ,i)perylene	U 926 U	1 7 95	U 82£	n 19e	U 265 U	0000\$	-
Benzo(b)fluoranthene	N 95E	63 .6 J	U 825 U	n 19E	n 59E	0011	0082
Β επεο(a)pyrene	U 926 U	14.6 J	U 825 U	n 19e	U 265 U	19	082
ອດອວຣາຕ່າດຣ(ຣ)ຊາຍອີ	U 986 U	60.3 1	U 825	n 19e	N \$9£	554	0082
่อนจวธาน้ำกA	U 926 U	1 79 6	U 825	L 19E	U 265 U	0000\$	00000019
Acenaphthene	U 926 U	364 N	U 825 U	n 19E	U 265 U	0000\$	12000000
Test : Semivolation : 129T	00		l :simU	84/81			
Total PCBs	0/210	† 98 [.] 0	0.0104 J	0 [.] 0162 J	U 2220.0	01	-
Aroclor 1260	0/5'0	0`36¢	0.0104 J	0.0162 J	U 2220.0	01	6.2
Aroctor 1254	∩ 901°0	0.0444 U	U 9120.0	U 2220.0	U 2220.0	01	6.2
Test: PCBs - SW 8082			a :estinU	8ห/สิน		· · · · ·	· · · · · · · · · · · · · · · · · · ·
:01 slqms2 :91 slqms2 :91 slqms2 :(1) dlqsU AAAAAAA :(1) dlqsU AAAAAAAA	9 - 7 00/61/7 EZ-0ZSS-697D	8 - 9 00/61/t tz-0755-69tD	8 - 10 4/13/00 C463-28250-22	10 - 15 4(13)00 C463-S250-SE	8 - 6 4/50/00 C469-2251-21	LVGW 4049 * Nasdec	EPA Region III RBCs - Maleususubut

.

PARAMETER	Sample ID: Sample Date: Depth (ft):	G469-SS20-Z3 4/19/00 4 - 6	G469-SS20-Z4 4/19/00 6 - 8	G469-SS20-Z5 4/19/00 8 - 10	G469-SS20-Z6 4/19/00 10 - 12	G469-SS21-Z1 4/20/00 8 - 9	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Arsenic		0.92 U	0.707 U	1.09 U	0.893 U	4.93	7.5	3.8
Barium		18.2	20.9	23.9	17.0	34.9	300	140000
Beryllium		0.499	0.453	0.397 J	0.334 J	0.408 J	0.65	4100
Cadmium		1.76	1.66	1.22	1.15	0.483 U	1.1	1000
Calcium		859	1070	1150	1230	7140	23821	-
Chromium		13.2	11.5	8.28	7.56	11.8	22.6	6100
Cobalt		7.05	6.22	5.51	5.15	6.21	30	120000
Copper		39.7	32.0	20.3	18.0	33.1	43	82000
Iron		20900	19000	14600	13400	25100	47350	610000
Lead		6.06	5.87	5.95	5.35	9.59	200	400
Magnesium		4070	3750	2720	2510	4020	7175	-
Manganese		463	697	301	318	825	2106	41000
Mercury		0.0345 J	0.0229 J	0.00788 J	0.00678 J	0.0282 UJ	0.1	-
Nickel		18.2	14.5	13.7	13.5	16.7	46	41000
Potassium		742	714	898	807	995	1993	-
Silver		0.92 U	0.707 U	1.09 J	0.893 U	0.966 U	1.1	10000
Sodium		92 U	29.7 J	109 U	89.3 U	96.6 U	259	-
Thallium		0.92 U	0.707 U	1.09 UJ	0.893 U	0.813 J	0.45	140
Vanadium		18.6	16.4	13.0	12.1	23.6	150	14000
Zinc		56.0	49.8	37.3	36.1	60.9	120	610000
Test : TRPII - 4	18.1M			Units:	mg/kg	anna an Aireana Anna Martín Aireana		
Petroleum Hydrocarbons,	TR	434 U	447 U	441 U	443 UJ	456 U	-	-

For more details on the screening criteria see Table 2-1.

LEVE 5000 EXDENDED SILE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YOR SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM TABLE 4.4-2

pringerse and no slieteb erom 103	, aldet aas eivativo	2-1				
ynominnA	£9 [.] 1	82.1	£08.0		3.4	820
munimulA	00711	00911	2140		90881	00000Z
Test : TAL Metals - SW6010	B/1471A/1470A		n :ztinU	និង្/សិយ		
Dyrene	n 1/e	J 85E	0611		00005	00000019
Phenanthrene	n 1/e	U 825	742		20000	-
nəreno(1,2,3-cd)pyrene	n 1 <i>1</i> .5	U 825	10† 1		3200	0082
Lluorene	n 1/e	U 825	1001		00005	00000028
Huoranthene	N 128	U 825	££6		00005	00000028
ensoarding(d,a,b)	n 1/e	1 8SE	60.2 J		71	082
Chrysene	ח וגנ		173		400	000087
Satbazole	N 12E	U 825	n 99£		00005	000067
Butyl benzyl phthalate	n 1 <i>1</i> .5	U 825	N 99E		00005	41000000
કાઠાદતીયવ(lyxərlydiə.S)ટાંઇ	n 1 <i>1</i> 5	21.3 ا	n 99E		00005	410000
genzo(k)fluoranthene	n 1/e	U 825	SES		0011	0008L
Benzo(g,h,h)perylene	n 1/5	U 825	f E91		00005	-
3enzo(b)fluoranthene	n 1 <i>1</i> 5	U 82£	117		0011	0082
Jenzo(a)pyrene	n 1/e	U 825	LLT		19	082
ອເກລວຣາເກັງກາຣ(ລ)ຊາຍ	N 1/E	U 825	f 285		524	0082
Anthracene	n 1 <i>L</i> e	U 825	1121		00005	00000019
Acenaphthene	n 1/e	U 82£	10.74		00005	00000071
Test : Semivolatiles - SV 827	00		Units: µ	នអូវ៩		
Fotal PCBs	5.240	U 7120.0	0.0144 J		01	-
Lioclor 1260	5.240	U 7120.0	0.0144 J		01	6'7
J. 106 105 1254	U 024.0	U 7120.0	0.022 U		01	6.2
Lest : PCBs - SVV 8082	1 από τη τη του τουρηγού τους τη τη τη προστροποιου του ποροσφατητή τη ποροσφ		m :stinU	ວິນ/ອີເມ		
Sample ID: Sample Date: PARAMETER Depth (ft):	15 - 13 4/50/00 C468-2851-55	2 - S 4/30/00 C469-8233-51	10 - 15 4/50/00 C+469-2257-25		LVCW 4040 * NASDEC	EPA Region III RBCs - Industrial**
AEVE 5000 EXEVADED SILE INAESLICVLION' EORMEE CEIEEISZ VIE EOECE BVSE' EOWE' NEM AOEK VOI 469: NOELH HVLE OE BNILDING 112' VOI 469: NOELH HVLE OE BNILDING 112' Lapfe 4'4-5

-	-	44 N	¢37 U	n 6\$ 1	Petroleum Hydrocarbons, TR		
		gylygm :stinU			Test : TRPH - 418.1M		
000019	150	1.6	٤ ٢.٢٢	24.0	Zinc		
14000	051	4.3	1 6.52	L'SZ	muibeneV		
140	54.0	Π <i>L</i> 65	0 <u> </u>	U 46.1	muillerT		
-	520	n <i>L</i> 6	S U 4.08	U 6.08	muibo2		
10000	ГТ	∩ <i>L</i> 65'	0.804 U	U 608.0	Silver		
-	8661	85	L \$\$6	996	Potassium		
41000	97	3.2	1 8.61	5.61	Nickel		
-	1.0	n <i>L</i> 670'	0.0328 UJ	U 1620.0	Mercury		
41000	9017	II	1430 3	0511	osənegneM		
-	SLIL	950	7 06/7	3040	muisอกฎ _ิ ศพ		
400	500	86	t 96°S	40.7	Lead		
000019	05874	006	1 00657	00/87	uo.ŋ		
82000	43	5.8	I Z'ES	9.04	Copper		
1 20000	30	18	76.02	80°L	Cobalt		
0019	9'77	50'	8 5.51	1.2.1	Chromium		
-	12852	067	1 0521	1430	Calcium		
0001	L.I	 U 962.	0 T 207 0	0.404.U	muimbeO		
4100	\$9.0	1867 J	0 524.0	525.0	Beryllium		
140000	300	2.0	1 7.25	8.95	muinea		
8.6	S'L	19	٤ <i>LL</i> .S	16.9	oinos:A		
**lairiteubnI		10 - 13	L - S	12 - 13	PARAMETER Depth ((1):		
BBCs -	LVCM WWW *	4/20/00	\$\50\00	\$\50\00	Sample Date:		
EPA Region III		C469-5252-22	C469-5S222.Z1	72-178S-69#9	Sample ID:		

Table 4.4-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM AOI 469: NORTH HALF OF BUILDING 112, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:

Qualifiers:

estimated
not detected
not detected; estimated detection limit reported
not detected; rejected sample

Units:

mg/kg = milligrams per kilogram µg/kg = micrograms per kilogram

Test and Sample Information:

PCBs = polychlorinated biphenyls TAL = Target Analyte List TRPH ≈ total recoverable petroleum hydrcarbons /D = duplicate sample NA = not analyzed - = Standard or guidance value not available

Screening:



Result above NYSDEC recommended soil cleanup objectives, Technical and Administrative Guidance Memorandum (TAGM) 4046, (NYSDEC 1994).



Result above industrial EPA Region III Risk-Based Concentration (RBC), for soil, (EPA 2000).

- * The NYSDEC soil cleanup level for PCBs applies to the sum of these substances.
- ** The EPA OSWER (Directive No. 9355.4-12, July 1994) health-based screening value for lead in soil in a residential area with children was used in lieu of an RBC.



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G469-NS01	G469-NS05	G469-NS11	G469-NS16	G469-NS22	G4
0-0.17ft. BGS	0-0.17ft. BGS	0-0.17ft. BGS	0-0.17ft. BGS	0-0.17ft. BGS	5
ORGANICS (µg/kg)	ORGANICS (µg/kg)	ORGANICS (µg/kg)	ORGANICS (µg/kg)	ORGANICS (µg/kg)	INOR
Denzo(d)anthracene 9350	Benzo(a)pyrene 181J	Benzo(a)pyrene 143J	Benzo(a)anthracene 343J	Benzo(a)anthracene 951	Cadmium
Benzo(k)fluorenthono 1230	INORGANICS (mg/kg)	INORGANICS (mg/kg)	Benzo(d)pyrene 297J	Benzo(a)pyrene 735J	G46
Chysene 1090J	Cadmium 1.38	Beryllium 0.660	INORGANICS (mg/kg)	Chysene 1050	10.5
INORGANICS (mg/kg)		G469-NS11/D	Chromium 109J	INORGANICS (mg/kg)	INOR
Codmium 5.03	G469-NS06	0-0.17ft. BGS	Copper 45.0	Zinc 130	Cadmium
Chromium 32.3J	0-0.17ft. BGS	ORGANICS (ug/kg)	Mercury 1.02.1	C469-NS22/D	CA
Lead 272	ORGANICS (ug/kg)	Benzo(a)pyrene 194J	Zinc 597	0-0.17ft. BGS	4
Mercury 0.637J	Benzo(a)anthracene 712	INORGANICS (ma/ka)		ORGANICS (ug/kg)	INOR
G469-NS01/D	Benzo(a)pyrene 603J	Cadmium 1.62	G469-NS1/	Benzo(a)anthracene 649J	Cadmium
0-0.17ft. BGS	Chrysene 784			Benzo(a)pyrene 571J	G46
ORGANICS (ug/kg)	INORGANICS (mg/kg)		ORGANICS (µg/kg)		12
Benzo(a)anthracene 1110J	Cadmium 3.15		Benzo(d)onthracene 276J	INORGANICS (mg/kg)	INOR
Benzol olpyrene 12404		C469-NS12	INORGANICS (mg/kg)		Cadmium
Benzo(b)fluoranthene 1330J	G469-NS07	0-0.17ft. BGS	Cadmium 5.21		
Benzo(k)fluoranthene 1280J	0-0.17ft. BGS	ORGANICS (ug/kg)	Mercury 0.648J	0460 5001 71	G4
INORGANICS (mg/kg)	ORGANICS (µg/kg)	Benzo(a)anthracene 302J		017-2 ft BCS	6
Cadmium 5.25	Benzo(a)anthracene 2920J	Benzo(a)pyrene 324J	G469-NS18	OPCANICS (up /kg)	INOR
Chromium 31.6J	Benzolo bytene 23500	Chrysene 401	0-0.17ft. BGS	Benzo(a)anthracene 318.1	Codmium
Lead 226	Benzo(k)fluoranthene 3380J	INORGANICS (mg/kg)	ORGANICS (µg/kg)	Benzo(g)pyrene 354J	G46
Mercury 0.581J	Chysene 2930J	Caamium 1.62	Benzo(a)anthracene 320J	Chysene 409	
Zinc 432	INORGANICS (mg/kg)	、 、	Benzo(a)pyrene 288J	INORGANICS (mg/kg)	Codmium
	Cadmium 1.62	G469NS13	INORGANICS (mg/kg)	Cadmium 4.37	G4
		0-0.17ft. BGS	Selenium 1.84 Selenium 2.32J	Lead 252	10-
	G469-NS08	ORGANICS (µg/kg)		Mercury 0.388	INOR
G409-NSU2	0-0.17ft. BGS	Benzo(a)pyrene 195J	G469-NS19	G469-SS01-72	Cadmium
	ORGANICS (µg/kg)	INORGANICS (mg/kg)	0-0.17ft. BGS	2-4 ft BGS	
Benzo(g)anthracene 1230	Benzo(a)anthracene 610	Coomum 1.46	ORGANICS (µg/kg)	INORGANICS (ma/ka)	G4
Benzoldiowene	Benzo(a)pyrene 576J	·····	Benzo(a)anthracene 209J	Cadmium 2.36	
Benzo(b)fluoranthene 1340J	Cnysene 6//	G469-NS14	INORGANICS (mg/kg)	Calcium 27,600	
Benzo(k)fluoranthene 1150J	INORGANICS (mg/kg)	0-0.17ft. BGS	Copper 69.5	G469-SS01-Z3	(As exceed
INORGANICS (mg/kg)	Cadmium 1.97	ORGANICS (µg/kg)		ORGANICS (ug/kg)	Thallium
Cadmium 2.02		Benzo(a)anthracene 735J	G469-NS20	Benzo(a)pyrene 87.9J	G46
	G469-NS09	Chysene 952J	0-0.17ft. BGS	INORGANICS (mg/kg)	INOR
C460 NE07	0-0.17ft. BGS	INORGANICS (mg/kg)	ORGANICS (µg/kg)	Cadmium 1.22	Arsenie
0-0.17ft, BGS	ORGANICS (µg/kg)	Codmium 11.1	Benzo(a)anthracene 610J	G469-SS01-Z4	(As exceed
ORGANICS (ug/kg)	Benzo(a)anthracene 297J	Copper 43.3	Chysene 659J		Thallium
Benzo(a)anthracene 294J	Benzo(d)pyrene 30/J	1.600	INORGANICS (mg/kg)	Cadmium 1.77	
Benzo(a)pyrene 322J		Mercury 0.305J Selenium 2.59J	Çadmium 5.99	G469-SS01-Z5	G4
INORGANICS (mg/kg)	G469-NS10	Zinc	Chromium 33.0J	8-10 ft BGS	6
Cadmium 1.55			Iron 54,700	INORGANICS (mg/kg)	INOR
Selenium 2.24J	Benzo(g)pyrene 222J		Selenium 7.78J	C469_SS01_76	Codmium
	INORGANICS (mg/kg)	0-0 17# BCS	Zinc 206	10-12 ft BGS	C46
G469-NS04	Codmium 3,26	ORGANICS (mg/kg)		INORGANICS (mg/kg)	6
0-0.17ft. BGS	1260d	Benzo(a)pyrene 141J	G469-NS21	Codmium 2.07	INOR
ORGANICS (µg/kg)	Mercury 0.181J	INORGANICS (ma/ka)	0-0.17ft. BGS	G469-SS01-Z7	
Benzo(a)anthracene 243J	422	Codmium 1.41	ORGANICS (µg/kg)		CAL
Benzo(a)pyrene 270J			Benzo(a)anthracene 143J	Cadmium 203	10
INORGANICS (mg/kg)			Cadmium 3.50		INOR
Cadmium 2.85			Calcium 114,000		Cadmium
Zinc 241			28.6		
			Mercury 2.03J		
			Silver 4.42		

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Figure 4.4-1A YEAR 2000 ESI RESULTS NORTH HALF OF BUILDING 112 (AOI 469)

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G469-SS20-Z1		G469
0.17 - 2ft. BGS		12-
ORGANICS (ug/k	(p	INORC
Benzo(a)anthracene	424	
Benzo(g)pyrene	304J	Arsenic
Chrysene	572	(As exceede
Dibenz(a,h)anthracene	73.5J	
INORCANICS (mg/	ka)	CASS
INORGANICS (ITG/	KG)	6403
Codmium	7 30	<u></u>
Chromium	23.0	INORG
Copper	50.8	Arsenic
Mercury	0.107	(As avcede
G469-SS20-Z2		Copper
2-4 ft. BGS		Coppe.
INORGANICS (mg/	kg)	
Cadmium	1.87	
G469-SS20-Z3		
4–6 ft. BGS		C460
INORGANICS (mg/	kg)	6405
Cadmium	1.76	·····
		I INORG
		Benz(a)anth
G469-SS20-Z4		Benzo(a)nya
6-8ft. BGS		Chromene
OPCANICS (
	9/	UIDenz(a,h)a
Benzo(a)pyrene	74.6J	
INORGANICS (mg/	′kg)	
Cadmium	1.66	
C460 0000 7F		1
6409-5520-25		
O-IUTL BUS		
INODOANIOO ((1.0)	
INURGANICS (Mg/	NG)	
	1.22	
		NUIES:
		1. UNL
G469-SS20-Z6		(EXCEP
10-12ft. BGS		YEAR 2
		SCREEN
INORGANICS (mg/	/kg)	
Cadmium	1.15	2. ALL
		CRITER
		NOTED
CAE0 5501 74		1
G469-SS21-Z1		
G469-SS21-Z1 8-9ft. BGS		
G469-SS21-Z1 8-9ft. BGS INORGANICS (mg/	/kg)	
G469-SS21-Z1 8-9ft. BGS INORGANICS (mg/	/kg)	
G469-SS21-Z1 8-9ft. BGS INORGANICS (mg/ Arsenic	/kg) ₩93	
G469-SS21-Z1 8-9ft_BGS INORGANICS (mg/ Arsente (As exceeded RBC only Dolling	/kg) 4.93	
G469-SS21-Z1 8-9ft_BGS INORGANICS (mg/ Arsentc (As exceeded RBC only Thallium	/kg) 4.93 /) 0.813J	AOI
G469-SS21-Z1 8-9ft_BGS INORGANICS (mg/ Arsenic (As exceeded RBC only Thallium	/kg) 4.93) 0.813J	AOI
G469-SS21-Z1 8-9ft_BGS INORGANICS (mg/ Arsenic (As exceeded RBC only Thallium	/kg) 4.93) 0.813J	AOI AS
G469-SS21-Z1 8-9ft. BGS INORGANICS (mg/ Arsenic (As exceeded RBC only Thallium	/kg) 4.93 () 0.813J	AOI AS
G469-SS21-Z1 8-9ft. BGS INORGANICS (mg/ Arsenic (As exceeded RBC only Thallium	/kg) 4.93 () 0.813J	AOI A3 BGS
G469-SS21-Z1 8-9ft. BGS INORGANICS (mg/ Arsenic (As exceeded RBC only Thallium	/kg) 4.93 () 0.813J	AOI As BGS J
G469-SS21-Z1 8-9ft. BGS INORGANICS (mg/ Arsenic (As exceeded RBC only Thallium	/kg) #.93 0.813J	AQI AS BGS J
G469-SS21-Z1 8-9ft. BGS INORGANICS (mg/ Arsentc (As exceeded RBC only Thallium	/kg) 4.93 /) 0.813J	AOI As BGS J NYSDEC

G469-SS21-Z2 12-13ft. BGS INORGANICS (mg/kg) senic 6.91 is exceeded RBC only)
INORGANICS (mg/kg) Senic 6.91 as exceeded RBC only)
senic 6.91 is exceeded RBC only)
as exceeded RBC only)
G469-SS22-71
5-7ft. BGS
INORGANICS (mg/kg)
serie 5.77
opper 53.2

G469-SS22-Z2						
10-12ft. BGS						
INORGANICS (mg/kg)						
Benz(a)anthracene	587J					
Benzo(a)pyrene	477					
Chrysene	723					
Dibenz(a,h)anthracene	90.2J					

): LY ANALYTICAL DATA PT FOR PCB's) FROM THE 2000 ESI THAT EXCEEDED ENING CRITERIA ARE SHOWN.

DATA EXCEEDED NYSDEC RIA UNLESS OTHERWISE

	LEGEND
	EXCEEDS RISK BASED SCREENING CRITERIA
AQI	AREA OF INTEREST
As	Arsenic
BGS	BELOW GROUND SURFACE
J	ESTIMATED VALUE
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
RBC	RISKED BASED CONCENTRATION

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Figure 4.4-1B YEAR 2000 ESI RESULTS NORTH HALF OF BUILDING 112 (AOI 469)

4.5 OTH-305: Building 305- Paint Spray Booth

The objective of this effort was to establish whether hazardous substances were present in the floor drain pit inside the paint spray booth, and to determine the location of the floor drain discharge.

4.5.1 Site Background

Building 305 was originally a quartermaster motor pool garage before being converted to an automotive hobby shop (AFCEE 1998). The paint spray booth (OTH-305) is located inside Building 305 at the building's south end. The dates of operation and activities carried out at this site are unknown. At one time the location of a satellite waste accumulation point (STW 305) for paint thinners, the site is currently used to paint auto and truck parts.

4.5.2 Physical Characteristics of the Site

OTH-305 is located in the central industrial area of the base. The area around the building is generally flat, with less than 5 feet of topographic relief. It is grassed to the north, south, and west, and paved to the east. Building 305 is not located near any major surface water drainage features. Site runoff is channeled to the base stormwater drainage system, which drains into Three Mile Creek, which in turn drains to the New York State Barge Canal, approximately 1.5 miles south of the base.

The 13- by 22-foot paint spray booth is located inside Building 305 (the Auto Skills Center), at the building's south end. This enclosed unit (doors at one end and a filter wall at the other) is used for painting automobiles and small trucks. The filter wall consists of a forced air ventilation system with disposable filter elements.

The floor drain inside the paint spray booth consists of a concrete-lined sump (approximately 2 feet wide, 2.5 feet long, and 2 feet deep) with an overflow pipe that exits the sump to the northwest. This floor drain was covered by a steel grate, which was found to be sealed with plywood and tape during both the 1999 site inspection conducted by E & E and the Year 2000 ESI field program.

Most of Building 305 is being used to store lawn-mowing and snow-removal equipment. Five interconnected floor drains in this part of the building drain to the north before discharging to the sanitary sewer system (U.S. Army Air Corps 1942).

