FINAL
TECHNCIAL MEMORANDUM WORK PLAN
FOR REMEDIAL ACTION AT SITE 5

AT THE
106TH RESCUE WING
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON BEACH, NEW YORK

DECEMBER 2008

Prepared by
PEER Consultants, P.C.

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EST. 1978

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Prepared by

PEER Consultants, P.C.
78 Mitchell Road
Oak Ridge, TN 37830

Prepared for

NGB/A7OR
3500 Fetchet Avenue
Andrews AFB, MD 20762
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LIST OF ACRONYMS

NGB/A7OR	National Guard Bureau, Environmental Restoration Branch
ANG	Air National Guard
ASTM	American Society for Testing and Materials
bgs	below ground surface
COC	contaminant of concern
EM	Environmental Manager
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
FOIA	Freedom of Information Act
gpd	gallons per day
HASP	Health and Safety Plan
IDW	investigation-derived waste
MCL	Maximum Contaminant Level
MGD	million gallons per day
MS	matrix spike
MSD	matrix spike duplicate
MSL	mean sea level
NFRAP DD	No Further Response Action Planned Decision Document
NFA	No Further Action
NGB	National Guard Bureau
NOAA	National Oceanic and Atmospheric Administration
NYCRR	New York Codes, Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Act
PAHs	polyaromatic hydrocarbons
PCBs	polychlorinated biphenyls
PEER	PEER Consultants, P.C.
PID	photoionization detector
PPE	personal protective equipment
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
QC	quality control
RCP	reinforced concrete pipe
RI	Remedial Investigation
RQW	Rescue Wing
SCO	Soil Cleanup Objective
SHSO	Site Health and Safety Officer
SI	Site Investigation
SIM	selective ion method
SPCC	Spill Prevention Control and Countermeasures Plan
SVOC	semivolatile organic compound

LIST OF ACRONYMS (Continued)

TAT	turnaround time
TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbons
USGS	United States Geological Society
VOC	volatile organic compound

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1.0 INTRODUCTION

This Remedial Action Work Plan discusses the remedial action activities to be conducted at Site 5, Southwest Storm Drainage Ditch, located at the 106th Rescue Wing (RQW), Francis S. Gabreski Airport, Westhampton, Beach, New York. A base map showing the site location is provided on Figure 1.1.

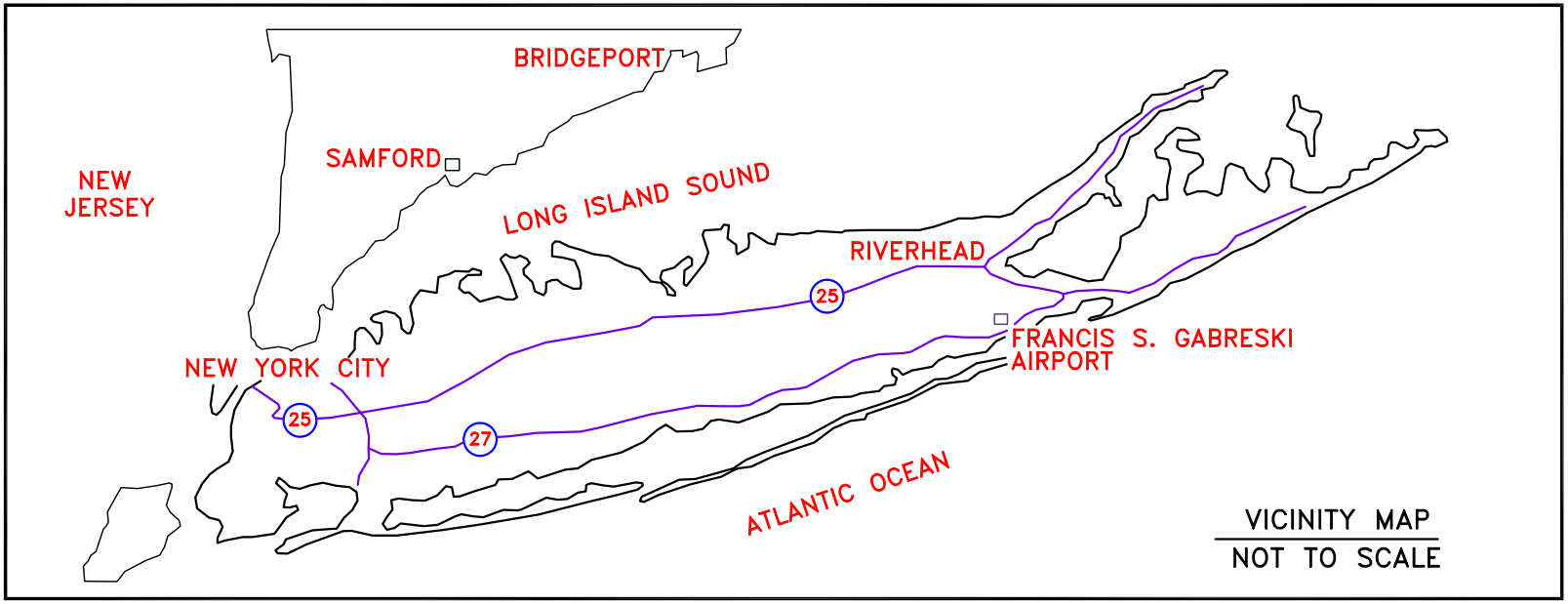
A Kickoff Meeting was held on August 21, 2008 to discuss the activities to be conducted at Site 5 [PEER Consultants, P.C. (PEER 2008a)]. The meeting was attended by representatives of the New York State Department of Environmental Conservation (NYSDEC), the base Environmental Manager (EM), the National Guard Bureau, Environmental Restoration Branch (NGB/A7OR) Program Manager, and the PEER Project Manager.

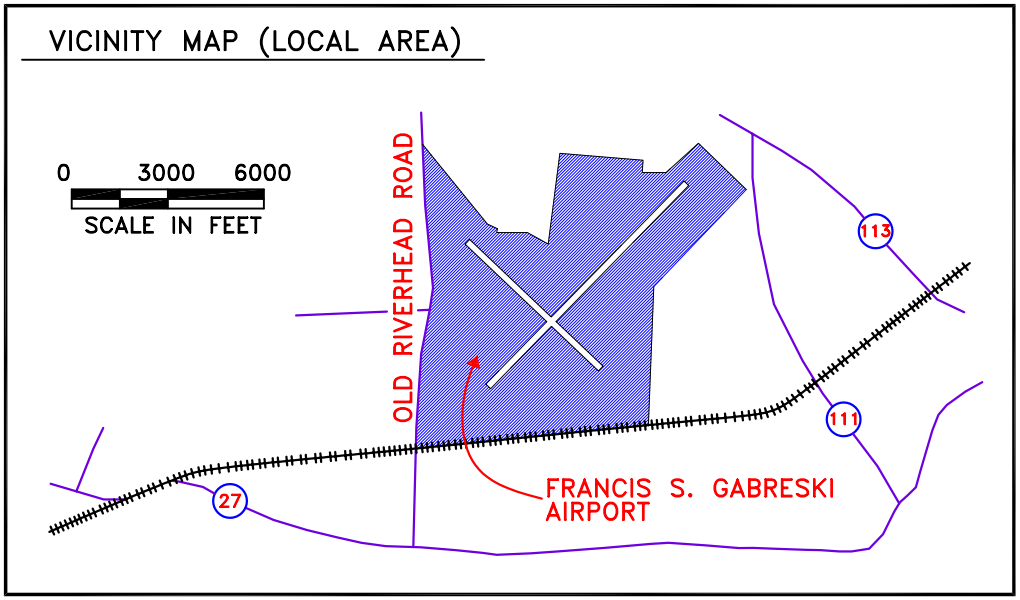
Based on the data presented in the *Site 5 Draft-Final No Further Response Action Planned Decision Document* (NFRAP DD) (PEER 2004b), the NYSDEC requested (September 2005) that semivolatile organic compound (SVOC) and volatile organic compound (VOC) contamination in soil at Site 5 be further delineated. The requested soil sampling at Site 5 was conducted in December 2007 as part of a Data Gap Investigation (PEER 2008b). Five areas of contaminated soil were identified during the Data Gap Investigation. PEER has been tasked by the NGB/A7OR to analyze and dispose of the contaminated soil, and the 106th RQW will provide the excavation services. PEER has also been tasked to present the results of the remedial action in an updated No Further Response Action Planned Decision Document (NFRAP DD).

