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FINAL
FORMER AIR FORCE PLANT NO. 51
HTRW INVESTIGATION

GREECE, NEW YORK

Contract Number: DACW51-97-D-0010
Delivery Order No. 60

Prepared for:

U.S. Army Corps of Engineers
New York District
26 Federal Plaza
New York, New York 10278-0090

Prepared by:

Ogden Environmental and Energy Services Co., Inc.
Northern Ecological Associates, Inc.

APRIL 2000

EXECUTIVE SUMMARY

Under Delivery Order (DO) 60 of Contract DACW51-97-D-0010, Ogden Environmental and Energy Services Co., Inc. (Ogden) was assigned by Northern Ecological Associates, Inc. (NEA) to perform a targeted Hazardous, Toxic and Radiological Waste (HTRW) investigation at Air Force Plant (AFP) No. 51 in Greece, Monroe County, New York. AFP No. 51 was built during World War II for production of ocean-going ships. Later, the facility was used by the Department of Defense (DoD) for production of B-52 bulkheads, and subsequently for production of Talos ground handling equipment.

The objective of the sampling program under DO 60 was to provide current information regarding the presence of HTRW at the project site, to allow for an evaluation of the need for further remedial investigation or remedial action by the USACE. In support of this objective, the sampling program was targeted to seven (7) areas of concern where prior investigation had revealed the potential for HTRW soil and ground water contamination. A total of 21 soil/ sediment, 6 surface water, and 9 ground water samples were obtained for laboratory analysis; most samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic base-neutral/acid extractable (BN/AE) compounds, and Target Analyte List (TAL) metals, or a subset of these analytes.

In accordance with the USACE-NYD approved Work Plan (NEA/Ogden 1999), sampling activities were performed during the period November 16-19, 1999. Sample results were compared to current NYSDEC standards, *i.e.*, ***Recommended Cleanup Objectives for Soils*** (T.A.G.M. HWR-94-4046, January 24, 1994), ***Technical Guidance for Screening Contaminated Sediments for Sediments*** (Division of Fish and Wildlife/Division of Marine Resources, July 1994), and ***Ambient Water Quality Standards and Guidance Values*** for the surface and ground water data (T.O.G.S. 1.1.1, June 1998, as revised January 1999 and November 11, 1999).

The results of the investigation indicated that the primary contaminants of concern at the project site are those associated with soil/sediment and surface water within Area One (the plating pond from which the waste stream from historical AFP No. 51 electroplating operations was discharged). Significantly elevated concentrations of several VOCs were detected in Area One sediments, primarily trichloroethene (TCE) and cis,1-2 dichloroethene (DCE). TCE was detected at a maximum concentration of 10,000,000 ug/kg (1 per cent); this concentration is orders of magnitude higher than the applicable sediment screening criteria and Recommended Soil Cleanup Objective (RSCO). DCE (a breakdown product of TCE) was detected at a maximum unqualified concentration of 2,600 ug/kg, an order of magnitude above the RSCO. In addition, most metals concentrations significantly exceeded Lowest Effect Level (LEL), Severe Effect Level (SEL), and/or RSCO criteria (by as much as four orders of magnitude). The primary inorganic contaminants are cadmium, chromium, and zinc, with maximum concentrations of 4,200, 3,690, and 4,340 mg/kg, respectively. Surface water concentrations of the identified organic and inorganic contaminants exceeded drinking water and wildlife protection criteria, in some cases by several orders of magnitude.

The primary organic and inorganic contaminants identified in the plating pond were also detected in Area Two sediments and surface water (in many cases exceeding regulatory criteria), documenting off-site migration from the Area One source to the adjacent wetland area to the west.

Organic and inorganic contamination was sporadically detected at concentrations in excess of regulatory criteria in soil borings and ground water within the other areas of concern at the project site, primarily fuel related constituents (*e.g.*, xylene and PAHs), and the metals chromium, nickel, and zinc. However, these contaminants were not present at concentrations approaching those identified in Area One, and do not appear to represent significant potential sources for off-site migration.

Based on surrounding land use and inferred surface and ground water flow paths, the primary receptor of contamination from the Area One source is wildlife located in the wetland area to the west of the project site, associated with Round Pond Creek and Round Pond. With the exception of a potential fish ingestion pathway, available data do not suggest the presence of a human receptor population from this source.

Given the apparent magnitude of Area One sediment contamination, and the ongoing potential for off-site migration of this contamination to the adjacent wetland area, remediation of these source area sediments may be warranted to address impact to the ecological receptor population. In support of decision-making relative to such action, additional source area HTRW characterization, wetland area HTRW characterization, habitat evaluation, and pathway analysis are recommended.

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), under direction from the Superfund Act, implements The Defense Environmental Restoration Program (DERP). The goal of this program is to evaluate and remediate contamination at both active and formerly used defense sites (FUDS), the result of maintenance and manufacturing operations at these installations.

The USACE currently uses the Relative Risk Site Evaluation Program (RRSEP) to evaluate human health and ecological risk posed by potential DoD-related hazardous, toxic, and radiological waste (HTRW) at DERP sites, and to compare potential hazards at a specific site with other sites throughout the nation for budget allocation purposes. HTRW analytical data must be collected at these sites to evaluate potential hazards using RRSEP.

Under Delivery Order (DO) 60 of contract DACW51-97-D-0010 between Northern Ecological Associates, Inc. (NEA) and the USACE–New York District (NYD), Ogden Environmental and Energy Services Co., Inc. (Ogden) was assigned to collect soil, sediment, surface water, and ground water samples at Air Force Plant No. 51, 4800 Dewey Avenue, Greece, Monroe County, New York in accordance with the USACE-NYD approved Work Plan (NEA/Ogden 1999). Air Force Plant No. 51 was built during World War II for production of ocean-going ships. Later, the facility was used by the Department of Defense (DoD) for production of B-52 bulkheads, and subsequently for production of Talos ground handling equipment.

This report consists of the following six subsections: Site Background (Section 2.0), Sample Collection and Analysis (Section 3.0), Results and Discussion (Section 4.0), Conclusions and Recommendations (Section 5.0), References (Section 6.0), and Abbreviations and Acronyms (Section 7.0).

2.0 SITE BACKGROUND

2.1 SITE HISTORY

The project area is located at the former Air Force Plant No. 51, located in Greece, Monroe County, New York, north of the Lake Ontario State Parkway and adjacent to Dewey Avenue (Figure 2-1). Air Force Plant No. 51 was built during World War II for production of ocean-going ships. Later, the facility was used by the DoD for production of B-52 bulkheads, and subsequently for production of Talos ground handling equipment.

On 24 September 1959, the site was declared excess to the needs of the U.S. Air Force, and care and custody for the site, was accepted by the General Services Administration (GSA). By quitclaim deed dated 10 March 1961, GSA conveyed 40.33 acres fee and 3.66 acres easement to the Monroe County Water Authority. By quitclaim deed dated 07 November 1963, the Monroe County Water Authority conveyed 36.63 acres fee and 3.24 acres easement to Genesee Scrap and Tin Co. As of the date of the DERP-FUDS Inventory Project Report (INPR), Genesee Scrap and Tin remained the owner of record. Genesee Scrap and Tin stores and repackages scrap tin products for resale.

2.2 AREAS OF CONCERN

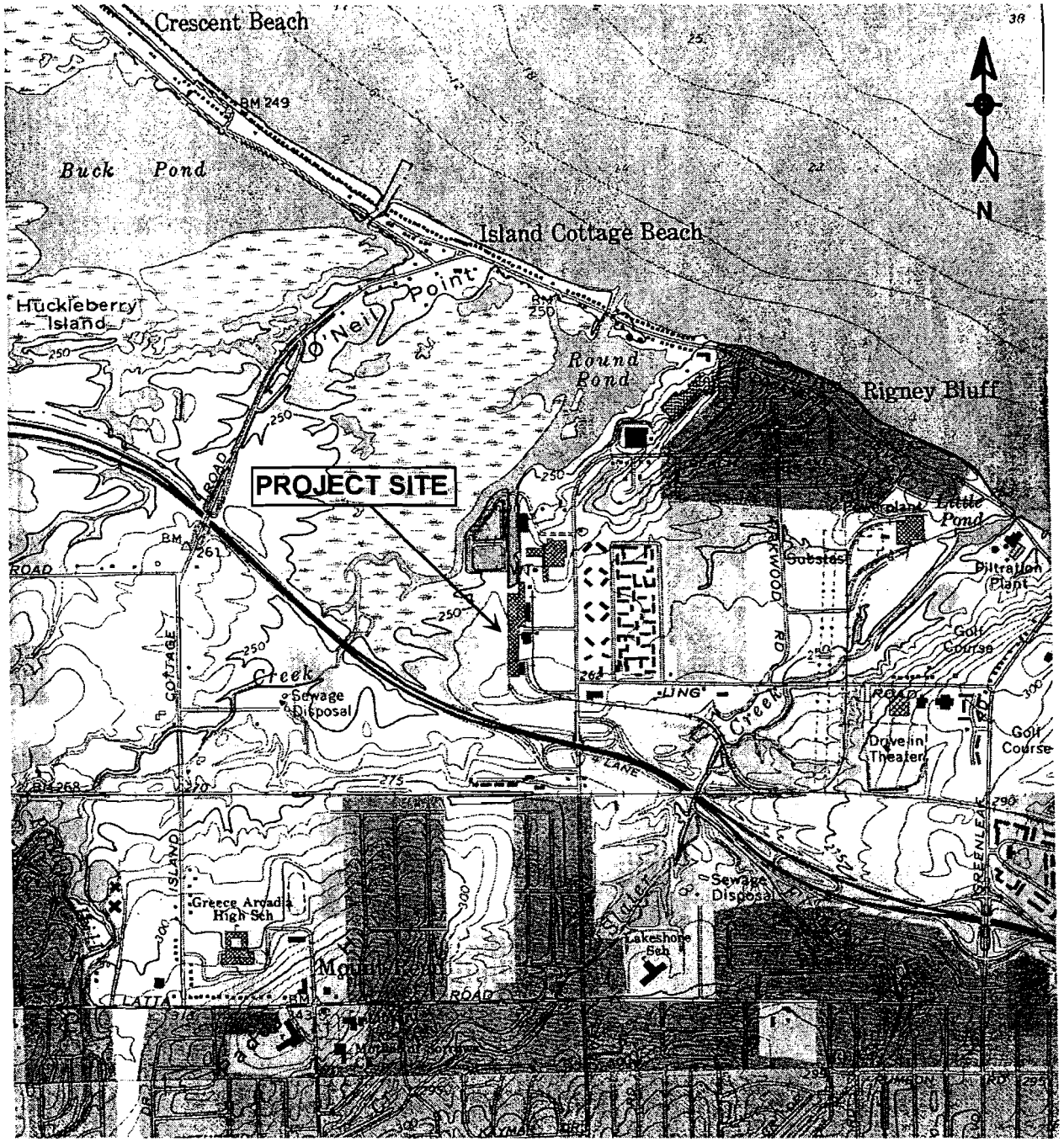
The INPR Project Summary Sheet (amended), dated 12 December 1995 noted twelve (12) potential areas of concern at the project site, of which seven (7) have been identified by USACE-NYD for further analysis. The identified areas of concern are described below and indicated in Figure 2-2.

Area One: Northwest of the main building is a pond that was formerly used to collect wastewater from electroplating operations. It is possible that the standing water in the pond and the soil around it are contaminated.

Area Two: The wastewater collection pond discharge point is to the west of an adjacent wetland area, just outside the fence surrounding the property. Sampling and testing of the discharge and the wetland was performed to investigate possible contamination.

Area Three: Based on the previous use of PCB containing oils used in the transformers at the site, sediment in the transformer sump (located west of the main building) may be contaminated.

Area Four: Discolored soil was identified in the area formerly occupied by Buildings 16, and 17 (now demolished). Soil and ground water may be contaminated in these areas.



0 2,000 4,000 ft

Source: US Department of the Interior, Geological Survey
7.5 Minute Series (Topographic)
Rochester West, N.Y., 1971 (PR 1978)
Braddock heights, N.Y., 1971 (PR 1978)

Figure 2-1
Site Location Map
Air Force Plant No. 51, Greece, New York

U.S. Army Corps of Engineers, New York District
DACW51-97-D-0010; Work Order No. 0060

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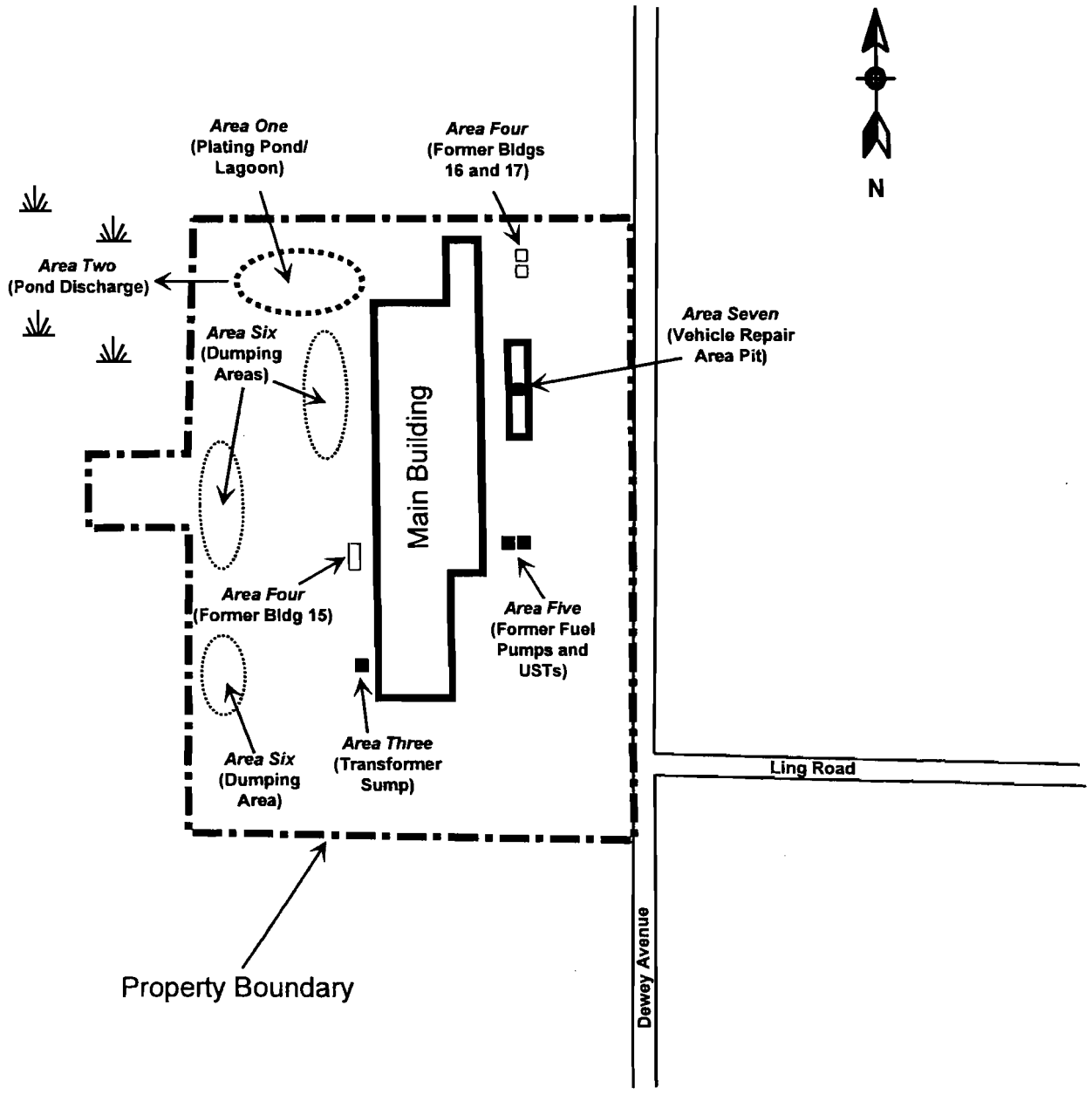

0 450 900 ft

Approximate Scale

Source: Site Map, Air Force Plant No.1
INPR, 29 July 1991

Figure 2-2
Location of HTRW Investigation Areas
Air Force Plant No. 51, Greece, New York

U.S. Army Corps of Engineers, New York District
DACW51-97-D-0010; Work Order No. 0061

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Area Five: Location of two former fuel pumps and underground storage tanks (USTs) located east of the main building; soil contamination may be present in the area adjacent to the USTs.

Area Six: A series of disposal / dumping areas were previously mapped across the site, primarily to the west of the main building; soil and ground water contamination may be present in these areas.

Area Seven: A series of drainage pits underlie the floor at the vehicle maintenance area; sediment in these pits may be contaminated.

2.3 SITE GEOLOGY AND SOILS

Based on surficial geologic mapping compiled by Muller and Caldwell (1986), the project site is dominated by lacustrine silt and clay, which is generally laminated clay and silt, deposited in proglacial lakes. It is generally calcareous, has potential land instability, and has a variable thickness of up to 50 meters. While predominantly mapped further to the south, till was also identified in borings advanced as part of this site investigation. Till has a variable texture and is usually poorly sorted. Its deposition occurs beneath glacial ice, and it is generally calcareous, relatively permeable and has variable thickness of up to 50 meters. Geologic mapping of the Rochester and Ontario Beach Quadrangles (Hartnagle 1907) indicates that surficial deposits at the project site are underlain by the Lower Medina shale. The Lower Medina shale is a division of the Medina Formation that consists of an extensive series of soft, red shales, with small amounts of interbedded silicious material. The thickness of the red shales is approximately 900 feet.

Soil series mapped by the United States Department of Agriculture, Soil Conservation Service (USDA-SCS) (1973), at and in the vicinity of the project site, consist of the following:

The project site and areas to the north consist of Made land. Made land consists of areas that have been filled with waste, such as stones, old masonry material, bricks and tree stumps. Some areas have been covered with a thin mantel of soil material. Dominant slopes are from 0 to 3 percent.

Collamer silt loam is found west, southwest and in small areas east of the subject property. The Collamer series is made up of deep, moderately well drained, medium textured soils that occur primarily in old glacial lakebeds. These soils formed in lacustrine deposits that are mainly very fine sand and silt with some clay. The Collamer silt series occupies knolls on the higher landscapes, and has 2 to 6 percent slopes in the vicinity of the project site.

Fresh water marsh is found west of the subject property. It consists of level, wet, periodically flooded areas where water is on or near the surface most of the year. The level of water fluctuates with adjacent bodies of fresh water. Cattails, rushes, and other tolerant herbaceous plants make up the dominant vegetation.

Niagara silt loam is found to the northeast, south and southeast of the subject property. The Niagara series is made up of deep, somewhat poorly drained soils that have a medium textured surface layer and a medium to fine textured subsoil. These soils formed in lacustrine deposits dominated by silt and fine sand with some clay. It occupies an intermediate landscape between high knobs and low depressions in old glacial lakebeds, and exhibits slopes in the 0 to 2 percent range in the vicinity of the project site.

Rhineback silt loam is found to the east of the subject property. The Rhineback series are deep, somewhat poorly drained soils that have a medium textured surface layer and a fine-textured subsoil. These nearly level soils developed in deep lacustrine deposits of calcareous clay and silt. They are in old glacial lakebed areas between low depressions, higher knobs and ridges. Slopes range from 0 to 2 percent in the vicinity of the project site.

3.0 SAMPLE COLLECTION AND ANALYSIS

All data collection activities were completed at the Air Force Plant No. 51 in accordance with the site specific Letter Work Plan (LWP). The LWP (NEA/Ogden 1999) contained the following components that described sample collection and analysis procedures: Management Plan, Field Sampling Plan, Quality Assurance Program Plan (QAPP), and Health and Safety Plan. As appropriate to describe the performance of the HTRW investigations, field sampling plan procedures are summarized below, and exemptions are noted where necessitated by field conditions.

3.1 PROJECT OBJECTIVE

The objective of the sampling program under DO 60 was to provide current information regarding the presence of HTRW at the project site, to allow for an evaluation of the need for further remedial investigation or remedial action by the USACE. In support of this objective, the sampling program was targeted to areas where prior investigation had revealed the potential for HTRW soil and ground water contamination, and a total of 21 soil/sediment, 6 surface water, and 9 ground water samples were obtained for laboratory analysis (Table 3-1).

3.2 WORK PLAN MODIFICATIONS

Several modifications to the sampling specifications contained in the LWP were necessitated during the execution of project work due to environmental conditions or constraints encountered in the field, as detailed below:

Due to the potential for encountering construction debris during the advancement of soil borings, and the anticipated low yield of soil materials expected at the project site, hollow stem auger (HSA) drilling equipment was used exclusively at the site (rather than direct-push, Geoprobe equipment), and temporary 2 in. diameter wells were installed in each borehole rather than attempting ground water recovery using direct push (hydropunch) techniques.

As a result of the shallow depth to ground water at several sampling locations and/or the lack of measurable organic vapor readings obtained from head space monitoring of soil core samples, only one subsurface soil sample (rather than the two specified in the LWP) was processed for laboratory analysis at several borings; *i.e.*, SB4-2, SB4-3, SB5-1, SB5-2, and SB5-3.

An attempt was made to advance a supplemental boring (SB6-1) within an additional Area Six "dumping area"; however, work hour constraints (site access gate closure at 4:30 PM daily) coupled with the additional labor required to install 2 in. temporary monitoring wells in all on-site borings did not allow for initiation of drilling at that location.