4.5.3 Description of Previous Studies

During a site inspection conducted in April 1994 by Tetra Tech, paint residue and overspray was observed on the floor and walls of the booth. Overall, however, the booth was in good condition. A satellite waste accumulation point (STW 305) was located inside the booth.

Parsons Engineering Science, Inc., and OHM Remediation Services Corp. performed a Closure of Hazardous Waste/Hazardous Materials Storage Areas Investigation at the former Griffiss Air Force Base in 1996. Building 305 was included in this investigation and underwent a closure action under RCRA. The investigation included preclosure sampling in July 1996, remediation in December 1996, and post-remediation sampling in December 1996.

The pre-closure sampling consisted of the collection of six wipe samples from within Building 305, one of which was collected from STW 305 within the paint spray booth (OTH-305). All six of the wipe samples were analyzed for metals and extractable organic halides, three of the six samples (collected from north of the paint spray booth) were also analyzed for PCBs, and one of the three was analyzed for pesticides. Lead was detected in two samples and aldrin was detected in one sample at concentrations above action levels in samples collected from north of the paint spray booth (OTH-305). None of the samples contained exceedances of the PCB action level, and the sample collected from STW 305 (inside the paint spray booth) contained no exceedances.

Due to the percentage of exceedances (one of one for aldrin, two of six for lead), Building 305 was recommended for remediation. Approximately 225 square feet of the area north of OTH-305, including a sand trap that discharges north into the storm drain, were remediated for lead and aldrin.

Three post-remediation wipe samples were collected and analyzed for lead and aldrin. Lead and aldrin were not detected at concentrations above action levels. Remediation goals were met, and the building was recommended for closure (AFCEE 1998).

E & E inspected the booth on May 26, 1999, and confirmed its condition. There was no waste or evidence of spills at the satellite waste accumulation point. However, a floor drain partly filled with water and containing sludge approximately one inch deep was observed at the eastern end of the booth. A drainpipe was observed exiting the floor

drain toward the northwest. The discharge point of the drainpipe could not be determined during the inspection.

4.5.4 Description of Year 2000 ESI Field Investigations

To determine the discharge point of the floor drain, a dye test was conducted. To establish whether hazardous substances were present in the floor drain pit, one water sample and one sludge sample were collected from the floor drain. The samples were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, and TAL metals.

The Year 2000 ESI sampling locations for OTH-305 are shown in Figure 4.5-1. A list of sample identifications and analyses is presented in Table 4.5-1.

4.5.5 Year 2000 ESI Results and Interpretation

Dye Test

A water-soluble non-toxic sodium fluorescein dye was mixed in the floor-drain pit, and potable water was then flushed through the drain until the dye was observed flowing through the storm sewer system. It was determined that the water was flowing south through the storm sewer system that parallels March Street, west of Building 305. Water in this storm sewer flows south for approximately 1,000 feet before being discharged into the headwaters of Three Mile Creek.

Sample Results

A list of samples collected and their respective analyses is presented in Table 4.5-1. All samples were subjected to a detailed screening, as described in Section 2. Table 4.5-2 summarizes the positive analytical results and applicable NYSDEC and USEPA RBC screening criteria for soils. Table 4.5-3 summarizes the positive analytical results and applicable NYSDEC, USEPA RBC, and federal MCL criteria for drinking water. A complete analytical data summary for each sample is presented in Appendix C, and QC evaluations are included in the QCSR for the Year 2000 ESI (E & E 2000). A summary of results is presented below.

Sludge

Organics. One sludge sample (OTH305-SD01) and a duplicate were collected at OTH-305 from the floor drain pit and analyzed for TCL VOCs and SVOCs, TCL pesticides/PCBs, and TAL metals (see Table 4.5-1). Positive results and screening are summarized in Table 4.5-2.

Two PCBs (Aroclor 1242 and Aroclor 1254) were detected in sludge samples OTH305-SD01 and SD01D. Concentrations of Aroclor 1242 ranged from 4.88 mg/kg to 8.48 mg/kg, and concentrations of Aroclor 1254 from 10.6 mg/kg to 18.9 mg/kg. OTH305-SD01 contained a total PCB concentration of 15.48 mg/kg and SD01D contained a total PCB concentration of 27.74 mg/kg. Detected concentrations of total PCBs and the individual congeners (Aroclor 1242 and Aroclor 1254) exceed NYSDEC screening criteria for total PCBs and USEPA RBCs for soils (See Table 4.5-2 and Figure 4.5-1).

Three VOCs were detected in the sludge sample, all at levels exceeding the NYSDEC screening criteria, but not exceeding the USEPA RBCs. VOCs detected in concentrations above NYSDEC screening criteria are ethylbenzene, m- and p-xylene, and total xylenes (see Table 4.5-2 and Figure 4.5-1). Concentrations of these three compounds ranged from 489 mg/kg to 1,610 mg/kg.

Twelve SVOCs were detected in the sludge samples, five at concentrations exceeding NYSDEC screening criteria but not exceeding USEPA RBCs. SVOCs detected at levels above NYSDEC screening criteria are bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, di-n-butyl phthalate, di-n-octyl phthalate, and naphthalene (see Table 4.5-2 and Figure 4.5-1).

Four pesticides were detected in the sludge samples, two at concentrations above screening criteria. Heptachlor epoxide was detected at 133 mg/kg, which exceeds the NYSDEC screening criteria but not the USEPA RBC. Concentrations of dieldrin ranged from 226 mg/kg to 501 mg/kg, which exceed NYSDEC screening criteria and the USEPA RBC, respectively (see Table 4.5-2 and Figure 4.5-1). The lab labeled the two lower values as "estimated."

Inorganics. Twenty-one metals were detected in the sludge samples (see Figure 4.5-1 and Table 4.5-2). Fourteen of these metals were detected at concentrations above

NYSDEC screening criteria. These included antimony, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, mercury, nickel, selenium, sodium, and zinc. Only concentrations of lead, detected at levels ranging from 3,080 mg/kg to 4,910 mg/kg, were found to exceed both NYSDEC screening criteria and USEPA RBC. Concentrations of the metals detected above NYSDEC screening criteria are antimony at 57.6 to 80.8 mg/kg, barium at 12,000 to 15,100 mg/kg, cadmium at 51.2 to 65.7 mg/kg, calcium at 28,900 mg/kg, chromium at 1,020 to 1,440 mg/kg, cobalt at 143 to 165 mg/kg, copper at 532 to 586 mg/kg, iron at 56,700 to 58,000 mg/kg, mercury at 1.43 to 1.52 mg/kg (labestimated values), nickel at 91.2 to 105 mg/kg, selenium at 6.86 to 7.89 mg/kg (labestimated values), sodium at 263 mg/kg, and zinc at 10,800 to 14,500 mg/kg (labestimated values).

Water

Organics. One grab water sample (OTH305-WG01) and a duplicate were collected from the floor drain pit and analyzed for TCL VOCs and SVOCs, TCL PCBs/pesticides, and TAL metals (see Table 4.5-1). Positive results and screening are summarized in Table 4.5-3 and in Figure 4.5-1.

One PCB (Aroclor 1254) was detected in the grab samples of water. Concentrations of Aroclor 1254 ranged from 3.07 to 3.44 μ g/L, which exceeds NYSDEC, federal MCL screening values for total PCBs, and the USEPA RBC for groundwater (see Table 4.5-3 and Figure 4.5-1).

Three VOCs were detected in the grab water samples. Two of these were detected at levels that exceeded the NYSDEC screening criteria, but not USEPA RBCs or federal MCLs. VOCs that were detected at concentrations above NYSDEC screening criteria are ethylbenzene, from 149 to 159 μ g/L; and m- and p-xylene, from 448 to 492 μ g/L (see Ta-ble 4.5-3 and Figure 4.5-1).

Four SVOCs were detected in the grab water samples, but only bis(2ethylhexyl)phthalate was detected at levels that exceed NYSDEC, USEPA RBC and federal MCL screening values (see Table 4.5-3 and Figure 4.5-1). Concentrations of bis(2ethylhexyl)phthalate ranged from 33.8 to 56.2 μ g/L.

No pesticides were detected in the grab water sample.

Inorganics. Seventeen metals were detected in the grab water sample (see Table 4.5-3 and Figure 4.5-1). Ten of these metals were detected at concentrations above NYSDEC screening criteria, federal MCLs, or USEPA RBCs. These were aluminum, antimony, barium, cadmium, chromium, iron, lead, manganese, sodium, and zinc. Antimony (at 828 to 1,420 μ g/L), barium (at 2,000 to 3,050 μ g/L), and chromium (at 123 to 220 μ g/L, lab-estimated values) were all detected at levels exceeding NYSDEC screening criteria, federal MCLs, and USEPA RBCs. Cadmium (at 5.14 to 9.38 μ g/L), lead (at 449 to 822 μ g/L, lab-estimated values), and iron (at 5,320 to 10,400 μ g/L, lab-estimated values) were detected at levels exceeding Criteria and federal MCLs, but not USEPA RBCs. Aluminum (at 828 to 1,420 μ g/L) and manganese (at 146 to 225 μ g/L) were detected at levels exceeding only federal MCLs. Sodium (at 48,200 to 48,700 μ g/L) and zinc (at 1,660 to 3,130 μ g/L, lab-estimated values) were detected at levels exceeding NYSDEC screening criteria and sected at levels exceeding NYSDEC screening (at 148,200 to 48,700 μ g/L) and zinc (at 1,660 to 3,130 μ g/L, lab-estimated values) were detected at levels exceeding only federal MCLs.

4.5.6 Conclusions and Recommendations

Results of the dye trace test indicated that the overflow pipe contained within the paint spray booth floor drain discharges westward into the storm sewer system that parallels March Street, west of Building 305. This 1,000-foot storm sewer discharges into the headwaters of Three Mile Creek, approximately 1,000 feet south of Building 305.

Levels of two PCBs, two pesticides, three VOCs, five SVOCs, and thirteen metals detected in samples collected from the Building 305 floor drain pit were found to exceed state or federal standards. However, the standing water and sludge is contained within the floor drain sump (beneath the level of the overflow pipe), appears stagnant and does not appear to be leaking into the ground beneath Building 305. The floor drain is currently restricted from use, there is no flow into the storm sewer and the water/sludge remaining in the floor drain pit is contained.

Based on these findings and on the planned commercial use of this site (USAF 1995), it is recommended that the water and sludge within the paint spray booth floor drain be removed, and the floor drain pit and associated piping be plugged with concrete.

TABLE 4.5-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR BUILDING 305 PAINT SPRAY BOOTH FORMER GRIFFISS AIR FORCE BASE

									ANALYSES
Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	rcL vocs Sw8260B rcL SvOC Sw8270C ral Metals Sw6010B/7470/71A % Solids ASTM_D2216 rcL Pesticides Sw8081A rcL PCB Sw8082
OTH-305	03/14/00	OTH305-WG01	ASC	Water Grah	0.00-0.00	V	т	NI1	
0111000	03/14/00	OTH305-WG01/D	<u></u>	Water Grab	0.00-0.00	<u> </u>			
	03/14/00	OTH305-WG01/S		Water Grab	0.00-0.00	T			
	03/14/00	OTH305-WG01/5		Sludge	0.00-0.00				
	03/14/00	OTH305-SD01	<u>ASC</u>	Sludge	0.00-0.17	<u> </u>	<u> </u>		<u> </u>
	03/14/00	01H305-SD01/D	ASC	Sludge	0.00-0.17	Y	T	FD1	<u> </u>
	03/14/00	OTH305-SD01/S	ASC	_Sludge	0.00-0.17	<u>Y</u>	<u> </u>	FR1	<u> </u>
	03/14/00	FIELDQC-TB305-WG1	ASC	DI water	0.00-0.00	Y	Т	TB1	X
	03/14/00	FIELDQC-TB305-WG2	ERDC	DI water	0.00-0.00	Y	Т	TB2	<u>X</u>

ASC = E & E's Analytical Services Center.

/D = Duplicate sample.

- Depth = Depth interval at which sample was collected.
 - DI = Deionized water.
- ERDC = U.S. Army Engineer Research and Development Center Quality Assurance Laboratory.
 - FD = Field duplicate.
 - FR = Field split/replicate.
 - N = Original.
- OTH = Other Miscellaneous Environmental Factor sites.
- PCB = Polychlorinated biphenyls.

- QC = Quality control sample.
- /S = Split sample.
- SD = Sediment sample.
- Stat = Status (T = Taken, S = Skipped).
- SVOCs = Semivolatile organic compounds.
 - TAL = Target Analyte List.
 - TB = Trip blank sample.
 - TCL = Target Compound List.
- VOCs = Volatile organic compounds.
 - WG = Water grab sample.
 - WP = Sample in work plan (Y = Yes, N = No).

Key:

AEVE 5000 EXDENDED SILE INAESLICETION' EORMEE CERTERS AIR FORCE BASE, ROME, NEW YORK OTH-305: BUILDING 305 PAINT SPRAY BOOTH, SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SLUDGE SAMPLES FROM DAMMARY OF POSITIVE HITS AND SCREENING FOR THE SLUDGE SAMPLES FROM

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			8 7/8 w	:stinU		VOLFLIVILFLIS	Toto TAL Metals - SW60101
0000019	00005			ikei e 40	2021	43300 N1	Pyrene
-	00005				ودع ۱	43300 N	Phenanthrene
4100000	13000				4650 J	18200 1	Naphthalene
8200000	00005				1 171	43300 N	Fluorene
8200000	00005			<u></u>	548 1	43300 N	Fluoranthene
4100000	00005				135001	64800 1	Di-n-octyl phthalate
200000000	0018				534001	f 000911	Di-n-butyl phthalate
000082	400		· · · · · · · · · · · · · · · · · · ·	······································	505 1	43300 M	Chrysene
10000000	00005			······································	85900 1	383000 1	Butyl benzyl phthalate
410000	0000\$				30300 1	1/3000 1	Bis(2-ethylhexyl)phthalate
4100000	30700			······································	ſ 09/1	43300 N	2-Methylnaphthalene
4100000	-				f 06/1	43300 N	2,4-Dimethylphenol
			8 %)	:stinU	*	00	Test : Semivolatiles · SV 827
069	50	[1331	N 9ES	Heptachlor epoxide
00091	075				r 951	D 892	gamma-Chlordane
12000000	006				224	544)	I neilusobn A
09E	44				1 IOS	5361	Dieldrin
			8y/8r	Units:			Test : Pesticides - SW 8081A
-	I				07L'LZ	084.21	Total PCBs
5.9	I				006.81	009.01	Aroclor 1254
5.9	I				078.8	088.4	Aroclor 1242
	L	I	ฮีสุ/ฮิน	n stinU	- I noney	*****	Test : PCBs - SVV 8082
EPA Region III RBCs - Industrial**	LVCW 4046 * NASDEC				L1:0 - 0 00/p1/E 0/1003-5061110	L1'0 - 0 00/#1/E 1005-50EHLLO	Sample ID: Sample Date: PARAMETER Depth ((1):

For more details on the screening criteria see Table 2-1.

Table 4.5-2SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SLUDGE SAMPLES FROM
OTH-305: BUILDING 305 PAINT SPRAY BOOTH,YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Sample II Sample Dat PARAMETER Depth (fi	OTH305-SD01 2: 3/14/00 3: 0 - 0.17	OTH305-SD01/D 3/14/00 0 - 0.17			NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Antimony	80.8	57.6			3.4	820
Barium	12000	15100	······································		 300	140000
Beryllium	0.331 J	0.268 J	······································		0.65	4100
Cadmium	65.7	51.2	· · · · · · · · · · · · · · · · · · ·		1.1	1000
Calcium	28900	23700			 23821	-
Chromium	1440	1020			22.6	6100
Cobalt	165	143			 30	120000
Copper	586	532	·		 43	82000
Iron	56700 .	58000	·······		 47350	610000
Lead	4910	3080			 200	400
Magnesium	4740	3620			7175	-
Manganese	436	370			2106	41000
Mercury	1.52 J	1.43 J			0.1	
Nickel	105	91.2			 46	41000
Potassium	776	612	· · · · · · · · · · · · · · · · · · ·		1993	-
Selenium	7.89 J	6.86 J			 2	10000
Silver	1.05 J	0.500 J			1.1	10000
Sodium	263	246 J			 259	-
Vanadium	7.59	7.47			 150	14000
Zinc	14500 J	10800 J			 120	610000
Test : Volatiles - SW 8260	3		Units: J	ig/kg	 1	· · ·
Ethylbenzene	489000	505000			5500	20000000
m,p-Xylene	1590000	1670000			 1200	410000000
Xylenes, Total	1610000	1690000			 1200	4100000000

For more details on the screening criteria see Table 2-1.

Table 4.5-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SLUDGE SAMPLES FROM OTH-305: BUILDING 305 PAINT SPRAY BOOTH, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:						
Qualifiers:						
	J	estimated				
	U	not detected				
	UJ	not detected; estimated detection limit reported				
Units:			Test and Sample Information:			
mg/kg = milligrams per kilogram			PCBs = polychlorinated biphenyls			
µg/kg = microgra	ams per kilogram		TAL = Target Analyte List			
			TRPH = total recoverable petroleum hydrcarbons			
			D = duplicate sample			
			NA = not analyzed			
			- = Standard or guidance value not available			
Screening:						
	Result above NYSDEC recommended soil cleanup objectives, Technical and Administrative Guidance Memorandum (TAGM) 4046, (NYSDEC 1994).					
	Result above industrial EPA Region III Risk-Based Concentration (RBC), for soil, (EPA 2000).					
*	The NYSDEC soil c	leanup level for PCBs applies to the sum of these	substances.			
**	The EPA OSWER (I for lead in soil in a re	Directive No. 9355.4-12, July 1994) health-based esidential area with children was used in lieu of a	screening value n RBC.			

Table 4.5-3 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE GRAB WATER SAMPLES FROM OTH-305: BUILDING 305 PAINT SPRAY BOOTH, YEAR 2000 EXPANDED SITE INVESTIGATION FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

	Sample ID:	OTH305-WG01	OTH305-WG01/D		NYSDEC		EPA
	Sample Date:	3/14/00	3/14/00		Class GA	Federal MCL **	Region III RBCs for
PARAMETER	Depth (ft):	0 - 0	0 - 0		Standard *	MCL **	Tap Water

Test : PCBs - SW 8082	: . 4 ₈₁ - 62 - 3		Units:	µg/L			· ·
Aroclor 1254	3.07	<u>3.44</u>			0.09	0.5	0.033
Test : Semivolatiles - SV	V 8270C		Units:	μg/I,			
Bis(2-ethylhexyl)phthalate	33.8	56.2			5	6	4.8
Butyl benzyl phthalate	181	134			50	-	7300
Di-n-butyl phthalate	31.3	45.8			50	3700	-
Di-n-octyl phthalate	10.2	17.3			50	730	-
Test : TAL Metais - SW	6010B/7471A/7470A		Units:	µg/L			
Aluminum	1420	828_	aaagenne allen allen allen soort of the soort of		-	50	37000
Antimony	17.01	9.62 J			3	6	15
Barium	3050	2000			1000	2000	2600
Cadmium	9.38 J	5.14 J			5	5	18
Calcium	44000	40600			-	-	-
Chromium	2201	123 J			50	100	110
Cobalt	19.8 J	15.2 J			-	-	2200
Copper	72.2	36.7			200	1300	1500
Iron	10400 J	<u>5320 J</u>			300	300	11000
Lead	822 J	<u>449 J</u>			25	15	-
Magnesium	3870	3390			35000	-	-
Manganese	225	146			300	50	730
Nickel	28.2	19.4 J			100	-	730
Potassium	29200	28900			-	-	-
Sodium	48700	48200			20000	-	-
Vanadium	1.03 J	20 U			-	-	260

For more details on the screening criteria see Table 2-2.

Source: Ecology and Environment, Inc., November 2000

Table 4.5-3 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE GRAB WATER SAMPLES FROM OTH-305: BUILDING 305 PAINT SPRAY BOOTH, YEAR 2000 EXPANDED SITE INVESTIGATION FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	OTH305-WG01 3/14/00 0 - 0	OTH305-WG01/D 3/14/00 0 - 0				NYSDEC Class GA Standard *	Federal MCL **	EPA Region III RBCs for Tap Water
Zinc		3130 J	1660 J				2000	5000	11000
Test : Volatile	s - SW 8260B			Units:	μg/L	••••••••••••••••••••••••••••••••••••••			
Acetone		10 U	4.36 J				50	-	610
Ethylbenzene		149	159		1		5	700	1300
m,p-Xylene		492	448				5	10000	12000

Table 4.5-3 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE GRAB WATER SAMPLES FROM **OTH-305: BUILDING 305 PAINT SPRAY BOOTH,** YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK



(NYSDEC 1998).



Result above EPA Region III Risk-Based Concentration (RBC) for tap water (EPA 2000).

Result above Federal Maximum Contaminant Level (MCL), Drinking Water Regulations and Health Advisories (EPA 2000).

- The NYSDEC standard for PCBs applies to the sum of these substances. *
- ** The MCL for PCBs applies to the sum of these substances. MCLs for aluminum, iron, manganese, and zinc are secondary MCLs based on aesthetics. In lieu of an MCL for copper and lead, action levels are used.



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	LEGEND
A	YEAR 2000 ESI GRAB WATER
s	SANITARY SEWER 1942
ş	SANITARY SEWER CURRENT
ST	STORMWATER SEWER 1942
ST	
ST	
0	SATELLITE WASTE ACCUMULATION POINT (STW)
┫	DIRECTION OF DRAIN FLOW
	EXCEEDS RISK BASED SCREENING CRITERIA
<u>3.07</u>	VALUE ALSO EXCEEDS FEDERAL MCL
AI	Aluminum
OTH	OTHER MISCELLANEOUS SITES
J	ESTIMATED VALUE
MCL	MAXIMUM CONTAMINANT LEVEL
Mn	Manganese
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NOTES: 1. ONLY INVESTIGA ARE SHOW	ANALYTICAL DATA FROM THE YEAR 2000 ESI TION THAT EXCEEDED SCREENING CRITERIA VN.
2. ALL DA OTHERWIS	ATA EXCEEDED NYSDEC CRITERIA UNLESS E NOTED.
	SCALE IN FEET
1	100 200 300

Figure 4.5-1 YEAR 2000 ESI RESULTS BUILDING 305 PAINT SPRAY BOOTH (OTH-305)

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4.6 OTH-5485-2: Trash Scatter/Dump

The primary objective of this work was to clean up refuse in this area. The secondary objective was to determine if refuse at this dump may result in any impacts to the environment.

4.6.1 Site Background

OTH-5485-2 is a trash scatter/dump located east of the Weapons Storage Area (WSA), northeast of the former Rome Air Development Center (RADC) Site Number 3 adjacent to the base's eastern boundary line (see Figure 4.6-1). Some of the scatter extended up to 10 feet past the base's property line, marked by a barbed-wire fence. Most of the debris located at the site included assorted cans and bottles, household trash items, oil containers, and 55-gallon drums (Tetra Tech 1994). Several items, however, including chemical bottles, an electrical test box, a power supply box, and broken pieces of a video monitor, indicate that this area may contain trash from the former use of the RADC site.

E & E inspected the site on May 27, 1999, and confirmed the presence of most of these items (e.g., electrical equipment, drums, appliances, food jars and cans, automobile parts, oils cans, clothing, etc.). The drums were without tops, were rusted inside and out, and showed no sign of residue.