1.1 OBJECTIVES AND SCOPE

The objective of the project is to excavate and dispose of contaminated soils to allow closure of the site in accordance with NYSDEC and NGB guidance. The following activities will be conducted to meet the project objective:

- providing oversight of soil excavation activities;
- characterizing excavated soils;
- collecting confirmation soil samples from the sidewalls and floors of the five excavations;
- transporting and disposing of the excavated soils; and
- presenting the results, conclusions and closure recommendations in an NFRAP DD.





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PROJ./3005-036
GAB/WORK PLAN/FIG 1.1

FRANCIS S. GABRESKI AIRPORT AND ANG BASE LOCATION
106th RESCUE WING
WESTHAMPTON BEACH, NEW YORK

FIGURE
1.1

2.0 INSTALLATION DESCRIPTION AND BACKGROUND

The 106th RQW of the New York Air National Guard (ANG) is located at the Francis S. Gabreski Airport in Suffolk County, New York, on the eastern end of Long Island, approximately 80 miles east of New York City. Francis S. Gabreski Airport, formerly known as Suffolk County Airport, is located on Old Riverhead Road approximately 2 miles north of the Atlantic Ocean shoreline in Westhampton Beach. The airport is owned by the Suffolk County Department of Public Works. The *Francis S. Gabreski Airport Master Plan* reports the current area of the airport as 1,486 acres (Latino 2002). The 106th RQW leases approximately 70 acres of runways, hangars, and maintenance/service facilities on the southwest side of the airport. The airport is bounded to the north by undeveloped land, to the east by the Quogue Wildlife Refuge, to the south by the Long Island Railroad, and to the west by Old Riverhead Road.

The airport property was acquired in 1942 by the Civil Aeronautics Authority and was used for military training, aircraft maintenance, and armed forces support until 1969. As of 1958, the airport occupied approximately 2,500 acres of relatively flat terrain (Anthony J. Vasell, personal communication 2001). Since 1970, Suffolk County has leased portions of the airport to numerous tenants, including the New York Air National Guard (ANG). In 1990, Suffolk County purchased the property and began operation of Suffolk County Airport. The airport was renamed the Francis S. Gabreski Airport in 1999, in honor of Colonel Francis S. Gabreski, World War II and Korean War Veteran, and former Base Commander.

The 106th RQW is the parent organization of the oldest Air National Guard unit in the country. The 102nd Rescue Squadron, which traces its roots back to the 1st Aero Squadron, was formed in 1908 in New York. The peacetime mission of the 106th RQW is two-fold. First, it is tasked with conducting Search and Rescue and Medevac Operations in an area delineated from the northeast United States, south to the Bahama Islands and east to the Azores. The 106th RQW conducts over water search and rescue operations, and operates and maintains the only rescue aircraft in the northeast designed for aerial refueling. This allows the unit to provide long range rescue operations. The 106th RQW is also tasked by the New Hampshire Fish and Wildlife Service with conducting extensive mountain search support. Secondly, the 106th RQW provides pararescuemen on board HC-130s for deployment in the event of an emergency. In addition, pararescuemen from the unit are occasionally deployed to overseas locations to provide support to the Air Force.