Table 3-1: Summary of HTRW Sampling Activities

AREA	DESCRIPTION	SAMPLE ID	MATRIX	ANALYSIS	Date
One	Plating discharge pond	S1-1	Sediment	TCL VOCs, TAL Metals, Cyanide	11/16/1999
		S1-2	Sediment	TCL VOCs, TAL Metals, Cyanide	11/19/1999
		S1-3	Sediment	TCL VOCs, TAL Metals, Cyanide	11/16/1999
		SW1-1	Surface Water	TAL Metals, Cyanide	11/16/1999
		SW1-2	Surface Water	TCL VOCs, BN/AE, TAL Metals, Cyanide	11/19/1999
		SW1-3	Surface Water	TAL Metals, Cyanide	11/16/1999
Two	Plating pond discharge (wetlands)	S2-1	Sediment	TCL VOCs, TAL Metals, Cyanide	11/16/1999
		S2-2	Sediment	TCL VOCs, TAL Metals, Cyanide	11/16/1999
		S2-3	Sediment	TCL VOCs, TAL Metals, Cyanide	11/16/1999
		SW2-1	Surface Water	TAL Metals, Cyanide	11/16/1999
		SW2-2	Surface Water	TAL Metals, Cyanide	11/16/1999
		SW2-3	Surface Water	TAL Metals, Cyanide	11/16/1999
Three	Transformer Sump	S3-1	Sediment	PCBs	11/19/1999
Four	Former Building Nos. 15, 16, 17	SB4-1-7	Soil	TCL VOCs, BN/AE, TAL Metals	11/17/1999
		SB4-1-9	Soil	TCL VOCs, BN/AE, TAL Metals	11/17/1999
		SB4-2-2	Soil	TCL VOCs, BN/AE, TAL Metals	11/17/1999
		SB4-3-2	Soil	TCL VOCs, BN/AE, TAL Metals	11/18/1999
		GW4-1	Ground Water	TCL VOCs, BN/AE, TAL Metals	11/18/1999
		GW4-2	Ground Water	TCL VOCs, BN/AE, TAL Metals	11/18/1999
		GW4-3	Ground Water	TCL VOCs, BN/AE, TAL Metals	11/19/1999
Five	Fuel pump/UST area	SB5-3-1	Soil	TCL VOCs, PAH, Lead	11/17/1999
		SB5-1-1	Soil	TCL VOCs, PAH, Lead	11/17/1999
		SB5-2-1	Soil	TCL VOCs, PAH, Lead	11/17/1999
		GW5-3	Ground Water	TCL VOCs, PAH, Lead	11/19/1999
		GW5-1	Ground Water	TCL VOCs, PAH, Lead	11/19/1999
		GW5-2	Ground Water	TCL VOCs, PAH, Lead	11/19/1999
Six	Former disposal/dumping areas	SB6-4-4	Soil	TCL VOCs, BN/AE, TAL Metals	11/18/1999
		SB6-4-8	Soil	TCL VOCs, BN/AE, TAL Metals	11/18/1999
		SB6-2-2	Soil	TCL VOCs, BN/AE, TAL Metals	11/18/1999
		SB6-2-9	Soil	TCL VOCs, BN/AE, TAL Metals	11/18/1999
		SB6-3-5	Soil	TCL VOCs, BN/AE, TAL Metals	11/18/1999
		SB6-3-7	Soil	TCL VOCs, BN/AE, TAL Metals	11/18/1999
		GW6-2	Ground Water	TCL VOCs, BN/AE, TAL Metals	11/19/1999
		GW6-3	Ground Water	TCL VOCs, BN/AE, TAL Metals	11/19/1999
		GW6-4	Ground Water	TCL VOCs, BN/AE, TAL Metals	11/19/1999
Seven	Drainage pit in the vehicle maintenance area.	S7-1	Sediment	TAL Metals, TCL VOCs, BN/AE	11/19/1999
QA/QC	QA/QC Samples	TB111699-1	Water	TCL VOCs	11/16/1999
		TB111699-2	Water	TCL VOCs	11/16/1999
		S2-DUP	Sediment	TCL VOCs, TAL Metals, Cyanide	11/16/1999
		TB111799-3	Water	TCL VOCs	11/17/1999
		TB111899	Water	TCL VOCs	11/17/1999
		TB111999	Water	TCL VOCs	11/19/1999
		FB1119999	Water	TCL VOCs, BN/AE, TAL Metals	11/19/1999
		GW6-4-02	Ground Water	TCL VOCs, BN/AE, TAL Metals	11/19/1999
		GW4-3-03	Ground Water	TCL VOCs, BN/AE, TAL Metals	11/19/1999

Due to the presence of a strong chemical odor and water discoloration during the extraction of sediment sample S1-2 in Area One, an additional water sample was obtained at location SW1-2 for the analysis of Target Compound List (TCL) volatile organic compounds (VOCs) and semivolatile base-neutral/acid-extractable organic (BN/AE) compounds, in addition to the Target Analyte List (TAL) metals and cyanide analyses specified in the LWP. Use of sample bottles for BN/AE sample collection from this location precluded processing of a BN/AE field (rinsate) blank.

Failure of the laboratory information management system (LIMS) at the Severn Trent Laboratory (STL) in Whippany, NJ (the laboratory specified in the LWP for sample analysis) precluded acceptance of project samples. Consequently, all project samples were shipped to the STL in Monroe, Connecticut for analysis. As with STL-Whippany, the STL-Monroe laboratory is New York State and USACE-MRD certified.

3.3 SAMPLING PROCEDURES

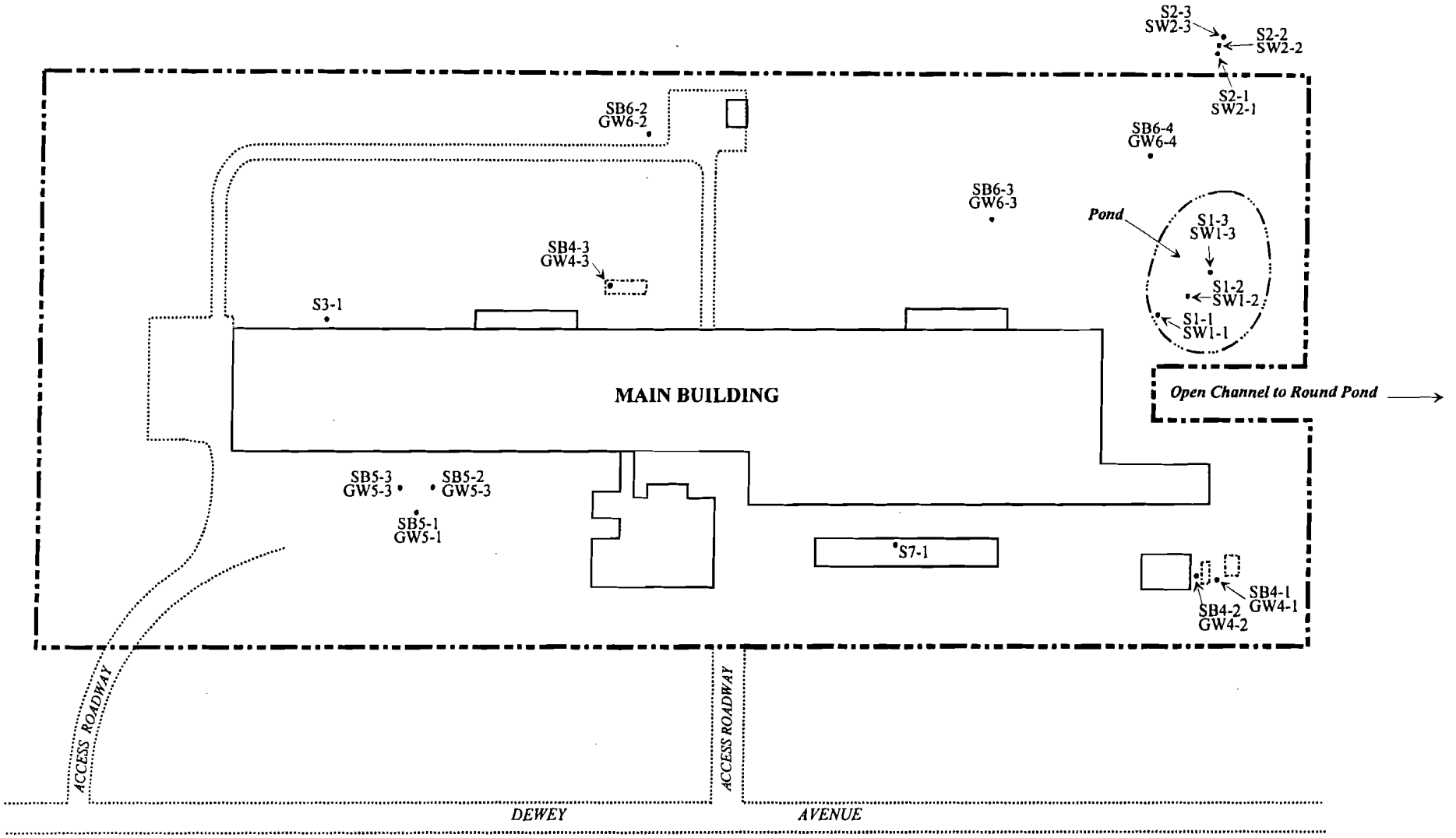
Sampling activities were performed over a period of four days (November 16–19, 1999). Sample locations are indicated on Figure 3-1, and survey coordinates of these locations are contained in Table 3-2 (including vertical control for temporary well installations). The following sections describe the sampling procedures implemented at each of the seven areas of concern identified at the project site. A summary of field investigation activities is contained in the Daily Chemical Quality Control Reports (DCQCRs) contained in Appendix A.

Table 3-2: Horizontal and Vertical Survey Control

Boring/Well ID	Easting (ft)	Northing (ft)	Ground Surface Elevation (ft. MSL)	Top of Casing Elevation (ft. MSL) [1]
S1-1 / SW1-1	748,491.3754	1,191,761.2258		
S1-2 / SW1-2	748,479.4111	1,191,819.8178		
S1-3 / SW1-3	748,496.1615	1,191,791.1202		
S2-1 / SW2-1	748,241.4184	1,191,846.9479		
S2-2 / SW2-2	748,231.2924	1,191,848.5330		
S2-3 / SW2-3	748,223.2081	1,191,854.2952		
SB4-1 / GW4-1	748,864.0484	1,191,853.0699	261.62	264.12
SB4-2 / GW4-2	748,860.3385	1,191,826.8254	260.99	263.51
SB4-3 / GW4-3	748,503.5983	1,191,113.1582	260.80	261.3
SB5-1 / GW5-1	748,782.6550	1,190,887.8616	260.12	262.14
SB5-2 / GW5-2	748,753.8150	1,190,906.6444	260.30	261.69
SB5-3 / GW5-3	748,753.2034	1,190,869.1321	260.33	261.27
SB6-2 / GW6-2	748,344.3570	1,191,163.8785	261.23	261.53
SB6-3 / GW6-3	748,444.0548	1,191,576.6991	256.88	257.22
SB6-4 / GW6-4	748,369.9904	1,191,767.3611	253.06	253.57

[1] Temporary well (top of PVC well casing)

Site Survey: James M. Parker, Land Surveyor, Rush, New York - November, 1999



0 90 180 270 ft

Approximate Scale

Site Survey: James M. Parker, Land Surveyor, Rush, New York
November 1999

Figure 3-1
HTRW Sampling Locations
Air Force Plant No. 51, Greece, New York

Army Corps of Engineers, New York District
DACW51-97-D-0010; Work Order No. 0060

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All samples collected on-site were documented on chain-of-custody forms; immediately following collection, samples were placed on ice in coolers maintained at a temperature of 4° C pending shipment to the analytical laboratory. Samples were shipped to STL-Monroe, 200 Monroe Turnpike, Monroe, Connecticut via Federal Express on November 17 and 19, 1999.

Headspace screening of soil samples for total organic vapor concentration (TOVC) using a photoionization detector (PID) was performed on soil core (split-spoon) samples recovered from all soil borings. This screening was performed to assist in the selection of soil increments within each boring to be processed for laboratory analysis (in addition to the increment associated with the inferred water table interface). Headspace screening was performed in accordance with the following procedure: (1) based on observed soil core lithology, odor, mottling, or other discoloration, soil from one or more increments within each split-spoon sample was placed in a soil sample jar, sealed with aluminum foil, and placed in storage at ambient temperature; (2) split sample from each increment was also sealed and placed on ice in a sample cooler; (3) at the end of each day, a TOVC reading from each sample increment was measured by piercing the aluminum foil seal on the ambient sample jar with the PID probe, and allowing the instrument reading to equilibrate over a period of 1–3 minutes; (4) where differentiation in TOVC was observed across sample increments within a single boring, the split sample corresponding to the sample increment with the highest recorded TOVC was removed from the sample cooler and processed for laboratory analysis; (5) where no differentiation in TOVC was noted across sample increments, the split sample increment corresponding to the inferred water table interface, and/or sample with other distinguishing feature (*i.e.*, discoloration) was processed for laboratory analysis.

3.3.1 Area One

On November 16 and 19, 1999 three sediment samples (S1-1, S1-2, and S1-3) were collected for TCL VOC, TAL metals, and cyanide analysis.

The sediment samples were obtained at a sampling depth of 0-6 inches using precleaned stainless steel hand trowels and/or a stainless steel sediment corer fitted with either a lexan liner (for metals and cyanide samples) or a nonreactive brass liner (for VOC samples). Following sample retrieval, the liners were sealed with Teflon® tape and capped prior to storage in a sample cooler.

Sediment sample S1-1 was obtained in the vicinity of the pipe discharge from the main building to the pond, S1-3 was obtained in the center of the pond, and S1-2 was obtained midway between the other two sample locations. Surface water grab samples SW1-1, SW1-2, and SW1-3 were obtained adjacent to the sediment sampling locations, and analyzed for TAL metals and cyanide. SW1-2 was also analyzed for TCL VOCs and BN/AE due to the presence of a strong chemical odor and water discoloration during the extraction of sediment sample S1-2. The maximum water depth in the pond was approximately one foot. An inflatable raft was used to access the sampling locations in the center of the pond.

3.3.2 Area Two

On November 16, 1999, sediment samples S2-1, S2-2, and S2-3 were collected for TCL VOC, TAL metals, and cyanide analysis. The sediment samples were obtained using precleaned stainless steel hand trowels at a sampling depth of 0-6 inches. Sample S2-1 was obtained at the pipe discharge from the pond into the wetland area, and samples S2-2 and S2-3 were obtained approximately 10 and 20 feet downstream, respectively. One duplicate sediment sample (S2-DUP) was collected. Surface water grab samples SW2-1, SW2-2 and SW2-3 were collected adjacent to the sediment sampling locations and analyzed for TAL metals and cyanide analysis. The depth of the water column was approximately 1.5 feet at location SW2-1, and 0.5 feet at the other sample locations.

3.3.3 Area Three

On November 19, 1999 sediment sample S3-1 was collected using a precleaned stainless steel hand trowel for polychlorinated biphenols (PCBs) analysis. Approximately 1.5 feet of standing water was present in the transformer sump at the time of sampling. A fuel/organic odor was noted during sample extraction.

3.3.4 Area Four

On November 17, 1999 soil borings SB4-1 and SB4-2 were advanced in the area formerly occupied by Buildings 16 and 17. Boring SB4-3 was advanced in the area formerly occupied by Building 15 on November 18, 1999. Drilling was performed by Earth Dimensions, Inc. of Elma, New York. Soil boring SB4-1 was sampled continuously with a split spoon sampler from ground surface to a depth of 20 feet below ground surface (bgs). Soil boring SB4-2 was sampled in 5 ft increments, starting at 3-5 ft bgs increment, and ending at the 13-15 ft bgs increment. Soil boring SB4-3 was sampled in 5 ft increments, starting at the 3-5 ft bgs increment and ending at the 13-15 ft bgs increment. From these borings, samples SB4-1-7 (12-14 ft bgs), SB4-1-9 (16-18 ft bgs), SB4-2-2 (8-10 ft bgs), and SB4-3-2 (8-10 ft bgs) were selected for TCL VOC, BN/AE, and TAL metals analysis.

Temporary two-inch diameter monitoring wells were placed in each of the borings with well screens placed across the inferred water table elevation. On November 18 and 19, 1999, ground water samples GW4-1, GW4-2, and GW4-3 were obtained from SB4-1, SB4-2, and SB4-3, respectively, for TCL VOC, BN/AE, and TAL metals analysis. One matrix spike/matrix spike duplicate sample (GW4-3-03) was collected from SB4-3. Disposable Teflon® bailers were used for sample collection at each well.

3.3.5 Area Five

On November 17, 1999, soil borings SB5-1, SB5-2, and SB5-3 were advanced by Earth Dimensions, Inc., in the location of the former fuel pumps and USTs. Soil boring SB5-3 was sampled continuously with a split spoon sampler from ground surface to a depth of 14 ft bgs. Soil borings SB5-1 and SB5-2 were sampled at the 3-5 ft bgs and 8-10 ft bgs increments. From

these borings, samples SB5-1-1 (3-5 ft bgs), SB5-2-1 (3-5 ft bgs), and SB5-3-1 (0-2 ft bgs) were selected for TCL VOC, polycyclic aromatic hydrocarbon (PAH), and lead analysis.

Temporary two-inch diameter monitoring wells were placed in each of the borings with well screens placed across the inferred water table elevation. On November 19, 1999, ground water samples GW5-1, GW5-2, and GW5-3 were obtained from SB5-1, SB5-2, and SB5-3, respectively, for TCL VOC, PAH, and lead analysis. Disposable Teflon® bailers were used for sample collection at each well.

3.3.6 Area Six

On November 18, 1999, soil borings SB6-2, SB6-3, and SB6-4 were advanced by Earth Dimensions Inc., in several selected former disposal/dumping areas located to the west of the main building. Soil boring samples SB6-4 and SB6-2 were sampled continuously with a split spoon sampler from ground surface to a depth of 20 ft bgs. Soil boring SB6-3 was sampled continuously from ground surface to 16 ft bgs. From these borings, samples SB6-2-2 (2-4 ft bgs), SB6-2-9 (16-18 ft bgs), SB6-3-5 (8-10 ft bgs), SB6-3-7 (14-16 ft bgs), SB6-4-4 (6-8 ft bgs), and SB6-4-8 (14-16 ft bgs) were selected for TCL VOC, BN/AE, and TAL metals analysis.

Temporary two-inch diameter monitoring wells were placed in each of the borings with well screens placed across the inferred water table elevations. On November 19, 1999, ground water samples GW6-2, GW6-3, and GW6-4 were obtained from SB6-2, SB6-3, and SB6-4, respectively, for TCL VOC, TCL BN/AE, and TAL metals analysis. A duplicate ground water sample (GW6-4-02) was collected from SB6-4. Disposable Teflon® bailers were used for sample collection at each well.

3.3.7 Area Seven

On November 19, 1999, sediment sample S7-1 was obtained from the drainage pit in the vehicle maintenance area for TCL VOC, BN/AE, and TAL metals analysis. The sample was obtained using a precleaned stainless steel hand trowel.

3.4 Sample Analytical Requirements

A summary of sample analytical requirements for the HTRW investigation at the AFB Plant No. 51 project site (as modified per Section 3.2) is contained in Table 3-2. Laboratory analytical services were provided by STL of Monroe, Connecticut. STL is currently certified by the USACE-MRD. All analyses were performed in accordance with the United States Environmental Protection Agency (USEPA) Test Methods of Evaluating Solid Wastes (SW-846, 3rd Edition). Laboratory analytical methods are specified in Table 3-3. Data quality protocols were specified in Section 4.1.2 (Data Quality Protocols) of the LWP. Sample maintenance, preservation, and handling procedures were implemented in accordance with Section 4.3 (Sample Documentation, Custody, and Shipping) of the LWP.