4.6.2 Physical Characteristics of the Site

The site is in a newly wooded undeveloped area that had debris scattered over a 0.5-acre parcel prior to this investigation. Topography gently slopes to the northeast. Aerial photos dating back to 1943 show that the site was a farm field between 1943 and 1955, with mature trees along the current base property boundary. Between 1967 and 1982 the site was an open field, with a minor surface disturbance noted in the 1967 photo.

4.6.3 Description of Previous Studies

Other than E & E's site inspection in 1999, and the site visit by Tetra Tech in 1994, no other investigations have been performed.

4.6.4 Description of Year 2000 ESI Field Investigations

Since the site contained chemical bottles, oil containers, and corroded 55-gallon drums, an investigation, including soil sampling, debris removal, a geophysical survey, and temporary monitoring well was proposed. To determine whether buried materials were present, a geophysical survey was performed using an EM31 ground conductivity meter and magnetometer (see Section 3). The survey was performed following the removal of surficial debris.

Debris Removal

All surficial debris was removed from the debris area shown in Figure 4.6-1. The removal was initially performed by an E & E field crew using shovels and rakes. Since, however, the materials were embedded in 3 to 4 inches of forest litter (i.e., decaying leaves and branches), the remainder of the debris removal was accomplished using the front bucket of a backhoe. Approximately 3 inches of soil and all the debris were placed in two roll-off storage bins (30-cubic-yard capacity each) staged adjacent to the asphalt access road on the northeast side of the WSA. The removed debris included remains of the corroded drums, glass bottles, oil cans, pieces of metal, plastic sheeting, and other various household trash. On May 26, 2000, two samples were collected from the storage bins and tested for TCLP VOCs, SVOCs, herbicides, pesticides, and metals, and for the hazardous waste characteristics of ignitability, corrosivity, and reactivity (cyanide and sulfate). Results of TCLP analyses indicated that the materials were not hazardous. The debris in the roll-off bins were therefore removed in August 2000 and disposed of as non-hazardous waste.

Prior to debris removal, six near-surface soil samples were collected at the locations of potential contamination (i.e., adjacent to the corroded drums, chemical bottles, oil cans, etc.). Following near-surface soil sampling and debris removal, three temporary wells were drilled, installed and sampled. Two soil samples were collected from each well boring, one at 0 to 2 feet BGS, and one directly above the water table. One groundwater sample was collected from each well. All samples were analyzed for TCL VOCs and SVOCs, TCL pesticides/PCBs, and total TAL metals. Soil samples were also analyzed for percent solids. A filtered groundwater subsample from each groundwater sample was analyzed for dissolved TAL metals.

The year 2000 ESI sampling locations for OTH 5484-2 are provided on Figure 4.6-1, and sample results where the data exceeded screening criteria are shown on Figure 4.6-1A. A list of sample identifications and analyses performed is presented on Table 4.6-1.

4.6.5 Year 2000 ESI Results and Interpretation

All sample data were subjected to a detailed screening process, described in Section 2. Tables 4.6-2 and 4.6-3 summarize the positive analytical results and applicable NYSDEC and USEPA RBCs for soil and groundwater. A complete analytical data summary for each sample is presented in Appendix C, and QC evaluations are included in the QCSR for this site (E & E 2000). A summary of analytical results, geophysical survey, and visual observations is presented below.

Near-surface Soil

Organics. Six near-surface samples were collected and analyzed for TCL VOCs and SVOCs, and TCL pesticides/PCBs (see Table 4.6-2). Analytes detected at levels exceeding screening criteria values are identified in Table 4.6-2 and Figure 4.6-1A.

Low levels of two PCBs (Aroclor 1254 and Aroclor 1260) were detected in the near-surface soil samples NS01 through NS06. No PCBs were detected at concentrations exceeding NYSDEC screening criteria or USEPA RBCs.

Pesticides detected in the near-surface soil samples that exceeded NYSDEC screening criteria include 4,4'-DDT and dieldrin. Concentrations of 4,4'-DDT were detected above NYSDEC screening criteria in samples NS06 and NS06/D at 2,960 μ g/kg, and 2,400 μ g/kg, respectively. Dieldrin was found only in sample NS03, at a concentration of 54.7 μ g/kg (lab-estimated value). No pesticides were detected in concentrations exceeding the USEPA RBCs.

Thirteen of the sixteen SVOCs detected in the near-surface soil samples were PAHs and three were phthalates. Benzo(a)pyrene was the only SVOC found at levels exceeding NYSDEC screening criteria ($61.2 \mu g/kg$ in NS01 and $103 \mu g/kg$ in NS05, labestimated values). Concentrations of benzo(a)pyrene did not exceed the USEPA RBC. Elevated levels of PAHs are found throughout the base and are common in urban areas. Acetone, the only VOC detected, was not detected at concentrations above NYSDEC or USEPA RBCs. Since acetone is typically a laboratory artifact, the low levels detected are not of concern at this site.

Inorganics. Twenty-three TAL metals were detected in the near-surface soil samples (see Table 4.6-2). Ten were detected at concentrations that exceeded NYSDEC screening criteria: antimony, beryllium, cadmium, chromium, copper, iron, lead, mercury, selenium, and zinc. Two (arsenic and lead) exceeded USEPA RBCs, and one (lead) exceeded both. However, arsenic was not detected above the regional background concentration (16.0 mg/kg) for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984). Levels that exceeded criteria values are presented in Table 4.6-2 and Figure 4.6-1A. Most metals only slightly exceeded the criteria values, and in only one or two samples. Exceptions to this were cadmium in all six samples; copper in NS01 and NS03; and zinc in NS06 and NS06/D. Elevated levels of cadmium, copper, and zinc are thought to be from the breakdown of plated metal debris scattered about the site.

Subsurface soil

Organics. Six subsurface soil samples were collected and analyzed for TCL VOCs, SVOCs, and pesticides/PCBs (see Table 4.6-2). No organic compounds were detected at concentrations above NYSDEC screening criteria or USEPA RBCs.

Inorganics. Twenty-three metals were detected in subsurface soil samples (see Table 4.6-2). Seven were detected at concentrations that exceeded NYSDEC screening criteria: aluminum, beryllium, cadmium, chromium, copper, selenium, and thallium. However, arsenic was not detected above the regional background concentration (16.0 mg/kg) for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984). Concentrations of arsenic detected in shallow subsurface soil samples collected from borings SS01 and SS02 exceeded the USEPA RBC, but not the NYSDEC screening criteria.

As with the surface soils, most of the metals only slightly exceeded criteria in only one or two samples, except for cadmium in SS01-Z1, which exceeded criteria values by four times. Once again, the cadmium may be from the breakdown of plated metal debris.

Geophysical Survey

As previously mentioned, a geophysical survey was performed following removal of surficial debris. A description of the survey is provided in Section 3 of this report.

Except for interference in some areas by the barbed wire fences, no magnetic or electromagnetic anomalies were detected in the survey grid (see Figures 4.6-2, 4.6-3, and 4.6-4). No metallic materials, therefore, appear to be buried at this site.

Groundwater

Organics. One groundwater sample was collected from each of three temporary wells and analyzed for TCL VOCs, SVOCs, and pesticides/PCBs (see Table 4.6-3). No organic compounds were detected in any of the samples at levels above NYSDEC screening criteria or USEPA RBCs.

Inorganics. A groundwater sample was collected from each temporary well. A subsample was drawn from each for filtering and subsequent testing for dissolved inorganics. Twelve metals were detected in these groundwater samples (see Table 4.6-3). Metals detected at concentrations exceeding screening criteria values included aluminum at 122 μ g/L in SS01-GW to 241 μ g/L in SS02-GW; iron at 316 μ g/L in SS02-GW; selenium at 11.8 μ g/L in SS02-GW-F; and manganese at 78.4 μ g/L in SS02-GW to 244 μ g/L in SS01-GW and SS02-GW-F. Concentrations of iron exceeded NYSDEC screening criteria and the federal MCLs; selenium concentrations exceeded NYSDEC screening criteria.

Only two metals (iron and selenium) slightly exceeded the NYSDEC Class GA standards; none of the metals exceeded USEPA RBCs; three metals (aluminum, iron, and manganese) exceeded federal MCLs, and only one metal (iron) exceeded both NYSDEC standards and federal MCLs. Most of the exceedances occurred in the unfiltered ground-water. The exceptions were manganese, which exceeded federal MCLs in all filtered and

unfiltered samples, and selenium in SS02-GW-F, which exceeded only the NYSDEC Class GA groundwater standard. Selenium was detected at a concentration of 11.8 μ g/L in the filtered sample SS02-GW-F, although it was non-detect in the corresponding unfiltered sample (SS02-GW). Therefore, though selenium appears to be present, the concentration it was detected at is questionable. Most exceedances were slight, except aluminum in SS02-GW; manganese in SS01-GW (at almost five times the standard); and manganese in SS03-GW and SS03-GW-F (at three times the standard). Aluminum, iron, and manganese are common constituents of the soil and rock at this site, and therefore commonly detected in the groundwater at the former Griffiss AFB (Law 1996).

4.6.6 Conclusions and Recommendations

Near-surface soils at the site contained one PAH (benzo[a]pyrene), two pesticides (4,4-DDT and dieldrin), and 11 metals (antimony, arsenic, beryllium, cadmium, chromium, copper, iron, lead, mercury, selenium, and zinc) at levels exceeding screening criteria. Four metals (aluminum, iron, manganese, and selenium) were detected in groundwater at levels exceeding screening criteria. As previously stated, elevated levels of PAH are common throughout the base. Since pesticides were commonly used throughout the base, detected levels may be from usage rather than from disposal practices. Metals detected in soil may be from the breakdown of plated metal debris that was scattered throughout the site, or may in some cases be naturally occurring. Based on these factors, disposed materials do not appear to be a significant source of contamination. Most of the disposed materials represented domestic trash, with a small percentage potentially from the former RADC site. TCLP analysis of removed debris indicate that the trash was nonhazardous.

Since samples collected at potentially the most contaminated locations showed relatively low contamination, since the debris was surficial only (i.e., there is no evidence of buried waste), and since both topsoil and debris were found to be non-hazardous and were removed, NFS is recommended.

TABLE 4.6-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR TRASH SCATTER/DUMP (OTH-5485-2) FORMER GRIFFISS AIR FORCE BASE

ANALYSES

Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	TCL VOCS SW8260B	TCL SVOCs SW8270C	Total TAL Metals SW6010B/7470/71A	Dissolved TAL Metals SW6010B/7470/71A	TCL Pesticides SW8081A	NUL PUBS SW8002 % Solids ASTM_D2216
OTH-5485-2	03/14/00	OTH5485-2-NS01	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	X	Х	X	1.1	x >	(X
	03/14/00	OTH5485-2-NS01(extra volume)	ASC	Near-surface Soil (MS/MSD)	0.00-0.17	Y	Т	MS1	X	Χ	X	5	X >	(
	03/14/00	OTH5485-2-NS02	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	X	X	X		x >	<u>(x</u>
	03/14/00	OTH5485-2-NS03	ASC	Near-surface Soil	0.00-0.17	Y	т	N1	Х	Χ	X		X >	x
	03/14/00	OTH5485-2-NS04	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	X	X	X	1	x >	C X
	03/14/00	OTH5485-2-NS05	ASC	Near-surface Soil	0.00-0.17	Y	т	N1	X	X	X	- D	x >	(X)
	03/14/00	OTH5485-2-NS06	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	X	X	X		X)	(X)
	03/14/00	OTH5485-2-NS06/D	ASC	Near-surface Soil	0.00-0.17	Y	Т	FD1	X	X	X		X)	<u>(X</u>
	03/14/00	OTH5485-2-NS06/S	ERDC	Near-surface Soil	0.00-0.17	Y	Т	FR1	X	X	X		X >	<u>(X</u>
	04/03/00	OTH5485-2-SS01-Z1	ASC	Subsurface Soil	29.00-39.00	Y	Т	N1	X	X	X		X)	<u>(X</u>
	04/04/00	OTH5485-2-SS01-Z2	ASC	Subsurface Soil	28.00-30.00	Y	Т	N1	X	X	X		X >	< X
	04/06/00	OTH5485-2-SS02-Z1	ASC	Subsurface Soil	0.00-2.00	Y	т	N1	X	X	X		X)	< X
	04/06/00	OTH5485-2-SS02-Z2	ASC	Subsurface Soil	20.00-22.00	Y	т	N1	X	X	X		X)	< X
	04/07/00	OTH5485-2-SS03-Z1	ASC	Subsurface Soil	0.00-2.00	Y	т	N1	X	Χ	X		X >	(X)
	04/07/00	OTH5485-2-SS03-Z2	ASC	Subsurface Soil	18.50-20.20	Y	т	N1	X	X	X		x >	X
	05/04/00	OTH5485-2-SS01-GW	ASC	Groundwater	29.00-39.00	Y	Т	N1	X	Χ	X		X)	<u> </u>
	05/04/00	OTH5485-2-SS01-GW-F	ASC	Groundwater	29.00-39.00	Y	T.	N2				X		
	05/02/00	OTH5485-2-SS02-GW	ASC	Groundwater	20.60-30.60	Y	Т	N1	X	X	X		X)	<u> </u>
	05/02/00	OTH5485-2-SS02-GW-F	ASC	Groundwater	20.60-30.60	Y	T	N2	1. A A A			X		
	05/03/00	OTH5485-2-SS03-GW	ASC	Groundwater	18.00-28.00	Y	Т	N1	X	X	X		X)	(
	05/03/00	OTH5485-2-SS03-GW/D	ASC	Groundwater	18.00-28.00	Y	Т	FD1	X	X	X		X)	(
	05/03/00	OTH5485-2-SS03-GW/S	ERDC	Groundwater	18.00-28.00	Y	Т	FR1	X	X	X	Į.	X)	(
	05/03/00	OTH5485-2-SS03-GW (extra volume)	ASC	Groundwater (MS/MSD)	18.00-28.00	Υ	T	MS1	X	X	X	. li	X)	(
	05/03/00	OTH5485-2-SS03-GW-F	ASC	Groundwater	18.00-28.00	Y	Т	N1			aere e	X		

TABLE 4.6-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR TRASH SCATTER/DUMP (OTH-5485-2) FORMER GRIFFISS AIR FORCE BASE

Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	TCL VOCs SW8260B TCL SVOCs SW8260B Total TAL Metals SW6010B/7470/71A Dissolved TAL Metals SW6010B/7470 TCL Pesticides SW8081A TCL PCBs SW8082 % Solids ASTM_D2216
—	04/03/00	FIELDQC-DW01	ASC	Drilling Water	0.00-0.00	N	т	QC	<u> </u>
	05/03/00	FIELDQC-RB5485-GW1	ASC	Eqpt. Washwater	0.00-0.00	Y	Т	RB1	X X X _ X X
	04/03/00	FIELDQC-RB5485-SS1	ASC	Eqpt. Washwater	0.00-0.00	N	Т	RB1	XXXXXX
	04/03/00	FIELDQC-TB5485-GW1	ASC	DI water	0.00-0.00	Y	Т	TB1	X
	05/04/00	FIELDQC-TB5485-GW2	ASC	DI water	0.00-0.00	N	Т	TB1	X
	05/02/00	FIELDQC-TB5485-GW3	ASC	DI water	0.00-0.00	N	Т	TB1	X
	04/03/00	FIELDQC-TB5485-SS1	ASC	DI water	0.00-0.00	N	T	TB1	X

Key:

- ASC = E & E's Analytical Services Center.
- ERDC = U.S. Army Engineer Research and Development Center Quality Assurance Laboratory.
- Eqpt. = Equipment.
 - /D = Duplicate sample.
- Depth = Depth interval at which sample was collected.
 - DI = Deionized water.
 - FD = Field duplicate.
 - FR = Field split/replicate.
 - GW = Groundwater sample.
- MS/MSD = Matrix spike/matrix spike duplicate.
 - NS = Near-surface soil sample.
 - OTH = Other Miscellaneous Environmental Factor Sites.

PCB = Polychlorinated biphenyls.

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- QC = Quality control sample.
- RB = Rinsate blank sample.
- /S = Split sample.
- SS = Subsurface soil sample.
- SVOCs = Semivolatile organic compounds.
 - TAL = Target Analyte List.
 - TB = Trip blank sample.
 - TCL = Target Compound List.
- VOCs = Volatile organic compound.
- Stat = Status (T = Taken, S = Skipped).
- WP = Sample in work plan (Y = Yes, N = No).

Table 4.6-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM OTH-5485-2: TRASH SCATTER/DUMP, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

	Sample ID:	OTH5485-2-NS01	OT115485-2-NS02	OTH5485-2-NS03	OTH5485-2-NS04	OTH5485-2-NS05	NYSDEC	EPA Region III
	Sample Date:	3/14/00	3/14/00	3/14/00	3/14/00	3/14/00	TAGM 4046 *	RBCs - Industrial**
PARAMETE	ER Depth (ft):	0 - 0.17	0 - 0.17	0 - 0.17	0 - 0.17	0 - 0.17	1	maastra
Test : PO	CBs - SW 8082			Units:	mg/kg			
Aroclor 1254		0.0850	0.0257 U	0.280 U	0.0238 J	0.0298 U	1	2.9
Aroclor 1260		0.0963	0.126	0.596	0.0344	0.0298 U	1	2.9
Total PCBs	,	0.1813	0.126	0.596	0.0582 J	0.0298 U	1	-
Test : Po	esticides - SW 8081A	· · · · · · · · · · · · · · · · · · ·		Units:	µg/kg		· · · ·	
4,4'-DDD		2.62 J	19.7 J	18.8 J	3.23 U	2.98 U	2900	24000
4,4´-DDE		17.3	41.8	7.54 J	7.90	3.89	2100	17000
4,4'-DDT		27.2	115	122	8.75	6.47	2100	17000
Aldrin		1.33 U	12.8 U	28 U	1.61 U	1.49 U	41	340
alpha-BHC		1.33 U	12.8 U	28 U	2.91	1.49 U	110	910
Dieldrin		2.66 U	25.7 U	54.7 J	1.21 J	2.98 U	44	360
Endosulfan 1		3.07	25.7 U	56 U	3.23 U	2.98 U	900	12000000
Endrin ketone		1.48 J	25.7 U	56 U	3.23 U	0.738 J	~	610000
gamma-Chlordan	e	0.463 J	12.8 U	28 U	1.61 U	1.49 U	540	16000
Heptachlor		0.712 J	25.7 U	56 U	3.23 U	2.98 U	100	1300
Heptachlor epoxic	de	2.66 U	25.7 U	56 U	3.23 U	2.98 U	20	630
Methoxychlor	,	13.3 U	128 U	280 U	16.1 U	2.94 J	10000	1000000
Test : So	emivolatiles - SW 827	/0C	81.25	Units:	µg/kg		ul en en	Aureu , t 11
Benz(a)anthracen	e	443 UJ	422 U	115 J	61.4 J	77.3 J	224	7800
Benzo(a)pyrene		61.2 J	422 U	925 UJ	534 UJ	103 J	61	780
Benzo(b)fluorantl	hene	72.5 J	422 U	279 J	101 J	137 J	1100	7800
Benzo(g,h,i)peryl	ene	443 UJ	422 U	254 J	534 UJ	494 UJ	50000	-
Benzo(k)fluorantl	hene	443 UJ	422 U	202 J	93.6 J	158 J	1100	78000
Bis(2-ethylhexyl)	phthalate	1890 J	168 J	925 UJ	534 UJ	494 UJ	50000	410000
Butyl benzyl phth	nalate	122 J	422 U	407 J	534 UJ	494 UJ	50000	41000000

For more details on the screening criteria see Table 2-1.

Source: Ecology and Environment, Inc., November 2000

Table 4.6-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM OTH-5485-2: TRASH SCATTER/DUMP, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Sam Sampi PARAMETER Dep	pple ID: OTH54 e Date: 3/ pth (ft): 0 -	185-2-NS01 OTH5485- 14/00 3/14/ - 0.17 0 - 0.	2-NS02 OTH5485-2-NS0 00 3/14/00 17 0 - 0.17	3 OTII5485-2-NS04 3/14/00 0 - 0.17	OT115485-2-NS05 3/14/00 0 - 0.17	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Chrysene	67.9 J	51.7 J	257 J	101 J	152 J	400	780000
Di-n-butyl phthalate	186 J	205 J	286 J	458 J	128 J	8100	20000000
Fluoranthene	71.9 J	82.8 J	203 J	122 J	246 J	50000	82000000
Pentachlorophenol	255 J	1060 U	2330 U	1340 U	1240 U	1000	48000
Phenanthrene	61.4 J	50.8 J	283 J	127 J	224 J	50000	-
Pyrene	145 J	92.3 J	710 J	289 J	413 J	50000	61000000
Test : TAL Metals - S	W6010B/7471A/	7470A	Units:	mg/kg			
Aluminum	17800	15900	7330	12600	13400	18306	2000000
Antimony	1.36 U	0.871 UJ	4.28	0.798 UJ	0.997 U	3.4	820
Arsenic	1.36 U	5.32	1.17 U	4.94	6.64	7.5	3.8
Barium	90.4	173	123	66.4	63.5	300	140000
Beryllium	0.663 J	0.687	0.283 J	0.473 J	0.577	0.65	4100
Cadmium	16.8 J	5.37	14.0	3.94	3.65	1.1	1000
Calcium	1360	1660	3470	761	538	23821	-
Chromium	36.5 J	26.0	28.5	16.6	17.6	22.6	6100
Cobalt	16.7	14.7	8.54	8.26	9.94	30	120000
Copper	123 J	54.4	129	34.5	34.7	43	82000
Iron	101000	43300	94400	28100	31900	47350	610000
Lead	158	144	526	106	48.8	200	400
Magnesium	4760	4700	1760	2350	3010	7175	-
Manganese	1600	1530	1090	1220	1270	2106	41000
Mercury	0.330 J	0.118 J	0.286 J	0.291 J	0.194 J	0.1	-
Nickel	28.2	33.5	38.1	12.4	14.7	46	41000
Potassium	1260	1080	969	1090	1260	1993	-
Selenium	3.91 J	0.985 UJ	4.36 J	1.25 UJ	0.997 UJ	2	10000

For more details on the screening criteria see Table 2-1.

Source: Ecology and Environment, Inc., November 2000

Table 4.6-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM OTH-5485-2: TRASH SCATTER/DUMP, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	OTH5485-2-NS01 3/14/00 0 - 0.17	OTH5485-2-NS02 3/14/00 0 - 0.17	OTH5485-2-NS03 3/14/00 0 - 0.17	OT115485-2-NS04 3/14/00 0 - 0.17	OT115485-2-NS05 3/14/00 0 - 0.17	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Silver		0.389 J	0.985 UJ	0.643 J	1.25 UJ	0.552 J	1.1	10000
Sodium		47.0 J	35.2 J	36.4 J	125 U	99.7 U	259	-
Thallium		1.36 UJ	0.985 UJ	1.17 UJ	1.25 UJ	0.997 UJ	0.45	140
Vanadium		31.9	28.9	22.6	27.7	29.1	150	14000
Zinc		175 J	155 J	219 J	135 J	83.3 J	120	610000
Test : Volatile	s - SW 8260B			Units: J	ıg/kg			
Acetone	Nonconte la anna commune de mare y deb	13.6 U	12.4 U	13.6 U	15.4 U	14.5 U	200	20000000

For more details on the screening criteria see Table 2-1.