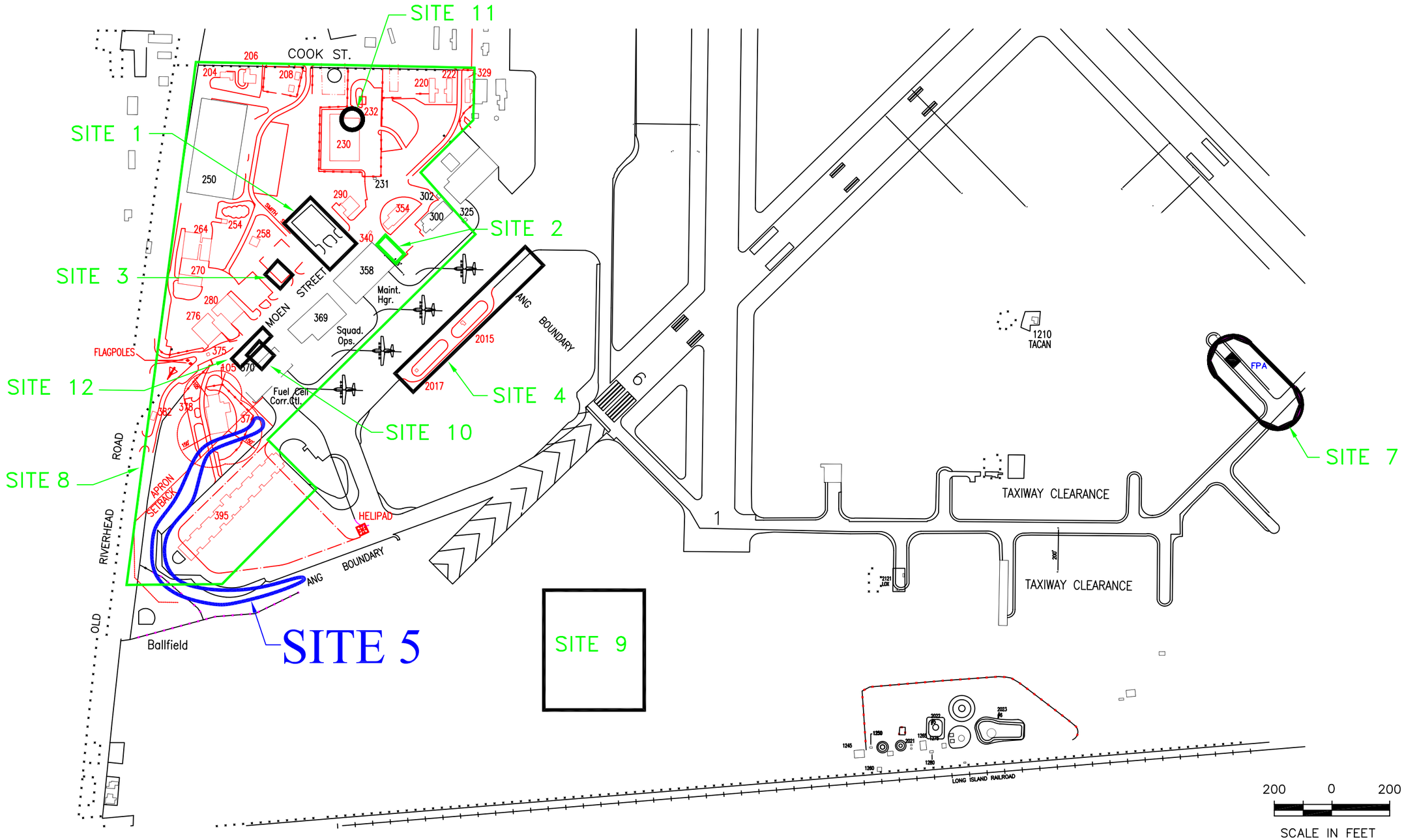
2.1 SITE 5 DESCRIPTION

The Southwest Storm Drainage Ditch (Site 5) is made up of a series of four open drainage swales and underground piping and originates at the subsurface outfall southwest of Building 370. The site is depicted on Figure 2.1.

From the subsurface outfall located southwest of Building 370, storm water is directed aboveground to the southwest for approximately 210 ft. Next, storm water flows through underground piping for approximately 40 ft. The drainage ditch resurfaces at the outfall and continues aboveground for approximately 75 ft south. Drainage is diverted underground again through 18-inch reinforced concrete pipe (RCP) for approximately 60 ft. The drainage ditch

resurfaces again for approximately 200 ft in the southwest direction. From there, drainage flows underground in a southern direction via an 18-inch RCP for approximately 450 ft, then resurfaces and flows east for approximately 550 ft to the southern-most portion of the base. Flow eventually discharges to a dry ravine about 1500 ft southeast of Site 5. The ravine in turn discharges to Aspatuck Creek about 1000 ft further south-southeast.

The drainage ditch receives rainwater from roof drains and runoff from paved areas in the southwestern portion of the base. Historically, an oily sheen was observed on the water surfaces in the ditch during periods of heavy rain. Stressed vegetation was observed in localized areas along the ditch during the Site Investigation (SI) (ABB-ES 1997). None of these conditions were observed during the Data Gap Investigation in 2007 (PEER 2008a).



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PROJ./3005-036
GAB/WORK PLAN/FIG2.1

SITE 5 LOCATION MAP
106th RESCUE WING
WESTHAMPTON BEACH, NEW YORK

FIGURE
2.1

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3.0 ENVIRONMENTAL SETTING

This section discusses the environmental setting in the vicinity of Francis S. Gabreski Airport, which includes the 106th RQW. Specifically, the climate, topography, geology, soils, surface water hydrology, hydrogeology, critical environments, and threatened and endangered species in the surrounding area are briefly discussed in this section. More detailed discussions of the environmental setting can be found in the referenced project documents.

3.1 CLIMATE

The climate of the area surrounding Francis S. Gabreski Airport is humid-continental with a maritime influence characterized by periods of freeze-free temperatures, a reduced range in diurnal and annual temperature, and heavy precipitation in winter relative to that in summer. The winter season lasts about three months with the coolest temperatures generally ranging from 0°F to 10°F (ABB-ES 1997). Average temperatures during the winter months (December through February) range from approximately 35°F to 37°F [National Oceanic and Atmospheric Agency (NOAA) 2008]. Temperatures 90°F or higher occur on average 4 to 6 days per year during summer (ABB-ES 1997). Average temperatures during the summer months range from approximately 69°F to 70°F (NOAA 2008).

The freeze-free growing season is about 217 days per year in much of Suffolk County (NOAA 2008). Precipitation averages approximately 43 in. per year, and dry periods during June and July are common. Average snowfall is approximately 26 in. [Stone & Webster (S&W 1999)]. Net precipitation at the base is 14.5 in. per year, and dry periods during June and July are common (Dames & Moore 1986). The 2-year, 24-hour rainfall total for the installation is 3.5 in. Local climatological data for January through May 2001 show that an individual rain event totaling 3.58 in. in 24 hours occurred on March 30, 2001 (NOAA 2001).

3.2 TOPOGRAPHY

Francis S. Gabreski Airport is situated on a glacial outwash plain south of the Ronkonkoma terminal moraine, which formed during the Wisconsin Glaciation. The outwash plain slopes southward from the terminal moraine to the bays and barrier islands along the Atlantic Ocean shoreline. Relief is characteristically flat with subtle rolling terrain and steeper stream channels (ABB-ES 1997).

3.3 GEOLOGY

Five unconsolidated formations are found at or near the Francis S. Gabreski Airport. These units dip generally to the south with the thicker units very widespread and underlying most of Suffolk County.

Bedrock

The bedrock that underlies the unconsolidated deposits includes hard, dense schist, gneiss, and granite similar in character to that which underlies much of the mainland in nearby parts of New York and Connecticut. Elevation of the bedrock is approximately 1600 ft below mean sea level (MSL). The surface of the bedrock in the region around the airport dips almost directly southward with an average gradient of 1% (Dames & Moore 1986).

Raritan Formation

The Raritan formation rests directly on highly to slightly weathered bedrock. On Long Island, the formation has two fairly distinct members which include the Lloyd sand member below, and a clay member above. The formation probably occurs beneath all of central Suffolk County.

Northward, the Lloyd sand thins and probably pinches out beneath Long Island Sound, and the clay member may do likewise. Southward, the formation extends a considerable distance offshore, possibly as far as 100 miles on the continental shelf (Dames & Moore 1986).

Magothy Formation

The Magothy formation is a thick body of continental deposits composed of lenses of sand, sandy clay, clay, and some gravel. It rests on the Raritan formation and is in turn unconformably overlain by upper Pleistocene deposits. The greatest thickness revealed by drilling is about 1000 ft. The present upper surface of the Magothy on Long Island is an erosional surface, and the original thickness is not known. The Magothy formation underlies most of Long Island except for some western areas where it was removed by erosion.

The Magothy is composed of beds of poorly sorted quartzose sand mixed with and interbedded with silt and clay, and locally it contains pebbles or small lenses of gravel. Sandy clay and clayey sand make up most of the fine beds, but there are also several thick beds of clay. These clay beds probably do not constitute as effective a barrier to the movement of groundwater as the clay member of the Raritan formation (Dames & Moore 1986).

Monmouth Greensand

Unconformably overlying the Magothy formation is the Monmouth Greensand. This unit is not present beneath the airport or to the north but is present 3,000 ft to the south. This unit extends southward and forms a wedge-like layer which thickens towards the south. It is approximately 50 ft thick beneath the barrier beach. The Monmouth Greensand consists of interbedded marine deposits of dark-gray, olive-green, dark-greenish-gray, and greenish-black glauconitic and lignitic clay, silt, and clayey and silty sand. This layer has a low hydraulic conductivity and tends to confine the water of the underlying aquifer (Dames & Moore 1986).