Table 3-3: Summary of Sample Analytical Requirements

Sample Designation	Sample Matrix	Sample Quantity	Sample Analytical Parameters	Field QA/QC Samples	Laboratory QA/QC Samples
Area One: S1-1 through S1-3	Soil / Sediment	3	TAL metals TCL VOC Cyanide	1 Field Blank	1 Matrix Spike\ Matrix Spike Dupe
Area One: SW1-1 through SW1-3	Surface Water	3	TAL metals Cyanide	1 Trip Blank	
Area Two: SW2-1 through SW2-3	Soil / Sediment	3	TAL metals TCL VOC Cyanide	1 Duplicate 1 Trip Blank	
Area Two: SW2-1 through SW2-3	Surface Water	3	TAL metals Cyanide		
Area Three: S3-1	Soil / Sediment	1	PCBs		
Area Four: SB4-1-7, SB4-1-9, SB4-2-2 and SB4-3-2	Soil	4	TAL metals TCL VOC TCL BN/AE	1 Duplicate 1 Trip Blank	1 Matrix Spike\ Matrix Spike Dupe
Area Four: GW4-1, GW4-2 and GW4-3	Ground Water	3	TAL metals TCL VOC TCL BN/AE		1 Matrix Spike\ Matrix Spike Dupe
Area Five: GW5-1, GW5-2 and GW5-3	Ground Water	3	TCL Metals TCL PAH Lead	1 Trip Blank	
Area Five: SB5-1-1, SB5-2-1 and SB5-3-1	Soil	6	TCL VOC TCL PAH Lead		
Area Six: SB6-2-2, SB6-2-9, SB6-3-5, SB6-3-7, SB6-4-4 and SB6-4-8	Soil	6	TAL metals TCL VOC TCL BN/AE	1 Trip Blank	
Area Six: GW6-2, GW6-3 and GW6-4	Ground Water	3	TAL metals TCL VOC TCL BN/AE	1 Duplicate	
Area Seven: SB7-1	Soil / Sediment	1	TAL metals TCL VOC TCL BN/AE		

Table 3-4: Sample Preservatives, Holding Times, and Sample Container Requirements

Parameter	Matrix	Analytical Method	Sample Preservation	Analytical Holding Times	Container (# / sample)
TCL Volatiles	Soil	8260	Cool 4° C	14 days	(1) Glass, wide-mouth, teflon lined cap, 4 oz
TCL Volatiles	Water	8260	Cool 4° C	7 days	(3) Glass vial, teflon lined septum cap, 40 ml (unpreserved)
TCL PAH	Soil	8270	Cool 4° C	Extraction: 14 days[1] Analysis: 40 days[1]	(1) Glass, wide-mouth, 8 oz
TCL PAH	Water	8270	Cool 4° C	Extraction: 7 days[1] Analysis: 40 days[1]	(2) Glass, amber, teflon lined cap, 1L
TAL Metals	Soil	6010, 7471[2]	Cool 4° C	180 days 26 days [2]	(1) Glass, wide-mouth, 8 oz
TAL Metals	Water	6010, 7471[2]	Cool 4° C HNO_3 pH < 2	180 days 26 days [2]	(1) Plastic, 1L
PCB	Soil	8082	Cool 4° C	Extraction: 10 days[1] Analysis: 40 days[1]	(1) Glass, wide-mouth, 8 oz
Lead	Soil	6010	Cool 4° C	180 days	(1) Glass, wide-mouth, 8 oz
Lead	Water	6010	Cool 4° C HNO_3 pH < 2	180 days	(1) Plastic, 1 L
Cyanide	Soil	9010	Cool 4° C	14 days	(1) Glass, wide-mouth, 8 oz
Cyanide	Water	9010	Cool 4° C NaOH pH > 12	14 days	(1) Plastic, 1L
TCL Semivolatiles (BN/AE)	Soil	8270	Cool 4° C	Extraction: 14 days[1] Analysis: 40 days[1]	(1) Glass, wide-mouth, 8 oz
TCL Semivolatiles (BN/AE)	Water	8270	Cool 4° C	Extraction: 7 days[1] Analysis: 40 days[1]	(2) Glass, amber, teflon lined cap, 1L

[1] Days from validated time of sample collection [2] Mercury

4.0 RESULTS AND DISCUSSION

4.1 ANALYTICAL RESULTS

Analytical results are discussed separately for each area of concern (Areas One through Seven) and each media sampled (soil, sediment, surface water, and ground water) in the ensuing sections. These data are compared to current NYSDEC criteria for soil, sediment, surface water and ground water media, as follows:

Soils

Recommended Soil Cleanup Objectives (RSCOs) defined in ***Determination of Soil Cleanup Objectives and Cleanup Levels*** (NYSDEC T.A.G.M. HWR-94-4046, January 24, 1994);

Sediments

Human Health Bioaccumulation, Benthic Aquatic Life Acute Toxicity, Benthic Aquatic Life Chronic Toxicity, and Wildlife Bioaccumulation levels of protection for organic compounds; and Lowest Effect Level (LEL) and Severe Effect Level (SEL) risk levels for metals defined in ***Technical Guidance for Screening Contaminated Sediments*** (NYSDEC Division of Fish and Wildlife/Division of Marine Resources, July 1994);

Surface Water

Source of Drinking Water [H(WS)], Human Consumption of Fish [H(FC)], Fish Propagation [A(C)], Fish Survival [A(A)], Wildlife Protection (W), and Aesthetics (E) standards and guidance values defined in ***Ambient Water Quality Standards and Guidance Values*** (NYSDEC T.O.G.S. 1.1.1, June 1998, as revised January 1999 and November 11, 1999).

Ground Water

Source of Drinking Water (GA) standards and guidance values defined in ***Ambient Water Quality Standards and Guidance Values*** (NYSDEC T.O.G.S. 1.1.1, June 1998, as revised January 1999 and November 11, 1999).

4.1.1 Area One

Area One consists of a pond, located northwest of the main plant, into which plating area rinse water from electroplating operations within Plant No. 51 was discharged. The results of laboratory analyses (TCL VOCs, TAL metals, and cyanide) for the sediment samples collected in this area are presented in Tables 4-1 and 4-2. Surface water sample analyses performed for TAL metals and cyanide are presented in Table 4-3, and surface water sample analyses performed for TCL VOCs and BN/AE are contained in Tables 4-4 and 4-5.

TABLE 4-1
AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK
VOLATILE ORGANIC COMPOUND (VOC) LABORATORY ANALYSIS OF SEDIMENT SAMPLING PERFORMED AT THE PROJECT SITE (ug/kg)
Sample Date: 11/16/99 - 11/19/99

Sample No.	S1-1	S1-2	S1-3	S2-1	S2-2	S2-3	NYSDEC Criteria [1]								Recommended
Laboratory Sample ID #	993083A-08	993083B-12	993083A-10	993083A-01	993083A-03	993083A-06	Benthic Aquatic Life Acute Toxicity		Benthic Aquatic Life Chronic Toxicity		Human Health Bioaccumulation		Wildlife Bioaccumulation		Soil Cleanup
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	SC_{oc}[2] ug/gOC	SC[3] ug/kg	SC_{oc}[2] ug/gOC	SC[3] ug/kg	SC_{oc}[2] ug/gOC	SC[3] ug/kg	SC_{oc}[2] ug/gOC	SC[3] ug/kg	Objectives (ug/kg) [5]
Acetone	310,000 JB	**90,000 J**	910 JB	65 B	1,100 JB	150 B	NS	NS	NS	NS	NS	NS	NS	NS	200
Benzene	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	0.6	30	NS	NS	60
Bromodichloromethane	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	NS
Bromoform	190,000 J	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	NS
Bromomethane	– U(1,000)	– U(1,000)	– U(1,000)	– U (10)	1,000 J	– U (10)	NS	NS	NS	NS	NS	NS	NS	NS	NS
2-Butanone	380,000 JB	31,000 JB	1,800 JB	17 JB	2,400 B	32 J	NS	NS	NS	NS	NS	NS	NS	NS	300
Carbon Disulfide	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	2,700
Carbon Tetrachloride	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	0.6[4]	30	NS	NS	600
Chlorobenzene	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	34.6	1,730	3.5	175	NS	NS	NS	NS	1,700
Chloroethane	– U(1,000)	– U(1,000)	– U(1,000)	– U (10)	– U(1,000)	– U (10)	NS	NS	NS	NS	NS	NS	NS	NS	1,900
Chloroform	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	300
Chloromethane	– U(1,000)	– U(1,000)	– U(1,000)	– U (10)	– U(1,000)	– U (10)	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dibromochloromethane	83,000 J	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	NS
1,1 - Dichloroethane	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	200
1,2-Dichloroethane	**73,000 J**	– U(1,000)	– U(1,000)	– U (5.0)	– U(1000)	– U (5.0)	NS	NS	NS	NS	0.7[4]	35	NS	NS	100
1,1 - Dichloroethene	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1000)	– U (5.0)	NS	NS	NS	NS	0.02[4]	1	NS	NS	400
cis-1,2-Dichloroethene	**450,000 J**	**62,000 J**	**2,600**	**460**	**320 J**	**320**	NS	NS	NS	NS	NS	NS	NS	NS	250
trans-1,2-Dichloroethene	– U(1,000)	– U(1,000)	– U(1,000)	3 J	– U(1,000)	3 J	NS	NS	NS	NS	NS	NS	NS	NS	300
1,2-Dichloropropane	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	300
cis-1,3-Dichloropropene	19,000 J	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	NS
trans1,3-Dichloropropene	70,000 J	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	NS
Ethlybenzene	**7,600 J**	– U(1,000)	50 J	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	5,500
2-Hexanone	310,000 J	– U(1,000)	– U(1,000)	– U (10)	– U(1,000)	– U (10)	NS	NS	NS	NS	NS	NS	NS	NS	NS
4-Methyl-2-Pentanone	**320,000 J**	– U(1,000)	– U(1,000)	– U (10)	360 J	– U (10)	NS	NS	NS	NS	NS	NS	NS	NS	1,000
Methylene Chloride	– U(1,000)	**13,000 J**	– U(1,000)	5 JB	– U(1,000)	17 J	NS	NS	NS	NS	NS	NS	NS	NS	100
Styrene	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	NS
1,1,2,2-Tetrachloroethane	**280,000 J**	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	0.3[4]	15	NS	NS	600
Tetrachloroethene	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	0.8	NS	NS	NS	1,400
Toluene	**14,000 J**	– U(1,000)	30 J	– U (5.0)	– U(1,000)	2 J	NS	NS	NS	NS	NS	NS	NS	NS	1,500
1,1,1-Trichloroethane	– U(1,000)	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	800
1,1,2-Trichloroethane	**170,000 J**	– U(1,000)	– U(1,000)	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	0.6[4]	30	NS	NS	NS
Trichloroethene	**10,000,000**	**1,300,000**	160 J	2 J	– U(1,000)	6 J	NS	NS	NS	NS	2.0	100	NS	NS	700
Vinyl Acetate	– U(1,000)	– U(1,000)	– U(1,000)	– U (10)	– U(1,000)	– U (10)	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vinyl Chloride	– U(1,000)	– U(1,000)	**590 J**	40 J	– U(1,000)	51 U	NS	NS	NS	NS	0.07[4]	4	NS	NS	200
Xylene (total)	**16,000 J**	– U(1,000)	74 J	– U (5.0)	– U(1,000)	– U (5.0)	NS	NS	NS	NS	NS	NS	NS	NS	1,200

NOTES:
U - Indicates that the compound was analyzed for but not detected (method detection limit).
J - Estimated value less than specified minimum detection limit.
B - The analyte is found in the laboratory blanks as well as the sample.
NS - No standard.

[1] - NYSDEC, Technical Guidance for Screening Contaminated Sediments, 1994.
[2] - Sediment Criteria - ug/gOC (Organic Carbon).
[3] - Sediment Criteria (assumed foc = 0.05).
[4] - Proposed criteria values.
[5] - NYSDEC, Division Technical Administrative Guidance Memorandum (TAGM) on Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-94-4046), NYSDEC, January 24, 1994

BOLD - Value exceeds Criteria and/or Recommended Soil Cleanup Objective (RSCO).

TABLE 4-2
AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK
METALS LABORATORY ANALYSIS OF SEDIMENT SAMPLING PERFORMED AT THE PROJECT SITE (mg/kg)
Sample Dates: 11/16/99 - 11/19/99

Sample No.	S1-1	S1-2	S1-3	S2-1	S2-2	S2-3	NYSDEC Criteria (mg/kg) [1]		Recommended Soil Cleanup	Eastern USA
Laboratory Sample ID #	993083A-08	993083B-12	993083A-10	993083A-01	993083A-03	993083A-06	LEL	SEL	Objectives (mg/kg) [2]	Background [2]
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment				
Aluminium	9,840 *	3,920 *	13,500 *	7,760 *	5,280 *	7,580 *	NC		SB	33,000
Antimony	**12.6** B	**4.2** B	**3.2** B	**12.1** B	**7.4** B	**8.2** B	2.0	25.0	SB	N/A
Arsenic	**13.1**	3.0 B	**8.1**	**12.9**	5.4	**7.4**	6.0	33.0	7.5 or SB	3.0-12
Barium	**569**	65.9 B	146	76.1	51.3 B	86.8 B	NC		300 or SB	15-600
Beryllium	-- U (0.45)	-- U (0.40)	**0.46** B	-- U (0.33)	-- U (0.28)	-- U (0.46)	NC		0.16 or SB	0-1.75
Cadmium	**4,200** *	**412**	**700** *	**2.9** *	**3.2** *	**5.7** *	0.6	9.0	1 or SB	0.1-1
Calcium	**42,300**	14,600	**40,300**	**101,000**	**48,200**	**68,600**	NC		SB	130-35,000
Chromium	**3,690** *	**758** *	**1,350** *	**637** *	**169** *	**98.8** *	26.0	110.0	10 or SB	1.5-40
Cobalt	10.6 B	3.3 B	10.8 B	16.2 B	9.0 B	9.3 B	NC		30 or SB	2.5-60
Copper	**563** *	**38.2** *	**133** *	**2,630** *	**708** *	**746** *	16.0	110.0	25 or SB	1,000-50,000
Iron	**71,500**	**7,930**	**24,600**	**110,000**	**30,300**	**32,700**	20,000	40,000	2,000 or SB	2,000-550,000
Lead	**923**	**46.0**	**83.5**	**1,460**	**749**	**914**	31.0	110.0	SB	200-500 [3]
Magnesium	**9,390**	3,040	**9,880**	**41,500**	**19,700**	**24,400**	NC		SB	100-5,000
Manganese	**562** *	174	**576** *	**708** *	**568**	**463** *	460.0	1,100.0	SB	50-5,000
Mercury	**0.40**	0.0087 B*	0.032	**0.93**	**0.58**	**1.1**	0.15	1.3	0.1	0.001-0.2
Nickel	**72.7** *	10 B*	**27.8** *	**417** *	**91.6** *	**71.1** *	16.0	50.0	13 or SB	0.5-25
Potassium	1,320 B	419 B	1,600 B	1,000 B	702 B	1,470 B	NC		SB	8,500-43,000
Selenium	**5.0** N	-- U (2.0)	1.9 UN	**5.7** N	2.0 N	**2.6** N	NC		2.0 or SB	0.1-3.9
Silver	0.80 BN	-- U (0.40)	-- U (0.37)	**3.7** N	**3.7** N	**4.1** BN	1.0	2.2	SB	N/A
Sodium	516 B	115 B	284 B	372 B	256 B	341 B	NC		SB	6,000-8,000
Thallium	-- U (4.5)	-- U (4.0)	-- U (3.7)	-- U (3.3)	-- U (2.8)	-- U (4.6)	NC		SB	N/A
Vanadium	56.1	20.1	48.0	94.1	35.6	41.7	NC		150 or SB	1-300
Zinc	**4,340** *	**400** *	**913** *	**1,340** *	**991** *	**1,410** *	120.0	270.0	20 or SB	9.0-50
Cyanide	1,220	17,200	7,380	5,670	1,250	1,280	NC		NC	NC

NOTES:
U - Indicates analyte was not detected (method reporting limit).
B - Indicates analyte result between IDL and contract required detection limit (CRDL).
N - Spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.

NC - No Criterion; N/A - Not Available
[1] - Technical Guidance for Screening Contaminated Sediments, NYSDEC, 1994.
LEL - lowest effect level; SEL - severe effect level.
[2] - Division Technical Administrative Guidance Memorandum (TAGM) on Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, January 24, 1994.
[3] - Avergae background levels in metropolitan/suburban areas or near highways.

BOLD - Values exceeds LEL and/or Recommended Soil Cleanup Objective (RSCO), or maximum Eastern USA background concentration.

TABLE 4-3
AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK
METALS LABORATORY ANALYSIS OF SURFACE WATER SAMPLING PERFORMED AT THE PROJECT SITE (ug/L)
Sample Dates: 11/16/99 - 11/19/99

Sample No.	SW1-1	SW1-2	SW1-3	SW2-1	SW2-2	SW2-3	NYSDEC Criteria (ug/L) [1]					
Laboratory Sample ID #	993083A-09	993083B-13	993083A-11	993083A-02	993083A-04	993083A-05						
Matrix	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	H(WS)[2]	H(FC)[3]	A(C)[4]	A(A)[5]	W[6]	E[7]
Aluminium	***17,200***	***928***	***2,440***	87.2 B	***38,800***	***1,660***	NA	NS	100	NS	NS	NS
Antimony	– U (6.0)	– U (6.0)	– U (6.0)	– U (6.0)	16.4 B	– U (6.0)	3	NS	NS	NS	NS	NS
Arsenic	11.9	4.0 B	– U (4.0)	– U (4.0)	21.4	– U (4.0)	50	NS	150[8]	340[8]	NS	NS
Barium	376	136 B	141 B	55.1 B	601	***2,100***	1,000	NS	NS	NS	NS	NS
Beryllium	– U (1.0)	– U (1.0)	– U (1.0)	– U (1.0)	2.2 B	– U (1.0)	3	NS	1,100 [9]	NS	NS	NS
Cadmium	***1,890***	***94.0***	***152***	– U (1.0)	***32.1***	***20.3***	5	NS	9.0 [9]	31.2 [9]	NS	NS
Calcium	151,000	94,300	103,000	74,900	538,000	32,500	NS	NS	NS	NS	NS	NS
Chromium	***816***	***143***	***274***	2.7 B	***305***	2.9 B	50	NS	339.2 [9]	2,606.7 [9]	NS	NS
Cobalt	15.8 B	– U (2.0)	3.5 B	– U (2.0)	64.8	5.6 B	NS	NS	NS	NS	NS	NS
Copper	***314*** N	12.0 B	20.1 BN	27.7 N	***5,970*** N	12.7 BN	200	NS	43.8 [9]	77.3 [9]	NS	NS
Iron	***52,900*** N	***3,040***	***5,990*** N	276 N	***134,000*** N	***899*** N	NA	NS	300	300	NS	300
Lead	***659***	14.0	25.6	***26.9***	***7,680***	***384***	50	NS	26.5 [9]	679.5 [9]	NS	NS
Magnesium	***45,400***	23,200 E	23,700	31,400	***225,000***	10,500	35,000	NS	NS	NS	NS	NA
Manganese	***2,120***	***1,160***	***793***	14.8 B	***6,240***	124	NS	NS	NS	NS	NS	300
Mercury	***2.3***	– U (0.1)	– U (0.1)	– U (0.1)	***6.2***	***7.3***	0.7	0.0007[13]	0.77[13]	1.4[13]	0.0026[13]	NA
Nickel	***213***	4.3 B	9.8 B	9.2 B	***525***	***776***	100	NS	250.3 [9]	2,252.7 [9]	NS	NS
Potassium	14,600	11,700	11,400	3,380 B	11,100	7,680	NS	NS	NS	NS	NS	NS
Selenium	– U (5.0)	– UN (5.0)	– U (5.0)	– U (5.0)	***5.1***	***12.4***	10	NS	4.6[11]	NS	NS	NS
Silver	***3.4*** B	– U (1.0)	– U (1.0)	– U (1.0)	***10.4***	– U (1.0)	50	NS	0.1[12]	99.1 [9]	NS	NS
Sodium	7,770	7,190	6,520	35,100	47,600	338,000	NS	NS	NS	NS	NS	NS
Thallium	– U (10.0)	– U (10.0)	***10.6***	***11.0***	– U (10.0)	***18.3***	0.5	NS	8[10]	20	NS	NS
Vanadium	***61.2***	5.1 B	10.0 B	– U (2.0)	***178***	2.7 B	NS	NS	14[10]	190[10]	NS	NS
Zinc	***1,360***	140	196	83.5	***8,040***	***1,310***	2,000	NS	400.6 [9]	565.2 [9]	NS	5,000
Cyanide	– U (10.0)	– U (10.0)	– U (10.0)	– U (10.0)	– U (10.0)	***58***	200	9,000	5.2	22	NS	NS

NOTES:
U - Indicates analyte was not detected (method reporting limit).
B - Indicates analyte result between IDL and contract required detection limit (CRDL)
E - Reported value is estimated because of presence of interference.
N - Spiked sample recovery not within control limits.

NS - No Standard.
[1] - Division of Water Technical and Operational Guidance Series, Ambient Water Quality Standards and Guidance Values, T.O.G.S. 1.1.1, 1998.
[2] - Values developed for the protection of a drinking water source (surface water).
[3] - Values developed for the protection of human consumption of fish (fresh waters).
[4] - Values developed for the protection of fish propagation (fresh waters).
[5] - Values developed for the protection of fish survival (fresh waters).
[6] - Values developed for wildlife protection (fresh waters).
[7] - Values developed for protections of aesthetics (fresh waters).
[8] - Dissolved Arsenic form.
[9] - Assumed hardness is 641 mg/L (Sherwood, 1997).
[10] - Acid-soluble form.
[11] - Dissolved form.
[12] - Ionic silver.
[13] - Dissolved form.

BOLD - Value exceeds most stringent standard/guidance value.

TABLE 4-4
AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK
VOLATILE ORGANIC COMPOUND (VOC) LABORATORY ANALYSIS OF SURFACE WATER SAMPLING PERFORMED AT THE PROJECT SITE (ug/L)
Sample Date: 11/19/99

Sample No.	SW1-2	NYSDEC Criteria (ug/L) [1]					
Laboratory Sample ID #	993083B-13						
Matrix	Water	H(WS)[2]	H(FC)[3]	A(C)[4]	A(A)[5]	W[6]	E[7]
Acetone	***285***	50	NS	NS	NS	NS	NS
Benzene	-- U (5.0)	1	10	210	760	NS	NS
Bromodichloromethane	-- U (5.0)	50	NS	NS	NS	NS	NS
Bromoform	-- U (5.0)	50	NS	NS	NS	NS	NS
Bromomethane	-- U (10)	5	NS	NS	NS	NS	NS
2-Butanone	-- U (10)	NS	NS	NS	NS	NS	NS
Carbon Disulfide	-- U (5.0)	60	NS	NS	NS	NS	NS
Carbon Tetrachloride	-- U (5.0)	0.4	NS	NS	NS.	NS	NS
Chlorobenzene	-- U (5.0)	5	400	5	NS	NS	20/50 [10]
Chloroethane	-- U (10)	5 [8]	NS	NS	NS	NS	NS
Chloroform	-- U (5.0)	7	NS	NS	NS	NS	NS
Chloromethane	-- U (10)	NS	NS	NS	NS	NS	NS
Dibromochloromethane	-- U (5.0)	50	NS	NS	NS	NS	NS
1,1 - Dichloroethane	-- U (5.0)	5	NS	NS	NS	NS	NS
1,2-Dichloroethane	-- U (5.0)	0.6	NS	NS	NS	NS	NS
1,1 - Dichloroethene	***4*** J	0.07	NS	NS	NS	NS	NS
cis-1,2-Dichloroethene	***530***	5	NS	NS	NS	NS	NS
trans-1,2-Dichloroethene	-- U (5.0)	5	NS	NS	NS	NS	NS
1,2-Dichloropropane	-- U (5.0)	1	NS	NS	NS	NS	NS
cis-1,3-Dichloropropene	-- U (5.0)	0.4 [11]	NS	NS	NS	NS	NS
trans1,3-Dichloropropene	-- U (5.0)	0.4 [11]	NS	NS	NS	NS	NS
Ethlybenzene	-- U (5.0)	5	NS	17	150	NS	NS
2-Hexanone	-- U (10)	50	NS	NS	NS	NS	NS
4-Methyl1-2-Pentanone	-- U (10)	NS	NS	NS	NS	NS	NS
Methylene Chloride	***12*** J	5	200	NS	NS	NS	NS
Styrene	-- U (5.0)	5 [8]	NS	NS	NS	NS	50
1,1,2,2-Tetrachloroethane	-- U (5.0)	0.2	NS	NS	NS	NS	NS
Tetrachloroethene	***4*** J	0.7	1	NS	NS	NS	NS
Toluene	-- U (5.0)	5	6,000	100	480	NS	NS
1,1,1-Trichloroethane	-- U (5.0)	5	NS	NS	NS	NS	NS
1,1,2-Trichloroethane	-- U (5.0)	1	NS	NS	NS	NS	NS
Trichloroethene	***260***	5	40	NS	NS	NS	NS
Vinyl Acetate	-- U (10)	NS	NS	NS	NS	NS	NS
Vinyl Chloride	***380***	0.3	NS	NS	NS	NS	NS
Xylene (total)	-- U (5.0)	5 [9]	NS	65	590	NS	NS

NOTES:

U - Indicates that the compound was analyzed for but not detected (method detection limit).