Table 4.6-2	
SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM	
OTH-5485-2: TRASH SCATTER/DUMP,	
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, N	NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	OTH5485-2-NS06 3/14/00 0 - 0.17	OTH5485-2-NS06/D 3/14/00 0 - 0.17	OTH5485-2-SS01-Z1 4/3/00 0 - 2	OTH5485-2-SS01-Z2 4/4/00 28 - 30	OTH5485-2-SS02-Z1 4/6/00 0 - 2	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Test : PCBs	- SW 8082			Units: 1	ng/kg	2.49 2.49		n an an Arabana an Arab
Aroclor 1254		0.126 U	0.0259 U	0.0253 U	0.0244 U	0.0245 U	1	2.9
Aroclor 1260		0.126 U	0.0259 U	0.0253 U	0.0244 U	0.0245 U	1	2.9
Total PCBs		0.126 U	0.0259 U	0.0253 U	0.0244 U	0.0245 U	1	-
Test : Pestic	ides - SW 8081A			Units: J	ug/kg			
4,4´-DDD		373	347	2.53 U	2.44 U	2.45 U	2900	24000
4,4´-DDE		403	306	2.53 U	2.44 U	1.57 J	2100	17000
4,4´-DDT		2960	2400	2.53 U	2.44 U	1.58 J	2100	17000
Aldrin		126 U	64.8 U	1.26 U	1.22 U	2.56	41	340
alpha-BHC		126 U	64.8 U	1.26 U	1.22 U	1.22 U	110	910
Dieldrin		252 U	130 U	2.53 U	2.44 U	2.45 U	44	360
Endosulfan I		252 U	130 U	2.53 U	2.44 U	2.45 U	900	12000000
Endrin ketone	14 - 19 - 19 - 19 - 19 - 19 - 19 - 19 -	252 U	130 U	2.53 U	2.44 U	2.45 U	-	610000
gamma-Chlordane		126 U	64.8 U	1.26 U	1.22 U	1.22 U	540	16000
Heptachlor		252 U	130 U	2.53 U	2.44 U	2.45 U	100	1300
Heptachlor epoxide		252 U	130 U	2.53 U	2.44 U	2.45 U	20	630
Methoxychlor		275 J	112 J	12.6 U	12.2 U	12.2 U	10000	1000000
Test : Semiv	olatiles - SW 827	OC		Units: 1	µg/kg	andar Mariana Marijana		
Benz(a)anthracene	<u> </u>	52.2 J	48.4 J	428 U	402 U	404 U	224	7800
Benzo(a)pyrene		53.7 J	426 UJ	428 UJ	402 U	404 U	61	780
Benzo(b)fluoranthene	;	78.9 J	71.8 J	428 UJ	402 U	404 U	1100	7800
Benzo(g,h,i)perylene		420 UJ	426 UJ	428 UJ	402 U	404 U	50000	-
Benzo(k)fluoranthene	;	75.5 J	426 UJ	428 UJ	402 U	404 U	1100	78000
Bis(2-ethylhexyl)phth	alate	99.5 J	426 U	146 J	402 U	404 U	50000	410000
Butyl benzyl phthalat	e	420 U	426 U	428 U	402 U	404 U	50000	41000000

For more details on the screening criteria see Table 2-1.

Source: Ecology and Environment, Inc., November 2000

L^aDIE 4.000 EXPANDED SITE INVESTICATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK OTH-5485-2: TRASH SCATTER/DUMP, OTH-

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-	£661	זו או	n †8†	81 939 JB	0111	LL6	muisseloq
41000	40	t [.] 91	89 [.] 5	1 .15	8'91	8.81	Nickel
-	1.0	0.0485	U £140.0	8190.0	0.252.J	f 8/1.0	Μειςμιγ
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000019	0SE74	009£7	0/99	40400	00/6†	41400	μοη
82000	57	2.12	8.25	43.5	1.02	9.85	Copper
000071	30	8.25	LE.2	6'EI	Þ.I [8.01	JedoD
0019	55.6	14.5	4.22	£'97	L'97	\$.02	Chromium
-	12852	0191	998	1550	0\$17	0525	muiəlsƏ
0001	I.I	08.2	170.0	¢'30	60.8	6.23	muimbsO
4100	\$9.0	0'306 1	0.132 J	L6L.0	655.0	185.0	Beryllium
140000	300	801	40 [.] 7	1`£9	20Z	130	muinea
8.£	\$"L	4.12 J	1.24	4.32	ſ <i>L</i> \$6 [.] 0	5.83	Arsenic
820	3.4	U 298.0	0.4L1	U 176.0	5.24	1.25 UJ	γιοπιλη
0000002	90681	15500	0897	00\$61	00111	00551	munimulA
	A	• • • • • • • • • • • • • • • • • • •	ฮิหุ/ฮิน	n :2JinU		VOLFL/VILFL/	Test : TAL Metals - SW60101
00000019	00005	10.64	1 Z07	458 N	f 0/1	ſ 8/1	Pyrene
-	0000\$	404 N	405 N	458 N	e4.0 J	l 2.26	Բիշոձուիւշոշ
78000	0001	1020 U	<u> </u>	<u>0 0801</u>	N 0201	<u>0 0901</u>	Pentachlorophenol
00000078	00005	1 2.84	405 N	¢58 N	1131	1 661	Fluoranthene
50000000	0018	404 N	405 N	458 N	450 N	508 J	Di-n-butyl phthalate
000082	400	404 N	405 N	458 N	۲ <i>۲</i> .28 ا	[† 8L	Chrysene
		7 - 0	06 - 87	7 - 0	/10-0	/1:0-0	FARAMETER Depth (ft):
- sour Industrial**	TAGM 4046 *	00/9/৳	00/t/t	00/2/7	00/11/5	00/#1/8	:916(I) Sample Date:
III noig9A AAI	ASDEC	12-2022-2-284511LO	7Z-1055-7-58#51110	1Z-1055-2-58#51110	(1/90SN-7-58#511LO	90SN-2-584511LO	:OI olquns2

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Table 4.6-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM OTH-5485-2: TRASH SCATTER/DUMP, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample 1D: Sample Date: Depth (ft):	OTH5485-2-NS06 3/14/00 0 - 0.17	OTH5485-2-NS06/D 3/14/00 0 - 0.17	OTH5485-2-SS01-Z1 4/3/00 0 - 2	OTH5485-2-SS01-72 4/4/00 28 - 30	OTH5485-2-SS02-Z1 4/6/00 0 - 2	NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Silver		0.531 J	0.367 J	0.971 U	1.14 U	0.331 U	1.1	10000
Sodium		31.7 J	46.6 J	97.1 U	114 U	86.2 U	259	-
Thallium		0.897 UJ	1.06 UJ	0.971 U	1.14 U	0.449 J	0.45	140
Vanadium		25.8	26.0	30.7	5.35	19.7	150	14000
Zinc		686 J	928 J	98.0	16.3	93.1	120	610000
Test : Volatiles	- SW 8260B			Units: p	ıg/kg		• • • • • • • • • • • • • • • • • • •	
Acetone		11.6 U	12.7 U	12.9 U	5.67 JB	11.4 U	200	20000000

XEVE 3000 EXEVIDED SILE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK OTH-5485-2: TRASH SCATTER/DUMP, SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM 2-**3.4** sldsT

	eldeT and citating				
Butyl benzyl phthalate	N 98E	45 <i>1</i> N	452 N	00005	41000000
Bis(2-ethylhexyl)phthalate	1 8 [.] 82	n 124	90'8 1	00005	410000
Benzo(k)fluoranthene	N 98E	45 <i>1</i> N	452 N	0011	00087
Benzo(g,h,i)perylene	U 985	457 U	U 224	00005	-
Benzo(b)fluoranthene	N 98E	45 <i>1</i> N	452 N	1100	0081
Benzo(a)pyrene	n 98E	45 <i>1</i> N	452 N	19	081
Benz(a)anthracene	U 985 U	n 724	452 N	554	0084
T28 WE - Solitalovians : 189T	0C		8xl/gu :stinU		
Methoxychlor	U 2.11	U 2.EI	וז־ד ח	00001	1000000
Heptachlor epoxide	U 8.2	l 70.S	5.64 U	50	0£9
Heptachlor	U £.2	7.65 U	5.64 U	001	1300
gamma-Chlordane	U 21.1	U 25.1	U 32.U	240	00091
Endrin ketone	U 8.2	U 265 U	5.64 U	-	000019
I neilusobnA	U 8.2	U 2.65 U	5 [.] 64 U	006	1 2000000
Dieldrin	U E.S	D 29.2	5.64 U	**	09£
aipha-BHC	ה גרו	U 25.1	ו יז ז ח	011	016
ninblA	U 21.1	U 28.1	1.32 U	41	340
4,4'-DDT	ሀ ይ.ኋ	2.47 J	5.64 U	5100	00071
\$'\$DDE	U E.S	۲.28 ک	5.64 U	5100	000/1
d(d-,‡'‡	U 8.2	U 20.2	5.64 U	5000	54000
Test : Pesticldes · S/V 8081A			galgu :slinU		
Total PCBs	U £20.0	0.0265 U	0.0264 U	I	-
Aroclor 1260	U 520.0	U 2020.0	0.0264 U	I	5'7
Aroclor 1254	U 520.0	U 2620.0	0.0264 U	I	6.2
Test : PCBs - SW 8082			gal\gm :esinU	1999) - Handrey Alexandron and a second s	· · · · · · · · · · · · · · · · · · ·
PARAMETER Sample ID: Sample Date: Depth (ft):	50 - 55 4/6/00 0LH2482-5-2205-25	0 - 2 4/7/00 0145485-2-2503-21	22-508-2-2893-22 4/7/00 18.5 - 20.2	LVCW 1019 *	EPA Region III RBCs - Industrial**

Source: Ecology and Environment, Inc., November 2000

Table 4.6-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM OTH-5485-2: TRASH SCATTER/DUMP, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	OT115485-2-SS02-Z2 4/6/00 20 - 22	OT115485-2-SS03-Z1 4/7/00 0 - 2	OTH5485-2-SS03-Z2 4/7/00 18.5 - 20.2			NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Chrysene		386 U	427 U	425 U			400	780000
Di-n-butyl phthalate		386 U	427 U	425 U			8100	20000000
Fluoranthene		386 U	427 U	425 U			50000	82000000
Pentachlorophenol		972 U	1070 U	1070 U			1000	48000
Phenanthrene		386 U	427 U	425 U			50000	-
Pyrene		386 U	427 U	425 U			50000	61000000
Test : TAL M	Test : TAL Metals - SW6010B/7471A/7470A		······································	Units: 1	mg/kg			
Aluminum		3090	13000	5280			18306	2000000
Antimony		1.17 U	1.04 U	1.25 U			3.4	820
Arsenic		1.94 U	3.00 U	2.95 U			7.5	3.8
Barium		8.44	54.6	18.9		•	300	140000
Beryllium		0.587 U	0.381 J	0.242 J			0.65	4100
Cadmium		1.03 J	3.05	1.57			1.1	1000
Calcium		899	125 U	1250			23821	-
Chromium		4.88	15.7	6.61	1		22.6	6100
Cobalt		3.32	9.38	4.51			30	120000
Copper		8.55 J	22.0	18.4	1		43	82000
Iron		7880	26700	12700			47350	610000
Lead		0.959	11.2	2.48			200	400
Magnesium	· · · ·	1440	2770	1940	1		7175	-
Manganese		282	1120	395			2106	41000
Mercury		0.0387 U	0.0413	0.0438 U			0.1	-
Nickel		6.69	13.6	10.3			46	41000
Potassium		542 U	631 U	701 JB			1993	-
Selenium	·······	1.17 UR	2.46	1.25 U	-		2	10000
			<u> </u>		the second se			

For more details on the screening criteria see Table 2-1.

Source: Ecology and Environment, Inc., November 2000

Table 4.6-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM OTH-5485-2: TRASH SCATTER/DUMP, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	OTH5485-2-SS02-Z2 4/6/00 20 - 22	OTH5485-2-SS03-Z1 4/7/00 0 - 2	OTH5485-2-SS03-Z2 4/7/00 18.5 - 20.2			NYSDEC TAGM 4046 *	EPA Region III RBCs - Industrial**
Silver		0.840 U	0.507 U	0.728 U		den en forste de la construction de	1.1	10000
Sodium		117 U	104 U	125 U			259	-
Thallium		1.17 U	0.806 J	1.25 U		·······	0.45	. 140
Vanadium		6.28	23.0	9.78			150	14000
Zinc		18.6	61.9	32.2			120	610000
Test : Volatiles - SW 8260B			· · ·	Units: 4	ig/kg			la Martina La Martina La Martina
Acetone		10.7 U	13 U	12.6 U			200	20000000
Table 4.6-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM OTH-5485-2: TRASH SCATTER/DUMP, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:

Qualifiers:

Units:

mg/kg = milligrams per kilogram µg/kg = micrograms per kilogram **Test and Sample Information:**

PCBs = polychlorinated biphenyls TAL = Target Analyte List TRPH = total recoverable petroleum hydrcarbons /D = duplicate sample NA = not analyzed - = Standard or guidance value not available

Screening:



Result above NYSDEC recommended soil cleanup objectives, Technical and Administrative Guidance Memorandum (TAGM) 4046, (NYSDEC 1994).



Result above industrial EPA Region III Risk-Based Concentration (RBC), for soil, (EPA 2000).

- The NYSDEC soil cleanup objective for PCBs applies to the sum of these substances.
- This criterion is 1 ppm for surface soils and 10 ppm for subsurface soils. Since there were no positive hits in the subsurface soil samples from OTH 5485-2 the tables present the screening value for surface soils (1ppm).
- ** The EPA OSWER (Directive No. 9355.4-12, July 1994) health-based screening value for lead in soil in a residential area with children was used in lieu of an RBC.

Table 4.6-3 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE GROUNDWATER SAMPLES FROM OTH-5485-2: TRASH SCATTER/DUMP, YEAR 2000 EXPANDED SITE INVESTIGATION FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

	Sample ID:	OTH5485-2-SS01-GW	OT115485-2-SS01-GW-F	OTH5485-2-SS02-GW	OTH5485-2-SS02-GW-F	OT115485-2-SS03-GW	NYSDEC		ЕРА
	Sample Date:	5/4/00	5/4/00	5/2/00	5/2/00	5/3/00	Class GA	Federal	Region III BBCs for
PARAMETER	Depth (ft):	29 - 39	29 - 39	20.6 - 30.6	20.6 - 30.6	18 - 28	Standard	MCL *	Tap Water

Test :	TAL Metals - SW6010	B/7471A/7470A		Unit	s: µg/L				
Aluminum	************************************	<u>122 J</u>	22.3 U	241_	56.9 U	50.1 U	-	50	37000
Barium		12.2 J	10.5 J	3.22 J	2.53 J	3.08 J	1000	2000	2600
Calcium		21400	22200	12500	14300	8600 J	-	-	-
Cobalt		20 U	20 U	20 U	0.611 J	20 U	-	-	2200
Iron		213 J	84.4	316	64.6 U	73.9 U	300	300	11000
Magnesium		6700 J	6970 J	3240	3520	2380 J	35000	-	-
Manganese		<u>244 J</u>	231	78.4	75.8	160	300	50	730
Potassium		858 J	763 J	923 J	919 J	854 J	-	<u>~</u>	-
Selenium		9.95 J	10 U	10 U	11.8	10 U	10	50	180
Sodium		5320	5620	2850	3250	2020	20000	-	-
Zinc		4.18 J	4.88 U	4.61 J	4.46 J	10 U	2000	5000	11000

RBCs for Tap Water	WCL *	Standard		 18 - 28	18 - 28	Depth (U):	PARAMETER
EPA III noig9A	Federal	Class GA NYSDEC		00/2/5 DTH5485-2-25803-CW/D	907575 A-W-D-E0222-25893HTC	:Of slgme2	

11000	0005	5000			U 01	4.33 J		Sinc
-	-	00002			0007	5110		muibo2
081	0\$	01			U 01	N 01	· · · · · · · · · · · · · · · · · · ·	muinələ2
-	-	-			1 EL8	0201		Potassium
0EL	05	300	PN		124	<u>1891</u>		əsənegneM
-	-	000SE			1 0862	5200 1		muisəngaM
11000	300	300			U E.I Z	U 8.22		Iron
0077	-	-			l est.0	1 75L 0		Cobalt
-	-	-			1 0058	0988		muiols)
0097	0002	1000			1.22.5	3.10 J		muinsB
000LE	05	-			U 7.85	∩ <i>L</i> .П		munimulA
				 lnU		V0/\$//V1/\$//8(TAL Menals - SW6010	: 189T

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Source: Ecology and Environment, Inc., November 2000

Table 4.6-3 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE GROUNDWATER SAMPLES FROM OTH-5485-2: TRASH SCATTER/DUMP, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:

Qualifiers:

J	estimated
U	not detected
UJ	not detected; estimated detection limit reported
UR	not detected; rejected sample

Units:

 $mg/L = milligrams per liter \mu g/L = micrograms per liter$

Test and Sample Information:

PCBs = polychlorinated biphenyls TAL = Target Analyte List TRPH = total recoverable petroleum hydrcarbons /D = duplicate sample NA = not analyzed - = Standard or guidance value not available

Screening:

Result above NYSDEC Ambient Water Quality Standards and Guidance Values for Class GA (groundwater) source of drinking water (NYSDEC 1998).



Result above EPA Region III Risk-Based Concentration (RBC) for tap water (EPA 2000).



Result above Federal Maximum Contaminant Level (MCL), Drinking Water Regulations and Health Advisories (EPA 2000).

* MCLs for aluminum, iron, manganese, and zinc are secondary MCLs based on aesthetics. In lieu of an MCL for copper and lead, action levels are used.



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TRASH SCATTER/DUMP (OTH-5485-2)







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OTH-5485-2 EM31 Ground Conductivity

Figure 4.6-4



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4.7 EOD Range 2 (Area 18) – Rocket Range

The objective of the investigation at this site was to determine the extent and nature of any residual contamination from the disposal and demolition of ordnance at this site.

4.7.1 Site Background

EOD Range 2, known in the early 1970s as the "rocket range," was the site of a small arms burn pit and an EOD demolition site. A horseshoe-shaped berm surrounded a demolition pit and the surrounding area contained small craters. Three additional berms were discovered that might have been used to contain case fragments from larger detonations (HFA 1998).

4.7.2 Physical Characteristics of the Site

EOD Range 2 covers approximately 6.25 acres roughly 2,000 feet north of the runway. The site slopes to the south, with approximately 10 feet in topographic relief across the site. The northern portion of the site is wooded, and the eastern portion is heavily overgrown with brush. A wetland area in the southern portion of the site extends to the waters of an unnamed creek. Runoff from the site is channeled to the unnamed creek and a tributary, which drain the site along its eastern and southern boundaries. The unnamed creek drains into Six Mile Creek, which ultimately drains to the New York Barge Canal, approximately 1.5 miles south of the base.

Based on field descriptions of soils encountered in 10 soil borings constructed during the Year 2000 ESI, the upper 4 feet of soil at EOD Range 2 consists of predominantly brown, sandy silt with some medium to coarse gravel and weathered shale fragments.

4.7.3 Description of Previous Studies

In 1998, EOD Range 2 was investigated by HFA under the Final Base Realignment and Closure (BRAC) Removal Action. During the period of May 18 through August 12, 1998, HFA performed Unexploded Ordnance (UXO) and ordnance-related scrap removal activities at various locations at the former Griffiss AFB, including the EOD Range 2 site. During these activities, the pit in the larger berm was excavated with a backhoe, sifted, and searched with magnetometers. No UXO was located in the large berm, except for small amounts of ordnance-related scrap. The soil from the smaller berms was also leveled and searched with a magnetometer. No ordnance was found in any of the small berms. A survey grid was then established over the entire site and searched with Schonstedt magnetometers. Twelve UXOs were discovered, including eight 20-mm projectiles, one pencil flare signal, one aircraft signal cartridge, and two MK18 smoke grenades. In addition to UXO, the following ammunition was found: seven rounds of .22-caliber Hornet, three rounds of .30-caliber carbine, two rounds of .357caliber ball, four rounds of 5.56-mm ball, and 11 rounds of 5.56-mm blank ammunition.

During a site visit in May 1999, E & E observed that all berms had been leveled during UXO removal activities.

4.7.4 Description of Year 2000 ESI Field Investigations

To determine whether any residual ordnance contamination is present at this site, 24 near-surface soil samples (0 to 2 inches BGS) were collected from within HFA's geophysical survey grid. The near-surface soil samples were collected from the former bermed areas and locations where UXO was found. At ten of these locations, a subsurface sample (2- to 4-foot depth interval) was also collected. The samples were analyzed for TCL SVOCs, TAL metals, explosives, and percent solids.

Two unnamed creeks enter the site from the east, merge within the site boundaries, and exit to the west. These creeks, which flow through the two southernmost rows of the HFA geophysical grid, are situated downgradient from the bermed areas. Four surface water/sediment samples were therefore collected (two upstream of the confluence of the two creeks, one at the confluence, and one downstream of it) and analyzed for the same parameters mentioned above, with the addition of hardness for surface waters only and total organic carbon (TOC) for sediments only.

Sampling locations for EOD Range 2 are provided in Figure 4.7-1, and sample results where concentrations exceeded screening criteria are shown in Figure 4.7-1A. A list of sample identifications and analyses performed is presented on Table 4.7-1.

4.7.5 Year 2000 ESI Results and Interpretation

All samples were subjected to a detailed screening, described in Section 2. Tables 4.7-2, 4.7-3, and 4.7-4 summarize the positive analytical results and applicable NYSDEC and USEPA criteria for soil, surface water, and sediment. A complete analytical data summary for each sample is presented in Appendix C, and QC evaluations are included in the QCSR for this Year 2000 ESI (E & E 2000). A summary of analytical results is presented below.

Soils

Twenty-four near-surface soil and ten subsurface soil samples were collected and analyzed for TCL SVOCs, TAL metals, explosives, and percent solids. The near-surface soil samples, collected from ground surface to 0.17 ft BGS, are designated with the suffix Z1. The subsurface soil samples were collected from 2 to 4 ft BGS and are designated with the suffix Z2.

Near-Surface Soil

Explosives. Twenty-four near-surface soil samples were collected (plus duplicates) and analyzed for explosives (see Table 4.7-2). Residual levels of eight chemicals associated with explosives were detected in eight instances, but none were found at concentrations that exceeded NYSDEC screening criteria or USEPA RBCs.

Organics. Twenty-four near-surface soil samples were collected (plus duplicates) and analyzed for SVOCs. Nine SVOCs were detected in the near-surface soil samples (see Table 4.7-2 and Figures 4.7-1 and 4.7-1A). Benzoic acid was the only SVOC encountered at concentrations exceeding NYSDEC criteria values. Benzoic acid was detected at concentrations exceeding criteria values at SS08-Z1 (4,070 μ g/kg), SS08-Z1/D (3,000 μ g/kg), and SS18-Z1 (6,050 μ g/kg). None of the detected concentrations for SVOCs exceeded USEPA RBC criteria values.