Gardiners Clay

An approximately 40 ft-thick clay bed lies above the Magothy formation and below the glacial deposits below the airport. This clay is present at about 100 ft below MSL at the airport and extends southward where it overlaps the Monmouth Greensand. The Gardiners clay pinches out just north of the airport, but equivalent clay bodies can be found locally at various locations on Long Island. This unit is made up of green and gray clay, silt, and clayey and silty sand including some interbedded clayey and silty gravel. This layer as a whole has low hydraulic conductivity and tends to confine water in the underlying aquifer (Dames & Moore 1986).

Glacial Deposits

These upper Pleistocene sediments are composed of glacial outwash deposits; lacustrine and marine deposits; and terminal, ground, and ablation-moraine till deposits. The sediments below the airport are mostly outwash deposits consisting of stratified fine to coarse sand and gravel of light- to dark-brown, tan, and yellowish-brown color. Approximately 100 to 120 ft of these sediments are found below the airport and above the underlying Gardiners clay. Till deposits known as the Ronkonkoma Terminal Moraine are expressed as hills approximately 2 miles north of the airport. Lacustrine and marine deposits are usually thin and discontinuous and are found locally throughout Long Island (ABB-ES 1997).

3.4 SOILS

Surface soils in the vicinity of the airport belong to either the Riverhead-Plymouth-Carver Association or the Plymouth-Carver Association. As the names suggest, both soil associations are characteristically similar, with only subtle variations between them. The former occurs over 95% of the installation, and is characterized by deep, nearly level to gently sloping, well-drained to excessively drained, moderately coarse textured and coarse-textured soils. The latter is generally rolling and hilly, with deep excessively well drained, coarse-textured soils on moraines. These glacially derived soils have characteristically low soil moisture content which are not suitable for most agricultural purposes and support only limited types of native vegetation (Dames & Moore 1986).

3.5 SURFACE WATER

The topography of the Francis S. Gabreski Airport area is such that surface water runoff flows in a southerly and southeasterly direction. Precipitation at the airport mainly percolates into the soil and moves in the subsurface aquifers although some may move short distances as runoff. The airport drains to Aspatuck Creek located near the southeast corner of the installation. This creek flows into Quantuck Bay, which is separated from the Atlantic Ocean by a narrow barrier island (S&W 1999).

3.6 HYDROGEOLOGY

Three aquifers and two aquitards are present in the region around the Francis S. Gabreski Airport. Overlying the bedrock is the Lloyd Aquifer. The Lloyd Aquifer correlates to the Lloyd

sand member of the Raritan formation. Overlying the Lloyd is the Raritan clay member, an aquitard which is the upper member of the Raritan formation. Overlying the Raritan clay is the Magothy aquifer, a water-bearing unit which correlates to the Magothy formation. Overlying the Magothy is the Gardiners clay, an aquitard present beneath and south of the airport.

Overlying the Gardiners clay at the airport and overlying the Magothy north of the airport is the upper glacial aquifer, a predominantly sand and gravel unit deposited during the Wisconsin glaciation (Dames & Moore 1986). The general characteristics of each aquifer and aquitard including hydrologic properties are presented below, and summarized on Table 3.1.

Table 3.1
Hydrologic Properties of Regional Aquifers
106th Rescue Wing
Westhampton Beach, New York

Unit	Texture	Thickness (ft)	Hydraulic Conductivity (gpd/ft^2) (cm/s)	Estimated Transmissivity (gpd/ft) (cm^2/s)
Upper Glacial	Sand and gravel	120	2,000 (9.4×10^{-2})	200 (2.9×10^{-1})
Gardiners Clay	Clay and silt	40	Aquitard	Aquitard
Magothy Formations	Sand, clayey sand	930	380 (1.8×10^{-2})	300 (4.5×10^{-1})
Raritan Clay	Clay and silt	200	Aquitard	Aquitard
Lloyd Sand	Sand and gravel	400	300 (1.4×10^{-2})	75 (1.1×10^{-1})
Bedrock	Granitic gneiss	--	Aquiclude	Aquiclude

Lloyd Aquifer

The Lloyd sand is one of the most important aquifers on Long Island largely because it yields adequate supplies of good water in areas, generally beneath the margins of Long Island, where supplies from overlying formations are inadequate or are contaminated by, or readily subject to, contamination by seawater. The Lloyd can supply water under these circumstances because it is overlain by the relatively impermeable and virtually continuous blanket of the clay member (Dames & Moore 1986).

The hydraulic conductivity of the Lloyd around the airport was estimated to be 300 gallons per day (gpd)/ft^2 (1.4×10^{-2} cm/s), and transmissivity was estimated as 75 gpd/ft (1.1×10^{-1} cm^2/s) (Dames & Moore 1986). The Lloyd aquifer as of 1974 was not used as a water source at or near the Suffolk County Airport. In 1982, 0.19 million gallons per day (MGD) were withdrawn from the Lloyd in the east central area of Long Island (Dames & Moore 1986).

Magothy Aquifer

Although it consists in part of beds of dense clay and layers of coarse sand and gravel, by far the greater part of the Magothy formation is made up of sandy clay and clayey sand. The formation as a whole, because of this thickness, can transmit and store large amounts of groundwater. There are no effective barriers to the movement of water through the formation except locally.

Hydraulic conductivity of the Magothy below the airport was estimated to be 380 gpd/ft^2 (1.8 x 10^{-2} cm/s), and transmissivity was at least 300 gpd/ft (4.5 x 10^{-1} cm^2/ft) with a saturated thickness of approximately 930 ft. Below the airport, the top of the Magothy aquifer is about 150 ft below MSL. The potentiometric surface of this aquifer is approximately 15 ft above MSL. This confined, artesian nature of the Magothy would cause an upward flow of water through the overlying Gardiners clay (Dames & Moore 1986).

Upper Glacial Aquifer

This aquifer correlates to the saturated interval of the glacial outwash deposits of the Wisconsin glaciation. This water-bearing unit is an unconfined aquifer present directly below the airport. Groundwater elevations are approximately 15 to 19 ft above the National Geodetic Vertical Datum, but may be less or more due to seasonal variations.

The clean, coarse sand and gravel is very porous and highly permeable. It makes a porous soil, so that a high proportion of rainfall infiltrates where it falls. There is virtually no surface runoff. The glacial deposits store large quantities of water and, due to their high porosity and permeability, yield large quantities of water to wells.

Hydraulic conductivity of the outwash deposits was estimated to be about 2000 gpd/ft^2 (9.4 x 10^{-2} cm/s) (ABB-ES 1997). Transmissivity is approximately 200 gpd/ft (2.9 x 10^{-1}cm^2/s) (Dames & Moore 1986). The direction of groundwater movement beneath the Francis S. Gabreski Airport (i.e., in the upper glacial aquifer) is toward the south-southeast. Depth to groundwater averages 35 to 40 ft bgs. Slug tests performed on installation monitoring wells and piezometers (screened in the upper glacial aquifer) produced hydraulic conductivities ranging from 1.6 x 10^{-2} to 5.2 x 10^{-2} cm/sec (Dames & Moore 1986).