J - Estimated value less than specified minimum detection limit.

B - The analyte is found in the laboratory blanks as well as the sample.

NS - No standard.

[1] - Division of Water Technical and Operational Guidance Series Ambient Water Quality Standards and Guidance Values, T.O.G.S. 1.1.1, 1998.

[2] - Values developed for the protection of a drinking water source (surface water).

[3] - Values developed for the protection of human consumption of fish (fresh waters).

[4] - Values developed for the protection of fish propagation (fresh waters).

[5] - Values developed for the protection of fish survival (fresh waters).

[6] - Values developed for wildlife protection (fresh waters).

[7] - Values developed for protections of aesthetics (fresh waters).

[8] - Substance does not have a more stringent specific MCL.

[9] - Applies to the sum of 1,2 - 1,3 and 1,4-xylene.

[10] - Potable water, aesthetics / aquatic life, aesthetics.

[11] - Applies to the sum of cis and trans -1,3 - dichloropropene.

BOLD - Value exceeds most stringent standard/guidance value.

TABLE 4-5
AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK
SEMIVOLATILE ORGANIC COMPOUND (VOC) LABORATORY ANALYSIS OF SURFACE WATER SAMPLING PERFORMED AT THE PROJECT SITE (ug/L)
Sample Date: 11/19/99

Sample No.	SW1-2	NYSDEC Criteria (ug/L) [1]					
Laboratory Sample ID #	993083B-13						
Matrix	Water	H(WS) [2]	H(FC) [3]	A(C) [4]	A(A) [5]	W [6]	E [7]
Phenol	– U (10)	NS	NS	NS	NS	NS	1 [9]
bis (2-Chloroethyl) ether	– U (10)	0.03	NS	NS	NS	NS	NS
2-Chlorophenol	– U (10)	5	NS	NS	NS	NS	NS
1,3-Dichlorobenzene	– U (10)	3	NS	5	NS	NS	20
1,4-Dichlorobenzene	– U (10)	3	NS	5	NS	NS	30
Benzyl alcohol	– U (10)	NS	NS	NS	NS	NS	NS
1,2-Dichlorobenzene	– U (10)	3	NS	5	NS	NS	50
2-Methylphenol	– U (10)	5	NS	NS	NS	NS	NS
2,2'-oxybis (1-Chloropropane)	– U (10)	NS	NS	NS	NS	NS	NS
4-Methylphenol	– U (10)	5	NS	NS	NS	NS	NS
N-Nitroso-di-n-propylamine	– U (10)	50	NS	NS	NS	NS	NS
Hexachloroethane	– U (10)	5	0.6	NS	NS	NS	NS
Nitrobenzene	– U (10)	0.4	NS	NS	NS	NS	30
Isophorone	0.6 J	50	NS	NS	NS	NS	NS
2-Nitrophenol	– U (10)	5	NS	NS	NS	NS	NS
2,4-Dimethylphenol	– U (10)	50	1,000	NS	NS	NS	NS
Benzoic acid	– U (50)	NS	NS	NS	NS	NS	NS
bis (2-Chloroethoxy) methane	– U (10)	5	NS	NS	NS	NS	NS
2,4-Dichlorophenol	– U (10)	5	NS	NS	NS	NS	0.3
1,2,4-Trichlorobenzene	– U (10)	5	NS	5 [8]	NS	NS	10 [8]
Naphthalene	0.2 J	NS	NS	13	110	NS	10
4-Chloro-3-methylphenol	– U (10)	NS	NS	NS	NS	NS	NS
2-Methylnaphthalene	0.4 J	NS	NS	4.7	42	NS	NS
Hexachlorocyclopentadiene	– U (10)	5	NS	0.45	4.5	NS	1
2,4,6-Trichlorophenol	– U (10)	5	NS	NS	NS	NS	NS
2,4,5-Trichlorophenol	– U (50)	5	NS	NS	NS	NS	NS
2-Chloronaphthalene	– U (10)	NS	NS	NS	NS	NS	10
2-Nitroaniline	– U (50)	5	NS	NS	NS	NS	NS
Dimethylphthalate	– U (10)	50	NS	NS	NS	NS	NS
Acenaphthylene	– U (10)	NS	NS	NS	NS	NS	NS
2,6-Dinitrotoluene	– U (10)	0.07	NS	NS	NS	NS	NS
3-Nitroaniline	– U (50)	5	NS	NS	NS	NS	NS
Acenaphthene	– U (10)	NS	NS	5.3	48	NS	20
2,4-Dinitrophenol	– U (50)	10	400	NS	NS	NS	NS
4-Nitrophenol	– U (50)	5	NS	NS	NS	NS	NS
Dibenzofuran	– U (10)	NS	NS	NS	NS	NS	NS
2,4-Dinitrotoluene	– U (10)	5	NS	NS	NS	NS	NS
Diethylphthalate	– U (10)	50	NS	NS	NS	NS	NS
4-Chlorophenyl-phenylether	– U (10)	NS	NS	NS	NS	NS	NS
Fluorene	– U (10)	50	NS	0.54	4.8	NS	NS
4-Nitroaniline	– U (20)	5	NS	NS	NS	NS	NS
4,6-Dinitro-2-methylphenol	– U (50)	5	NS	NS	NS	NS	NS
N-Nitrosodiphenylamine (1)	– U (10)	50	NS	NS	NS	NS	NS
4-Bromophenyl-phenylether	– U (10)	NS	NS	NS	NS	NS	NS
Hexachlorobenzene	– U (10)	0.04	3×10^{-5}	NS	NS	NS	NS
Pentachlorophenol	– U (50)	NS	NS	4.03[10]	5.28[10]	NS	1[9]
Phenanthrene	– U (10)	50	NS	5	45	NS	NS
Anthracene	– U (10)	50	NS	3.8	35	NS	NS
Carbazole	– U (10)	NS	NS	NS	NS	NS	NS
Di-n-butylphthalate	0.7 JB	50	NS	NS	NS	NS	NS
Fluoranthene	– U (10)	50	NS	NS	NS	NS	NS
Pyrene	– U (10)	50	NS	4.6	42	NS	NS
Butylbenzylphthalate	– U (10)	50	NS	NS	NS	NS	NS
3,3'-Dichlorobenzidine	– U (20)	5	NS	NS	NS	NS	NS
Benzo(a)anthracene	– U (10)	0.002	NS	0.03	0.23	NS	NS
Chrysene	– U (10)	0.002	NS	NS	NS	NS	NS
bis(2-Ethylhexyl)phthalate	0.8 JB	5	NS	0.6	NS	NS	NS
Di-n-octylphthalate	0.4 JB	50	NS	NS	NS	NS	NS
Benzo(b)fluoranthene	– U (10)	0.002	NS	NS	NS	NS	NS
Benzo(k)fluoranthene	– U (10)	0.002	NS	NS	NS	NS	NS
Benzo(a)pyrene	– U (10)	0.002	0.0012	NS	NS	NS	NS
Indeno(1,2,3-cd)pyrene	– U (10)	0.002	NS	NS	NS	NS	NS
Dibenzo(a,h)anthracene	– U (10)	NS	NS	NS	NS	NS	NS
Benzo(g,h,i)perylene	– U (10)	NS	NS	NS	NS	NS	NS

NOTES:
U - Indicates that the compound was analyzed for but not detected (method detection limit).
J - Estimated value less than minimum detection limit.
B - The analyte is found in the laboratory blanks as well as the sample.

NS - No Standard.
[1] - Division of Water Technical and Operational Guidance Series Ambient Water Quality Standards and Guidance Values, T.O.G.S.1.1.1, 1998.
[2] - Values developed for the protection of a drinking water source (surface water).
[3] - Values developed for the protection of human consumption of fish (fresh waters).
[4] - Values developed for the protection of fish propagation (fresh waters).
[5] - Values developed for the protection of fish survival (fresh waters).
[6] - Values developed for wildlife protection (fresh waters).
[7] - Values developed for protections of aesthetics (fresh waters).
[8] - Applies to the sum of 1,2,3-1,2,4 and 1,3,5-trichlorobenzene.
[9] - Value for total phenols.
[10] - pH assumed to be 6.5.

Significantly elevated concentrations of several VOCs were detected in Area One sediments, primarily trichloroethene (TCE) and cis,1-2 dichloroethene (DCE). TCE was detected at a concentration of 10,000,000 ug/kg (1 per cent) in S1-1, and 1,300,000 ug/kg in S1-2; these concentrations are orders of magnitude higher than the applicable sediment screening criteria and RSCO. DCE was detected at a concentration of 2,600 ug/kg in S1-3, an order of magnitude above the RSCO. As indicated in Table 4-1, a range of other VOCs were also detected in S1-1, and to a lesser degree in S1-2 and S1-3; however, due to the effect of sample dilution (necessitated by the elevated TCE and/or DCE concentrations), the detection limits for these analytes were elevated. Reported estimated ('J' qualified) concentrations exceeded screening criteria or the RSCO for DCE, ethylbenzene, 1,2-dichloroethane, 4-methyl-2-pentanone, methylene chloride, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, toluene, vinyl chloride, and xylenes.

As would be expected from the source of the water discharge into the pond, most metals concentrations significantly exceeded LEL and SEL criteria (by as much as four orders of magnitude). The most significant contaminants are cadmium, chromium, and zinc, with maximum concentrations (at S1-1) of 4,200, 3,690, and 4,340 mg/kg, respectively. At all three sample locations, antimony, cadmium, chromium, copper, lead, and zinc exceeded the LEL, and all (with the exception of copper (in S1-2), lead (in S1-2 and S1-3), and antimony) exceeded the SEL. In addition, arsenic exceeded the LEL in S1-1 and S1-3; iron exceeded the LEL and SEL in S1-1 and the LEL S1-3; manganese exceeded the LEL in S1-1 and S1-3; mercury exceeded the LEL in S1-1; and nickel exceeded the LEL and SEL in S1-1 and the LEL in S1-3. Many of the inorganic concentrations also exceed RSCOs, as follows: cadmium, chromium, copper, iron, and zinc at all three sample locations; arsenic (at S1-1 and S1-3), barium (at S1-1), beryllium (at S1-3; estimated concentration), mercury (at S1-1), and nickel (at S1-1 and S1-3).

At SW1-2, the drinking water and human consumption of fish criteria were exceeded for TCE, and drinking water criteria were exceeded for acetone, DCE, and vinyl chloride (the latter two compounds representing breakdown products of TCE). Estimated concentrations of 1,1-dichloroethene, methylene chloride, and tetrachloroethene also exceeded the drinking water criterion (and for tetrachloroethene, the human consumption of fish criterion). No semivolatile organic base-neutral/acid extractable (BN/AE) constituents were detected in excess of NYSDEC criteria.

Surface water samples SW1-1, SW1-2, and SW1-3 exceeded fish propagation [A(C)] criteria for aluminum; drinking water [H(WS)], fish propagation, and fish survival [A(A)] criteria for cadmium; the drinking water criterion for chromium; fish propagation and fish survival criteria for iron; and the aesthetics (E) criterion for manganese. In addition, at SW1-1, all surface water criteria were exceeded for mercury; drinking water, fish propagation, and fish survival criteria were exceeded for copper; drinking water criteria were exceeded for magnesium, and nickel; drinking water and fish propagation criteria were exceeded for lead; fish propagation criteria were exceeded for chromium and silver; and fish propagation and fish survival criteria were exceeded for zinc. Also, at SW1-3, the drinking water and fish propagation criteria were exceeded for thallium.

4.1.2 Area Two

The results of laboratory analyses (TCL VOCs, TAL metals, and cyanide) of sediment samples collected at and downstream of the plating pond discharge into the Area Two wetland are presented in Tables 4-1 and 4-2. Surface water sample analyses performed for TAL metals and cyanide are presented in Table 4-3.

DCE (a breakdown product of TCE) exceeded the RSCO in samples S2-1 and S2-3 (and as an estimated concentration in S2-2). As in Area One, sediment enrichment with metals was also exhibited in Area Two sediments. At all three sample locations, antimony, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc exceeded the LEL, and chromium (S2-1 and S2-2), copper, iron (S2-1), lead, nickel, silver, and zinc also exceeded the SEL. In addition, arsenic exceeded the LEL at S2-1 and S2-3. The RSCO was exceeded at all sample locations for cadmium, chromium, copper, iron, mercury, nickel, and zinc; at S2-1 for arsenic; and at S2-3 for selenium (estimated concentration). Relative to Area One, the Area Two sediments appear to be more enriched in copper, iron, lead, magnesium, mercury, nickel, and silver.

With the exception of lead and thallium (both for fish propagation criterion), no surface water criteria were exceeded for metals at sample location SW2-1. At SW2-2 and SW2-3, all surface water criteria were exceeded for mercury. In addition, at SW2-2, drinking water criteria were exceeded for cadmium, chromium, copper, lead, magnesium, nickel, and zinc; fish propagation criteria were exceeded for cadmium, copper, lead, nickel, silver, selenium, vanadium, and zinc; fish survival criteria were exceeded for cadmium, copper, lead, and zinc; and the aesthetics criterion was exceeded for manganese. At SW2-3, drinking water criteria were exceeded for barium, cadmium, lead, nickel, and thallium; fish propagation criteria were exceeded for cadmium, lead, nickel, selenium, thallium, and zinc; and the fish survival criterion was exceeded for zinc.

4.1.3 Area Three

Soils in the transformer sump located west of the main building were sampled and analyzed for polychlorinated biphenyls (PCBs). No PCBs were detected above the reporting limit in Sample S3-1.

4.1.4 Area Four

The results of soil and ground water analyses for TCL VOC, BN/AE, and TAL metals obtained at the former locations of Building 15, Building 16 (former maintenance storage building) and Building 17 (former lumber storage shed) are presented in Tables 4-6, 4-7, 4-8 (soils); and 4-9, 4-10, and 4-11 (ground water).

No VOC or semivolatile BN/AE compounds were detected in Area Four soil samples in excess of RSCOs. In all samples, chromium, iron, zinc, and beryllium (estimated concentrations)

TABLE 4-6
AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK
VOLATILE ORGANIC COMPOUND (VOC) LABORATORY ANALYSIS OF SOIL SAMPLING PERFORMED AT THE PROJECT SITE (ug/kg)
Sample Dates: 11/16/99 - 11/19/99

Sample No.	SB4-1-7	SB4-1-9	SB4-2-2	SB4-3-2	SB5-1-1	SB5-2-1	SB5-3-1	SB6-2-2	SB6-2-9	SB6-3-5	SB6-3-7	SB6-4-8	SB6-4-4	S7-1	Recommended Soil Cleanup Objectives (ug/kg) [1]
Laboratory Sample ID #	993083A-12	993083A-13	993083A-14	993083C-03	993083A-16	993083A-17	993083A-15	993083B-17	993083B-18	993083C-01	993083C-02	993083B-16	993083B-15	993083C-05	
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Acetone	14 B	14 B	67 B	29 B	10 JB	150 B	740 JB	10 JB	20 B	11 JB	8 JB	11 B	7 JB	2 JB	200
Benzene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (10)	60
Bromodichloromethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	NS
Bromoform	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	270 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	0.4 J	-- U (5.0)	-- U (5.0)	NS
Bromomethane	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (1,000)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (5.0)	NS
2-Butanone	-- U (10)	3 J	5 J	4 JB	-- U (10)	18 J	1,300 B	-- U (10)	3 JB	3 JB	2 JB	2 J	-- U (10)	-- U (5.0)	300
Carbon Disulfide	5	-- U (5.0)	-- U (5.0)	-- U (5.0)	1 J	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	2 J	-- U (5.0)	-- U (5.0)	2,700
Carbon Tetrachloride	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	600
Chlorobenzene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	0.8 J	1,700
Chloroethane	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (1,000)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (5.0)	1,900
Chloroform	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	300
Chloromethane	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (1,000)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	11 JB	NS
Dibromochloromethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	60
1,1 - Dichloroethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (10)	200
1,2 -Dichloroethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	100
1,1 - Dichloroethene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	400
cis-1,2-Dichloroethene	2 J	-- U (5.0)	-- U (5.0)	0.2 J	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	250
1,2-Dichloropropane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	300
cis-1,3-Dichloropropene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	300
Ethylbenzene	-- U (5.0)	-- U (5.0)	-- U (5.0)	0.4 J	-- U (5.0)	-- U (5.0)	220 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (10)	5,500
2-Hexanone	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (1,000)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (5.0)	NS
4-Methyl-2-Pentanone	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (1,000)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (5.0)	1,000
Methylene Chloride	-- U (5.0)	-- U (5.0)	-- U (5.0)	2 JB	-- U (5.0)	24 J	-- U (1,000)	2 JB	2 JB	2 JB	2 JB	-- U (5.0)	2 JB	-- U (10)	100
Styrene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (10)	NS
1,1,2,2-Tetrachloroethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	520 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	600
Tetrachloroethene	2 J	0.6 U (5.0)	0.4 J	2 J	0.6 J	-- U (5.0)	-- U (1,000)	0.9 J	0.4 J	-- U (5.0)	0.2 J	-- U (5.0)	0.5 J	-- U (5.0)	1,400
Toluene	0.8 J	-- U (5.0)	0.2 J	0.8 J	-- U (5.0)	-- U (5.0)	-- U (1,000)	0.3 J	0.2 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	1,500
trans-1,2-Dichloroethene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (10)	300
trans1,3-Dichloropropene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	2 JB	300
1,1,1-Trichloroethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (1,000)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	800
1,1,2-Trichloroethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	320 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (10)	NS
Trichloroethene	-- U (5.0)	1 J	0.6 J	61	1 J	12 J	240 J	1 J	1 J	0.2 J	0.8 J	0.8 J	2 J	-- U (5.0)	700
Vinyl Acetate	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (1,000)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (5.0)	NS
Vinyl Chloride	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (1,000)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (5.0)	200
Xylene (total)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	***3,700***	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	1,200

NOTES:

U - Indicates that the compound was analyzed for but not detected (method detection limit).

J - Estimated value less than minimum detection limit.

B - Analyte is found in the laboratory blanks as well as the sample.

NS - No Standard.

[1] - Division Technical Administrative Guidance Memorandum (TAGM) on Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-94-4046), NYSDEC, January 24, 1994.