Inorganics. Twenty-four near-surface soil samples (plus duplicates) were collected and analyzed for TAL metals. Twenty-one metals were detected in the near-surface soil samples (see Table 4.7-2 and Figures 4.7-1 and 4.7-1A.).

Arsenic was detected in one sample at 6.41 mg/kg, which exceeds the USEPA RBC, but not the NYSDEC screening criteria. This concentration of arsenic is typical of those found on base and does not exceed the regional background of 16.0 mg/kg for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984). Arsenic is the only metal detected that exceeded the USEPA RBC (see Figure 4.7-1A).

Nine other metals were detected at concentrations exceeding NYSDEC screening criteria, but not the USEPA RBCs. These were aluminum, beryllium, cadmium, chromium, copper, iron, magnesium, manganese, and mercury.

Copper concentrations detected do not exceed the base background of 43.8 mg/kg or the regional background of 48.7 mg/kg for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984). Copper concentrations detected are not thought to be significant.

Aluminum, beryllium, chromium, iron, and magnesium were detected at concentrations that only marginally exceed the base background levels, and do not exceed the regional background for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984).

Manganese was detected in one sample at 3,930 mg/kg, which exceeds both the site background and the background for eastern soils in the United States (Shacklette and Boerngen 1984). However, manganese is a common metal in soils. Cadmium was detected in 23 samples, at concentrations ranging from 2.39 to 5.48 mg/kg. These levels exceeded the NYSDEC screening criteria but not the USEPA RBC. Mercury was detected in six samples, at concentrations ranging from 0.105 to 0.683 mg/kg. Four detections were very close to the NYSDEC screening criteria of 0.1 mg/kg. These low concentrations suggest that mercury is not a concern.

Subsurface soil

Explosives. Ten subsurface soil samples (plus duplicates) were collected and analyzed for chemical residues of explosives (see Table 4.7-2 and Figure 4.7-1A), and none were detected in any of the subsurface soil samples.

Organics. Ten subsurface soil samples were collected (plus duplicates) and analyzed for SVOCs. No SVOCs were detected at concentrations exceeding NYSDEC screening criteria or USEPA RBCs.

Inorganics. Ten subsurface soil samples were collected (plus duplicates) and analyzed for TAL metals. Twenty metals were detected (see Table 4.7-2).

Nine metals were detected at concentrations exceeding NYSDEC screening criteria, but not the USEPA RBCs. These were aluminum, beryllium, cadmium, chromium, copper, iron, magnesium, nickel, and zinc. None of the metals detected in subsurface soils were detected at concentrations above the USEPA RBCs.

Aluminum, beryllium, and iron were detected at concentrations that only marginally exceed base background levels, and do not exceed regional background for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984).

Chromium and magnesium were detected at concentrations that exceed the base background levels, but do not exceed regional background for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984).

Cadmium was detected in all ten subsurface soil samples, at concentrations ranging from 1.87 to 5.39 mg/kg. These concentrations exceed the NYSDEC screening criteria, but not the USEPA RBC. Nickel (at 55 and 66.4 mg/kg) and zinc (at 121 and 303 mg/kg) were each detected in only two samples at concentrations that exceed the base background and regional background of soils from the eastern United States. The limited extent of nickel and zinc detected on site suggests that these metals do not represent significant contamination. Copper was detected in eight samples at concentrations ranging from 48.8 to 63.9 mg/kg. These concentrations exceed both base background levels and background for eastern soils on the United States (Shacklette and Boerngen 1984), but do not exceed the USEPA RBC.

Sediment

Four sediment samples were collected (plus duplicates) and analyzed for TCL SVOCs, TAL metals, TOC, and chemical residues of explosives. Two of the samples (EOC2-SD03 and EOD2-SD04) were collected upstream of the EOD range, and two samples (EOD2-SD01 and EOD2-SD02) were collected on site (see Figure 4.7-1).

Explosives. None of the concentrations of chemical residues of explosives detected exceeded NYSDEC screening criteria or USEPA RBCs (see Table 4.7-3).

Organics. No SVOCs were detected at concentrations above NYSDEC screening criteria or USEPA RBCs (see Table 4.7-3).

Inorganics. Twenty TAL metals were detected in the sediment samples (see Table 4.7-3). Five of these metals (cadmium, copper, iron, lead, and manganese) were detected at concentrations above NYSDEC Lowest-Effect-Level screening values, and two metals (iron and manganese) exceeded Highest Effect Levels.

Cadmium exceeded the Lowest Effect Level in all four samples; copper exceeded it in EOD2-SD01/D, EOD2-SD02, and EOD2-SD03; iron exceeded it in all four samples, as well as exceeding the Highest Effect Level in EOD2-SD03; lead exceeded it in EOD2-SD02 and EOD2-SD03; and manganese exceeded it in all samples, as well as exceeding the Highest Effect Level in EOD2-SD01/0, EOD2-SD03, and EOD2-SD04. Based on this information, EOD2-SD02 and EOD2-SD03 contain the highest levels of metals.

When compared, however, to background sediment levels from RI samples (LAW 1996) from Six Mile Creek (i.e., off-site, upstream samples [SMCSD-01, -02, -03]), the levels of these metals are similar, except for iron in EOD2-SD03 and manganese in EOD2-SD01/D, -SD02, -SD03, and -SD04, all of which were detected at relatively high concentrations. Iron and manganese are common constituents of the natural soil and bedrock at the site. Although no analysis for cadmium in sediment was performed during the RI, it has been detected above criteria values in sediments from other areas of the base. It

does not, therefore, appear as though the elevated concentrations of metals are related to the EOD site.

Surface Water

Four surface water samples were collected (plus duplicates) and analyzed for TCL SVOCs, TAL metals, hardness, and explosives. Two of the samples (EOD2-SW03 and EOD2-SW04) were collected upstream of the EOD range, and two samples (EOD2-SW01 and EOD2-SW02) were collected on site (see Figure 4.7-1).

Four surface water samples were collected and analyzed for explosives, TCL SVOCs, TAL metals, and hardness (see Table 4.7-4).

Explosives. No explosives were detected at concentrations exceeding NYSDEC Class C water criteria values.

Organics. No organic compounds were detected at concentrations above NYSDEC standards or USEPA RBCs.

Inorganics. Twelve TAL metals were detected in surface water samples (see Table 4.7-4). Aluminum was the only metal detected at concentrations exceeding NYSDEC Class C water criteria. Aluminum concentrations ranged from 159 μ g/L in SW01 to 206 μ g/L in SW04. None of the aluminum concentrations exceeded the USEPA RBC screening criteria value. Similar levels of aluminum have been found in other surface waters throughout the base, and aluminum is therefore not considered to be related to the EOD site.

4.7.6 Conclusions and Recommendations

To determine the extent and nature of residual ordnance contamination at this site, 24 near-surface soil samples (0 to 2 inches BGS) and 10 subsurface samples (2 to 4 feet BGS) were collected from within HFA's geophysical survey grid (see Figure 4.7-1). The near-surface soil samples were collected from the former bermed areas and locations where UXO was found. The subsurface samples were collected from the former bermed areas only. All soil samples were analyzed for TCL SVOCs, TAL metals, explosives, and percent solids.

Two surface water/sediment samples were collected upstream of the confluence of two unnamed creeks, one at the confluence, and one approximately 200 feet downstream of it. All surface water/sediment samples were analyzed for the same parameters mentioned above, with the addition of hardness for surface waters and total organic carbon (TOC) for sediments.

Explosives

Explosives were detected at very low concentrations in the near-surface soil, sediment and water samples. None were detected at concentrations that exceeded the applicable screening values. No explosives were detected in the subsurface soil samples.

Semi-volatile Organic Compounds

TCL SVOCs were also detected in the near-surface soil, subsurface soil, sediment and surface water samples, although benzoic acid was the only SVOC detected at levels exceeding NYSDEC screening values. Concentrations of benzoic acid that exceeded NYSDEC screening values were detected in only two near-surface soil samples. These concentrations of benzoic acid ranged from 3,000 μ g/kg in SS08-Z1/D to 6,050 μ g/kg in SS18-Z1. None of the detected concentrations of SVOCs exceeded any other applicable screening values.

Metals

TAL metals were detected in the near-surface soil, subsurface soil, sediment, and surface water samples.

Near-surface soil. Arsenic was detected in one near-surface soil sample at a concentration of 6.41 mg/kg, which exceeds the USEPA RBC, but not the NYSDEC screening criteria. This concentration of arsenic is typical of those found on base and does not exceed the regional background of 16.0 mg/kg for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984). Arsenic is the only metal detected at levels exceeding the USEPA RBC, (see Figure 4.7-1A). Nine other metals were detected in the near-surface soil samples at concentrations exceeding NYSDEC screening criteria, but not USEPA RBCs. These were aluminum, beryllium, cadmium, chromium, copper, iron, magnesium, manganese, and mercury.

Copper concentrations detected do not exceed the base background of 43.8 mg/kg or the regional background of 48.7 mg/kg for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984). Copper concentrations detected are not thought to be significant.

Aluminum, beryllium, chromium, iron, and magnesium were detected at concentrations that only marginally exceed the base background levels, and do not exceed regional background for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984).

Manganese was detected in one sample at 3,930 mg/kg, which exceeds both the site background and the background for soils in the eastern United States (Shacklette and Boerngen 1984). Manganese, however, is a common metal in soils. Cadmium was detected in 23 samples with concentrations ranging from 2.39 to 5.48 mg/kg. This concentration exceeded the NYSDEC screening criteria but not the USEPA RBC. Mercury was detected in six samples, at concentrations ranging from 0.105 to 0.683 mg/kg. Four detections were very close to the NYSDEC screening criteria of 0.1 mg/kg. These relatively low concentrations suggest that mercury is not a significant concern in the near-surface soil.

Subsurface soil. Nine metals were detected in the subsurface soil samples at concentrations exceeding NYSDEC screening criteria, but not USEPA RBCs. These were aluminum, beryllium, cadmium, chromium, copper, iron, magnesium, nickel, and zinc. None of the concentrations of metals detected in subsurface soils were above USEPA RBCs.

Aluminum, beryllium, and iron were detected at concentrations that only marginally exceed base background levels, and do not exceed the regional background for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984).

Chromium and magnesium were detected at concentrations significantly exceeding base background levels, but not regional background for the 90th percentile of soils from the eastern United States (Shacklette and Boerngen 1984). Cadmium was detected in all ten subsurface soil samples, with concentrations ranging from 1.87 to 5.39 mg/kg. These concentrations exceeded the NYSDEC screening criteria, but not the USEPA RBC. Nickel (55 and 66.4 mg/kg) and zinc (121 and 303 mg/kg) were each detected in only two samples at concentrations exceeding base background and regional background values for soils from the eastern United States. The limited extent of nickel and zinc detected on site suggests that these metals do not represent significant contamination. Copper was detected in eight samples at concentrations ranging from 48.8 to 63.9 mg/kg. These concentrations exceed both base background levels and background for eastern soils on the United States (Shacklette and Boerngen 1984), but do not exceed the USEPA RBC.

Sediment. TAL metals were detected in the sediment samples. Five of these exceeded NYSDEC Lowest-Effect-Level screening values. These include cadmium, copper, iron, lead, and manganese. Iron and manganese also exceeded Highest Effect Levelscreening values. Based, however, on a comparison with other sediment data both on base and off, these metals do not appear to be attributable to EOD site activities.

Surface Water. TAL metals were detected in surface water samples. Aluminum was the only metal detected at concentrations exceeding NYSDEC Class C standards. Since similar levels of aluminum have been detected in other surface waters on base, the presence of aluminum does not appear to be site-related.

Based on the above findings and on the planned future use of this site for Vacant Land – Development Reserved, NFS is recommended.

TABLE 4.7-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR EOD RANGE 2 (AREA 18) - ROCKET RANGE FORMER GRIFFISS AIR FORCE BASE

ANALYSES

Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	CL SVOC SW8270C AL Metais SW6010B/7470A	COLLECT D. Norman Explosives SW8330 & Solids ASTM_D2216 Mardness 130.2
EOD RANGE 2	03/16/00	EOD2-SW01	ASC	Surface Water	0.00-0.00	Y	Ť	N1	XX	X X
	03/16/00	EOD2-SW01/D	ASC	Surface Water	0.00-0.00	Ý		FD1	<u>x x</u>	XX
	03/16/00	EOD2-SW01/S	ERDC	Surface Water	0.00-0.00	Y	T	FB1	XX	XX
	03/16/00	EOD2-SW02	ASC	Surface Water	0.00-0.00	Y	Ť	N1	XX	XX
	03/16/00	EOD2-SW03	ASC	Surface Water	0.00-0.00	Y	Ť	N1	XX	X X
	03/16/00	EOD2-SW04	ASC	Surface Water	0.00-0.00	Y	Т	N1	XX	X X
	03/16/00	EOD2-SW04 (extra volume)	ASC	Surface Water (MS/MSD)	0.00-0.00	Y	Т	MS1	XX	X X
	03/16/00	EOD2-SD01	ASC	Sediment	0.00-0.17	Y	Т	N1	XXX	XX
	03/16/00	EOD2-SD01/D	ASC	Sediment	0.00-0.17	Y	Т	FD1	XXX	XX
	03/16/00	EOD2-SD01/S	ERDC	Sediment	0.00-0.17	Y	Т	FR1	XXX	XX
	03/16/00	EOD2-SD02	ASC	Sediment	0.00-0.17	Y	Т	N1	XXX	XX
	03/16/00	EOD2-SD03	ASC	Sediment	0.00-0.17	Y	Т	N1	XXX	(_ X _ X
	03/16/00	EOD2-SD04	ASC	Sediment	0.00-0.17	Y	Т	N1	XXX	XX
	03/16/00	EOD2-SD04 (extra volume)	ASC	Sediment (MS/MSD)	0.00-0.17	Y	Т	MS1	XXX	XX
	03/15/00	EOD2-SS01-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N <u>1</u>	XX	ХХ
	03/15/00	EOD2-SS02-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	<u>N1</u>	XX	ХХ
	03/15/00	EOD2-SS03-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	XX
	03/15/00	EOD2-SS04-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	XX
	03/15/00	EOD2-SS05-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	XX
	03/15/00	EOD2-SS06-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	XX
	04/17/00	EOD2-SS06-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Т	N1	XX	XX
	03/15/00	EOD2-SS07-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	XX
	04/17/00	EOD2-SS07-Z2	ASC	Subsurface Soil	2.00-4.00	· Y	Т	N1	XX	XX

TABLE 4.7-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR EOD RANGE 2 (AREA 18) - ROCKET RANGE FORMER GRIFFISS AIR FORCE BASE

ANALYSES

Is ASTM_D2216

ves SW8330 OYD KAHN

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etals SW6010B/74

/OC SW8270C

Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	FCL SVOC SW8: FAL Metals SW6	FOC LLOYD KAt Explosives SW83 4. Solide ASTM	Auror Auror
	04/15/00	EOD2-SS08-Z1	ASC	Near-surface Soil	0.00-0.17	Y	т	N1	XX	XX	
-	03/15/00	EOD2-SS08-Z1/D	ASC	Near-surface Soil	0.00-0.17	Ý	Ť	FD1	XX		i i
	03/15/00	EOD2-SS08-Z1/S	ERDC	Near-surface Soil	0.00-0.17	<u> </u>	Ť	FB1	$\frac{x}{x}$	X X	
	04/17/00	EOD2-SS08-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Ť	N1	XX	X X	
	03/15/00	EOD2-SS09-Z1	ASC	Near-surface Soil	0.00-0.17	Y	T	N1	XX	XX	i i i i i i i i i i i i i i i i i i i
	04/17/00	EOD2-SS09-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Т	N1	XX	XX	<u> </u>
	03/15/00	EOD2-SS10-ZI	ASC	Near-surface Soil	0.00-0.17	Ŷ	T	N1	XX	ХХ	(
	03/15/00	EOD2-SS11-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	ХХ	(
	04/17/00	EOD2-SS11-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Т	N1	XX	XX	
	03/15/00	EOD2-SS12-Z1	ASC	Near-surface Soil	0.00-0.17	Υ	Т	N1	XX	XX	
·	03/15/00	EOD2-SS13-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	XX	[
	03/15/00	EOD2-SS13-Z1 (extra volume)	ASC	Near-surface Soil (MS/MSD)	0.00-0.17	Y	Т	MS1	XX	X X	
	04/17/00	EOD2-SS13-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Т	N1	XX	XX	
	04/17/00	EOD2-SS13-Z2/D	ASC	Subsurface Soil	2.00-4.00	Y	Т	FD1	XX	ХХ	(
	04/17/00	EOD2-SS13-Z2/S	ERDC	Subsurface Soil	2.00-4.00	Y	Т	FR1	ХХ	XX	
	03/15/00	EOD2-SS14-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	ХХ	<u> </u>
	04/17/00	EOD2-SS14-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Т	N1	XX	XX	
	03/15/00	EOD2-SS15-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	XX	
	04/17/00	EOD2-SS15-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Т	N1	XX	XX	(
	03/15/00	EOD2-SS16-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Ť	N1	XX	XX	(
	04/17/00	EOD2-SS16-Z2	ASC	Subsurface Soil	2.00-4.00	Y ·	Т	N1	XX	XX	
	03/15/00	EOD2-SS17-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	XX	[
	03/15/00	EOD2-SS18-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	XX	(

02:00100 3_0 T4.7-1.xls-T., 16/00 3_04_03_90-B0492

TABLE 4.7-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR EOD RANGE 2 (AREA 18) - ROCKET RANGE FORMER GRIFFISS AIR FORCE BASE

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Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	TCL SVOC SW8270C TAL Metals SW6010B/7470A	TOC LLOYD KAHN Explosives SW8330	% Solids ASTM_D2216 Hardness 130.2
	03/15/00	EOD2-SS19-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	X
	03/15/00	EOD2-SS19-Z1/D	ASC	Near-surface Soil	0.00-0.17	Y	Т	FD1	XX	X	X
	03/15/00	EOD2-SS19-Z1/S	ERDC	Near-surface Soil	0.00-0.17	Y	Ť	FR1	XX	X	X
	03/15/00	EOD2-SS20-Z1	ASC	Near-surface Soil	0.00-0.17	Y	T	N1	XX	X	X
	03/15/00	EOD2-SS21-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	X
	03/15/00	EOD2-SS22-Z1	ASC	Near-surface Soil	0.00-0.17	Ý	Ť	N1	XX	X	X
	04/17/00	EOD2-SS22-Z2	ASC	Subsurface Soil	2.00-4.00	Y	Т	N1	XX	X	X
	03/15/00	EOD2-SS23-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	X
	03/15/00	EOD2-SS24-Z1	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XX	X	X
	04/17/00	FIELDQC-RBEOD2-SS1	ASC	Eqpt. Washwater	0.00-0.00	Y	Ť	RB1	XX	X	X

Key:

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- ASC = E & E's Analytical Services Center.
- ERDC = U.S. Army Engineer Research and Development Center Quality Assurance Laboratory.
 - /D = Duplicate sample.
- Depth = Depth interval at which sample was collected.
- EOD = Explosive Ordnance Disposal.
- FD = Field duplicate.
- FR = Field split/ replicate.
- MS/MSD = Matrix spike/matrix spike duplicate.
 - N = Original.
 - RB = Rinsate blank sample.

/S = Split sample.
SD = Sediment sample.
SS = Soil sample.
SVOC = Semivolatile organic compounds.
SW = Surface water sample.
TAL = Target Analyte List.
TCL = Target Compound List.
TOC = Total organic carbon.
Stat = Status (T = Taken, S = Skipped).

ANALYSES

WP = Sample in work plan (Y = Yes, N = No).

XEVE 3000 EXEMDED SILE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK EOD BANGE 2 (AREA 18)-ROCKET RANGE, SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM 2-7.4 MdBT

or more details on the screening	criteria see Table	5-1'					
teryllium	L0L'0	0:156	1.28	6†8'0	0.682	\$9.0	0017
muins	6'97	0.14	8.08	S'.L†	45.7	300	0000#1
visenic	5.40	1 878.0	85.2	15.2	11.1	S'L	8.£
utimony .	U £.1	ט וג.ו	U 4.I	U 928.0	U 00,1	3 .4	820
munimul	00651	13000	00951	16200	12400	90£81	500000
Test : TAL Metals - SW6010	¥0L+L/¥1L+L/H		Units:	84/8ш			
yrene	U 25.0	485 N	U 282	360 U	0 80 7	00005	00000019
henanthrene	U 25.0	485 N	N 885	n 09e	1080 1	20000	-
animslynadqibosouiN-V	U 26.8	485 N	U 282	09E N	64'3 1	•	1200000
luoranthene	U 25.0	487 N	U 282 U	09E N	408 N	00005	8200000
i-n-butyl phthalate	U 25.0	485 N	U 282	09£	1580	8100	0000000Z
յրւ λշերե	U 25.0	485 N	U 282	09E N	408 N	400	00008L
sis(2-ethylhexyl)phthalate	0°32 N	485 N	U 282 U	U 09£	408 N	00005	410000
jenzyl alcohol	U 25.0	485 N	U 282 U	U 09£	1 80 1	-	00000019
bios acid	16.2	1420	U 0741	N 506	1030 N	00/2	820000000
728 WS + solitalovimos 🚦 tzoT	30		:sihU	8หุ/สิท			
SDX	U 02.0	U 02.0	U 02.0	U 02.0	U 02.0	-	25
XWI	U 02.0	U 02.0	U 02.0	U 02.0	U 02.0	-	100000
-Nitrotoluene	U 22.0	U 22.0	U 22.0	0.49	0.25 U	-	50000
-Nitrotoluene	U 22.0	0.25 U	U 22.0	0.23 J	U 22.0	-	50000
-Amino-4,6-dinitrotoluene	U 22.0	0.25 U	U 22.0	U 22.0	U 22.0	-	-
-Dinitrotoluene	U 22.0	0.22.0	U 22.0	0.10 J	U 22.0	-	5000
,4-Dinitrotoluene	U 22.0	0.25 U	U 22.0	52.0	U 22.0	-	4100
.4,6-Trinitrotoluene	U 22.0	0.25 U	U 22.0	U 22.0	0 SZ 0	-	061
Test : Explosives - SW8330			isilaU	8 3/8 u			
Sample ID: Sample Date: Sample Date: AARAMETER A Depth (ft):	0 - 0'12 3/12/00 EOD5-2801-21	0 - 0 1 J 3/1 2/00 EOD5-2805-21	0 - 011 3/12/00 EOD5-2803-21	L1:0 - 0 0/S1/E 12:9055-2Q0H	0 - 0 1 J 3/12/00 EOD5-2202-21	LVGW 4049 NASDEC	EPA Region III EPA Region III RBCs -Industrial*

Source: Ecology and Environment, Inc., September 2000

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Table 4.7-2
SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM
EOD RANGE 2 (AREA 18)-ROCKET RANGE,
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	EOD2-SS01-Z1 3/15/00 0 - 0.17	EOD2-SS02-Z1 3/15/00 0 - 0.17	EOD2-SS03-Z1 3/15/00 0 - 0.17	EOD2-SS04-Z1 3/15/00 0 - 0.17	EOD2-SS05-Z1 3/15/00 0 - 0.17	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Cadmium		3.00	3.34	3.41	3,46	3.20	1.1	1000
Calcium		246	724	889	161	287	23821	-
Chromium		18.3	16.6	17.6	20.0	18.8	22.6	6100
Cobalt		8.06	7.93	16.5	11.7	11.9	30	120000
Copper		27.9	24.0	36.6	22.7	26.5	43	82000
Iron		24200	30000	23900	31800	29300	47350	610000
Lead		33.7	26.1	35.7	11.0	19.3	200	400
Magnesium		2740	3160	2820	3360	3760	7175	-
Manganese		566	841	3930	922	919	2106	41000
Mercury		0.0853	0.0797	0.123	0.0682	0.0781	0.1	-
Nickel		12.7	13.8	14.7	13.7	20.6	46	41000
Potassium		918	1010	925	951	923	1993	-
Silver		1.3 UR	1.21 UR	0.970 J	0.856 UR	0.777 UR	1.1	10000
Sodium		130 U	121 U	140 U	31.0 J	27.8 J	259	-
Vanadium		30.8	28.5	28.3	29.2	27.3	150	14000
Zinc		69.1	65.2	66.6	65.3	75.0	120	610000

Table 4.7-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM EOD RANGE 2 (AREA 18)-ROCKET RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Sample ID: Sample Date: PARAMETER Depth (ft):	EOD2-SS06-Z1 3/15/00 0 - 0.17	EOD2-SS06-22 4/17/00 2 - 4	EOD2-SS07-Z1 3/15/00 0 - 0.17	EOD2-SS07-Z2 4/17/00 2 - 4	EOD2-SS08-Z1 3/15/00 0 - 0.17	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Test : Explosives - SW8330			Units:	mg/kg			
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	<u>-</u>	190
2,4-Dinitrotoluene	0.071 J	0.25 U	0.25 U	0.25 U	0.25 U	-	4100
2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U		2000
2-Amino-4,6-dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	-	-
2-Nitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	-	20000
4-Nitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	-	20000
НМХ	0.50 U	0.50 U	0.50 U	0.50 U	0.30 J	-	100000
RDX	0.50 U	0.50 U	0.50 U	0.50 U	0.27 J	~	52
Test : Semivolatiles - SW 827	70C		Units:	µg/kg			
Benzoic acid	2310	965 U	1420 U	949 U	4070	2700	820000000
Benzyl alcohol	554 U	384 U	564 U	377 U	323 J	-	61000000
Bis(2-ethylhexyl)phthalate	554 U	384 U	564 U	377 U	701 U	50000	410000
Chrysene	67.1 J	384 U	564 U	377 U	701 U	400	780000
Di-n-butyl phthalate	554 U	384 U	564 U	377 U	701 U	8100	20000000
Fluoranthene	117 J	384 U	564 U	377 U	701 U	50000	82000000
N-Nitrosodiphenylamine	554 U	384 U	564 U	377 U	701 U	-	1200000
Phenanthrene	78.3 J	384 U	564 U	377 U	701 U	50000	-
Pyrene	201 J	384 U	564 U	377 U	701 U	50000	6100000
Test : TAL Metals - SW6010	B/7471A/7470A		Units	mg/kg			
Aluminum	14400	9860	18900	19300	17500	18306	2000000
Antimony	1.41 U	0.656 U	1.09 U	0.909 U	1.47 U	3.4	820
Arsenic	3.55	1.53	2.97	0.909 U	1.41 J	7.5	3.8
Barium	58.8	25.9	39.7	42.0	62.1	300	140000
Beryllium	0.533 J	0.442	0.812	0.968	0.902	0.65	4100

For more details on the screening criteria see Table 2-1.