The upward movement of water from the Magothy Aquifer would cause the upper glacial water to flow horizontally toward surface water discharge points. Migration of contaminants downward into lower aquifers is very unlikely (Dames & Moore 1986).

Groundwater is the only water supply source for Suffolk County. Most of the water in the vicinity of the Francis S. Gabreski Airport is obtained from the upper glacial aquifer; the rest is obtained from the Magothy and Lloyd aquifers. At present, Suffolk County Water Authority supplies the majority of the water in the area; the rest is supplied by several smaller companies. Suffolk County Water Authority operates 18 wells in 4 well fields within a 4-mile radius of the site. The nearest public water supply is the Meeting House Road well field. The field is located 0.6 miles southeast of Francis S. Gabreski Airport. It is operated by the Suffolk County Water Authority.

A number of domestic water wells are located within 1 mile of the base boundary, south of the airport (ABB-ES 1997). Due to concerns about groundwater contamination from Site 6 (the POL Facility), most or all of the residences utilizing private water wells were provided with access to the public water supply through the Suffolk County Water Authority in the early- to mid-1980s. Information on private water wells was researched at the NYSDEC Division of

Water, Water Supply, at Stony Brook, New York. Access to NYSDEC files was obtained under the Freedom of Information Act (FOIA), FOIA Request Number 735. According to the information obtained, all residential properties on major and secondary roads in areas directly downgradient of the base currently have access to the available public water supply (PEER 2004a).

3.7 CRITICAL HABITATS AND ENDANGERED/THREATENED SPECIES

The Francis S. Gabreski Airport is located within the Long Island Pine Barrens. The Pine Barrens are characterized by open, sunlit woodlands dominated by pitch pine interspersed with white and scarlet oak (Dames & Moore 1986). In the immediate area of the airport, the Pine Barrens are characterized by a transition from 33 to 83 ft tall pitch pines. The nearby Quogue Wildlife Refuge is characterized by dwarf pitch pines ranging from 3 to 6 ft tall (Dames & Moore 1986). The airport itself is characterized by surrounding wooded areas consisting of 25 ft pitch pines and scattered scrub oak (Dames & Moore 1986).

Of the wildlife, birds are the most abundant in the area. Few mammals inhabit the region. Of those that do, the most common are the whitetail deer and red fox. Large animals generally do not inhabit the airport but may pass through.

The following are the Threatened and Endangered Species potentially located within a 4-mile radius of the site (ABB-ES 1995).

- Northern Harrier (*Circus cyaneus*)
- Osprey (*Pandion haliaetus*)
- Tiger Salamander (*Ambystoma tigrinum tigrinum*)
- Eastern Mud Turtle (*Kinosteron subrabrum subrubum*)

A more detailed description of the vegetation and animal life in the area is provided in the Phase I Records Search (Dames & Moore 1986).

4.0 PREVIOUS INVESTIGATIONS

Four previous investigations involving sampling have been conducted at Site 5 including a 1994 SI (ABB 1997), and a 1998 Remedial Investigation (RI) (S & W 1999). Site 5 was not investigated during the 2000 to 2001 RI, but groundwater samples were collected in the vicinity of the site (PEER 2004a). Therefore, the results for groundwater sampling during the 2000 to 2001 RI are briefly discussed as they pertain to Site 5. In addition, an NFRAP DD was prepared for Site 5 in 2004 (PEER 2004b) and a Data Gap Investigation was conducted at Site 5 in 2007 (PEER 2008a). The results of these investigations and the NFRAP DD are briefly discussed below.

1994 Site Investigation

During the 1994 SI, three direct-push probes were installed and sampled at Site 5 for a total of 11 subsurface soil samples and one groundwater sample. In addition, nine sediment grab samples were collected and one surface water sample was collected from surface water pooled at the head of the ditch. Contaminants detected above action levels in sediments and soil, and groundwater are summarized in Tables 4.1 and 4.2, respectively. The results are shown on Figure 4.1.

Overall, the results indicated that sediment and shallow subsurface soil contained concentrations of VOCs, SVOCs, and metals (including arsenic, cadmium, lead, and chromium) that exceeded previous NYSDEC action levels. Surficial soil within the drainage ditch was primarily impacted at the two most upgradient and exposed sections of the ditch. In addition, one concentration of chromium that was collected from the direct-push groundwater sample exceeded action levels. This exceedance of chromium in the direct-push groundwater sample was attributed to the sampling methodology.

1998 Remedial Investigation

In 1998, S&W conducted hand auger soil sampling within the drainage ditch at Site 5. Table 4.3 summarizes the soil exceedances. The results are also shown on Figure 4.2 (results from the 1994 SI are included on the figure for comparison purposes). Two rounds of groundwater samples were collected from monitoring wells at Site 8 (Cell 5) which is adjacent to Site 5. There were no detections of chromium exceeding action levels in groundwater. This result supports the conclusion of the 1994 SI that the exceedance of chromium in the direct-push groundwater sample was due to the sampling methodology.

The soil samples contained exceedances of the polyaromatic hydrocarbons (PAHs) benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene, as well as the metals arsenic and lead. The exceedances of benzene, toluene, dibenzofuran, cadmium, and chromium which were detected during the 1994 SI were not confirmed during the 1998 RI.

The report for the 1998 RI recommended No Further Action (NFA) at Site 5 due to the results of the baseline risk assessment which indicated that levels of exposure to cancer and noncancer causing constituents were acceptable.

Table 4.1
Site 5 Sediment and Surface Soil Results Exceeding Action Levels - 1994 SI
106th Rescue Wing
Westhampton Beach, New York

Sample ID Depth (Ft bgs)	Action Levels		GB-001	GB-001	GB-002	GB-003	GB-004	GB-005	GB-014	GB-015	GB-016	DP-034
	Saturated	Unsaturated	0.5-1	1.5-2	0.5-1	0.5-1	0.5-1	0.5-1	0.5-1	0.5-1	0.5-1	10-12
Volatile Organics (µg/kg)												
Benzene	0.6	60	1100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	15	1500	14000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organics (µg/kg)												
Acenaphthene	330	50,000	NA	NA	NA	NA	NA	NA	NA	58,000	NA	NA
Anthracene	330	50,000	NA	NA	NA	NA	NA	NA	NA	76,000	NA	NA
Benzo(a)anthracene	330	330	19,000	NA	NA	1700	NA	4900	1800	140,000	NA	NA
Benzo(a)pyrene	0.33	330	22,000	NA	NA	1600	NA	4300	2600	120,000	NA	NA
Benzo(b)fluoranthene	330	1100	21,000	12,000	NA	1600	NA	4300	3500	120,000	NA	NA
Benzo(g,h,i)perylene	330	50,000	NA	NA	NA	NA	NA	NA	NA	71,000	NA	NA
Benzo(k)fluoranthene	330	1100	20,000	NA	NA	1500	NA	3800	2600	91,000	NA	NA
Chrysene	400	400	19,000	NA	NA	1800	NA	500	2600	140,000	NA	NA
Dibenz(a,h,)anthracene	340	340	7700	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	62	6200	NA	NA	NA	NA	NA	NA	NA	27000	NA	NA
Fluoranthene	1000	50,000	NA	NA	NA	NA	NA	NA	NA	340,000	NA	NA
Indeno(1,2,3-cd)pyrene	320	3200	18,000	NA	NA	NA	NA	NA	NA	68,000	NA	NA
Phenanthrene	330	50,000	NA	NA	NA	NA	NA	NA	NA	300,000	NA	NA
Pyrene	1000	50,000	NA	NA	NA	NA	NA	NA	NA	270,000	NA	NA
Metals (mg/kg)	**NYS**	**BKG**										
Arsenic	7.5 or SB	0.10/0.10	0.88	5.2	0.22	0.20	0.36	0.30	4.2	2.4	0.59	NA
Cadmium	1 or SB	0.10/0.10	0.73	1.3	0.45	0.88	0.26	0.57	0.21	2.4	0.57	NA
Chromium	10 or SB	6.1/0.84	86	54	23	6.2	NA	NA	52	17	NA	NA
Lead	SB	4.4/0.65	864	1400	45	40	20	27	1200	360	58	0.21
Selenium	2 or SB	0.10/0.10	NA	NA	NA	NA	NA	NA	0.41	0.27	NA	NA
Silver	SB	0.10/0.10	NA	NA	NA	NA	NA	NA	0.41	NA	NA	NA