BOLD - Value exceeds Recommended Soil Cleanup Objective (RSCO)

TABLE 4-7
AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK
SEMIVOLATILE ORGANIC COMPOUND (SVOC) LABORATORY ANALYSIS OF SOIL SAMPLING PERFORMED AT THE PROJECT SITE (ug/kg)
Sample Dates: 11/17/99 - 11/19/99

Sample No.	SB4-1-7	SB4-1-9	SB4-2-2	SB4-3-2	SB6-2-2	SB6-2-9	SB6-3-5	SB6-3-7	SB6-4-4	SB6-4-8	S7-1	Recommended
Laboratory Sample ID #	993083A-12	993083A-13	993083A-14	993083C-03	993083B-17	993083B-18	993083C-01	993083C-01	993083B-15	993083B-16	993083C-05	Soil Cleanup
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Objectives (ug/kg) [1]
Phenol	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	**570** J	30 or MDL
bis (2-Chloroethyl) ether	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
2-Chlorophenol	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	800
1,3-Dichlorobenzene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
1,4-Dichlorobenzene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
Benzyl alcohol	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
1,2-Dichlorobenzene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
2-Methylphenol	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	100 or MDL
2,2'-oxybis (1-Chloropropane)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
4-Methylphenol	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	900
N-Nitroso-di-n-propylamine	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
Hexachloroethane	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
Nitrobenzene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	200 or MDL
Isophorone	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	4,400
2-Nitrophenol	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	330 or MDL
2,4-Dimethylphenol	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
Benzoic acid	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	140 J	NS
bis (2-Chloroethoxy) methane	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
2,4-Dichlorophenol	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	0
1,2,4-Trichlorobenzene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
Naphthalene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	28 J	13,000
4-Chloro-3-methylphenol	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	240 or MDL
2-Methylnaphthalene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	**39** J	36
Hexachlorocyclopentadiene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
2,4,6-Trichlorophenol	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
2,4,5-Trichlorophenol	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	0
2-Chloronaphthalene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
2-Nitroaniline	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	430 or MDL
Dimethylphthalate	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	180 J	2,000
Acenaphthylene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	62 J	41,000
2,6-Dinitrotoluene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	1,000
3-Nitroaniline	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	500 or MDL
Acenaphthene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	85 J	50,000
2,4-Dinitrophenol	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	200 or MDL
4-Nitrophenol	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	100 or MDL
Dibenzofuran	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	41 J	6,200
2,4-Dinitrotoluene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
Diethylphthalate	– U (330)	11 J	42 J	– U (330)	6 JB	8 JB	– U (330)	– U (330)	25 JB	– U (330)	– U (330)	7,100
4-Chlorophenyl-phenylether	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
Fluorene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	87 J	50,000
4-Nitroaniline	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	NS
4,6-Dinitro-2-methylphenol	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	NS
N-Nitrosodiphenylamine (1)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
4-Bromophenyl-phenylether	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	NS
Hexachlorobenzene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	410
Pentachlorophenol	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	– U (1,600)	1,000 or MDL
Phenanthrene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	1,500	50,000
Anthracene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	180 J	50,000
Carbazole	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	220 J	NS
Di-n-butylphthalate	15 JB	36 JB	33 JB	17 JB	14 JB	24 JB	24 JB	18 JB	20 JB	14 JB	130 JB	8,100
Fluoranthene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	2,100	50,000
Pyrene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	2,400	50,000
Butylbenzylphthalate	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	1,400	50,000
3,3'-Dichlorobenzidine	– U (660)	– U (660)	– U (660)	– U (660)	– U (660)	– U (660)	– U (660)	– U (660)	– U (660)	– U (660)	– U (660)	N/A
Benzo(a)anthracene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	**970** J	224 or MDL
Chrysene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	**1,600**	400
bis(2-Ethylhexyl)phthalate	160 JB	410 B	260 JB	63 JB	51 JB	280 JB	270 JB	220 JB	160 JB	170 JB	1,200 B	50,000
Di-n-octylphthalate	16 JB	12 JB	28 JB	18 JB	9 JB	32 JB	21 JB	23 JB	– U (330)	10 JB	– U (330)	50,000
Benzo(b)fluoranthene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	**1,200**	1,100
Benzo(k)fluoranthene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	**1,700**	1,100
Benzo(a)pyrene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	**1,200**	61 or MDL
Indeno(1,2,3-cd)pyrene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	450 J	3,200
Dibenzo(a,h)anthracene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	**140** J	14 or MDL
Benzo(g,h,i)perylene	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	– U (330)	370 J	50,000

NOTES:
U - Indicates that the compound was analyzed for but not detected (method detection limit).
J - Estimated value less than minimum detection limit.
B - Analyte is found in the laboratory blanks as well as the sample.

NS - No Standard, N/A - Not Available, MDL - method detection limit.
[1] - Division Technical Administrative Guidance Memorandum (TAGM) on Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-94-4046), NYSDEC, January 24, 1994.

BOLD - Value exceeds Recommended Soil Cleanup Objective (RSCO)

TABLE 4-8
AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK
METALS LABORATORY ANALYSIS OF SOIL SAMPLING PERFORMED AT THE PROJECT SITE (mg/kg)
Sample Date: 11/17/99 - 11/18/99

Sample No.	SB4-1-7	SB4-1-9	SB4-2-2	SB4-3-2	SB5-1-1	SB5-2-1	SB5-3-1	SB6-2-2	SB6-2-9	SB6-3-5	SB6-3-7	SB6-4-4	SB6-4-8	S7-1	Recommended Soil Cleanup Objectives (mg/kg) [1]	Eastern USA Background [1]
Laboratory Sample ID #	993083A-12	993083A-13	993083A-14	993083C-03	993083A-16	993083A-17	993083A-1	993083B-17	993083B-18	993083C-01	993083C-02	993083B-15	9903083B-16	993083C-05		
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Aluminium	7090 *	6,940 *	11,600 *	14,200	NR	NR	NR	18,300 *	5,250 *	3,890	4,550	8,640 *	4,370 *	4,160	SB	33,000
Antimony	1.8 B	1.6 B	– U (1.3)	– UN (1.6)	NR	NR	NR	– U (1.6)	1.5 B	– UN (1.2)	– UN (1.3)	1.9 B	2.0 B	4.2 BN	SB	N/A
Arsenic	1.3 B	1.6	4.1	6.5	NR	NR	NR	***10.1***	1.1 B	1.6 B	1.8 B	2.2	1.8 B	***24.6***	7.5 or SB	3-12
Barium	77.8	68.5	75.9	125	NR	NR	NR	115	39.1	58.2	83.6	67.8	86.2	86.8	300 or SB	15-600
Beryllium	***0.22*** B	***0.21*** B	***0.47*** B	***0.56*** B	NR	NR	NR	***0.84*** B	– U (0.16)	– U (0.17)	– U (0.19)	***0.3*** B	– U (0.22)	– U (0.25)	0.16 or SB	0-1.75
Cadmium	– U* (0.18)	0.20 B*	0.39 B*	– U (0.22)	NR	NR	NR	– U (0.22)	– U (0.16)	– U (0.17)	– U (0.19)	– U (0.17)	– U (0.22)	***1.9***	1 or SB	0.1-1
Calcium	***42,500***	***54,700***	7,050	***59,500***	NR	NR	NR	3,790	***50,300***	***65,000***	***37,100***	***102,000***	***41,400***	***46,800***	SB	130-35,000
Chromium	***11.3*** *	***14.7*** *	***24.8*** *	***22.0***	NR	NR	NR	***26.7*** *	9.5 *	8.1	9.7	***14.5*** *	7.7 *	***106***	10 or SB	1.5-40
Cobalt	6.0 B	6.0 B	8.9 B	21.3	NR	NR	NR	17.9	5.0 B	4.4 B	4.1 B	6.6 B	4.5 B	19.9	30 or SB	2.5-60
Copper	11.0 *	12.0 *	***41.0*** *	***26.1***	NR	NR	NR	***29.8*** *	9.6 *	9.6	9.7	16.1 *	11.8 *	***300***	25 or SB	1-50
Iron	***13,600***	***12,900***	***29,300***	***26,800***	NR	NR	NR	***35,100***	***11,900***	***10,900***	***11,800***	***15,800***	***10,500***	***250,000***	2,000 or SB	2,000-550,000
Lead	3.4	3.5	69.9	16.9	10.6	6.5	41.1	18.1	3.5	3.3	3.5	4.9	2.4	126	SB	200-500 [2]
Magnesium	***11,200***	***11,200***	***5,850***	***16,200***	NR	NR	NR	***5,920***	***11,800***	***8,530***	***8,300***	***15,800***	***11,000***	***22,400***	SB	100-5,000
Manganese	398 *	528 *	206 *	1,280 *	NR	NR	NR	872	400	415 *	357	435	385	1,730 *	SB	50-5,000
Mercury	0.0087	0.011	0.0053 B	0.019	NR	NR	NR	0.0082 *	0.0044 B*	0.0052 B	– U (0.0046)	0.064 *	0.012 *	***0.35***	0.1	0.001-0.2
Nickel	12.8 *	***14.0*** *	***27.5*** *	***49.1***	NR	NR	NR	***38.8*** *	10.2 *	8.8	8.8	***14.4*** *	9.5 *	***112***	13 or SB	0.5-25
Potassium	1,470	1,390	895 B	2,440	NR	NR	NR	1,640	974	714 B	842 B	1,820	752 B	889 B	SB	8,500-43,000
Selenium	– UN (0.88)	– UN (0.76)	1.3 N	1.5	NR	NR	NR	1.7	1.2	– U (0.84)	– U (0.95)	– U (0.86)	– U (1.1)	***13.6***	2.0 or SB	0.1-3.9
Silver	– UN (0.18)	– U (0.15)	0.40 B	– U (0.22)	NR	NR	NR	– U (0.22)	– U (0.16)	– U (0.17)	– U (0.19)	– U (0.17)	– U (0.22)	7.5	SB	N/A
Sodium	274 B	344 B	73.6 B	376 B	NR	NR	NR	124 B	279 B	534 B	348 B	380 B	219 B	334 B	SB	6,000-8,000
Thallium	– U (1.8)	– U (1.5)	– U (1.9)	– U (2.2)	NR	NR	NR	– U (2.2)	– U (1.6)	– U (1.7)	– U (1.9)	– U (1.7)	– U (2.2)	13.3	SB	N/A
Vanadium	15.4	13.4	25.1	26.6	NR	NR	NR	35.2	– U (13.7)	10.4	14.2	18.1	11.0 B	17.0	150 or SB	1-300
Zinc	***32.8*** *	***37.9*** *	***302*** *	***78.2***	NR	NR	NR	***88.1*** *	***27.2*** *	***28.2***	***28.1***	***38.7*** *	***27.2*** *	***382***	20 or SB	9-50

NOTES:
U - Indicates analyte was not detected (method reporting limit).
B - Indicates analyte result between IDL and contract required detection limit (CRDL).
N - Spiked sample recovery not within control limits.
* - Duplicate analysis not within control limit.

NR - Not Required; N/A - Not Available
[1] - Division Technical Administrative Guidance Memorandum (TAGM) on Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, January 24, 1994.
[2] - Average background levels in metropolitan/suburban areas or near highways.
SB - Site background.

BOLD - Values exceeds Recommended Soil Cleanup Objective (RSCO), or maximum Eastern USA background concentration.

TABLE 4-9

AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK

VOLATILE ORGANIC COMPOUND LABORATORY ANALYSIS OF GROUND WATER SAMPLING PERFORMED AT THE PROJECT SITE (ug/L)

Sample Date: 11/18/99 - 11/19/99

										Trip Blanks					Field Blank	
Sample No.	GW4-1	GW4-2	GW4-3	GW5-1	GW5-2	GW5-3	GW6-2	GW6-3	GW6-4	TB111699-1	TB111699-2	TB111799	TB111899	TB111999	FB111999	NYSDEC Criteria
Laboratory Sample ID #	993083B-19	993083B-20	993083B-04	993083B-01	993083B-03	993083B-02	993083B-05	993083B-06	993083B-07	993083A-18	993083A-19	993083A-20	993083C-04	993083B-11	993083B-10	(ug/L)
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	[1]
Acetone	-- U (10)	-- U (10)	4 JB	-- U (10)	3 JB	7 JB	3 JB	3 JB	100 B	3 JB	-- U (10)	-- U (10)	4 JB	4 JB	10 B	50
Benzene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	1 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	1
Bromodichloromethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	50
Bromoform	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	50
Bromomethane	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	5
2-Butanone	-- U (10)	-- U (10)	3 JB	-- U (10)	-- U (10)	2 JB	3 JB	3 JB	5 JB	-- U (10)	-- U (10)	-- U (10)	-- U (10)	2 JB	2 JB	50
Carbon Disulfide	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	NS
Carbon Tetrachloride	-- U (5.0)	0.9 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
Chlorobenzene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
Chloroethane	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	5
Chloroform	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	7
Chloromethane	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	5
Dibromochloromethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
1,1 - Dichloroethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
1,2 - Dichloroethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	0.6
1,1 - Dichloroethene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
cis-1,2-Dichloroethene	-- U (5.0)	-- U (5.0)	2 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	**7**	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
1,2-Dichloropropane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	1
cis-1,3-Dichloropropene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	0.4 [2]
Ethlybenzene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	1 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
2-Hexanone	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	50
4-Methyl-2-Pentanone	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	1 J	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	NS
Methylene Chloride	0.8 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
Styrene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
1,1,2,2-Tetrachloroethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
Tetrachloroethene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
Toluene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	0.3 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
trans-1,2-Dichloroethene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
trans1,3-Dichloropropene	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	0.4 [2]
1,1,1-Trichloroethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
1,1,2-Trichloroethane	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	1
Trichloroethene	-- U (5.0)	-- U (5.0)	***21***	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5
Vinyl Acetate	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	NS
Vinyl Cloride	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	0.8 J	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	-- U (10)	2
Xylene (total)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	***7***	-- U (5.0)	0.4 J	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	-- U (5.0)	5

NOTES:

U - Indicates that the compound was analyzed for but not detected (method detection limit).

J - Estimated value less than minimum detection limit.

B - The analyte is found in the laboratory blanks as well as the sample.

NS - No standard

[1] - Division of Water Technical and Operational Guidance Series, Ambient Water Quality Standards and Guidance Values, T.O.G.S. 1.1.1, 1998.

[2] - Applies to the sum of cis and trans 1,3 - dichloropropene.

BOLD - Value exceeds standard/guidance value.

TABLE 4-10
AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK
SEMIVOLATILE ORGANIC COMPOUND (VOC) LABORATORY ANALYSIS OF GROUND WATER SAMPLING PERFORMED AT THE PROJECT SITE (ug/L)
Sample Dates: 11/18/99 - 11/19/99

Sample No.	GW4-1	GW4-2	GW4-3	GW6-2	GW6-3	GW6-4	NYSDEC
Laboratory Sample ID #	993083B-19	993083B-20	993083B-04	993083B-05	993083B-06	993083B-07	Criteria
Matrix	Water	Water	Water	Water	Water	Water	(ug/L) [1]
Phenol	– U (10)	0.3 J	– U (10)	– U (10)	– U (10)	0.3 J	1
bis (2-Chloroethyl) ether	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	1
2-Chlorophenol	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
1,3-Dichlorobenzene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	3
1,4-Dichlorobenzene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	3
Benzyl alcohol	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	NS
1,2-Dichlorobenzene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	3
2-Methylphenol	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
2,2'-oxybis (1-Chloropropane)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	NS
4-Methylphenol	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	8 J	5
N-Nitroso-di-n-propylamine	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	NS
Hexachloroethane	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
Nitrobenzene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	0.4
Isophorone	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	50
2-Nitrophenol	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
2,4-Dimethylphenol	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	50
Benzoic acid	3 J	4 J	4 J	– U (50)	1 J	4 J	NS
bis (2-Chloroethoxy) methane	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
2,4-Dichlorophenol	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
1,2,4-Trichlorobenzene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
Naphthalene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	10
4-Chloro-3-methylphenol	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
2-Methylnaphthalene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	0.8 J	NS
Hexachlorocyclopentadiene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
2,4,6-Trichlorophenol	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
2,4,5-Trichlorophenol	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	5
2-Chloronaphthalene	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	10
2-Nitroaniline	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	5
Dimethylphthalate	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	50
Acenaphthylene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	NS
2,6-Dinitrotoluene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	5
3-Nitroaniline	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	5
Acenaphthene	– U (10)	– U (10)	– U (10)	2 J	– U (10)	– U (10)	20
2,4-Dinitrophenol	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	10
4-Nitrophenol	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	5
Dibenzofuran	– U (10)	– U (10)	– U (10)	0.5 J	– U (10)	– U (10)	NS
2,4-Dinitrotoluene	– U (10)	– U (10)	0.9 J	– U (10)	– U (10)	– U (10)	5
Diethylphthalate	0.4 J	0.5 J	0.4 J	0.3 J	0.3 J	1 J	50
4-Chlorophenyl-phenylether	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	NS
Fluorene	– U (10)	– U (10)	– U (10)	3 J	– U (10)	– U (10)	50
4-Nitroaniline	– U (20)	– U (20)	– U (20)	– U (20)	– U (20)	– U (20)	5
4,6-Dinitro-2-methylphenol	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	5
N-Nitrosodiphenylamine	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	50
4-Bromophenyl-phenylether	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	NS
Hexachlorobenzene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	0.04
Pentachlorophenol	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	– U (50)	1
Phenanthrene	– U (10)	– U (10)	– U (10)	2 J	– U (10)	– U (10)	50
Anthracene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	50
Carbazole	– U (10)	– U (10)	– U (10)	0.8 J	– U (10)	– U (10)	NS
Di-n-butylphthalate	0.9 JB	1 JB	0.8 JB	0.5 JB	0.7 JB	0.9 J	50
Fluoranthene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	50
Pyrene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	50
Butylbenzylphthalate	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	50
3,3'-Dichlorobenzidine	– U (20)	– U (20)	– U (20)	– U (20)	– U (20)	– U (20)	5
Benzo(a)anthracene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	0.002
Chrysene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	0.002
bis(2-Ethylhexyl)phthalate	2 JB	4 JB	2 JB	2 JB	1 JB	7 JB	5
Di-n-octylphthalate	0.4 JB	0.4 JB	0.4 JB	0.5 JB	0.4 JB	0.4 JB	50
Benzo(b)fluoranthene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	0.002
Benzo(k)fluoranthene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	0.002
Benzo(a)pyrene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	ND
Indeno(1,2,3-cd)pyrene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	0.002
Dibenzo(a,h)anthracene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	NS
Benzo(g,h,i)perylene	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	– U (10)	NS

NOTES:
U - Indicates that the compound was analyzed for but not detected (method detection limit).
J - Estimated value less than minimum detection limit.
B - The analyte is found in the laboratory blanks as well as the sample.

NS - No standard, ND - Non Detectable.
[1] - Division of Water Technical and Operational Guidance Series, Ambient Water Quality Standards and Guidance Values, T.O.G.S. 1.1.1, 1998.

BOLD - Value exceeds standard/guidance value.

TABLE 4-11
AIR FORCE PLANT # 51 IITRW, GREECE, NEW YORK
METALS LABORATORY ANALYSIS OF GROUND WATER SAMPLING PERFORMED AT THE PROJECT SITE (ug/L)
Sample Dates: 11/17/99 - 11/19/99

Sample No.	GW4-1	GW4-2	GW4-3	GW5-1	GW5-2	GW5-3	GW6-2	GW6-3	GW6-4	Field Blank FB111999	NYSDEC Criteria
Laboratory Sample ID #	993083B-19	993083B-20	993083B-04	993083B-01	993083B-03	993083B-02	993083A-08	993083A-08D	993083B-07	993083B-10	
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	(ug/L) [1]
Aluminium	210	1,750	398	NR	NR	NR	15,900	400	585	-- U (19.0)	NC
Antimony	-- U (6.0)	-- U (6.0)	-- U (6.0)	NR	NR	NR	-- U (6.0)	-- U (6.0)	-- U (6.0)	-- U (6.0)	3
Arsenic	-- U (4.0)	-- U (4.0)	-- U (4.0)	NR	NR	NR	11.8	-- U (4.0)	-- U (4.0)	-- U (4.0)	25
Barium	104 B	125 B	120 B	NR	NR	NR	316	61.5 B	177 B	-- U (1.0)	1,000
Beryllium	-- U (1.0)	-- U (1.0)	-- U (1.0)	NR	NR	NR	-- U (1.0)	-- U (1.0)	-- U (1.0)	-- U (1.0)	3
Cadmium	1.8 B	-- U (1.0)	-- U (1.0)	NR	NR	NR	-- U (1.0)	-- U (1.0)	-- U (1.0)	-- U (1.0)	5
Calcium	58,800	109,000	84,800	NR	NR	NR	252,000	149,000	46,800	46.2 B	NC
Chromium	6.5 B	***309***	2.4 B	NR	NR	NR	33.6	-- U (2.0)	2.4 B	-- U (2.0)	50
Cobalt	20.0 B	7.6 B	2.3 B	NR	NR	NR	22.7 B	3.4 B	2.1 B	-- U (2.0)	NC
Copper	4.2 B	13.3 B	3.3 B	NR	NR	NR	56.8	2.2 B	4.2 B	-- U (1.0)	200
Iron	***806***	***4,140***	***1,040***	NR	NR	NR	***32,700***	***701***	***1,180***	92.8 B	300 [2]
Lead	-- U (3.0)	-- U (3.0)	-- U (3.0)	-- U (3.0)	-- U (3.0)	6.8	20.6	-- U (3.0)	-- U (3.0)	-- U (3.0)	25
Magnesium	***50,600*** E	27,100 E	***49,000*** E	NR	NR	NR	***86,500*** E	***73,600*** E	***48,700*** E	19.0 UE	35,000
Manganese	113	***437***	263	NR	NR	NR	***1,780***	216	179	-- U (1.0)	300 [2]
Mercury	-- U (0.10)	-- U (0.10)	-- U (0.10)	NR	NR	NR	-- U (0.10)	-- U (0.10)	-- U (0.10)	-- U (0.10)	0.7
Nickel	3.2 B	13.4 B	4.2 B	NR	NR	NR	42.0	5.5 B	4.0 B	-- U (3.0)	100
Potassium	16,500	4,370 B	4,770 B	NR	NR	NR	7,950	2,980 B	8,350	-- U (79.0)	NC
Selenium	-- UN (5.0)	-- UN (5.0)	-- UN (5.0)	NR	NR	NR	-- UN (5.0)	-- UN (5.0)	-- UN (5.0)	-- UN (5.0)	10
Silver	-- U (1.0)	-- U (1.0)	-- U (1.0)	NR	NR	NR	-- U (1.0)	-- U (1.0)	-- U (1.0)	-- U (1.0)	50
Sodium	***71,400***	***43,200***	***23,300***	NR	NR	NR	18,600	13,000	***45,400***	95.2 B	20,000
Thallium	-- U (10.0)	-- U (10.0)	***24.2***	NR	NR	NR	-- U (10.0)	***10.8***	-- U (10.0)	-- U (10.0)	0.5
Vanadium	-- U (2.0)	2.6 B	-- U (2.0)	NR	NR	NR	28.7 B	-- U (2.0)	-- U (2.0)	-- U (2.0)	NC
Zinc	11.9 B	31.5	20.0	NR	NR	NR	140	17.2 B	32.3	36.0	2,000

NOTES:
U - Indicates analyte was not detected (method reporting limit).
B - Indicates analyte result between IDL and contract required detection limit (CRDL).
N - Spiked sample recovery not within control limits.
E - Reported value is estimated because of the presence of interference.