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Source: Ecology and Environment, Inc., September 2000 Page 1 of 2

 Table 4.7-2

 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM

 EOD RANGE 2 (AREA 18)-ROCKET RANGE,

 YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	EOD2-SS06-Z1 3/15/00 0 - 0.17	EOD2-SS96-Z2 4/17/00 2 - 4	EOD2-SS07-Z1 3/15/00 0 - 0.17	EOD2-SS07-Z2 4/17/00 2 - 4	EOD2-SS08-Z1 3/15/00 0 - 0.17	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Cadmium		2.90	1.87	3.81	3.88	5.48	1.1	1000
Calcium		442	99.8	354	1810	834	23821	
Chromium		17.5	14.0	21.8	30.0	23.5	22.6	6100
Cobalt		10.4	6.87	14.1	27.5	13.1	30	120000
Copper		24.0	21.3	40.4	60.1	40.6	43	82000
Iron		22300	21000	33200	42100	48000	47350	610000
Lead		45.7	7.32	17.2	25.6	27.5	200	400
Magnesium		2500	3350	4600	9420	4620	7175	-
Manganese		1320	233	827	1010	1890	2106	41000
Mercury		0,166	0.0401	0.0896	0.0634	0.105	0.1	
Nickel		10.9	14.9	20.7	55.0	19.3	46	41000
Potassium		817	494	1110	1560	1340	1993	-
Silver		0.481 J	0.656 U	0.544 J	0.307 J	1.47 UR	1.1	10000
Sodium		43.2 J	65.6 U	39.9 J	43.5 J	147 U	259	-
Vanadium		29.8	19.3	31.1	37.9	36.9	150	14000
Zinc		66.6	36.6	87.2	121	95.1	120	610000

Table 4.7-2

Ladie 4.7-2 YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK BOD RANGE 2 (AREA 18)-ROCKET RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YOR YOR YOR YOU WANTED FOR YO

or more details on the screening	criteria see Table 2	·1·					
Beryllium	0.712 J	968'0	\$99'0	944:0	1°03 1	\$9.0	4100
Barium	1.78	۲۱٬3	4 [.] I 4	94.6	L'S†	300	140000
Arsenic	86 [.] I	0.732 J	2.42	0.812 U	t 18.1	\$"L	8.6
ynomijnA	∩ <i>L</i> †′ I	U 688.0	∩ 86 <i>L</i> `0	U 218.0	3' 4 N	3 .4	850
munimulA	00051	008/1	00741	00 <i>L</i> 91	00\$81	90681	500000
Test : TAL Metals - SW60101	VOLPL/VTLPL/B		1 :slinU	8 %/ 8u			
pyrene	U 0941	n 12e	∩ 68£	364 N	U 0621	0000\$	00000019
ревлинсев	U 0941	n 1 <i>1</i> 5	U 68£	364 U	N 0671	0000\$	-
animslynandibozotiN-N	U 0941	n 1 <i>1</i> 5	N 68£	364 N	1 200 N		1 200000
Fluoranthene	∩ 09 ⊅ 1	n 1 <i>1</i> .5	N 68£	364 N	1 200 N	0000\$	8200000
Di-n-butyl phthalate	U 0941	n 1/e	U 68£	364 N	1 200 N	0018	50000000
Chrysene	U 0941	n 126	1 68E	364 N	1 067 I	400	00008L
Bis(2-ethylhexyl)phthalate	U 0941	n 1/e	U 68£	364 U	1 067 I	0000\$	410000
Benzyl alcohol	U 0941	n 1/e	N 68E	3 64 N	1 067 I	-	00000019
Benzoic acid	3000 1	034 N	n 6 <i>L</i> 6	014 N	3540 N	5100	820000000
728 WE - solliniovimoe : Jeo T) 0		t islinU	87/81	n - California de California d		
KDX	U 02.0	U 02.0	U 02.0	U 02.0	U 02.0	-	25
ХМН	l 72.0	U 02.0	U 02.0	U 02.0	U 02.0	-	000001
+-Nitrotoluene	U 22.0	U 22.0	U 22.0	0.25 U	0.25 U	-	50000
2-Nitrotoluene	U 22.0	U 22.0	0.25 U	0.25 U	0.25 U	. .	50000
2.Amino-4,6-dinitrotoluene	U 22.0	U 22.0	0.25 U	U 22.0	0.25 U	-	-
2,6-Dinitrotoluene	0.25 U	U 22.0	0.25 U	U 22.0	0.25 U	-	5000
2,4-Dinitrotoluene	U 22.0	U 22.0	U 22.0	U 22.0	0.25 U	-	4100
2,4,6-Trinitrotoluene	U 22.0	U 22.0	0.25 U	0.25 U	0.25 U	-	061
Test : Explosives - SW8330			ı izhnU	8 3/8u			
Sample ID: Sample Date: PARAMETER Depth (11):	0 - 0'1) 3/12/00 EOD5-2208-21/D	5 - 4 4/1//00 EOD5-2208-22	0 - 0'1' 3/12/00 EOD5-2200-21	5 - 4 4/11/00 EOD5-2200-23	0 - 0'1') 3/12/00 EOD5-2210-21	LVGW 4049 NASDEC	EPA Region III RBCs -Industrial*

Source: Ecology and Environment, Inc., September 2000

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Table 4.7-2
SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM
EOD RANGE 2 (AREA 18)-ROCKET RANGE,
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (ft):	EOD2-SS08-Z1/D 3/15/00 0 - 0.17	EOD2-SS08-Z2 4/17/00 2 - 4	EOD2-SS09-Z1 3/15/00 0 - 0.17	EOD2-SS09-7.2 4/17/00 2 - 4	EOD2-SS10-Z1 3/15/00 0 - 0.17	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Cadmium		3.59	3,29	3.69	3.06	2.80	1.1	1000
Calcium		970	891	202	683	328	23821	-
Chromium		18.3	28.9	17.1	25.2	16.8	22.6	6100
Cobalt		10.1	17.7	8.77	18.8	10.1	30	120000
Copper		32.1	59.2	42.8	48.8	27.1	43	82000
Iron		27900	37200	30900	35000	21500	47350	610000
Lead		30.0	22.0	52.1	23.8	24.0	200	400
Magnesium		3610	8320	2920	8290	2380	7175	-
Manganese		1080	1090	1030	936	664	2106	41000
Mercury		0.118	0.0447	0.240	0.0607	0.148 U	0.1	-
Nickel		17.4	36.0	13.0	36.0	13.4	46	41000
Potassium		1230	1290	767	1120	1260	1993	-
Silver		1.47 UR	0.889 U	0.322 J	0.236 J	3.4 UR	1.1	10000
Sodium		147 U	35.9 J	23.8 J	32.1 J	340 U	259	-
Vanadium		29.1	32.8	28.2	31.0	26.7	150	14000
Zinc		85.9	91.2	71.4	68.3	65.3	120	610000

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For more details on the screening criteria see Table 2-1.

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XEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM 2-7.4 sldsT

r more details on the screenin	criteria see Tabi	.1-2 6					
muillum	085.0	656.0	904:0	r 195 [.] 0	Þ\$8'0	\$9'0	4100
muin	1.85	1.64	L'9E	0.14	33.4	300	140000
sins:	98 [.] 2	O 228.0	51.5	. 17.9	N 9 <i>LL</i> 0	\$`L	8.6
Киошри	U 880.0	U 228.0	U 20.1	2.38	N 9 <i>LL</i> 0	4.E	820
munimu	13300	00681	12200	14500	20800	90681	5000000
Test : TAL Metals - SW60	¥01411¥1141/8		ı :stinU	8 _{3/} 8u			
anair	N 964	38 4 N	N 69E	N 785	N 1/2	00005	00000019
อกอาปาตรกอ	136 U	38 4 N	N 69E	N 785	n 1/2	00005	•
animstynadqibozottiN-	1 9EÞ	38¢ N	N 69E	U 785	U 175	-	1500000
anathene	1 9EÞ	38 4 N	N 69E	N 785	n 1 <i>1</i> 5	0000\$	8200000
-n-butyl phthalate	¢30 N	38 4 N	N 69E	∩ <i>L</i> 8€	N 1/E	0018	20000000
nysene	¢30 N	38¢ N	U 695	n <i>L</i> 8e	N 1/2	400	00008L
s(2-ethylhexyl)phthalate	439 N	101 1	0 69E	U 785	n 1 <i>L</i> £	00005	410000
lodoja iva	136 U	38 4 N	1921	n <i>1</i> 8£	n 1 <i>1</i> 5	-	00000019
bios acid	1100 N	N \$96	5100	∩ † ∠6	03¢ N	00/2	820000000
Test : Semivolatiles - SW 8	OC.		l :2JhU	8 _{3/81}			
XO	U 02.0	U 02.0	U 02.0	U 02.0	U 02.0	-	25
XW	U 02.0	U 02.0	U 02.0	U 02.0	U 02.0	-	000001
Nitrotoluene	U 22.0	U 22.0	U 22.0	U 22.0	U 22.0	_	00002
Nitrotoluene	0 SZ.0	0.25 U	U 22.0	U 22.0	0.25 U	•	50000
Amino-4,6-dinitrotoluene	0.25 U	U 22.0	0.22.0	U 22.0	0.25 U	-	-
o-Dinitrotoluene	0.25 U	0.25 U	U 22.0	U 22.0	0.22.0	-	5000
4-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.046 J	U 22.0	-	4100
ansutototinitT-0,4	0.25 U	U 22.0	U 22.0	0.22 U	0.25 U	-	061
Test : Explosives - SW833			ı :zilnU	8 _{3/} 8u			
Depth Depth (II	L1.0 - 0	5 - 4	L1'0 - 0	LI.0 - 0	5-4	0606 MOVI	
sample Dat	00/S1/E	00//1/7	00/S1/E	00/S1/E	00//1/1	LVEN WIT	RBCs -Industrial*
II slgme2	EOD2-SSI1-Z1	EOD2-SSII-Z2	EOD2-5125-21	EOD2-5513-21	EOD2-SSI3-Z2		EPA Region III

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1 able 4.7-2	
SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM	
EOD RANGE 2 (AREA 18)-ROCKET RANGE,	
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, 1	NEW YORK

Sa PARAMETER	Sample ID: Imple Date: Depth (ft):	EOD2-SS11-Z1 3/15/00 0 - 0.17	EOD2-SS11-Z2 4/17/00 2 - 4	EOD2-SS12-Z1 3/15/00 0 - 0.17	EOD2-SS13-Z1 3/15/00 0 - 0.17	EOD2-SS13-Z2 4/17/00 2 - 4	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Cadmium		3.45	5.39	4.21	0.641 U	3,44	1.1	1000
Calcium		888	2520	803	222	464	23821	-
Chromium		18.3	33.0	25.5	16.5	30.4	22.6	6100
Cobalt		8.19	15.9	12.9	8.56	16.1	30	120000
Copper		32.5	58.4	42.9	49.0	51.3	43	82000
Iron		30700	49500	40000	29600	41400	47350	610000
Lead		24.0	15.9	22.7	72.7	17.9	200	400
Magnesium		4570	10000	7340	4270	10100	7175	-
Manganese		513	1950	625	668	579	2106	41000
Mercury		0.0596	0.0519	0.0558	0.683	0.0632	0.1	-
Nickel		25.3	66.4	31.4	17.2	37.9	46	41000
Potassium		945	1250	1320	1240	1260	1993	-
Silver		0.986 UR	0.369 J	1.02 UR .	1.28 UR	0.776 U	1.1	10000
Sodium		98.6 U	47.0 J	33.0 J	128 U	35.7 J	259	-
Vanadium		24.1	38.5	27.8	30.5	36.2	150	14000
Zinc		72.8	303	107	76.7	74.8	120	610000

For more details on the screening criteria see Table 2-1.

Table 4.7-2

XEVE 3000 EXEMIDED SILE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK EOD KANGE 2 (AREA 18)-ROCKET RANGE, SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM 2-7.4 əldrT

or more details on the screening	criteria see Table :	2-1.					
3eryllium	1\$6.0	LLL'Q	166.0	665.0	E0'1	\$9.0	4100
muinst	S.2E	6 [.] 9L	38.2	7.25	5".LÞ	300	140000
Arsenic	1.25	2.82	U 807.0	. 62.1	U \$25.0	S.T	8.£
vnomyn z	U 41.1	U 61.1	U 807.0	U £97.0	0'224 N	\$'E	820
munimulA	50400	14500	00181	14000	00\$61	90681	2000000
10109W2 - 21a15M JAT 1 129T	V0L7L/V1L7L/8		:shinU	฿ฦ/฿щ			
yrene	343 N	N 66E	1 09E	U 625	∩ 9 † €	20000	00000019
իշրձուիչշոշ	343 N	1 66E	0 09E	U 925 U	34e U	00005	-
-Nitrosodiphenylarnine	343 N	N 66E	U 09E	N 65E	34e N	*	0000071
luoranthene	143 N	N 66E	U 09E	U 925	1 9¢E	00005	8200000
əsteriyi phthalate	3 4 3 N	U 995 U	U 09£	U 925	1 9⊅€	0018	00000007
ζµελεευς	343 N	1 66E	1 09E	U 625	34e N	400	000082
3is(2-ethylhexyl)phthalate	343 N	П 66£	09E N	U 925	349 N	00005	410000
senzyl alcohol	343 N	N 66E	N 09E	U 925	1 9¢E	-	00000019
senzoic acid	U 298	1 000 I	П 906	U 509	N 1/8	00/2	820000000
Test : Semivolatiles : 125T	0C		:sìtrU	8४/छत			
SDX	U 02.0	U 02.0	U 02.0	U 02.0	U 02.0	-	25
XMI	U 02.0	U 02.0	U 02.0	U 02.0	U 02.0	-	100000
-Nitrotohuene	0.25 U	U 22.0	U 22.0	U 22.0	0.25 U	•	0000Z
-Nitrotoluene	U.25.0	U 22.0	U 22.0	U 22.0	0.25 U	-	20000
Amino-4,6-dinitrotoluene	0.25 U	U 22.0	0.25 U	U 22.0	0.25 U	-	-
6-Dinitrotoluene	U 22.0	U 22.0	U 25.0	U 22.0	0.25 U	-	5000
4-Dinitrotoluene	U 22.0	£ 51.0	0.25 U	U 22.0	0.25 U	-	4100
snaulotottinitT-d,4,	U 22.0	U 22.0	0.25 U	U 22.0	U 22.0		061
Test 1 Explosives - SW8330			:alhU	8 4/au			
Sample ID: Sample Date: PARAMETER Depth (11):	5 - 4 4/1//00 EOD5-2213-23/D	0 - 0'12 3/12/00 EODS-2214-21	5 - 4 4/1//00 EOD5-2214-53	0 - 0'12 3/12/00 EOD5-2818-21	5 - 4 4/12/00 EOD5-2212-25	LAGM 4046 NYSDEC	EPA Region III RBCs -Industrial*

Source: Ecology and Environment, Inc., September 2000

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1 able 4.7-2	
SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM	
EOD RANGE 2 (AREA 18)-ROCKET RANGE,	
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW Y	YORK

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PARAMETER	Sample 1D: Sample Date: Depth (ft):	EOD2-SS13-Z2/D 4/17/00 2 - 4	EOD2-SS14-Z1 3/15/00 0 - 0.17	EOD2-SS14-Z2 4/17/00 2 - 4	EOD2-SS15-Z1 3/15/00 0 - 0.17	EOD2-SS15-Z2 4/17/00 2 - 4	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Cadmium		3.78	3.30	3.33	3.13	3.79	1.1	1000
Calcium		471	195	1070	139	909	23821	-
Chromium		30.2	17.1	26.9	15.2	29.2	22.6	6100
Cobalt		21.0	10.3	18.8	8.48	19.9	30	120000
Copper		57.7	27.9	55.6	22.7	63.9	43	82000
Iron		45000	28500	40000	27800	41200	47350	610000
Lead		32.9	30.7	20.5	14.3	17.2	200	400
Magnesium		10000	3080	8940	3400	9690	7175	-
Manganese		676	1420	793	541	1340	2106	41000
Mercury		0.0965	0.163	0.0389	0.0646	0.0487	0.1	-
Nickel		41.4	12.4	39.3	15.9	43.7	46	41000
Potassium		1510	956	1160	691	1160	1993	-
Silver	·	1.14 U	0.247 J	0.708 U	0.763 UR	0.554 U	1.1	10000
Sodium	·····	38.7 J	119 U	32.7 J	76.3 U	34.9 J	259	•
Vanadium		37.5	27.7	34.2	22.9	36.5	150	14000
Zinc		73.1	67.9	84.2	64.3	120	120	610000

For more details on the screening criteria see Table 2-1.

XEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YOR YOU EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YOR YOU SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM TABLE 4.7-2

or more details on the screening	criteria see Table 2	·1-3					
Beryllium	\$1°t	£88 .0	109.0	† 09'0	0.629	\$9.0	4100
muine8	1.99	0.14	34.8	8.02	5'67	300	140000
Arsenic	\$9°£	n <i>L</i> #6'0	6 7 .E	90 [.] E	2.28	\$'L	8.E
	U 245.0	U 742.0	U 207.0	U 2.1	∩ 9 <i>L</i> °0	3 .4	820
munimulA	00851	00607	00851	00851	00651	90681	5000000
Test : TAL Metals - SW6010	¥01\$1/¥\$1\$		ı :zılnU	8 %/8u			
yrene	ח <i>נג</i> נ	ח <i>ג</i> ระ	1 95E U	58.2 J	325 N	0000\$	00000019
ohenanthrene	n <i>LL</i> S	ח <i>ג</i> se	U 926 U	43e N	325 N	0000\$	-
-Nittosodiphenylamine	ח <i>נו</i> נ	n <i>L</i> se	1 9 2 8 U	450 N	1252 N	-	1200000
ananthene	n <i>LL</i> S	n <i>L</i> se	U 985	450 N	125 N	00005	8200000
i-n-butyl phthalate	n <i>LL</i> E	n <i>L</i> se	U 985	45e N	122 N	0018	20000000
Chrysene	n <i>LL</i> S	n <i>L</i> se	32e N	45e N	152 U	400	00008
3is(2-ethylhexyl)phthalate	ח <i>ננ</i> נ	n <i>L</i> se	326 U	43e N	U 222 U	00005	410000
jenzyl alcohol	n <i>LL</i> E	n <i>L</i> se	326 U	308 1	U 222 U	-	00000019
Benzoic acid	048 N	П <i>L</i> 68	N 968	6030 J	U 288	00/2	000000028
728 W2 - səlihrlovimə2 : 129T) (l :slnU	\$ % [#			
SDX	U 02.0	U 02.0	U 02.0	0.33 J	0.50 U	-	25
XMF	U 02.0	U 02.0	U 02.0	U 02.0	U 02.0	-	000001
-Nitrotoluene	U 22.0	0.25 U	U 22.0	0.30	U.25.0	-	0000Z
2-Nitrotoluene	U.25.0	0.25 U	U 22.0	0.25 U	U 22.0		20000
9.4-00 second	U 22.0	0.25 U	0.25 U	0.21 J	U.25.0	-	-
ensite of the second	U 22.0	0.25 U	U 22.0	0.25 U	U 22.0	-	5000
.4-Dinitrotoluene	U 22.0	0.25 U	U 22.0	٥.070 ا	0.25 U	_	4100
9,4,5-Trinitrotoluene	U \$2.0	0.25 U	U 22.0	0'10 1	U 22.0	-	061
Test : Explosives - SW8330			ı :stinU	ชิงุ/ฮิน			
Sample ID: Sample Date: PARAMETER Depth ((t):	0 - 0'1J 3/12/00 ROD5-2219	5 - 4 4/1//00 EOD5-2316-23	0 - 0'1J 3/12/00 EOD5-2811-21	0 - 0'12 3/12/00 EOD5-2218-21	0 - 0'1 3/12/00 вод5-2216-21	LVGW 4049 NASDEC	EPA Region III RBCs -Industrial*

Source: Ecology and Environment, Inc., September 2000

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SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM EOD RANGE 2 (AREA 18)-ROCKET RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

PARAMETER	Sample ID: Sample Date: Depth (It):	EOD2-SS16-771 3/15/00 0 - 0.17	EOD2-SS16-Z2 4/17/00 2 - 4	EOD2-SS17-Z1 3/15/00 0 - 0.17	EOD2-SS18-Z1 3/15/00 0 - 0.17	EOD2-5519-21 3/15/00 0 - 0.17	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Cadmium		4.03	3,29	3.28	3.35	3.40	1.1	1000
Calcium		264	853	135	501	175	23821	-
Chromium		18.1	29,5	18.1	17.6	20.3	22.6	6100
Cobalt		10.8	17.5	11.0	8.10	9.66	30	120000
Copper		24.4	50.4	30.3	31.9	35.3	43	82000
Iron		34400	40100	29500	29500	30800	47350	610000
Lead		17.4	14.0	13.6	26.1	19.3	200	400
Magnesium		3280	10600	3740	3150	5430	7175	-
Manganese		539	1130	459	469	409	2106	41000
Mercury		0.0734	0.0478	0.0551	0.0571	0.0508	0.1	•
Nickel		13.2	39.3	18.3	16.2	25.1	46	41000
Potassium		755	1340	781	921	967	1993	-
Silver		0.745 UR	0.256 J	0.795 UR	0.274 J	0.170 J	1.1	10000
Sodium		24.7 J	38.7 J	25.1 J	120 U	24.4 J	259	-
Vanadium		31.6	36.2	26.0	29.4	23.4	150	14000
Zinc	· · · · · · · · · · · · · · · · · · ·	66.8	77.3	77.4	83.7	76.5	120	610000

For more details on the screening criteria see Table 2-1.