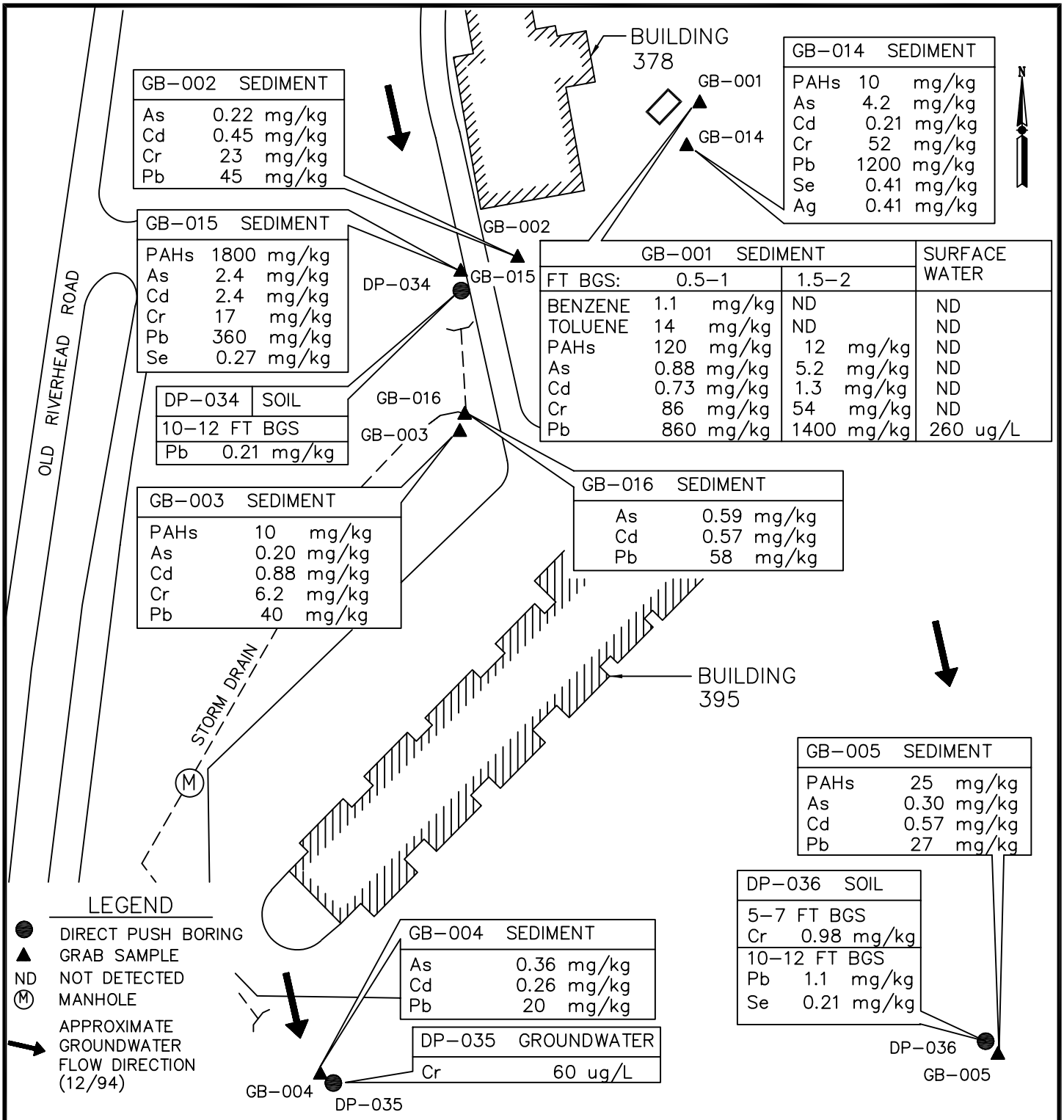
Source: Site Investigation Report, Vol. 1, ABB-ES 1997.
Note: Only exceedances are shown. No other data available.
bgs Below ground surface.
DP Direct probe sample.
GB Soil grab sample.
NA Not available.
NYS New York State Recommended Soil Cleanup Objectives.
SB Site background.

Table 4.2
Site 5 Surface Water and Groundwater Results Exceeding Action Levels - 1994 SI
106th Rescue Wing
Westhampton Beach, New York

Sample	Action Levels		GB-01	GB-035
Depth (ft)	**NYS**	**MCL**	**0-0.2**	**30-32**
Metals (µg/L)				
Chromium	50	1000	NA	60
Lead	25	15	260	NA

Notes:

GB-01 Surface water sample
GB-035 Direct-push groundwater sample
MCL Maximum contaminant level
NYS New York State



NOTES:

1. RESULTS FOR INORGANIC COMPOUNDS IN SOIL COMPARED TO BACKGROUND CONCENTRATIONS (ABB-ES 1997).
2. GROUNDWATER RESULTS COMPARED TO FEDERAL AND NEW YORK STATE DRINKING WATER STANDARDS.
3. RESULTS FOR ORGANIC COMPOUNDS IN SOIL COMPARED TO NYSDEC GUIDANCE LEVELS (ABB-ES-1997).
4. SEDIMENT SAMPLES COLLECTED AT 0.5-1 BGS, EXCEPT AS NOTED.