NC - No Criterion, NR - Not Required.
[1] - Division of Water Technical and Operational Guidance Series, Ambient Water Quality Standards and Guidance Values, T.O.G.S.1.1.1, June 1998.
[2] - Iron + Manganese = 500ug/L.

BOLD - Value exceeds standard/guidance value.

exceeded RSCOs, and calcium and magnesium concentrations appeared enriched relative to reported eastern United States background concentrations. In addition, copper and nickel exceeded RSCOs in samples obtained from borings SB4-2 and SB4-3.

TCE was detected at a concentration in excess of the GA (drinking water) ground water criterion in sample GW4-3 (21 ug/L); obtained from the temporary well installed in boring SB4-3, located near the former location of Building 15. No other VOCs or semivolatile BN/AE compounds were detected at concentrations in excess of criteria in the GW4-3 sample, or the samples obtained from the area of former Buildings 16 and 17 (GW4-1 and GW4-2).

All three ground water samples exceeded GA ground water criteria for iron and sodium; in addition, samples GW4-1 and GW4-3 exceeded the criterion for magnesium. Sample GW4-2 exceeded criteria for chromium and manganese, and GW4-3 exceeded the criterion for thallium.

4.1.5 Area Five

Soil results for TCL VOCs, PAHs, and lead from the former UST/fuel pump area located east of the main building are presented in Tables 4-6, 4-12, and 4-8, respectively. Ground water results for TCL VOCs, PAHs, and lead are presented in Tables 4-9, 4-12, and 4-11, respectively.

The concentration of total xylenes (3,700 ug/kg) exceeded the RSCO in soil sample SB5-3-1. In soil sample SB5-1-1, the PAHs chrysene, benzo(a)anthracene, benzo(a)pyrene, and dibenzo(a,h)anthracene (estimated concentration) exceeded RSCOs.

No constituent concentrations exceeded the ground water criteria in Area Five well samples.

4.1.6 Area Six

The results of soil analysis for TCL VOCs, BN/AE, and TAL metals are contained in Tables 4-6, 4-7, and 4-8. The results of ground water analysis for TCL VOCs, BN/AE, and TAL metals are presented in Tables 4-9, 4-10, and 4-11.

No RSCOs were exceeded in any Area Six soil samples for VOCs or semivolatile BN/AE compounds. Relative to the metals, all soil samples exceeded the RSCOs for iron and zinc; in addition, all samples appeared enriched with magnesium and calcium (excepting SB6-2-2) relative to reported eastern United States background concentrations. Sample SB6-2-2 exceeded RSCOs for arsenic, beryllium (estimated concentration), chromium, copper, and nickel, and SB6-4-4 exceeded RSCOs for beryllium (estimated concentration), chromium, and nickel.

Ground water sample GW6-2, obtained from the temporary well installed in boring SB6-2, exceeded the GA (drinking water) criterion for xylene. Sample GW6-4, obtained from the temporary well located west (hydraulically down gradient) of the Area One plating pond, exceeded the criterion for DCE. Also in this sample, TCE was detected at the 5 ug/L drinking water criterion, and an estimated concentration of the BN/AE compound 4-methylphenol exceeded the GA criterion. No other organic compounds were detected at concentrations in excess of criteria.

TABLE 4-12
AIR FORCE PLANT #51 HTRW, GREECE, NEW YORK
POLYCYCLIC AROMATIC HYDROCARBON (PAH) LABORATORY ANALYSIS OF SOIL AND GROUND WATER SAMPLING PERFORMED AT THE PROJECT SITE
Sample Dates: 11/17/99 - 11/19/99

Sample No. Laboratory Sample ID # Matrix	SB5-1-1 993083A-16 Soil (ug/kg)	SB5-2-1 99308A-17 Soil (ug/kg)	SB5-3-1 993083A-15 Soil (ug/kg)	Recommended Soil Cleanup Objectives (ug/kg) [1]	GW5-1 993083B-01 Water (ug/L)	GW5-2 993083B-03 Water (ug/L)	GW5-3 993083B-02 Water (ug/L)	NY State Ambient Water Quality Standards & Guidance Values (ug/L) [2]
Napthalene	49 J	340 J	-- U (330)	13,000	-- U (10)	0.2 J	-- U (10)	10
2-Methylnaphthalene	25 J	4,300 E	-- U (330)	36,400	-- U (10)	1 J	-- U (10)	NS
Acenaphthylene	13 J	-- U (330)	-- U (330)	41,000	-- U (10)	-- U (10)	-- U (10)	NS
Acenaphthene	190 J	580	-- U (330)	50,000	-- U (10)	0.5 J	-- U (10)	20
Fluorene	250 J	770	-- U (330)	50,000	-- U (10)	0.6 J	-- U (10)	50
Phenanthrene	1,500	2,900	-- U (330)	50,000	-- U (10)	0.5 J	-- U (10)	50
Anthracene	560	310 J	-- U (330)	50,000	-- U (10)	-- U (10)	-- U (10)	50
Fluoranthene	1,600	52 J	16 J	50,000	-- U (10)	-- U (10)	-- U (10)	50
Pyrene	1,500	230 J	22 J	50,000	-- U (10)	-- U (10)	-- U (10)	50
Benzo (a) anthracene	***930***	-- U (330)	-- U (330)	224 or MDL	-- U (10)	-- U (10)	-- U (10)	0.002
Chrysene	***970***	40 J	-- U (330)	400	-- U (10)	-- U (10)	-- U (10)	0.002
Benzo (b) fluoranthene	610	-- U (330)	-- U (330)	1,100	-- U (10)	-- U (10)	-- U (10)	0.002
Benzo (k) fluoranthene	1,000	-- U (330)	-- U (330)	1,100	-- U (10)	-- U (10)	-- U (10)	0.002
Benzo (a) pyrene	***770***	-- U (330)	-- U (330)	61 or MDL	-- U (10)	-- U (10)	-- U (10)	ND
Indeno (1,2,3-cd) pyrene	220 J	-- U (330)	-- U (330)	3,200	-- U (10)	-- U (10)	-- U (10)	0.002
Dibenzo (a,h) anthracene	***85*** J	-- U (330)	-- U (330)	14 or MDL	-- U (10)	-- U (10)	-- U (10)	NS
Benzo (g,h,i) perylene	160 J	-- U (330)	-- U (330)	50,000	-- U (10)	-- U (10)	-- U (10)	NS

NOTES:
U - Indicates that the compound was analyzed for but not detected (method detection limit).
J - Estimated value less than minimum detection limit.
E - Reported value it exceeds the calibration curve range.

MDL - Method Detection Limit.
NS - No standard, ND - Non-detectable.
[1] - Division Technical Administrative Guidance Memorandum (TAGM) on Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-94-4046), NYSDEC, January 24, 1994.
[2] - Division of Water Technical and Operational Guidance Series, Ambient Water Quality Standards and Guidance Values, T.O.G.S. 1.1.1, 1998.

a = 1
b = 2

BOLD - Value exceeds Recommended Soil Cleanup Objectives (RSCO)

All three Area Six well samples exceeded the ground water criterion for iron. In addition, GW6-2 exceeded the criterion for manganese, GW6-3 exceeded the criterion for thallium, and GW6-4 exceeded the criterion for sodium.

4.1.7 Area Seven

One soil sample was collected from beneath a floor drain in the former vehicle maintenance area and analyzed for TCL VOCs, BN/AE, TAL metals. Laboratory analytical results are presented in Tables 4-6, 4-7, and 4-8.

No VOCs exceeded RSCOs in the Area Seven soil sample. Several PAHs (chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, and benzo(a)pyrene) exceeded RSCOs, as well as several BN/AE compounds reported as estimated concentrations: phenol, 2-methylnaphthalene, and benzo(a)anthracene (also a PAH). Relative to the metals, arsenic, cadmium, chromium, copper, iron, mercury, nickel, selenium, and zinc all exceeded RSCOs, and calcium and magnesium appeared enriched relative to reported eastern United States background concentrations.

4.2 DATA QUALITY

4.2.1 Laboratory Analysis

Three laboratory analytical data packages were prepared to document the results of analysis performed on samples obtained from the Air Force Plant No. 51 site (7099-3083A, 7099-3083B, 7099-3083C). These data packages are contained in Appendix C. A series of minor data quality issues were identified through review of the data packages, as detailed below.

- **Accuracy**

This data quality indicator is defined as a measure of closeness of an observed concentration to the true value, and is evaluated in terms of matrix spike/matrix spike duplicate (MS/MSD) and matrix spike blank (MSB) recoveries (%R).

Data Package 7099-3083A

One soil MS/MSD (SB4-1-7) exhibited recovery outside internal laboratory control limits for the volatile organic compounds vinyl acetate and tetrachloroethene. One soil MS/MSD (S1-1) exhibited recovery outside internal laboratory control limits for the organic compounds trichloroethene and acetone. One soil MSB (S1-1) exhibited recovery slightly outside the internal laboratory control limit for the volatile organic compound 1,1,2,2-tetrachloroethane. With the exception of trichloroethene in soil, none of the out of range volatile organic constituents were detected in the site media. Estimated concentrations of trichloroethene reported for samples S1-1, S1-3, S2-1, S2-3, and S2-DUP may be slightly low relative to their true value. One soil MSB (SB4-1-7) exhibited recovery outside the internal laboratory control limit for the semivolatile compound 4-nitrophenol. One aqueous MS/MSD (BS#1, DRUM#3S) exhibited

recoveries outside the internal laboratory control limits for the metals copper and iron; and one soil MS/MSD (S1-1S) exhibited recoveries outside the internal laboratory control limits for the metals selenium and silver; associated sample data were flagged with the 'N' data qualifier.

Data Package 7099-3083B

One aqueous MS/MSD (SBLKFP) exhibited recoveries outside the internal laboratory control limits for the semivolatile organic compounds 4-methylphenol, 2,4-dinitrophenol and indeno(1,2,3-cd)pyrene. One soil MS/MSD (SBLKNP) exhibited recovery outside the internal laboratory control limits for the semivolatile organic compound benzyl alcohol. None of the out of the range constituents were detected in the site media. One aqueous MS/MSD (GW4-3S) exhibited recovery below the internal laboratory control limit for the metal selenium; associated sample data were flagged with the 'N' data qualifier.

Data Package 7099-3083C

One soil MS/MSD (SS7S) exhibited recovery outside of the internal laboratory control limit for the metal antimony; associated sample data were flagged with the 'N' data qualifier.

- **Precision**

This data quality indicator is defined as a measure of reproducibility or variability of a measurement under a given set of conditions, and is evaluated in terms of relative percent difference (%RPD) between field duplicate sample analyses, laboratory duplicate (replicate) analyses, and matrix spike / matrix spike duplicate sample analyses.

Variability relative to duplicate sample analysis is often a function of field sampling procedures or the characteristics of the sample matrix (*i.e.*, the ability or lack thereof to fully homogenize the sample prior to division into sample aliquots).

Data Package 7099-3083A

One soil MS/MSD (SB4-1-7) exhibited recoveries outside the internal laboratory control limits for the volatile organic compounds acetone, vinyl acetate, 2-butanone, 4-methyl-2-pentanone, 2-hexanone and tetrachloroethene. One soil MS/MSD (S1-1) exhibited recoveries outside internal laboratory control limits for the volatile organic compounds acetone, bromomethane, and 2-butanone. One duplicate sample (S2-1D) exhibited recoveries outside internal laboratory control limits for the metals aluminum, cadmium, chromium, copper, manganese, nickel, and zinc; and one duplicate sample (S1-1D) exhibited recoveries outside the internal laboratory control limits for the metals aluminum, cadmium, chromium, and manganese; associated sample data were flagged with the '*' data qualifier.

Data Package 7099-3083B
One soil duplicate sample (S2-1D) exhibited recoveries outside of internal laboratory control limits for the metals aluminum, chromium, copper, nickel, and zinc; associated sample data were flagged with the '*' data qualifier.

Data Package 7099-3083C
One soil duplicate (SS7D) exhibited recovery outside the internal laboratory control limit for the metal manganese; associated sample data were flagged with the '*' data qualifier.

- **Representativeness**

This data quality indicator is defined as the extent to which data measure the objective of the data collection. It is less quantitatively defined than accuracy or precision and represents the ability of sample collection and handling steps to accurately reflect site characteristics. As such, it is controlled primarily by sampling program design and is influenced by field QA/QC sample results (Section 4.2.2). The executed sampling program, targeted to areas of previously documented or suspected HTRW contamination, is believed to provide a representative characterization of actual site conditions.

- **Comparability**

This data quality indicator is a measure of the equivalence of data. Comparability for sampling involves application of consistent sample designs and time periods, while comparability for analyses encompasses issues related to different methodologies, detection limits, laboratories, units of measure, and sample preparation procedures. The potential for comparability concerns were minimized through the design of the Quality Assurance Program Plan (QAPP) and sampling methodologies. Standardized sampling techniques and analytical methods were used to attain project objectives.

- **Completeness**

This data quality indicator is defined as the measure of the amount of useable data resulting from a data collection activity. All samples collected for in the field are accounted for in the sample data packages and the data is 100 percent complete from a deliverables standpoint, as tracked through the chain-of-custody process. Based on the evaluation of the data packages, analytical data for samples obtained from the project site are judged to be virtually 100 percent complete.

4.2.2 Field QA/QC Samples

A total of six trip blanks, one field (rinsate) blank, one soil/sediment field duplicate, one aqueous field duplicate, one soil/sediment matrix/matrix spike duplicate, and one aqueous matrix/matrix spike duplicate were obtained in the field during sample collection activities at Air Force Plant No. 51. With the exception of low concentrations of acetone and 2-butanone (common laboratory contaminants) and zinc (in the field blank), no compounds were detected above detection limits in the field QA/QC blanks. The RPDs for TCL VOC, BN/AE, and TAL metals

analyses performed for the soil/sediment matrix field duplicate (S2-3/S2DUP), and the aqueous matrix field duplicate (GW6-4/GW6-4-02) were consistently below 30% for non-qualified results. These data indicate that sample collection, equipment decontamination and sample processing protocols were implemented consistently and appropriately.

4.3 LAND USE/DEMOGRAPHICS

Land use in the vicinity of AFP No. 51 consists of: commercial/residential use across Dewey Avenue to the east; undeveloped, wooded upland areas and the Lake Ontario State Parkway to the south; wooded upland areas descending to wetlands to the west (associated with Round Pond Creek which flows into Round Pond); and Round Pond to the north, which discharges north into Lake Ontario. A water treatment plant (Monroe County Water Authority) is located to the northeast of the site, adjacent to the canal that adjoins the northern portion of the AFP No. 51 building. During historic operations, this canal was used to transport aircraft and weapons components manufactured at the project site to Lake Ontario for outbound shipment.

In addition to the scrap metal operation that currently occupies the project site and main building (Genesee Scrap and Tin, Co.), a number of commercial operations are housed in several structures abutting the main building to the east. Water supply in the vicinity of the site is provided by a municipal utility.

4.4 FATE AND TRANSPORT

4.4.1 Contaminants of Concern

The primary contaminants of concern (CoCs) at the project site are those associated with soil/sediment and surface water within Areas One and Two (*i.e.*, the plating pond, from which the waste stream from historical AFP No. 51 electroplating operations was discharged, and the adjacent wetland area that receives seepage/drainage from the pond), as detailed below. Within each media, a distinction is made between primary and secondary CoCs, with the former representing the most consistently identified contaminants, exhibiting the most significant mass, and at a concentration well in excess of regulatory criteria (*e.g.*, exceeding the SEL as well as LEL, or several orders of magnitude above the RSCO); and the latter representing those contaminants that exceeded criteria, but were only sporadically identified, or were reported as estimated concentrations.

Soil/Sediment Organic Compounds

Primary:	trichloroethene (TCE), cis-1,2 dichloroethene (DCE), and vinyl chloride
Secondary:	acetone, 1,2-dichloroethane, ethylbenzene, 4-methyl-2-pentanone, 1,1,2,2-tetrachloroethane, toluene, and xylene

Soil/Sediment Inorganic Constituents

Primary:	cadmium, chromium, copper, lead, nickel, and zinc
Secondary:	antimony, arsenic, barium, beryllium, iron, magnesium, manganese, mercury, selenium, and silver

Surface Water Organic Compounds

Primary:	acetone, TCE, DCE, and vinyl chloride
Secondary:	1,1-dichloroethene, methylene chloride, and tetrachloroethene

Surface Water Inorganic Constituents

Primary:	aluminum, cadmium, chromium, and lead
Secondary:	barium, copper, iron, magnesium, manganese, mercury, nickel, selenium, silver, thallium, vanadium, zinc, and cyanide

No CoCs (*i.e.*, PCB) were identified in Area Three. No organic CoCs were identified in Area Four soils. However, beryllium, chromium, iron, magnesium, nickel, and zinc were routinely detected at concentrations in excess of RSCOs, and many of these metals (as well as manganese, sodium, thallium) were detected in Area Four ground water in excess of GA (drinking water) criteria. TCE was also detected in well sample GW4-3 (to the west of the main building) at a concentration in excess of regulatory criteria.

Within Area Five soils, xylene and several PAH constituents were identified at concentrations exceeding RSCOs. No CoCs were identified in Area Five ground water. No organic CoCs were identified in Area Six soils; however, several metals exceeded RSCOs in at least half of the recovered samples, including chromium, iron, magnesium, nickel, and zinc. Iron and magnesium exceeded criteria in all of the Area Six wells, and manganese, sodium, thallium, DCE, and xylene sporadically exceeded criteria. Area Seven CoCs in soil include arsenic, cadmium, chromium, copper, iron, magnesium, mercury, nickel, selenium, zinc, and a suite of PAHs.

In the ensuing discussion, summary health effects information is provided for the primary CoCs identified on-site; *i.e.*, Areas One and Two primary contaminants, and other contaminants identified elsewhere on the site.

Acetone is a manufactured chemical used to make plastic, fibers, drugs, and other chemicals. It is also found naturally in plants, trees, volcanic gases, forest fires, and as a product of the breakdown of body fat. Acetone is present in vehicle exhaust, tobacco smoke, and landfill sites. Breathing moderate to high levels of acetone for short periods of time can cause nose, throat, lung, and eye irritation; headaches; light-headedness; confusion; increased pulse rate; effects on blood; nausea; vomiting; unconsciousness and possibly coma; and shortening of the menstrual cycle in women. Swallowing high levels of acetone can result in unconsciousness and damage to the mouth tissue. Skin contact can result in irritation and damage to the skin. Kidney, liver, and

nerve damage, increased birth defects, and lowered ability to produce (males only) occurred in long term exposure to animals (ATSDR 1995).

1,2 dichloroethene exists in two forms, cis-1,2-dichloroethene and trans-1,2-dichloroethene. The chemical is used most often in the production of solvents and chemical mixtures, and is released to the environment primarily from chemical factories, landfills, hazardous waste sites, and from the burning of vinyl-containing objects. In animal studies, high doses of 1,2-dichloroethene resulted in death; lower doses caused adverse effects on the blood and liver. Long-term effects on humans from exposure to low concentrations of 1,2-dichloroethene are unknown. The chemical has not been shown to effect fertility in animals or humans, and cis-1,2-dichloroethene is not classifiable as to its human carcinogenicity (ATSDR 1997).

The ***PAHs*** (polycyclic aromatic hydrocarbons), consisting of compounds with a series of joined benzene rings, are typically associated with petroleum products, asphalt, coal tar, and creosote, and result from the incomplete combustion of fossil fuel. Studies in animals have shown that PAHs can cause harmful effects on skin, body fluids, and the immune system after both short- and long-term exposure. These effects have not been reported in humans. The U.S. Department of Health and Human Services has determined that PAHs may reasonably be anticipated to be carcinogens (ATSDR 1996).

Trichloroethene (TCE) is a man-made chemical used mainly to remove grease from metal parts, but is also an ingredient in adhesives, paint removers and strippers, typewriter correction fluids, and spot removers. TCE is present in many surface water sources and underground water sources as a result of manufacture, use, and disposal of the chemical. Breathing small amounts of TCE for short periods of time may cause headaches, lung irritation, dizziness, poor coordination and difficulty concentrating. Breathing high levels cause the most severe effects on the central nervous system, such as unconsciousness and possible death. Studies in animals have shown that ingesting or breathing levels of TCE that are higher than typical environmental levels can produce nervous system changes; nerve, kidney, liver and lung damage; effects on the blood; tumors of the kidney, lung, liver, and male sex organ. The International Agency for Research on Cancer has determined that TCE is not classifiable as to its carcinogenicity to humans (ATSDR 1989).

Vinyl Chloride is a man-made chemical that does not occur naturally in the environment. It is used to make polyvinyl chloride (PVC), which is used to make a variety of plastic products, including pipes, wire and cable coatings, and furniture and automobile upholstery. Smaller amounts of vinyl chloride are used as a cooling gas and in the manufacture of other compounds. Short term exposures to high levels of vinyl chloride can cause dizziness, lack of muscle coordination, headache, unconsciousness, and death. Long term exposure to lower but unmeasured amounts in factories where vinyl chloride is made or processed has caused "vinyl chloride disease," which is characterized by severe damage to the liver, effects on lungs, poor circulation in the fingers, changes in the bones at the end of the fingers, thickening of the skin, and changes in the blood. Animal studies have shown that breathing vinyl chloride can harm unborn offspring and cause early miscarriages. Laboratory animals have developed cancer in several tissues after eating food or breathing air containing vinyl chloride. The Department of

Health and Human Services has determined that vinyl chloride is a known human carcinogen (ATSDR 1997).