XEVE 3000 EXEMDED SILE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK EOD BANGE 2 (AREA 18)-ROCKET RANGE, SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM 2-7.4 sldsT

nalapprop out as effortsh even ve	criteria see Table	S-1.					
ຣະນຸງແກ	0.444 J	0.633	9\$6'0	0.822	19/0	\$9.0	0017
muine	6'68	0.82	£'£9	4.12	2.02	300	140000
rsenic	82.1	L6'1	\$L'E	5.35	0.344 J	S.T	8.6
γιοιημ	U 21.1	U £28.0	U 826.0	U 118.0	U £79.0	3 .4	078
แบกเตมไ	00111	000/1	00/91	14100	00581	90681	0000002
Test : TAL Metals - SW6010	V0L7L/VTL7L/1		istinU	8 _{7/8} w			
yrene	IU 724	415 N	U 12.4	451 N	N 887	00005	00000019
henanthrene	n <i>L</i> \$ \$	415 N	4"21 N	n 124	n 88Þ	0000\$	-
-Nitrosodiphenylamine	n <i>L</i> \$†	415 N	U 12.4	477 U	n 887	-	1200000
luoranthene	∩ <i>L</i> S⋫	415 ()	U 12.4	457 U	n 88 †	00005	8200000
i-n-butyl phthalate	Ω / \$ 7	415 U	4'2I N	45 <i>1</i> N	N 88Þ	0018	00000002
μιλεευς	rn /\$*	t 15 N	0 15.4	177 U	∩ 88 ⊅	400	00008L
sisited and the second states are also as a second state and the second states are also as a second state at a	۲۵۱ LSt	415 N	U 12.4	n 727 U	∩ 88 †	00005	410000
enzyl alcohol	Ω <i>L</i> S‡	415 N	U 12.4	457 U	∩ 88⊅	*	00000019
enzoic acid	U 0211	1040 0	1 L'SI	U 0701	1530 N	00/2	000000028
Test : Semivolatiles - SW 827)0		isilnU	8 _{3/} 8n			
DX	U 02.0	U 02.0	U 02.0	U 02.0	U 02.0	•	25
XW	U 02.0	U 02.0	U 02.0	U 02.0	U 02.0	•	000001
-Nitrotoluene	U 22.0	U 22.0	U 22.0	0 SZ.0	0.22.0	-	20000
-Nitrotoluene	U 22.0	U 22.0	0.25 U	0 SZ.0	0 52 .0	-	50000
snsulototinib-0,4-onimA-	U 22.0	U 22.0	0.25 U	0.25 U	U 22.0	-	-
6-Dinitrotoluene	U 22.0	U 22.0	0.25 U	0.25 U	0.25 U	-	5000
	U 22.0	U 22.0	t 270.0	0.25 U	U 22.0	-	4100
4-Dinitrotoluene	0.0710	0.22.0	0.25 U	U 22.0	U 22.0	-	061
,4,6-Trinitrotoluene ,4-Dinitrotoluene	11 5 6 0		the second s				
Test : Explosives - SW8330 4,6-Trinitrotoluene	11 50 0		:shinU	ay/sm			
PARAMETER Depth ((1): 7est : Explosives - SW8330 ,4,6-Trinitrotoluene	0 - 0.17	۲۱.0 - 0	0 - 0.17	ш5\к5 0 - 0 1 1	5-4		
Sample Date: SARAMETER Depth ((t): 765t : Explosives - SW8330 4,6-Trinitrotoluene	۲۱٬۵۰۵ ۲۱٬۵۰۵ ۵۰/۶۱/۶	۲۱٬۵۰۵ ۵0/۶۱/۶	0 - 0.17	21'0 - 0 00/51/E	۲- ۲ ۲ - ۲	LVGW 4040	RBCs -Industrial

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SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM	
EOD RANGE 2 (AREA 18)-ROCKET RANGE,	
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME,	NEW YORK

00 11

4 7 0

Samp Sample PARAMETER Dept	te ID: EOD2-SS19-Z1/ Date: 3/15/00 h (ft): 0 - 0.17	D EOD2-SS20-Z1 3/15/00 0 - 0.17	EOD2-SS21-Z1 3/15/00 0 - 0.17	EOD2-SS22-Z1 3/15/00 0 - 0.17	EOD2-SS22-72 4/17/00 2 - 4	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Cadmium	2.39	3.13	3.80	3.03	3.26	1.1	1000
Calcium	732	161	420	201	197	23821	-
Chromium	13.2	16.6	18.4	16.1	21.1	22.6	6100
Cobalt	6.67	6.45	9.21	7.92	12.7	30	120000
Copper	24.3	21.5	28.0	18.7	41.0	43	82000
Iron	18700	29600	33300	26900	38500	47350	610000
Lead	22.4	14.8	21.8	16.3	17.4	200	400
Magnesium	2720	2100	3260	2410	4430	7175	-
Manganese	588	575	1520	1650	857	2106	41000
Mercury	0.0714	0.0873	0.0611	0.0677	0.0742	0.1	-
Nickel	15.3	10.0	13.6	10.1	20.4	46	41000
Potassium	993	638	959	767	585	1993	-
Silver	1.12 UR	0.823 UR	0.460 J	0.310 J	0.973 U	1.1	10000
Sodium	112 U	82.3 U	95.8 U	81.1 U	97.3 U	259	-
Vanadium	19.5	31.4	29.3	26.8	38.0	150	14000
Zinc	65.3	69.7	109	88.6	85.8	120	610000

Table 4.7-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM EOD RANGE 2 (AREA 18)-ROCKET RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Sample ID: Sample Date: PARAMETER Depth (ft):	EOD2-SS23-Z1 3/15/00 0 - 0.17	EOD2-SS24-Z1 3/15/00 0 - 0.17				NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Test : Explosives - SW8330			Units:	mg/kg			
2,4,6-Trinitrotoluene	0.25 U	0.25 U		1	**************************************	<u>.</u>	190
2,4-Dinitrotoluene	0.25 U	0.10 J			· · · · · · · · · · · · · · · · · · ·	-	4100
2,6-Dinitrotoluene	0.25 U	0.25 U				-	2000
2-Amino-4,6-dinitrotoluene	0.25 U	0.25 U				-	-
2-Nitrotoluene	0.25 U	0.25 U				-	20000
4-Nitrotoluene	0.25 U	0.10 J				-	20000
нмх	0.50 U	0.50 U				-	100000
RDX	0.50 U	0.50 U				-	52
Test : Semivolatiles - SW 827	0C		Units:	µg/kg			
Benzoic acid	1210 U	1280 J			In the second	2700	820000000
Benzyl alcohol	481 U	494 U					61000000
Bis(2-ethylhexyl)phthalate	481 U	494 UJ				50000	410000
Chrysene	481 U	494 UJ				400	780000
Di-n-butyl phthalate	481 U	494 U				8100	20000000
Fluoranthene	481 U	494 U				50000	82000000
N-Nitrosodiphenylamine	481 U	494 U				-	1200000
Phenanthrene	481 U	494 U				50000	-
Pyrene	481 U	58.3 J				50000	61000000
Test : TAL Metals - SW6010	B/7471A/7470A		Unitsr	mg/kg			
Aluminum	15200	14300			21 1990)	18306	2000000
Antimony	1.18 U	1.03 U				3.4	820
Arsenic	2.02	1.40	-			7.5	3.8
Barium	51.3	34.8				300	140000
Beryllium	0.518 J	0.391 J				0.65	4100

For more details on the screening criteria see Table 2-1.

Table 4.7-2SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROMEOD RANGE 2 (AREA 18)-ROCKET RANGE,YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Sample ID: Sample Date PARAMETER Depth (ft).	EOD2-SS23-Z1 3/15/00 0 - 0.17	EOD2-SS24-Z1 3/15/00 0 - 0.17	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Cadmium	2.82	2.57	1.1	1000
Calcium	938	421	23821	-
Chromium	16.9	15.8	22.6	6100
Cobalt	6.28	5.56	30	120000
Copper	24.4	20.6	43	82000
Iron	22600 [.]	22700	47350	610000
Lead	23.2	23.2	200	400
Magnesium	2690	2500	7175	-
Manganese	286	253	2106	41000
Mercury	0.0869	0.106	0.1	-
Nickel	11.4	11.2	46	41000
Potassium	802	628	1993	-
Silver	0.351 J	1.03 UR	1.1	10000
Sodium	118 U	103 U	259	-
Vanadium	30.1	25.9	150	14000
Zinc	72.9	67.8	120	610000

For more details on the screening criteria see Table 2-1.

Table 4.7-2 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM EOD RANGE 2 (AREA 18)-ROCKET RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:

Quaiifiers:

J	
U	
UJ	
UR	

estimated not detected

Units:

mg/kg = milligrams per kilogram µg/kg = micrograms per kilogram

Test and Sample Information:

PCBs = polychlorinated biphenyls TAL = Target Analyte List TRPH = total recoverable petroleum hydrcarbons /D = duplicate sample NA = not analyzed

Screening:



Result above NYSDEC recommended soil cleanup objectives, Technical and Administrative Guidance Memorandum (TAGM) 4046, (NYSDEC 1994).



Result above industrial EPA Region III Risk-Based Concentration (RBC), for soil, (EPA 2000).

not detected; estimated detection limit reported

not detected; rejected sample

* The EPA OSWER (Directive No. 9355.4-12, July 1994) health-based screening value for lead in soil in a residential area with children was used in lieu of an RBC.

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Table 4.7-3 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SEDIMENT SAMPLES FROM EOD RANGE 2 (AREA 18)-ROCKET RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

	Sample ID:	EOD2-SD01	EOD2-SD01/D	EOD2-SD02	EOD2-SD03	EOD2-SD04	NYSDEC	NYSDEC	NYSDEC
	Sample Date:	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	Lowest Effect	Severe Effect	Screening Level for
PARAMETER	Depth (ft):	0 - 0.17	0 - 0.17	0 - 0.17	0 - 0.17	0 - 0.17	Metals	Metals	Organics

Test : E	Explosives - SW8330	and and a second se	Units:	mg/kg		nin an		
2,4-Dinitrotoluer	ne 0.25 U	0.047 J	0.25 U	0.25 U	0.25 U	-	-	-
Test : T	TAL Metals - SW6010B/7471A/7470A	· · · · · · · · · · · · · · · · · · ·	Units: I	mg/kg	and an and a second			
Aluminum	12300	15800	12400	17300	16800	-	-	-
Arsenic	1.36 U	3.19 U	3.35	3.53	1.21 J	6	33	-
Barium	61.3	100	60.3	73.2	115	-	-	-
Beryllium	0.618 J	0.999 J	0.643 J	1.01	1.08	-	-	-
Cadmium	2.52	3.99	3.01	5.41	4.14	0.6	9	-
Calcium	1130	2130	678	1430	2150	-	-	-
Chromium	12.5	18.5	16.3	23.1	21.4	26	110	-
Cobalt	8.82	15.0	10.7	24.6	18.1	-	-	-
Copper	13.8	23.0	21.5	16.1	15.0	16	110	-
Iron	15200	29000	23900	46500	29400	20000	40000	-
Lead	19.4	28.5	34.1	43.5	37.3	31	110	-
Magnesium	1910	2920	1830	3150	2820	-	-	-
Manganese	430	1200	933	2880	2170	460	1100	-
Mercury	0.116	0.138	0.0846	0.0925	0.142	0.15	1.3	-
Nickel	10.5	15.9	8.74	13.5	15.7	16	50	-
Potassium	905	1730	1210	1220	1850	-	-	-
Silver	1.36 UJ	0.887 J	1.74 UJ	1.42 UJ	1.98 UJ	1	2.2	-
Sođium	62.9 J	121 J	61.5 J	70.6 J	98.5 J	-	-	-
Vanadium	22.2	29.1	33.7	44.1	33.7	-	-	-
Zinc	82.3	111	59.1	102	107	120	270	-

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For more details on the screening criteria see Table 2-3.

Table 4.7-3SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SEDIMENT SAMPLES FROMEOD RANGE 2 (AREA 18)-ROCKET RANGE,YEAR 2000 EXPANDED SITE INVESTIGATIONFORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

	Sample ID:	EOD2-SD01	EOD2-SD01/D	EOD2-SD02	EOD2-SD03	EOD2-SD04	NYSDEC	NYSDEC	NYSDEC
	Sample Date:	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	Lowest Effect	Severe Effect	Screening Level for
PARAMETER	Depth (ft):	0 - 0.17	0 - 0.17	0 - 0.17	0 - 0.17	0 - 0.17	Metals	Metals	Organics

Test : Total Organic Carbo	n - Lloyd Kahn	en en ser en	Units:	mg/kg		nana. Marina da angla Angla Angla angla da angla Angla		
Total Organic Carbon	60200	122000	29800	53000	50400	-	-	-

For more details on the screening criteria see Table 2-3.

Table 4.7-3SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SEDIMENT SAMPLES FROMEOD RANGE 2 (AREA 18)-ROCKET RANGEYEAR 2000 EXPANDED SITE INVESTIGATION,FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:				
Qualifiers:				
	J	estimated		
	U	not detected		
	UJ	not detected; estimated detection limit reported		
Units:		Test and Sample	e Information:	
mg/kg = milligram	ns per kilogram	PCB	s = polychlorinated biphenyls	
µg/kg = microgra	ms per kilogram	TAL	= Target Analyte List	
		TRPI	H = total recoverable petroleum hydrcarbons	
		/D =	duplicate sample	
		NA =	= not analyzed	

Screening:



Result above NYSDEC Technical Guidance for Screening Contaminated Sediments lowest effect level (NYSDEC 1999).



Result above NYSDEC Technical Guidance for Screening Contaminated Sediments severe cffect level (NYSDEC 1999).

Note: The lowest and severe effect levels are used to screen inorganic contaminants; total organic carbon derived screening levels are used to screen organic contaminants (NYSDEC Technical Guidance for Screening Contaminated Sediments 1999).

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Note: Although SVOC analysis by Method SW8270C was performed for the sediments samples, no SVOCs were detected.

Table 4.7-4 SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SURFACE WATER SAMPLE FROM EOD RANGE 2 (AREA 18)-ROCKET RANGE, YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Sample Sample Da PARAMETER Depth (ID: EOD2-SW01 Ite: 3/16/00 ft): -	EOD2-SW01/D 3/16/00 -	EOD2-SW02 3/16/00 -	EOD2-SW03 3/16/00 -	EOD2-SW04 3/16/00 -	NYSDEC Class C Water Standard
Test: Hardness - EPA 130.2		Units: mg/L				
Hardness (As CaCO3)	21.2	21.2	19.3	17.4	19.3	-
Test: Nitroaromatics & Nitramines - En	plosives 8330	Units: µg/L		880 - Contra Contra 1980 - Contra C		_
2,4-Dinitrotoluene	20 U	20 U	20 U	0.10 J	20 U	l-
RDX	0.85 J	1.5 J	0.72 J	0.23 J	1,4 J	-
Tetryl	20 U	20 U	20 U	0.092 J	20 U	*
Test: Metals - SW6010B/7471A		Units: µg/L				-
Aluminum	159	171	198	187	206 J	100
Barium	11.9 J	11.2 J	12.9 J	9,99 J	11.3 J	-
Calcium	5670	5130	4770	6050	5680 J	-
Chromium	1.28 J	10 U	10 U	10 U	10 U	20.8
Cobalt	20 U	0.674 J	20 U	20 U	20 U	5
Iron	107	108	152	113	198 J	300
Magnesium	1850	1710	1620	1920	1860 J	-
Manganese	47.3	44.6	123	5.15 J	44.4 J	-
Potassium	1470	1310	1260	1600	1420	-
Sodium	9560	8660	8000	10500	9590	-
Vanadium	20 U	20 U	20 U	20 U	1.03 J	14
Zinc	9.76 J	10.6		_		22.1
			16.9			20.4
				10.9		18.7
					12.6 J	20.4

Qualifiers:

Key:

J = Estimated.U = Not detected.

Units:

mg/L = Milligrams per liter. $\mu g/L =$ Micrograms per liter.

Test and Sample Information:

PCBs = Polychorinated biphenyls.

Screening:

Result above NYSDEC Ambient Water Quality Standards and Guidance Values for Class C (fresh water) (NYSDEC 1998).

The standard for zinc is calculated based on the water hardness; therefore zinc concentrations for each sample are compared to sample-specific standards.

Key: Although surface water samples were applied for SVOCs by method SW8270C, no SVOCs were detected.



6/14/2000 DDL plotted: BUFF

EOD RANGE 2 (AREA 18)

EOD2-SS01-Z1 0-0.17ft. BGS INORGANICS (mg/kg) Beryllium 3.007 Cadmium 3.007
E002-SS08-Z1 0-0.017ft. BCS ORGANICS (wg/kg) Benzoic Acid 4070 INORGANICS (mg/kg) Cadmium 5,49
EOD2-SS12-Z1 0-0.17ft. BGS INORGANICS (mg/kg) Beryllum Cadmium Chromium Chromium 4.21 Chromium 7.340
E0D2-SS16-Z1 00.017fL BGS INORGANICS (mg/kg) Beryllium 1.15 Codmium 4.03 E0D2-SS16-Z2 9-4 # ACS
E002-SS22-Z1 0-0.017ft_BGS INORGANICS (mg/kg) Berylitum Gadmium Cadmium 5002-SS22-Z2 2-4 # BCS
ECO2-SD01 INORGANICS (mg/kg) Codmium ECO2-SD01/D INORGANICS (mg/kg) Codmium

FIGURE 4.

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4.8 PCI Site 20

The objective of this investigation was to determine the nature and extent of any near-surface soil contamination present at the site due to its historic and potentially current use as a dump.

4.8.1 Site Background

Panamerican Consultants, Inc., (PCI) Site 20 is located on a wooded bank of the Mohawk River on the western edge of a present-day golf course. According to PCI's archival search, this site is not depicted on any historical map (PCI 1997).

PCI conducted Phase I and Phase II archaeological investigations of the site in 1994 and 1995, respectively. Excavations performed by PCI during the Phase I and Phase II archaeological investigations revealed no hazardous or potentially hazardous materials. Artifacts recovered during the Phase I archaeological investigation originated predominantly from the post-World War II era. Other materials encountered during the Phase I investigation may be from an industrial community, including canning factories, dating from the late nineteenth century to the 1940s. The PCI Phase II investigation consisted of shovel tests and collection of artifacts. The artifacts recovered during the Phase II investigation included glass, ceramic, metal, rubber, plastic, leather, bone, shell, and coal. In addition to the artifacts recovered, a mound of modern asphalt rubble was observed on site during the archaeological investigations. PCI Site 20 was not recommended for listing in the National Register of Historic Places (PCI 1997).

E & E inspected the site on May 27, 1999, and confirmed the presence of a small amount of surface debris and a mound of asphalt rubble. No evidence of a release to the environment was observed.

4.8.2 Physical Characteristics of the Site

PCI Site 20 is located on a wooded bank of the Mohawk River on the western edge of a present-day golf course. PCI identified the site as a historic and potentially current dump with no significant or intact historic deposits. The approximate dimensions of the site are 49 by 97 feet, with an approximate depth of 3 to 6 inches BGS. The site, however, may extend further to the east, beneath a mound of asphalt. Erosion, additional dumping, and possible earth-moving activities have disturbed the site.

4.8.3 Description of Previous Studies

PCI conducted Phase I and Phase II archaeological investigations of the site in 1994 and 1995, respectively. E & E inspected the site on May 27, 1999. No other investigations have been performed.

4.8.4 Description of Year 2000 ESI Field Investigation

The debris scattered across the site consist of household trash (broken glass, ceramic fragments, coal residue, food remnants, etc.) and a mound of asphalt. Due to the presence of surface debris and the mound of asphalt, biased sampling of soils was performed. The debris area and asphalt mound at PCI Site 20 are shown in Figure 4.8-1. Upon completion of near-surface soil sampling, the debris was removed and disposed of in a dumpster along with the debris removed from the OTH-5485-2 site. The contents of the dumpster were sampled for Toxicity Characteristic Leaching Procedure analysis, and were subsequently identified as non-hazardous.

Prior to debris removal, and based on the character of the debris observed, five locations were selected and sampled. Areas of visible debris accumulation were chosen for the near-surface soil sampling locations. All near-surface soil samples were analyzed for TCL VOCs and SVOCs, TCL pesticides/PCBs, TAL metals, and percent solids. A list of sample identifications and analyses performed is presented in Table 4.8-1.

To determine whether metallic objects were buried at the site, a geophysical survey was conducted following debris removal. The geophysical survey consisted of an electromagnetic survey, using an EM31 ground conductivity meter, and a total earth-field magnetic survey using an EG&G 856 portable proton precession magnetometer. The PCI 20 geophysical grid measured 90 by 90 feet with station and line spacing of 10 feet.

4.8.5 Year 2000 ESI Results and Interpretation

The geophysical survey indicated an absence of buried metallic materials and geophysical anomalies (see Figures 4.8-2, 4.8-3, 4.8-4). A sample listing, including analyses performed, is presented in Table 4.8-1. All samples were subjected to a detailed screening as described in Section 2. Table 4.8-2 summarizes positive analytical results and applicable NYSDEC criteria and USEPA RBCs for soil. A complete analytical data

summary for each sample is presented in Appendix C, and QC evaluations are included in the QCSR for the Year 2000 ESI (E & E 2000). A summary of analytical results is presented below.

Geophysical Survey

As previously mentioned, a geophysical survey was performed following the removal of surficial debris. A description of the survey is provided in Section 3 of this report.