60 0 60
SCALE IN FEET

SOURCE: ADAPTED FROM ABB-ES,1997

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GAB/WORK PLAN/FIG 4.1

SITE 5 - 1994 SAMPLE RESULTS
106th RESCUE WING
WESTHAMPTON BEACH, NEW YORK

FIGURE 4.1

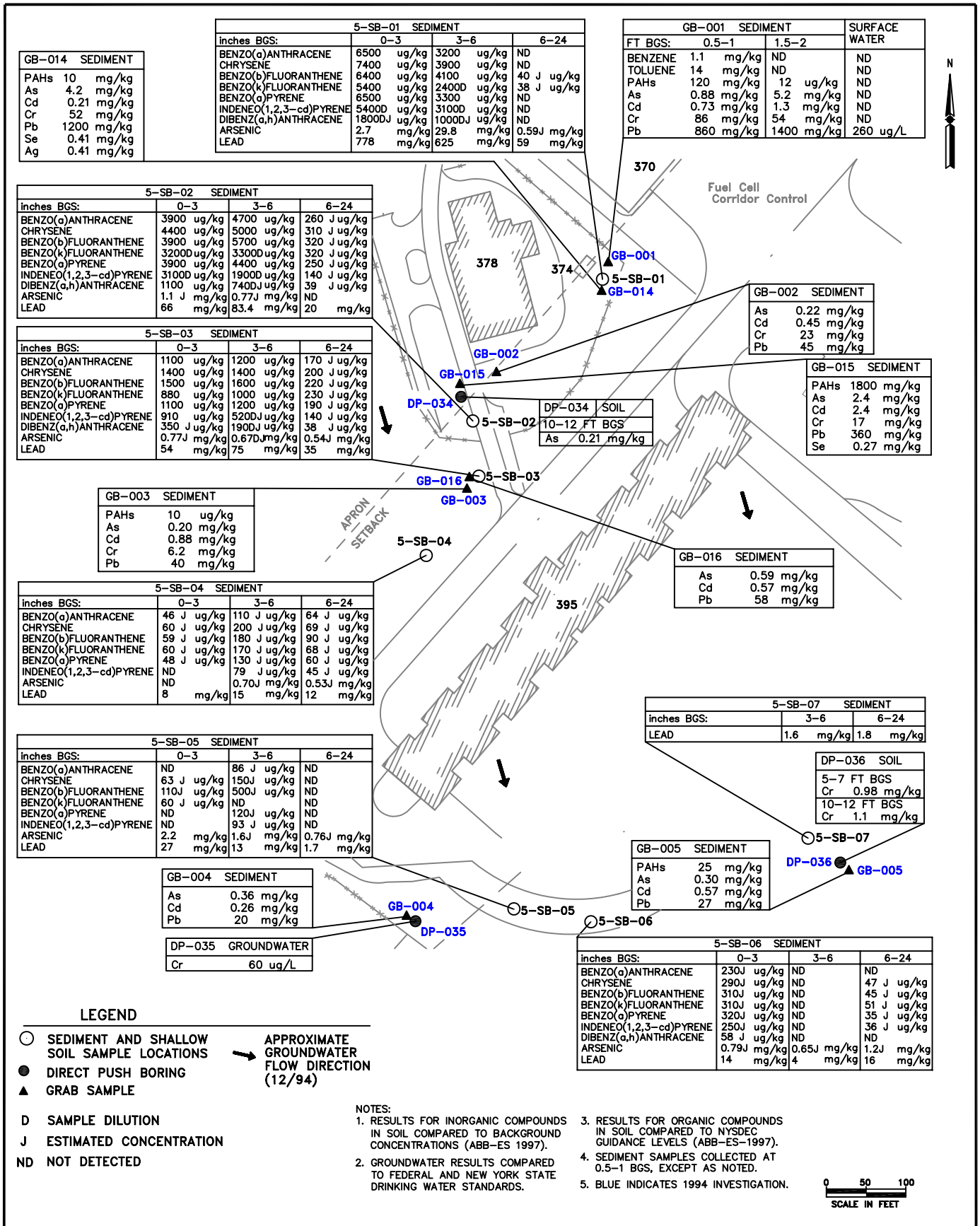
Table 4.3
Site 5 Surface and Shallow Soils Sample Results – 1998 RI
106th Rescue Wing
Westhampton Beach, New York

Sample Depth (in. bgs)	Action Levels		5-SB-01	5-SB-01	5-SB-01	5-SB-02	5-SB-02	5-SB-02	5-SB-03	5-SB-03	5-SB-03	5-SB-04
	Saturated	Unsaturated	0-3	3-6	6-24	0-3	3-6	6-24	0-3	3-6	6-24	0-3
Semivolatile Organics (µg/kg)												
Benzo(a)anthracene	330	330	**6500**	3200	ND	**3900**	**4700**	260 J	**1100**	**1200**	170 J	46 J
Chrysene	400	400	**7400**	3900	ND	**4400**	**5000**	310 J	**1400**	**1400**	200 J	60 J
Benzo(b)fluoranthene	330	1100	**6400**	4100	40 J	**3900**	**5700**	320 J	**1500**	**1600**	220 J	59 J
Benzo(k)fluoranthene	330	1100	**5400**	2400 D	38 J	**3200 D**	**3300 D**	320 J	880	**1000**	230 J	60 J
Benzo(a)pyrene	0.33	330	**6500**	3300	ND	**3900**	**4400**	250 J	**1100**	**1200**	190 J	48 J
Indeneo(1,2,3-cd)pyrene	320	3200	**5400 D**	3100 D	ND	3100 D	1900 D	140 J	910	520 DJ	140 J	ND
Dibenz(a,h,)anthracene	340	340	**1800 DJ**	**1000 DJ**	ND	**1100**	**740 DJ**	39 J	350 J	190 DJ	38 J	ND
Metals (mg/kg)	**NYS**	**BKG**										
Arsenic	7.5 or SB	0.2	2.7	**29.8**	0.59 J	1.1 J	0.77 J	ND	0.77 J	0.67 DJ	0.54 J	ND
Lead	SB	4.4	**778**	**625**	**59**	**66**	**83.4**	**20**	**54**	**75**	**35**	8

Sample Depth (in. bgs)	Action Levels		5-SB-04	5-SB-04	5-SB-05	5-SB-05	5-SB-05	5-SB-06	5-SB-06	5-SB-06	5-SB-07	5-SB-07
	Saturated	Unsaturated	3-6	6-24	0-3	3-6	6-24	0-3	3-6	6-24	3-6	6-24
Semivolatile Organics (µg/kg)												
Benzo(a)anthracene	330	330	110 J	64 J	ND	86 J	ND	230 J	ND	ND	ND	ND
Chrysene	400	400	200 J	69 J	63 J	150 J	ND	290 J	ND	47 J	ND	ND
Benzo(b)fluoranthene	330	1100	180 J	90 J	110 J	500 J	ND	310 J	ND	45 J	ND	ND
Benzo(k)fluoranthene	330	1100	170 J	68 J	60 J	ND	ND	310 J	ND	51 J	ND	ND
Benzo(a)pyrene	0.33	330	130 J	60 J	ND	120 J	ND	320 J	ND	35 J	ND	ND
Indeneo(1,2,3-cd)pyrene	3200	3200	79 J	45 J	ND	93 J	ND	250 J	ND	36 J	ND	ND
Dibenz(a,h,)anthracene	340	340	ND	ND	ND	ND	ND	58 J	ND	ND	ND	ND
Metals (mg/kg)	**NYS**	**BKG**										
Arsenic	7.5 or SB	0.1/0.10	0.70 J	0.53 J	2.2	1.6 J	0.76 J	0.79 J	0.65 J	1.2 J	NR	NR
Lead	SB	4.4/0.65	**15**	**12**	**27**	**13**	1.7	**14**	4	**16**	1.6	1.8

Notes:
1. Shading and bolding indicate action level exceeded.
2. Source: Revised Draft Remedial Investigation Sites 4, 5, 8, and 9, S&W 1999.

bgs Below ground surface.
BKG Upper limit of background concentrations (surface/subsurface).
J Estimated value.
ND Not detected.
NR Not reported.
NYS New York State Recommended Soil Cleanup Objectives.
SB Site background (action level), or soil boring (sample ID).