Aluminum occurs naturally and makes up about eight percent of the surface of the earth. It is always found as a component of minerals and rocks in the crust and overlying sediments. Low level exposure to aluminum from food, air, water or contact with skin is not thought to be harmful to human health. Aluminum is not a carcinogen, but high doses are suspected to potentially result in skeletal and neurological problems. The MCL for aluminum has been established primarily in consideration of taste and odor problems (ATSDR 1995).

Arsenic is found naturally at low levels in the environment. It is primarily a component with oxygen, chlorine and sulfur compounds (inorganic arsenic compounds). In plants and animals it combines with carbon and hydrogen, forming various organic arsenic compounds. Organic arsenic compounds are generally less harmful than the inorganic compounds. Organic arsenic bioaccumulates in shellfish and fish, but most arsenic in fish is not toxic. Arsenic is a known carcinogen; ingesting inorganic arsenic increases the risk of skin cancer and tumors of the bladder, kidney, liver, and lung. High concentrations (> 60 mg/L) of inorganic arsenic in food or water can be fatal. Lower levels of inorganic arsenic exposure may cause nausea, vomiting and diarrhea, decreased production of red and white blood cells, abnormal heart rhythm, and blood vessel damage. Chronic low level exposure may result in a darkening of the skin and the appearance of "corns" or "warts" on the torso and extremities (ATSDR 1993).

Cadmium is a natural element found in all soil and rocks. This metal is used in batteries, pigments, metal coatings, and plastics. Cadmium enters the body by absorbing through the stomach, intestine or lung walls after ingestion or inhalation. Inhalation is the greatest exposure route (*i.e.*, 30 to 50 percent of the metal inhaled is absorbed into the blood stream). Cadmium is strongly retained in the body and bioaccumulates as exposure continues. Ingesting and inhaling high doses of cadmium causes severe irritation of the lungs, stomach, and intestines. Effects of long-term, low-level exposure to cadmium include kidney, liver, and lung damage, lung cancer, and high blood pressure. Since such high exposures are rare today, effects from long-term, low-level exposure are of greater concern (ATSDR 1993).

Chromium is a naturally occurring element found in rocks, soil, plants, and animals. Chromium III is an essential nutrient in small quantities; the body does not utilize other forms of chromium. Typically, only small quantities of chromium migrate from soil to water. Fish do not accumulate chromium in their bodies. Ingesting very large amounts of chromium can cause stomach upsets and ulcers, convulsions, and kidney and liver damage. Certain chromium VI compounds are known carcinogens (ATSDR 1993).

Copper is a naturally occurring metal used for electrical wiring, some water pipes, and is mixed with other metals to make alloys. In addition, this metal is an essential element for all living organisms. Long-term exposure to copper dust can result in headaches, dizziness, nausea, and diarrhea and the irritation of the nose, mouth, and eyes. Consuming water with high levels of copper can result in vomiting, diarrhea, stomach cramps, and nausea. Exposure to very high levels of copper can result in liver and kidney damage and possibly death. Children are

especially sensitive to exposure to copper. Children exposed to high levels of this metal may experience liver damage and death. Copper is not a known carcinogen (ATSDR 1990).

Lead is a naturally occurring metal found in small concentrations in the earth's crust. Enrichment of lead in soil occurs routinely through airborne deposition from many sources, including gasoline and coal combustion. Leaching rates of lead from soil are very low and are inversely related to soil pH. The fate of lead in soil is affected by the specific or exchange adsorption at mineral interfaces, the precipitation of sparingly soluble solid phases, and the formation of relatively stable organo-metal complexes or chelates with the organic matter in soil (USEPA 1986, NSF 1977). Mobility of lead from soil is due primarily to runoff of lead-containing particles to surface water. In water, lead is adsorbed onto sediment particles and organic matter and is transported by sediment movement. Lead may bioaccumulate, particularly in bottom-dwelling organisms (ATSDR 1992, USEPA 1986, NSF 1977). The routes of exposure for lead include inhalation of soil particles, ingestion or dermal contact. Exposure to environmental media containing lead is the primary source of evaluated blood lead in children (ATSDR 1992).

Mercury is used in thermometers, barometers, and other common consumer products. Mercury can combine with other chemicals, such as chlorine, carbon, or oxygen to form either inorganic or organic mercury compounds. One form of organic mercury (methylmercury) can accumulate in the tissues of certain fish. Mercury released into the environment is persistent, and it can change between organic and inorganic forms in soil and water by reaction with substances produced with microorganisms and varius chemical processes. Mercury can easily enter the body through inhalation or if eaten in organic forms in contaminated fish or other foods. Inorganic mercury (*e.g.*, salts) can also enter the body through ingestion of contaminated food or water, although at a particular dose level, less mercury will enter the body in this form relative to the organic form. Long-term exposure to either inorganic or organic forms of mercury can permanently damage the brain, kidneys, and developing fetuses. Mercury has not been shown to be a carcinogen (ATSDR 1990).

Nickel is a very abundant element, and is found primarily combined with oxygen (oxides) or sulfur (sulfides). Much of the nickel in the environment is found in soils and sediments because nickel has an affinity for soil materials containing iron or manganese. Nickel does not appear to accumulate in fish, plants, or animals used for food. The most common adverse health affect of nickel in humans is an allergic reaction. Ingestion of highly contaminated water (> 100,000 times normal concentration levels) has resulted in stomachaches and effects to blood and kidneys in humans. Eating or drinking large amounts of nickel has been reported to cause lung disease in dogs and rats, and to affect the stomach, blood, liver, kidneys, immune system, and reproduction and development in rats and mice (ATSDR 1997).

Selenium is a naturally occurring substance that is widely but unevenly distributed in the earth's crust and is commonly found in sedimentary rock. Much of the selenium in rocks is combined with sulfide minerals or with silver, copper, lead, and nickel minerals. Exposure to high levels of selenium result in dizziness, fatigue, irritation, collection of fluid in the lungs, and severe bronchitis. Selenium compounds have caused rashes, swelling, and pain upon skin contact. Selenium compounds can be harmful at daily dietary levels 5-10 times higher than the daily

requirement. Too much selenium in the diet can result in brittle hair, deformed nails and loss of feeling and control in the arms and legs. Very high amounts of selenium resulted in reproductive effects in rats and monkeys, and caused malformations in birds. The Department of Health and Human Services has determined that selenium sulfide may reasonably be anticipated to be a carcinogen (ATSDR 1997).

Zinc is an ubiquitous element, found in air, soil, water, and all foods. Commercially, zinc is used as a coating to prevent rust, in dry cell batteries, and mixed with other metals to make alloys. Although zinc is an essential element for the human body, too much zinc (generally levels over 10 to 15 times the recommended dietary allowance) is harmful. The short-term effects of ingesting large concentrations of zinc include stomach cramps, nausea, and vomiting. Over the long-term, such exposure can cause anemia, pancreas damage, and decrease the levels of high density lipoprotein cholesterol (the good form of cholesterol) in the body. Inhaling large amounts of zinc can cause a short-term disease called mental fume fever, which affects the lungs and body temperature. In addition, animals fed large amounts of zinc became infertile or had smaller babies. It is not known how this information compares to the effects of zinc on human reproduction (ATSDR 1995).

4.4.2 Potential Receptors

With the exception of Areas One and Two, contamination was detected only sporadically in soils and ground water across the project site. It is clear from the available data that the Area One plating pond sediments (located to the northwest of the AFP No. 51 building) represent the primary on-site source of contamination. Based on surrounding land use and inferred surface and ground water flow paths[1], the primary receptor of contamination from this source is wildlife located in the wetland area to the west of the project site, associated with Round Pond Creek and Round Pond. With the exception of a potential fish ingestion pathway, available data do not suggest the presence of a human receptor population from the identified source.

[1] Based on review of topographic mapping, surface water runoff is to the west, and ground water elevation data obtained from on-site temporary monitoring wells during well sampling also indicate a flow gradient to the west.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Seven areas of concern were identified for investigation at AFP No. 51 under Delivery Order 60. The objective of this targeted site investigation was to provide current information regarding the presence of HTRW in these areas, to allow for an evaluation of the need for further remedial investigation or remedial action by USACE. In support of this objective, a total of 21 soil/sediment samples, 6 surface water samples, and 9 ground water samples were obtained for laboratory analysis. Most samples were analyzed for TCL VOCs, BN/AE, and TAL metals, or a subset of these analytes.

The results of the investigation indicated that the primary contaminants of concern at the project site are those associated with soil/sediment and surface water within Area One (the plating pond from which the waste stream from historical AFP No. 51 electroplating operations was discharged). Significantly elevated concentrations of several VOCs were detected in Area One sediments, primarily trichloroethene (TCE) and cis,1-2 dichloroethene (DCE). TCE was detected at a maximum concentration of 10,000,000 ug/kg (1 per cent); this concentration is orders of magnitude higher than the applicable sediment screening criteria and Recommended Soil Cleanup Objective (RSCO). DCE (a breakdown product of TCE) was detected at a maximum unqualified concentration of 2,600 ug/kg, an order of magnitude above the RSCO. In addition, most metals concentrations significantly exceeded Lowest Effect Level (LEL), Severe Effect Level (SEL), and/or RSCO criteria (by as much as four orders of magnitude). The primary inorganic contaminants are cadmium, chromium, and zinc, with maximum concentrations of 4,200, 3,690, and 4,340 mg/kg, respectively. Surface water concentrations of the identified organic and inorganic contaminants exceeded drinking water and wildlife protection criteria, in some cases by several orders of magnitude.

The primary organic and inorganic contaminants identified in the plating pond were also detected in Area Two sediments and surface water (in many cases exceeding regulatory criteria), documenting off-site migration from the Area One source to the adjacent wetland area to the west.

Organic and inorganic contamination was sporadically detected at concentrations in excess of regulatory criteria in soil borings and ground water within the other areas of concern at the project site, primarily fuel related constituents (*e.g.*, xylene and PAHs), and the metals chromium, nickel, and zinc. However, these contaminants were not present at concentrations approaching those identified in Area One, and do not appear to represent significant potential sources for off-site migration.

Based on surrounding land use and inferred surface and ground water flow paths, the primary receptor of contamination from the Area One source is wildlife located in the wetland area to the west of the project site, associated with Round Pond Creek and Round Pond. With the exception of a potential fish ingestion pathway, available data do not suggest the presence of a human receptor population from this source.

Given the apparent magnitude of Area One sediment contamination, and the ongoing potential for off-site migration of this contamination to the adjacent wetland area, remediation of these source area sediments may be warranted to address impact to the ecological receptor population. In support of decision-making relative to such action, the following recommendations for further site investigation appear appropriate at this time:

(1) Delineation of the horizontal and vertical extent of Area One (plating pond) sediment contamination;

(2) Delineation of the horizontal and vertical extent of Area Two (wetlands) sediment contamination;

(3) Determination of migration pathway(s) between Area One and Area Two; *e.g.*, physical linkage (discharge piping), overflow/surface runoff, ground water migration;

(4) Performance of a habitat evaluation within the affected Area Two wetlands to: (1) characterize the resource, and (2) evaluate historic and potential continuing impact on the wildlife community from source releases; and

(5) Determination of the potential for a human receptor population associated with a fish ingestion pathway.

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7.0 ABBREVIATIONS AND ACRONYMS

AFP	Air Force Plant
ATSDR	Agency for Toxic Substances and Disease Registry
BECR	Biological, Environmental, and Cultural Resources
bgs	Below Ground Surface
BN/AE	Base Neutral-Acid Extractable Compound (*i.e.*, SVOC)
BRAC	Base Realignment and Closure program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CoC	Contaminant of Concern
DCE	Cis,1-2 dichlorethene
DCQCR	Daily Chemical Quality Control Report
DERP	Defense Environmental Restoration Program
DO	Delivery Order
DoD	Department of Defense
DSMOA/CA	Defense State Memorandum of Agreement/Cooperative Agreements program
FUDS	Formerly Used Defense Sites
GPS	Global Positioning System
GSA	General Services Administration
HSA	Hollow Stem Auger
HTRW	Hazardous, Toxic, and Radiological Waste
IAG	Interagency Agreement
INPR	Inventory Project Report
IRP	Installation Restoration Program
LEL	Lowest Effect Level
LIMS	Laboratory Information Management System
LWP	Letter Work Plan
mg/kg	Milligrams per kilogram (parts per million; soil matrix)
mg/L	Milligrams per liter (parts per million; aqueous matrix)
MRD	Missouri River Division
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSB	Matrix Spike Blank
NEA	Northern Ecological Associates, Inc.
NYD	New York District
NYSDEC	New York State Department of Environmental Conservation
Ogden	Ogden Environmental and Energy Services Co., Inc.
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Program Plan
%R	Percent Recovery

RPD	Relative Percent Difference
RRSEP	Relative Risk Site Evaluation Program
RSCO	Recommended Soil Cleanup Objective (NYSDEC)
SARA	Superfund Amendments and Reauthorization Act
SEL	Severe Effect Level
SOPs	Standard Operating Procedures
STL	Severn Trent Laboratories
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TIC	Tentatively Identified Compound
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbon
TOVC	Total Organic Vapor Concentration
ug/kg	Micrograms per kilogram (parts per billion; soil matrix)
ug/L	Micrograms per liter (parts per billion; aqueous matrix)
USACE	United States Army Corps of Engineers
USDA-SCS	United States Department of Agriculture-Soil Conservation Service; currently, USDA-NRCS (Natural Resources Conservation Service)
USEPA	United States Environmental Protection Agency
USTs	Underground Storage Tanks
VOCs	Volatile Organic Compounds

APPENDIX A

DAILY CHEMICAL QUALITY CONTROL REPORTS

DAILY CHEMICAL QUALITY CONTROL REPORT

PROJECT DCQCR REPORT NO: 1

DATE: 11/16/1999

USACE PROJECT MANAGER: Mark Lulka

PROJECT: Air Force Plant No. 51, Greece, NY

OGDEN JOB NUMBER: 7-7076-0060

CONTRACT: DACW51-97-D-0010

DELIVERY ORDER: 60

DAY:	SUN	MON	TUE	WED	THUR	FRI	SAT
			xx				

WEATHER:	CLEAR	HAZY	CLOUDY	RAIN	SNOW
			xx		

TEMP:	< 32 F	32 - 50 F	50 - 70 F	70 - 85 F	> 85 F
	xx				

WINDS:	CALM	MODERATE	HIGH
			xx

HUMIDITY:	DRY	MODERATE	HUMID
		xx	

SUB-CONTRACTORS ON-SITE:

Joseph Dorety of Day Engineering, P.C.

EQUIPMENT ON-SITE:

Sampling trowels and core samplers, inflatable raft, sampling bottles

WORK PERFORMED (INCLUDING SAMPLING):

The locations of soil borings were flagged in Areas Four, Five and Six.

The following samples were obtained in Area Two (the wastewater collection pond discharge point to wetlands): Surface water (SW2-1, SW2-2 and SW2-3) to be analyzed for TAL metals and cyanide, and Sediment (S2-1, S2-2 and S2-3) to be analyzed for TCL VOC,TAL metals, and cyanide.

The following samples were obtained in Area One (the pond that was formerly used to collect wastewater discharge from electroplating operations): Sediment (S1-1 and S1-3) to be analyzed for TCL VOC, TAL metals and cyanide, and Surface Water (SW1-1 and SW1-3) to be analyzed for TAL metals, and cyanide.

Sediment samples were obtained with stainless steel hand trowels in Area Two, and with a stainless steel sediment corer (using non-reactive brass or lexan liners) in Area One.

DAILY CHEMICAL QUALITY CONTROL REPORT

(CONTINUATION SHEET)

PROJECT: Air Force Plant No. 51, Greece, NY DATE: 11/16/1999

OGDEN JOB NUMBER: 7-7076-0060 PROJECT DCQCR REPORT NO: 1

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):
Duplicate sediment sample (S2-02) obtained in Area Two
Two trip blanks processed (TB111699-1 and TB111699-2)
HEALTH AND SAFETY LEVELS AND ACTIVITIES:
Level D Personal Protective Equipment
Personnel and equipment decontamination
PROBLEMS ENCOUNTERED/CORRECTIVE ACTIONS TAKEN:
No problems encountered.
SPECIAL NOTES:
TOMORROW'S EXPECTATIONS:
Initiate subsurface investigation in Areas Four and Five.

SIGNATURE: Vanessa M. Palla TITLE: Environmental Scientist

DAILY CHEMICAL QUALITY CONTROL REPORT

PROJECT DCQCR REPORT NO: 2

DATE: 11/17/1999

USACE PROJECT MANAGER: Mark Lulka

PROJECT: Air Force Plant No. 51, Greece, NY

OGDEN JOB NUMBER: 7-7076-0060

CONTRACT: DACW51-97-D-0010

DELIVERY ORDER: 60

DAY:	SUN	MON	TUE	WED	THUR	FRI	SAT
				xx			

WEATHER:	CLEAR	HAZY	CLOUDY	RAIN	SNOW
			xx		

TEMP:	< 32 F	32 - 50 F	50 - 70 F	70 - 85 F	> 85 F
		xx			

WINDS:	CALM	MODERATE	HIGH
			xx

HUMIDITY:	DRY	MODERATE	HUMID
		xx	

SUB-CONTRACTORS ON-SITE:

Steven D. Gingrich, Earth Dimensions, Inc. (drilling contractor)

EQUIPMENT ON-SITE:

Hollow stem auger drilling rig, sampling bottles, HNU photo-ionization meter, Ludlum Model 3 survey meter with alpha scintillator and pancake G-M (beta/gamma) detectors

WORK PERFORMED (INCLUDING SAMPLING):

The following soil boring samples were obtained in Area Four (area formerly occupied by Building 16 and 17): SB4-1-7, SB4-1-9 and SB4-2-2, to be analyzed for TCL VOC, TAL metals, and TCL BN/AE. The following soil borings were obtained in Area Five (fuel dispenser/UST area): SB5-1-1, SB5-2-1 and SB5-3-1 to be analyzed for lead, TCL VOC, and PAHs.

Soil boring SB4-1 was sampled continuously with a split spoon sampler from ground surface to a depth of 20 feet below ground surface (bgs). Soil boring SB4-2 was sampled in 5 ft increments, starting at 3-5 ft bgs increment, and ending at the 13-15 ft bgs increment. Soil boring SB5-3 was sampled continuously from ground surface to a depth of 14 ft bgs. Soil borings SB5-1 and SB5-2 were sampled at the 3-5 ft bgs and 8-10 ft bgs increments. For each sample increment (or sub-increment depending on lithology), equal portions of recovered sampled were placed in: (1) a soil jar sealed with aluminum foil and capped, and (2) a zip lock plastic bag placed on ice in a sampler cooler. Head space screening with an HNU photoionization detector was subsequently performed on the samples contained in the soil jars to select increments to be processed for laboratory analysis.

Temporary 2 inch diameter monitoring wells were placed in each of the borings SB4-1, SB4-2, SB5-1, SB5-2 and SB5-3, with well screens placed across the water table as inferred from sample inspection. Sand pack and bentonite seal were placed around and above the well screens during auger removal.

DAILY CHEMICAL QUALITY CONTROL REPORT

(CONTINUATION SHEET)

PROJECT: Air Force Plant No. 51, Greece, NY DATE: 11/17/1999

OGDEN JOB NUMBER: 7-7076-0060 PROJECT DCQCR REPORT NO: 2

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):
HNU zero and span gas calibration
Trip blank processed (TB111799)
HEALTH AND SAFETY LEVELS AND ACTIVITIES:
Level D Personal Protective Equipment
Personnel and equipment decontamination
Tailgate safety meeting with driling contractors
PROBLEMS ENCOUNTERED/CORRECTIVE ACTIONS TAKEN:
No problems encountered
SPECIAL NOTES:
An unvegetated depression was located south of the wastewater discharge pond (Area One) and east of the Area Two wetland. It
was decided to place a soil boring (SB6-4) and temporary well at this location rather than a previously identified location in the south
of the property adjacent to a bend in the access roadway (SB6-1).
TOMORROW'S EXPECTATIONS:
Complete soil borings in Areas Four and Six.
Meet with local surveyor (Jim Parker) to identify sample point locations.

SIGNATURE: Vanessa L. Gallo TITLE: Environmental Scientist

DAILY CHEMICAL QUALITY CONTROL REPORT

PROJECT DCQCR REPORT NO: 3

DATE: 11/18/1999

USACE PROJECT MANAGER: Mark Lulka

PROJECT: Air Force Plant No. 51, Greece, NY

OGDEN JOB NUMBER: 7-7076-0060

CONTRACT: DACW51-97-D-0010

DELIVERY ORDER: 60

DAY:	SUN	MON	TUE	WED	THUR	FRI	SAT
					xx		

WEATHER:	CLEAR	HAZY	CLOUDY	RAIN	SNOW
			xx		

TEMP:	< 32 F	32 - 50 F	50 - 70 F	70 - 85 F	> 85 F
		xx			

WINDS:	CALM	MODERATE	HIGH
		xx	

HUMIDITY:	DRY	MODERATE	HUMID
		xx	

SUB-CONTRACTORS ON-SITE:

Steven D. Gingrich, Earth Dimensions, Inc. (drilling contractor)

Jim Parker (surveyor)

EQUIPMENT ON-SITE:

Hollow stem auger drilling rig, sampling bottles, HNU photo-ionization meter, Ludlum Model 3 survey meter with alpha scintillator and pancake G-M (beta/gamma) detectors, and disposable bailers.

WORK PERFORMED (INCLUDING SAMPLING):

The following soil borings were obtained in Area Six (a series of former dumping areas), and Area Four (former location of Building 15): SB6-2-2, SB6-2-9, SB6-3-5, SB6-3-7, SB6-4-4, SB6-4-8, and SB4-3-2, to be analyzed for TCL VOC, TAL metals, and TCL BN/AE.