Except for interference in some areas by the barbed wire fence, no significant magnetic or electromagnetic anomalies were detected in the survey grid (see Figures 4.8-2, 4.8-3, and 4.8-4). No metallic materials, therefore, appear to be buried at this site.

Near-surface Soil

Organics. Five near-surface soil samples were collected and analyzed (see Table 4.8-2). The only PCB congener detected was Aroclor 1260, which was detected in all soil samples at concentrations below its NYSDEC criterion and USEPA RBC. Nine pesticides were also detected in the near-surface soil samples at concentrations below NYSDEC criteria or USEPA RBCs.

Nineteen SVOCs were detected in the near-surface soil samples. These included 16 PAHs. No SVOCs were detected above USEPA RBCs. Four PAHs were detected at concentrations exceeding NYSDEC screening criteria. PAH levels detected in the near-surface soil samples at PCI 20 are consistent with those found throughout the base. Exceedances of NYSDEC screening criteria were observed for benzo(a)pyrene in all samples, with concentrations ranging from 161 μ g/kg in NS01 to 741 μ g/kg in NS03; benz(a)anthracene in samples NS03 and NS05 at concentrations of 742 μ g/kg and 507 μ g/kg, respectively; chrysene in samples NS03 and NS05 at concentrations of 812 μ g/kg and 580 μ g/kg, respectively; and dibenz(a,h)anthracene in sample NS03 at a concentration of 117 μ g/kg.

Inorganics. Twenty-two metals were detected in the near-surface soil samples (see Table 4.8-2). Several metals were detected at concentrations exceeding screening

levels. Lead concentrations were above NYSDEC screening criteria and USEPA Region III RBCs in two samples at concentrations of 1,840 and 2,220 mg/kg. Arsenic exceeded both standards in one sample with a concentration of 7.39 mg/kg. The level of arsenic is typical of other levels of arsenic seen elsewhere at Griffiss, and represents site back-ground. Thirteen metals were detected at concentrations exceeding NYSDEC screening criteria. Lead concentrations were above NYSDEC screening criteria in three samples; cadmium, mercury, and zinc concentrations exceeded NYSDEC screening criteria in all samples; nickel concentrations exceeded NYSDEC screening criteria in two samples; and barium and cobalt exceeded NYSDEC screening criteria in one sample.

Most metals were detected at concentrations only slightly above NYSDEC screening criteria, with the exception of antimony, cadmium, and lead in sample NS03, and antimony, cadmium, copper, lead, mercury, selenium, and zinc in sample NS04. Specifically, the NYSDEC screening criteria were exceeded by the following: antimony in three samples at concentrations ranging from 4.41 mg/kg in NS05 to 19.7 mg/kg in NS03; barium in sample NS04 at a concentration of 759 mg/kg; beryllium in two samples at concentrations of 0.682 mg/kg in NS01 to 0.705 mg/kg in NS05; cadmium in all samples at concentrations ranging from 4.04 mg/kg in NS05 to 16.3 mg/kg in NS04; chromium in four samples at concentrations ranging from 25.8 mg/kg in NS01 to 45.2 mg/kg in NS04; cobalt in NS03 at a concentration of 30.1 mg/kg; copper in four samples at concentrations ranging from 74.3 mg/kg in NS01 to 251 mg/kg in NS04; iron in four samples at concentrations ranging from 69,200 mg/kg in NS02 to 145,000 mg/kg in NS04; lead in three samples at concentrations ranging from 222 mg/kg in NS02 to 2,220 mg/kg in NS03; mercury in all samples at concentrations ranging from 0.147 mg/kg in NS05 to 3.83 mg/kg in NS04; nickel in two samples at concentrations ranging from 59.0 mg/kg in NS04 to 68.9 mg/kg in NS03; selenium in all samples at concentrations ranging 2.64 mg/kg in NS05 to 9.03 mg/kg in NS04; and zinc in all samples at concentrations ranging from 143 mg/kg in NS05 to 465 mg/kg in NS04. With the exception of the lead exceedance, these concentrations are all relatively low and do not pose a concern.

4.8.6 Conclusions and Recommendations

A geophysical survey performed at the site using an EM31 ground conductivity meter and magnetometer indicated an absence of buried metallic materials and geophysical anomalies.

On the basis of density of debris and potential for soil contamination, five locations were selected for near-surface soil sampling. The five near-surface soil samples, collected prior to debris removal, were analyzed for TCL VOCs and SVOCs, TCL pesticides/PCBs, TAL metals, and percent solids.

Four PAHs were detected at concentrations above NYSDEC screening criteria. These were benzo(a)anthracene, benzo(a)pyrene, chrysene, and dibenz(a,h)anthracene. No SVOCs were detected above USEPA RBCs. PAH levels encountered in the PCI 20 samples are typical of those found elsewhere on base and in urban areas.

Aroclor 1260 and nine pesticides were detected in the near-surface soil samples at concentrations below NYSDEC screening criteria and USEPA RBCs.

The arsenic concentration in one sample exceeded only USEPA RBCs, concentrations of 13 metals exceeded only NYSDEC criteria, and lead concentrations in two samples exceeded both. Most metals were detected at concentrations slightly above the screening levels, with the exception of antimony, cadmium, and lead in sample NS03 and antimony, cadmium, copper, lead, mercury, selenium, and zinc in sample NS04, which were significantly higher. The presence of these metals is probably due to the degradation of metal debris. The presence of lead is thought to be due to glass fragments found at these locations.

Since the samples were collected prior to debris removal at locations with the most debris accumulation, the isolated presence of metals is considered to be associated with the surface debris at the two sampling locations. The potential future utilization of this site is for public/recreational use. Based on the potential future utilization of this site and the elevated levels of lead detected in near-surface soil samples NS03 and NS04, further sampling is recommended. The collection of three additional near-surface soil samples from within the small area surrounding near-surface soil samples NS03 and NS04, and analysis of those samples for lead content would be sufficient to determine if the debris removal conducted has sufficiently addressed the elevated levels.

TABLE 4.8-1 YEAR 2000 EXPANDED SITE INVESTIGATION SAMPLE LISTING FOR PCI-20 FORMER GRIFFISS AIR FORCE BASE

Location	Date	Sample Number	Lab	Matrix	Depth	WP	Stat	Туре	TCL VOCs SW8260B TCL SVOCs SW8270C Total TAL Metals SW6010B/7470/71A TCL Pesticides SW8081A TCL PCBs SW8082 % Solids ASTM_D2216
PCI 20	03/14/00	PCI20-NS01	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	<u> </u>
	03/14/00	PCI20-NS02	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	X X X X X X
	03/14/00	PCI20-NS03	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	X X X X X X
	03/14/00	PCI20-NS04	ASC	Near-surface Soil	0.00-0.17	Y	т	N1	X X X X X X
	03/14/00	PCI20-NS05	ASC	Near-surface Soil	0.00-0.17	Y	Т	N1	XXXXXXX
	03/15/00	PCI20-NS05 (extra volume)	ASC	Near-surface Soil (MS/MSD)	0.00-0.17	Y	Т	MS1	X X X X X X

Key:

- ASC = E & E's Analytical Services Center.
- ERDC = U.S. Army Engineer Research and Development Center Quality Assurance Laboratory.
- Eqpt. = Equipment.
 - /D = Duplicate.
- Depth = Depth interval at which sample was collected.
 - FD = Field duplicate.
 - FR = Field split/replicate.
 - GW = Groundwater sample.
- MS/MSD = Matrix spike/matrix spike duplicate.
 - NS = Near-surface soil sample.

- PCB = Polychlorinated biphenyls.
- PCI = Panamerican Consultants, Inc.
- QC = Quality control sample.
- /S = Split.
- SS = Subsurface soil sample.
- SVOCs = Semivolatile organic compounds.
 - TAL = Target Analyte List.
 - TCL = Target Compound List.
- VOCs = Volatile organic compounds.
- Stat = Status (T = Taken, S = Skipped).
- WP = Sample in work plan (Y = Yes, N = No).

XEVE 3000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK bCI SILE 30' SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM 2-8.4 əldsT

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., September 2000	and Environment, Inc	Source: Ecology					•
					'L-i	criteria see Table 2	For more details on the screening
00008 <i>L</i>	400	085	r <i>L</i> ez	8151	r 6/2	551 1	Сргузеле
000067	0000\$	1 23 1	522 U	U 784	U 812	442 N	Sarbazole
000017	20000	U 308 U	522 U	fN /87	tU 812	85.2 J	9isls(2-ethylhexyl)phthalate
820000000	00LZ	N 0/21	U 01E1	U 0221	1300 N	614 1	Benzoic acid
0008 <i>L</i>	0011	r 925	528 1	1000 1	r 672	555 1	Benzo(k)fluoranthene
-	20000	f \$11	255 N1	5141	10¢ 1	442 NI	Benzo(g,h,i)perylene
008L	0011	454 J	1 223 1	1251	555 J	551 J	Benzo(b)fluoranthene
08/	19	1 L6E	1 69 ا	741.1	5151	£ 191	Benzo(a)pyrene
008 <i>L</i>	554	LOS	1251	145 1	185 1	142 1	Senz(a)anthracene
00000019	0000\$	567 J	235 N	۲ S' <i>LL</i>	U 818	Ω \$ † †	Anthracene
-	41000	1 90S U	255 N	1 8' † 6	U 818	U 244	Acenaphthylene
12000000	20000	1 36 I	222 U	n <i>L</i> 8Þ	U 818	442 N	Acenaphthene
			84/8	y :21nU		90	Test : Semivolatiles - SW 827
1000000	00001	2.88 J	ח <i>ג</i> 'ונ	f †/.9	N 6'8L	<u> </u>	Μείμοχγεμίοι
0£9	50	0.2.0	0.909 J	0.48.C	U 8.21		Heptachior epoxide
00£1	001	0 2 9	0 75°9	2.84 U	15.31	U 9.EI	Heptachlor
000019	-	0 2 9	0 7 7 1	5 [.] 61	U 8.21	1.22 J	Endrin ketone
000019	001	2.00 J	U 45.3	2.84 U	U 8.21	U 9.EI	Bndrin
3200	500	1.02	n <i>L</i> 1'E	U 20.2	U 68.7	U 8.ð	DHa-BHC
000/1	0017	L'71	14.1	<i>L</i> '\$1	0.95	9.75	1,4°-DDT
00071	0017	53.5	8.22	7.21	40.4	34.0	1'4DDE
54000	0067	ſ <i>L</i> 6 [.] 7	1 '9' I	3.14 J	3.03 J	1 OS E	1'4DDD
			8 _{\/} 8	ц səlnU			Test : Pesticides - SW 8081A
5.9	1	0.0133 J	0.0245 J	0.0162 J	0.0225 J	0.0142 J	Arocior 1260
			8 % 8	n :etinU			Lest : PCB4 - SW 8082
EPA Region III BDCs -Industrial*	LVCW 4049 NAZDEC	0 - 0'1J 3/14/00 6/150-7802	0 - 0'1J 3\14\00 6C150-N204	0 - 0'1J 3/14/00 6C150-N203	0 - 0 1.1 3/14/00 dci50-n205	0 - 0'13 3/14/00 6C150-N201	PARAMETER Depth (ft): Sample Date: Sample (ft):

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Table 4.8-2
SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM
PCI SITE 20,
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Sample ID: Sample Date: PARAMETER Depth (11):	PCI20-NS01 3/14/00 0 - 0.17	PC120-NS02 3/14/00 0 - 0.17	PCI20-NS03 3/14/00 0 - 0.17	PCI20-NS04 3/14/00 0 - 0.17	PCI20-NS05 3/I4/00 0 - 0.17	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Di-n-butyl phthalate	445 U	518 U	487 U	1050	506 U	8100	20000000
Dibenz(a,h)anthracene	445 UJ	518 UJ	1173	522 UJ	506 UJ	14	780
Fluoranthene	303 J	355 J	871	369 J	1070	50000	82000000
Fluorene	445 U	518 U	487 U	522 U	220 J	50000	82000000
Indeno(1,2,3-cd)pyrene	445 UJ	518 UJ	101 J	522 U	506 U	3200	7800
Phenanthrene	255 J	284 J	373 J	271 J	1140	50000	-
Pyrene	583 J	[•] 723 J	1760 J	576	1360	50000	61000000
Test : TAL Metals - SW601(B/7471A/7470A	in an early the second s	Units:	mg/kg			
Aluminum	12600	9390	8340	7790	14400	18306	2000000
Antimony	1.28 UJ	1.62 UJ	19.7	11.9	4.41	3.4	820
Arsenic	0.923 U	0.842 J	1.22 U	7.39	1.73 J	7.5	3.8
Barium	98.3	69.7	193	759	96.3	300	140000
Beryllium	0.682	0.460 J	0.497 J	0.477 J	0.705 J	0.65	4100
Cadmium	9.77	7.65	10.5	16.3	4.04	1.1	1000
Calcium	3260	2460	1820	3400	7000	23821	-
Chromium	25.8	34.3	39.3	45.2	19.5	22.6	6100
Cobalt	11.1	7.28	30.1	25.8	8.67	30	120000
Copper	74.3	106	79.3	251	38.5	43	82000
Iron	81000	69200	96900	145000	30500	47350	610000
Lead	129	222	2220	1640	186	200	400
Magnesium	3600	1750	1600	1650	3320	7175	-
Manganese	2070	653	718	987	773	2106	41000
Мегсигу	0.317 J	1.17 J	0.251 J	3.83 J	0.147 J	0.1	-
Nickel	23.0 .	32.9	68.9	59.0	17.9	46	41000
Potassium	944	977	727	765	1440	1993	•

For more details on the screening criteria see Table 2-1.

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Table 4.8-2	
SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM	
PCI SITE 20,	
YEAR 2000 EXPANDED SITE INVESTIGATION, FORMER GRIFFISS AIR FORCE BASE, ROME, NEW Y	ORK

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PARAMETER	Sample ID: Sample Date: Depth (ft):	PCI20-NS01 3/14/00 0 - 0.17	PCI20-NS02 3/14/00 0 - 0.17	PC120-NS03 3/14/00 0 - 0.17	PCI20-NS04 3/14/00 0 - 0.17	PC120-NS05 3/14/00 0 - 0.17	NYSDEC TAGM 4046	EPA Region III RBCs -Industrial*
Selenium		3.91 J	3.98 J	5.33 J	9.03 J	2,64 J	2	10000
Silver	· · · · · · · · · · · · · · · · · · ·	0.568 J	0.538 J	1.02 J	0.748 J	0.399 J	1.1	10000
Sodium		36.2 J	34.9 J	58.2 J	141	51.8 J	259	-
Vanadium		37.4	31.6	32.1	56.2	42.8	150	14000
Zinc		367 J	147 J	332 J	465 J	143 J	120	610000

For more details on the screening criteria see Table 2-1.

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Table 4.8-2SUMMARY OF POSITIVE HITS AND SCREENING FOR THE SOIL SAMPLES FROM
PCI SITE 20,
YEAR 2000 EXPANDED SITE INVESTIGATION,
FORMER GRIFFISS AIR FORCE BASE, ROME, NEW YORK

Key:			
Qualifiers:			
-	J	estimated	
	U	not detected	
	UJ	not detected; estimated detect	tion limit reported
Units:			Test and Sample Information:
mg/kg = milli	igrams per kllogra	am	PCBs = polychlorinated biphenyls
µg/kg = micr	rograms per kllog	ram	TAL = Target Analyte List
			TRPH = total recoverable petroleum hydrcarbons
,			D = duplicate sample
			NA = not analyzed
Screening:			
11 - 13 - 1 - 2 - 3	Result above	NYSDEC recommended soil cleanup o	objectives. Technical and
	Administrati	ve Guidance Memorandum (TAGM) 40	046, (NYSDEC 1994).
	Desuk shows		
	(EPA 2000).	e industrial EPA Region III Risk-Based	Concentration (RBC), for soil,
•	 The EPA OS for lead in so 	WER (Directive No. 9355.4-12, July 19 bil in a residential area with children was	994) health-based screening value is used in lieu of an RBC.
Note: A1	Ithough the	e soil samples were an	alyzed for VOCs by method SW8260B, no VOCs were detected.

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Figure 4.8-2 PCI 20 TOTAL EARTH'S MAGNETIC FIELD Contour Interval = 25 gammas



Figure 4.8-4 PCI 20 EM31 Ground Conductivity Vertical Dipole Contour Interval = 2 millimhos/meter



References

- Air Force Enter for Environmental Excellence, 1998, Closure of Hazardous Waste/Hazardous Material Storage Areas at Griffiss Air Force Base, Rome, New York, April 1998.
- Bergmann Associates, July 3, 1996, Griffiss Business and Technology Park Industrial Site Development Project Engineer's Report, Rochester, New York.
- Code of Federal Regulations (CFR), 1995, USEPA National Primary Drinking Water Regulations, 40 CFR Part 141.11, and National Secondary Drinking Water Regulations, 40 CFR Part 143.3.
- Ecology & Environment, Inc., August 2000, Quality Control Summary Report for the Year 2000 Expanded Site Investigation at the Former Griffiss Air Force Base, Rome, New York.

_____, February 2000, Field Sampling Plan, Health and Safety Plan, and Quality Assurance Project Plan Addendum for the Expanded Site Investigation of AOI/OTH/PCI/EOD Sites at the Former Griffiss Air Force Base, Rome, New York.

_____, September 1999, Quality Control Plan, Griffiss Air Force Base, Rome, New York.

_____, July 1998, Draft Report for Expanded Site Investigation and Confirmatory Sampling of Areas of Interest and Drywell/Wastewater-Related Systems, Former Griffiss Air Force Base, Rome, New York.

_____, October 1997, Field Sampling Plan, Health and Safety Plan, and Quality Assurance Plan for the Expanded Site Investigation at the Former Griffiss Air Force Base, Rome, New York

5

_____, January 1997, Confirmatory Sampling Report for 10 Areas of Interest (AOIs), Group III AOIs, Griffiss Air Force Base, Rome, New York.

_____, November 1996, Confirmatory Sampling Report for 15 Areas of Interest (AOIs), Group I AOIs, Griffiss Air Force Base, Rome, New York.

_____, August 1995, Work Plan, Quality Assurance Plan, and Health and Safety Plan for the Preliminary Assessment/ Site Investigation of 15 Areas of Interest at Griffiss Air Force Base, Rome New York.

- Engineering-Science, Inc., 1981, Installation Restoration Program Phase 1 Record Search, Hazardous Materials Disposal Sites, Griffiss Air Force Base, New York. Prepared for United States Air Force, AFESC/DEV, Tyndall Air Force Base, Florida.
- Griffiss Local Development Corporation (GLDC), 1995, A Master Reuse Strategy for Griffiss Air Force Base, Rome, New York, Phase Two - Building the Foundation for Scenario Development, Rome, New York.
- Human Factors Applications, Inc., October 1998, Final BRAC Removal Action Report, Griffiss AFB, Rome, New York.
- Hydro-Environmental Technologies, Inc., 1986, Soil Borings, Sample Analysis, and Monitoring Well Installation at Various Locations, Griffiss Air Force Base, New York (Letter Report), Clarksville, New York.
- Law Engineering and Environmental Services, Inc. (Law Environmental), December 1996, Draft Final Report, Remedial Investigation at Griffiss Air Force Base, New York, Kennesaw, Georgia.

_____, 1995, Draft Primary Report, Remedial Investigation Background Information, Griffiss Air Force Base, New York, August 1995, prepared for the U.S. Army Corps of Engineers, Kansas City District, Kennesaw, Georgia.

_____, 1994a, Final Report, Identification of Areas of Interest, Griffiss Air Force Base, New York, Kennesaw, Georgia.

_____, 1994b, Final Site Investigation Report for IAG Regulator Chosen Sites, Griffiss Air Force Base, New York. Prepared for the United States Army Corps of Engineers Kansas City District, Kennesaw, Georgia.

New York Code of Rules and Regulations (NYCRR), 1999, 6 NYCRR Part 371, Identification and Listing of Hazardous Wastes, Title 6 of the Official Compilation of Codes, Rules, and Regulations, Division of Solid & Hazardous Materials NYSDEC, Albany, New York. New York State Department of Environmental Conservation (NYSDEC), 1999, Technical Guidance for Screening Contaminated Sediments, Division of Fish, Wildlife and Marine Resources, NYSDEC, Albany, New York.

_____, 1998, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, prepared by J. Zambrano and S. Stoner, Division of Water Technical and Operational Guidance Series (1.1.1), NYSDEC, Albany, New York.

- _____, 1994, Technical and Administrative Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Soil Cleanup Levels, prepared by M.J. O'Toole, Jr., Division of Hazardous Waste Remediation, NYSDEC, Albany, New York.
- Panamerican Consultants, Inc, 1997, Phase II Archaeological Investigation of 20 Sites at Griffiss Air Force Base, Rome, Oneida County, New York, Final Report, Tuscalosa, Alabama
- Shacklette, H.T., and J.G. Boerngen, 1984, Element Concentrations on Soils and Other Surficial Materials of the Conterminous United States, United States Geological Survey Professional Paper 1270, Washington, D.C.
- State University of New York (SUNY), 1991, Geology of New York, A short Account, Educational Leaflet 20, produced in conjunction with the State Education Department and the New York State Museum and Science Service, Albany, New York.
- Tetra Tech, Inc., 1995, EBS/AOI Summary Table, Griffiss Air Force Base, New York, San Bernardino, California.

_____, 1994, Basewide Environmental Baseline Survey, Griffiss Air Force Base, New York,

UNC Geotech, 1991, Hydrogeology Study Report, Griffiss Air Force Base, Rome, New York, Grand Junction, Colorado.

_____, 1989, Site Analysis, Griffiss AFB, Oneida County, New York, Vol. 1 and 2, USEPA Region II, OERR, Las Vegas, Nevada.

United States Air Force, 1999, Final Supplemental Environmental Impact Statement, Disposal and Reuse of Griffiss Air Force Base, New York, September 1999.

_____, 1995, Final Environmental Impact Statement, Disposal and Reuse of Griffiss Air Force Base, New York, November 1995.

- United States Air Force Base Conversion Agency (AFBCA), 1942, Air Corps Depot Plan & Profile – Sanitary Sewer System, File # 7831-13, Drawing # US-14, R.D. 607, SE – 28, Rome, New York.
- United States Department of Health and Human Services (USDOH&HS), 1993, Agency for Toxic Substances and Disease Registry, Toxicological Profile for Polycyclic Aromatic Hydrocarbons.
- United States Environmental Protection Agency (USEPA), 2000, Drinking Water Standards and Health Advisories, Summer 2000, Office of Water.

_____, 2000, Risk-Based Concentration Table, April 2000, prepared by Jennifer Hubbard, Superfund Technical Support Section, USEPA Region III, Philadelphia, Pennsylvania.

_____, 1995, Low Flow (Minimal Drawdown) Ground-Water Sampling Procedures, by R. Puls and M. Barcelona, Office of Solid waste and Emergency Response, USEPA/540/S-95/504, December 1995, Washington, DC.

- _____, 1994, Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities Memorandum, OWSER Directive No. 9355.4-12, July 1994 Washington, DC.
- UNC Geotech, 1989, Site Analysis, Griffiss AFB, Oneida County, New York, Vol. 1 and 2, USEPA Region II, OERR, Las Vegas, Nevada.
- United States Geological Survey, 1955, 7.5-Minute (Topographic) Map, Rome, New York, Quadrangle.