Soil boring SB6-4 and SB6-2 were sampled continuously with a split spoon sampler from ground surface to a depth of 20 ft below ground surface (bgs). Soil boring SB6-3 was sampled continuously from ground surface to a depth of 16 ft bgs. Soil boring SB4-3 was sampled in 5 ft increments, starting at the 3-5 ft bgs increment, and ending at the 13-15 ft bgs increment. For each sample increment (or sub-increment depending on lithology), equal portions of recovered samples were placed in: (1) a soil jar sealed with aluminum foil and capped, and (2) a zip lock plastic bag placed on ice in a sample cooler. Head space screening with an HNU photoionization detector was subsequently performed on the samples contained in the soil jars to select increments to be processed for laboratory analysis.

Temporary 2 inch diameter monitoring wells were placed in each of the borings SB6-2, SB6-3, SB6-4, and SB4-3, with well screens placed across the water table as inferred from sample inspection. Sand pack and bentonite seal were placed around and above the well screens during auger removal.

Groundwater samples were obtained from SB4-1 and SB4-2 to be analyzed for TCL VOC, TCL BN/AE and TAL metals.

DAILY CHEMICAL QUALITY CONTROL REPORT

(CONTINUATION SHEET)

PROJECT: Air Force Plant No. 51, Greece, NY DATE: 11/18/1999

OGDEN JOB NUMBER: 7-7076-0060 PROJECT DCQCR REPORT NO: 3

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):
HNU zero and span gas calibration
Trip blank processed (TB111899)
HEALTH AND SAFETY LEVELS AND ACTIVITIES:
Level D Personal Protective Equipment
Personnel and equipment decontamination
Tailgate safety meeting with drilling contractors
PROBLEMS ENCOUNTERED/CORRECTIVE ACTIONS TAKEN:
No problems encountered
SPECIAL NOTES:
TOMORROW'S EXPECTATIONS:
Finish groundwater sampling (Areas Four and Six), sediment and surface water sampling (Area Two), and obtain samples
from Areas Three and Seven.

SIGNATURE: Vanessa M. Gallo TITLE: Environmental Scientist

DAILY CHEMICAL QUALITY CONTROL REPORT

PROJECT DCQCR REPORT NO: 4

DATE: 11/19/1999

USACE PROJECT MANAGER: Mark Lulka

PROJECT: Air Force Plant No. 51, Greece, NY

OGDEN JOB NUMBER: 7-7076-0060

CONTRACT: DACW51-97-D-0010

DELIVERY ORDER: 60

DAY:	SUN	MON	TUE	WED	THUR	FRI	SAT
						xx	
WEATHER:	CLEAR	HAZY	CLOUDY	RAIN	SNOW		
	xx		xx				
TEMP:	< 32 F	32 - 50 F	50 - 70 F	70 - 85 F	> 85 F		
			xx				
WINDS:	CALM		MODERATE		HIGH		
			xx				
HUMIDITY:	DRY		MODERATE		HUMID		
			xx				

SUB-CONTRACTORS ON-SITE:

Joseph Dorety of Day Engineering, P.E. (late PM)

EQUIPMENT ON-SITE:

Sampling trowels, core samplers, sampling bottles, disposable bailers, inflatable raft

WORK PERFORMED (INCLUDING SAMPLING):

Ground water samples were obtained from GW5-1, GW5-3 and GW5-2, to be analyzed for Lead, TCL VOC, and PAHs; and at GW4-3, GW6-2, GW6-3 and GW6-4 to be analyzed for TCL VOC, TCL BN/AE and TAL metals.

Sediment and surface water sampling in Area One (S1-2 and SW1-2) was completed.

A soil sample was obtained in Area Three (transformer sump located west of the main building) for PCB analysis.

A sediment sample was obtained in Area Seven (vehicle maintenance area) to be analyzed for TCL VOC, TAL metals, and TCL BN/AE.

DAILY CHEMICAL QUALITY CONTROL REPORT

(CONTINUATION SHEET)

PROJECT: Air Force Plant No. 51, Greece, NY DATE: 11/19/1999

OGDEN JOB NUMBER: 7-7076-0060 PROJECT DCQCR REPORT NO: 4

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):
HNU zero and span gas calibration
Trip blank processed (TB111999)
Field Blank processed (FB111999)
Aqueous sample duplicate obtained (GW6-4-02)
Aqueous MS/MSD obtained (GW4-3-03)
HEALTH AND SAFETY LEVELS AND ACTIVITIES:
Level D Personal Protective Equipment
Personnel and equipment decontamination
PROBLEMS ENCOUNTERED/CORRECTIVE ACTIONS TAKEN:
Collection of an additional aqueous sample at location SW1-2 precluded processing of BN/AE sample for Field Blank FB111999.
SPECIAL NOTES:
Strong chemical odor and water discoloration during extraction of sediment sample S1-2 prompted collection of additional surface
water sample for TCL VOC and TCL BN/AE at SW1-2.
TOMORROW'S EXPECTATIONS:
Demobilization

SIGNATURE: Vanessa U. Fallo TITLE: Environmental Scientist

APPENDIX B

SOIL CHARACTERIZATION LOGS

SOIL BORING LOG

PROJECT NUMBER: 770760060	PROJECT NAME: AFP 51, Greece, NY		
BORING NUMBER: SB4-1	COORDINATES:	DATE: 11/30/99	
ELEVATION:	GWL: Depth 13:47 Date/Time 11/18/99/13:30	DATE STARTED: 11/17/99	
ENGINEER/GEOLOGIST: M. Patel	Depth Date/Time	DATE COMPLETED: 11/17/99	
DRILLING METHODS: Hollow stem Auger (continuous split spoon)		PAGE 1 OF 1	

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6"	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS PID (PPM)
1	0-2' S-1	20,13 17,24	18"	Fill material. Brown and Black f SAND and cmf Gravel w/ pieces of rock, asphalt, wood etc.	F			0
2								
3	2-4' S-2	22,47 58,84	16"	Dry. Brown f SAND, some Silt- trace f Gravel (lamination - Silt & Sand)	SM			0
4								
5	4-6' S-3	36,69 100/4"	12"	Dry, Brown SILT, trace f Sand little Gravel (lamination - Silt & Sand)	ML			
6	6-8' S-4	34,47 78,82	15"					0
7				Dry, Brown SILT, little f Sand little cf Gravel	ML			0
8	8-10' S-5	25,41 55,63	16"					
9				Dry. Dark to light Brown SILT Some f Sand, little mf Gravel	ML-SM			8.5' 0
10	10-12' S-6	6,21 49,100/5"	16"					10.0'
11				Dry. Multicolor cmf Gravel, trace f Sand, trace Silt	GW			0
12	12-14' S-7	100/2" 25,19	2"					0
13				Dry, Dark Brown and Gray SILT and CLAY (lenses), little f Gravel trace f Sand	ML-CL			0
14	14-16' S-8	21	10"					0
15				Wet, Same				15.0' 0
16	16-18' S-9	28,23 29,45	18"					▽ GWL (estimated)
17				Same (lenses 4")	CL-ML			
18	18-20' S-10	62,34 69,73	19"					
19				Same (lamination - Silt and clay)	CL-ML			0
20								
21								
22								
23								
24								
25								25'
				End of the Boring at 25.0'				

NOTES:

Drilling co. Earth Dimensions, Inc.
Elma, NY

Size of Hole - 6"
15-25' - 2" sch 40 PVC screen (0.010")
0-15' - 2" sch 40 PVC Riser
10'-25' - Sand pack
8.5'-10' - Bentonite.

OGDEN ENVIRONMENTAL AND ENERGY SERVICES

SOIL BORING LOG

PROJECT NUMBER: 770760060	PROJECT NAME: AFP 51, Greece, NY		
BORING NUMBER: SB4-2	COORDINATES:	DATE: 11/30/99	
ELEVATION:	GWL: Depth 7.05' Date/Time 11/15/99/1430	DATE STARTED: 11/17/99	
ENGINEER/GEOLOGIST: M. Patel	Depth Date/Time	DATE COMPLETED: 11/17/99	
DRILLING METHODS: Hollowstem Augers		PAGE 1 OF 1	

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 1'	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS PID (PPM)
1								
2								
3	3-5' S-1	80, 100/5"	8"	Fill material - Dark Brown cf SAND and GRAVEL, trace silt w/ pieces of Rock etc'	F			0
4								
5								
6								
7								
8	8-10' S-2	23, 41 49, 57	16"	Dry - Brown SILT and CLAY, trace F Gravel	ML-CL			7.5' 0
9				Wet - Dark Brown cf SAND, trace Silt	SW	9'		9.0' GWL-9.0' (estimated)
10								10.0'
11								
12								
13	13-15' S-3	10, 34 56, 58	18"	Wet - Dark Brown cf SAND, little mf Gravel, trace Silt	SW			0
14								
15								15.0'
				End of the Boring at 15.0'				

NOTES:

Name of Drilling co.
Earth Dimensions, Inc.
Elma, NY

Size of Hole - 6"
10'-15': 2" sch 40 PVC screen (0.010" slot)
0'-10': 2" sch 40 PVC Riser
9.0-15.0': Sand pack
7.5-9.0': Bentonite.

SOIL BORING LOG

PROJECT NUMBER: 770760060	PROJECT NAME: AFP 51, Greece, NY		
BORING NUMBER: SB4-3	COORDINATES:	DATE: 12/01/99	
ELEVATION:	GWL: Depth 12.62' Date/Time 11/17/99/ 11:30	DATE STARTED: 11/18/99	
ENGINEER/GEOLOGIST: M. Patel	Depth Date/Time	DATE COMPLETED: 11/18/99	
DRILLING METHODS: Hollow stem Auger.		PAGE 1 OF 1	

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6")	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS PID (PPM)
1								
2								
3								
4								
5	S-1 5-7'	7,17 20,23	18"	Dry, Tan SILT and CLAY, trace f Sand	ML-CL			2
6								
7								6.5'
8	S-2 8-10'	3,8 11,12	17"	Dry, Tan and Reddish yellow SILT & CLAY, little f Gravel (lenses (1") Sand & Gravel)	ML-CL			30
9								8.5'
10								10'
11								
12								
13	S-3 13-15'	4,7 8,5	18"	Wet Grey CLAY, trace silt	CL			0
14								GWL (estimated)
15								
16								
17								
18								
19								
20								20'
				End of the Boring at 20.0'				

NOTES:

Name of Drilling co.
Earth Dimensions, Inc.

Size of Hole - 6"
10-12' - 2" sch 40 PVC screen (0.010" slot)
0-10' - 2" sch 40 PVC Riser
8.5-20' - Sand pack
6.5-8.5' - Bentonite

SOIL BORING LOG

PROJECT NUMBER: 770760060	PROJECT NAME: AFP 51, Greece, NY		
BORING NUMBER: SB5-1	COORDINATES:	DATE: 11/30/99	
ELEVATION:	GWL: Depth 2.27' Date/Time 11/19/99/10:30	DATE STARTED: 11/17/99	
ENGINEER/GEOLOGIST: M. Patel	Depth Date/Time	DATE COMPLETED: 11/17/99	
DRILLING METHODS: Hollow stem Auger		PAGE 1 OF 1	

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6"	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS PID (PPM)
1								2.0' 1.2'
2								2.6'
3	3-5'	2,2	19"	Wet, Brown and Grey FSAND	SC	4'		
4	S-1	3,5		and Silty CLAY	CL			(estimated)
5								
6								
7								
8	8-10'	2,2	22"	Wet, Grey CLAY, trace				
9	S-2	2,4		Silt	CL			1
10								
11								
12								12.0'
				End of the Boring at 12.0'				

NOTES:

Name of Drilling Co.
Earth Dimensions, Inc.

Size of Hole - 6"
2.0' - 12.0' - 2" sch 40 PVC screen (0.010" slot)
0.0 - 2.0' - 2" sch 40 PVC Riser
1.2 - 12.0' - Sand pack.
0 - 1.2' - Bentonite

SOIL BORING LOG

PROJECT NUMBER: 770760060	PROJECT NAME: AFPSI, Greece, NY		
BORING NUMBER: SB5-2	COORDINATES:	DATE: 11/30/99	
ELEVATION:	GWL: Depth 2.24' Date/Time 11/19/99/11:00	DATE STARTED: 11/17/99	
ENGINEER/GEOLOGIST: M. Patel	Depth Date/Time	DATE COMPLETED: 11/17/99	
DRILLING METHODS: Hollow Stem Auger.		PAGE 1 OF 1	

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6"	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS PID (ppm)
1								1.2',
2								2.0 30
3	3-5'	2,2	18"	Wet, Gray CLAY, little mf Sand, trace Silt (lenses - clay & Sand)	CL			▽: Petroleum odor GWL (estimated) Strong)
4	S-1	2,2						
5								
6								
7								
8	8-10'	3,4	20"	Wet, Orange Brown and Gray CLAY, trace Silt	CL			0
9	S-2	4,4						
10								
11								
12								12.0'
				End of the Boring at 12.0'				

NOTES:

Name of Drilling Co.
Earth Dimensions, Inc.
Elma, NY

Size of Hole - 6"
2.0 - 10.0' - 2" sch 40 PVC screen (0.010" slot)
0 - 2.0' - 2" sch 40 PVC Risers
1.2 - 12.0 - Sand pack
0 - 1.2' - Bentonite.

SOIL BORING LOG

PROJECT NUMBER: 770760060	PROJECT NAME: AFPSI, Greece, NY		
BORING NUMBER: SBS-3	COORDINATES:		DATE: 11/30/99
ELEVATION:	GWL: Depth 7.94' Date/Time 11/17/99/10:40		DATE STARTED: 11/17/99
ENGINEER/GEOLOGIST: M. Patel	Depth	Date/Time	DATE COMPLETED: 11/17/99
DRILLING METHODS: Hollow stem Auger (continous sampling)			PAGE 1 OF 1

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6"	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS PID (PPM)
1	0-2' S-1	1, 1 3, 1	12"	Fill material - Brown & Black cmf SAND, trace silt, Gravel w/ Pieces of wood, roots, metal etc.	F			(Oily) 20
2	2-4' S-2	1, 4 4, 5	18"	moist, Greenish Grey CLAY, trace Silt	CL			0
3	4-6' S-3	4, 6 8, 11	20"	Same	CL			1
4	6-8' S-4	3, 4 7, 10	18"	Wet, Greenish Grey CLAY, trace Silt, trace f Sand, trace f Gravel	CL			0
5	8-10' S-5	3, 3 6, 6	16"	Wet, Greenish Grey and Brown CLAY, trace f Gravel	CL			1
6	10-12' S-6	2, 1 2, 3	17"	Wet, Greenish Grey and Orange CLAY, trace of Sand	CL			2
7	12-14' S-7	3, 2 4, 7	18"	Wet, Grey and Brown CLAY trace Silt	CL			0
8				End of the Boring at 14.0'				
9								
10								
11								
12								
13								
14								

5.0' 7.5' GWL 9' (estimated) 14'

NOTES:

Name of Drilling co.
Earth Dimensions, Inc.
Elma, NY

Size of Hole - 6"
9.0' - 14.0' - 2" sch 40 PVC screen (0.01" slot)
0.0 - 9.0' - 2" sch 40 PVC Riser
7.5 - 14.0' - Sand pack
5.0 - 7.5' - Bentonite

SOIL BORING LOG

PROJECT NUMBER: 770760060	PROJECT NAME: AFP 51, Greece, NY		
BORING NUMBER: SB6-2	COORDINATES:	DATE: 12/01/99	
ELEVATION:	GWL: Depth 15.13' Date/Time 11/19/99/1205	DATE STARTED: 11/18/99	
ENGINEER/GEOLOGIST: M. Patel	Depth Date/Time	DATE COMPLETED: 11/18/99	
DRILLING METHODS: Hollow stem Auger (continuous Sampling)		PAGE 1 OF 1	

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6"	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS PID (PPM)
1	0-2' S-1	3, 7 7, 8	18"	Dark Brown F SAND, some Silt, trace clay & organic w Pieces of Root	F	0.5'		1
3	2-4' S-2	7, 13 17, 19	16"	Dry, Tan-Brown SILT & F SAND, trace clay w Pieces of Root	ML-SM			1
5	4-6' S-3	39, 16 21, 21	18"	Dry, yellowish Brown SILT & F SAND, trace clay	ML-SM			0
7	6-8' S-4	11, 18 38, 42	16"	Dry, yellowish and Tan SILT and CLAY, some F Sand	ML-CL		6'	0
9	8-10' S-5	10, 15 23, 22	18"	same			8'	0
11	10-12' S-6	23, 30 25, 22	16"	Dry, Brown F SAND, some Silt little mF Gravel clenses Silt & Sand)	SM-SW		10'	0
13	12-14' S-7	33, 41 79, 20	18"	Moist, same				0
15	14-16' S-8	43, 95 100/2"	12"	Wet, Brown mF SAND, little cF Gravel, trace Silt	SW			0
17	16-18' S-9	22, 38 37, 49	16"	Wet, Reddish Brown FM SAND, little cF Gravel	SW			GWL (estimated) 0
19	18-20' S-10	8, 31 32, 34	18"	Wet, Reddish Brown F SAND, little mc Gravel	SW			0
20				End of the Boring at 20.0'			20'	

NOTES: Name of Drilling co.
Earth Dimensions, Inc.
Elma, NY

Size of Hole - 6"
10-20' - 2" sch 40 pvc screen (0.010" slott)
0-10' - 2" sch 40 pvc Riser
8-20' - Sand pack
6-8' - Bentonite

SOIL BORING LOG

PROJECT NUMBER: 770760060	PROJECT NAME: AFPSI, Greece, NY		
BORING NUMBER: SB6-3	COORDINATES:	DATE: 12/01/99	
ELEVATION:	GWL: Depth 6.55' Date/Time 11/19/99/12:40	DATE STARTED: 11/15/99	
ENGINEER/GEOLOGIST: M. Patel	Depth Date/Time	DATE COMPLETED: 11/18/99	
DRILLING METHODS: Hollow stem Auger (continous sampling)		PAGE OF	

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6"	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS PID (PPM)
1	0-2' S-1	23,47 9,6	12"	Fill Material. Grey and Brown cf Gravel, little mf Sand, trace silt & Piece of Rock etc.				0.5
2								
3	2-4' S-2	13,21 48,73	18"	Dry, Brown and Reddish Brown f SAND and SILT, some clay, trace mf Gravel	ML-SW			0.5
4								
5	4-6' S-3	20,75 43,32	19"	Dry, Reddish Brown mf SAND, little silt, trace mf Gravel & Piece of rock	SP			0
6								
7	6-8' S-4	25,30 31,24	18"	same	SP		6'	0
8								
9	8-10' S-5	37,65 51,52	20"	Dry. Reddish Brown mf SAND, little mf Gravel, trace Silt & Rock. (cinderly layer at 9.0')	SP		8'	6
10								
11	10-12' S-6	42,17 49,73	18"	Red Brown fm SAND, little cf Gravel & Pieces of Rock	SP		10'	0
12	13							
13								
14	14-16' S-7	40,61 67,23		same				GWL (estimated)
15								
16								
17								
18								
19								
20							20'	
				End of the Boring at 20.0'				

NOTES:

Name of Drilling co.
Earth Dimensions, Inc.

Size of Hole - 6"
10'-20'. 2" sch 40 pvc screen (0.010" slott)
0'-10' - 2" sch 40 pvc Riser
8-20' - Sand pack
6-8' - Bentonite.

SOIL BORING LOG

PROJECT NUMBER: 77076000	PROJECT NAME: AFPSI, Greece, NY		
BORING NUMBER: SB6-4	COORDINATES:		DATE: 11/30/99
ELEVATION:	GWL: Depth. 7.83'	Date/Time 11/15/99/13:10	DATE STARTED: 11/18/99
ENGINEER/GEOLOGIST: M. Patel	Depth	Date/Time	DATE COMPLETED: 11/18/99
DRILLING METHODS: Hollow stem Auger (continuous) Sampling.			PAGE 1 OF 1

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6"	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS PID (PPM)
0	0-2'	3,6	18"	Fill material. Dark Brown SILT and CLAY, trace f Sand & pieces of Rock, Wood, leaves etc.	F			0
1	S-1	7,7						
2	2-4'							
3	S-2	3,100	2"	Same (Debris)	F			0
4	4-6'	100/1"						
5	S-3	100/3"	3"	Dry - Same with organic	F			0
6	6-8'	3,5	20"	Dry, Brown SILT and CLAY	ML-CL			1
7	S-4	8,6		Dry, Brown and Grey mf SAND,	SP	7'		2
8	8-10'	4,5	15"	little mf Gravel				
9	S-5	22,38		Wet Same				0.5
10	10-12'	30,54	20"	Wet, Dark Brown cf SAND,	SP			0.5
11	S-6	62,32		little cmf Gravel, trace Silt				
12	12-14'	12,16	18"	Same	SP			0
13	S-7	19,19						
14	14-16'	20,17	16"	Wet, Brownish Grey f SAND,	SM-CL			0
15	S-8	19,16		some Silt and clay				GWL (estimated)
16	16-18'	6,16	15"					0
17	S-9	32,17		Same	SM-CL			
18	18-20'	12,22	14"					0
19	S-10	32,39		Same				
20								20'
				End of the Boring at 20.0'				

NOTES: Name of Drilling co.
Earth Dimensions, Inc.

Size of Hole - 6"
10 - 20' - 2" sch 40 PVC screen (0.010")
0 - 10' - 2" sch 40 PVC Riser
8 - 20' - Sand pack
6 - 8' - Bentonite

APPENDIX C

LABORATORY ANALYTICAL DATA PACKAGES
(under separate cover)