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GAB/WORK PLAN/FIG 4.2

SITE 5 – PREVIOUS RESULTS FOR 1994 SITE INVESTIGATION AND 1998 RI
106th RESCUE WING
WESTHAMPTON BEACH, NEW YORK

FIGURE 4.2

2000 to 2001 Remedial Investigation

Although Site 5 was not investigated during the 2000 to 2001 RI, groundwater samples were collected. During the basewide sampling, monitoring wells located at Site 8 Cell – 5 (adjacent to Site 5) were sampled, including PZ-003, PZ-006, SDW-014, SDW-015, and SDW-017. No constituents were detected at concentrations exceeding the action levels in the vicinity of Site 5. The analytical results are summarized on Table 4.4. The wells are hydraulically downgradient of the contaminated areas of the ditch that were identified during the 2007 Data Gap Investigation.

2004 No Further Response Action Required Decision Document

In 2004, a NFRAP DD was prepared for Site 5. The NFRAP recommended NFA for Site 5 on the basis of the previous investigations and the risk assessment which indicated that risks associated with the site were negligible (PEER 2204b).

However, the NYSDEC did not concur with the NFA recommendation and requested that the extent of VOCs and SVOCs (PAHs) be further delineated in soil, and that soil containing levels of contaminants that exceed action levels be removed primarily in the vicinity of GB-15 and GB-001 (NYSDEC 2005).

2007 Data Gap Investigation

In response to the NYSDEC's concerns, a Data Gap Investigation was conducted at Site 5 to further delineate the extent of soil contamination in the Southwest Storm Drainage Ditch. More than 60 soil samples were collected in the ditch to delineate and further characterize the contaminants. The results are presented in Table 4.5 and are shown on Figure 4.3.

Metals and PAHs were detected at concentrations that exceeded action levels in four isolated areas in the northern portions of the ditch where previous sampling (1994 SI and 1998 RI) indicated the presence of contamination, and in one area (lead) where no previous samples had been collected. No VOCs were detected in samples from the ditch and the existence of benzene and toluene (detected during the 1994 SI) was not confirmed. No contaminants were detected in the southern-most portion of the ditch. The results are discussed in the following paragraphs.

Benzo(a)anthracene exceeded the Soil Cleanup Objective (SCO) of 1 mg/kg in sample SS5-06-2 (2.1 mg/kg), SS5-17-1 (1.6 mg/kg), and SS5-18-1 (3.4 mg/kg). Benzo(a)pyrene exceeded the SCO of 1 mg/kg in sample SS5-06-1 (1.4 mg/kg), SS5-06-2 (1.9 mg/kg), SS5-17-1 (1.8 mg/kg), and SS5-18-1 (3.7 mg/kg). Benzo(b)fluoranthene exceeded the SCO of 1 mg/kg in sample SS5-06-1 (1.4 mg/kg), SS5-06-2 (1.5 mg/kg), SS5-17-1 (1.9 mg/kg), and SS5-18-1 (3.5 mg/kg). Benzo(k)fluoranthene exceeded (or was equal to) the SCO of 0.8 mg/kg in sample SS5-06-1 (1.1 mg/kg), SS5-06-2 (1.9 mg/kg), SS5-12-1 (0.8 mg/kg), SS5-17-1 (1.9 mg/kg), and SS5-18-1 (3.6 mg/kg). Chrysene exceeded the SCO of 1 mg/kg in sample SS5-06-2 (2.3 mg/kg), SS5-17-1 (1.8 mg/kg), and SS5-18-1 (3.6 mg/kg). Dibenz(a,h)anthracene exceeded the SCO of 0.33 mg/kg in sample SS5-06-1 (0.35 mg/kg) and SS5-18-1 (0.66 mg/kg). Indeno(1,2,3-cd)pyrene exceeded the SCO of 0.5 mg/kg in sample SS5-06-1 (0.83 mg/kg), SS5-06-2 (0.96 mg/kg), SS5-17-1 (0.74 mg/kg) and SS5-18-1 (1.4 mg/kg).

Cadmium exceeded the SCO of 2.5 mg/kg in sample SS5-02-2 at 6.4 mg/kg. Chromium exceeded the SCO of 30 mg/kg in sample SS5-02-1 (3500 mg/kg), SS5-02-2 (110 mg/kg) and SS5-05-1 (4400 mg/kg). Copper exceeded the SCO of 50 mg/kg in sample SS5-02-1 (2600 mg/kg), SS5-05-1 (2700 mg/kg), and SS5-12-1 (89 mg/kg). Lead exceeded the SCO of 63 mg/kg in sample SS5-02-2 (350 mg/kg), SS5-05-1 (12,000 mg/kg), and SS5-17-1 (81 mg/kg), and SS5-33-1 (64 mg/kg). Mercury exceeded the SCO of 0.18 mg/kg in sample SS5-01-1 at 0.45 mg/kg, and in sample SS5-02-2 at 1.3 mg/kg. Nickel exceeded the SCO of 30 mg/kg in SS5-05-1 at 1800 mg/kg.

The Technical Memorandum recommended that soils in the impacted areas be excavated and properly disposed of in accordance with state and federal guidance and requirements, and that once confirmation samples show that all impacted soils have been removed, the excavations should be backfilled, and Site 5 should be closed and recommended for NFA.

Table 4.4
Site 5 Monitoring Well Sample Results - 2000 to 2001 RI
106th Rescue Wing
Westhampton Beach, New York

Parameter	NYS [b]	MCL [c]	Concentration					
			Location [a]					
			BW-SDW014-02	BW-SDW015-02	BW-SDW017-02	BW-PZ003-02	BW-PZ003-22 (Duplicate)	BW-PZ006-02
Benzene	0.7	5	ND	ND	ND	ND	ND	ND
Carbon Disulfide	50	--	ND	ND	ND	0.2 J	4.0	ND
Chloroform	7	80	ND	ND	2.0	0.7 J	0.3 J	ND
Ethylbenzene	5	700	ND	ND	ND	ND	ND	ND
Toluene	5	1000	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5	200	ND	ND	ND	1.0	1.0	ND
Trichloroethene	5	5	ND	ND	ND	2.0	2.0	ND
Vinyl acetate	--	--	ND	ND	ND	ND	ND	ND
Total Xylenes	5	10,000	ND	ND	ND	ND	ND	ND
Semivolatile Organics (µg/L)								
Bis(2-ethylhexyl)phthalate	50	6	ND	4.0	ND	ND	ND	ND
1,2-Dichlorobenzene	4.7	--	ND	ND	ND	ND	ND	ND
Diethyl phthalate	50 [d]	--	ND	ND	ND	ND	ND	ND

Parameter	NYS [b]	MCL [c]	Concentration					
			Location/Depth [a]					
			BW-SDW014-02	BW-SDW015-02	BW-SDW017-02	BW-PZ003-02	BW-PZ003-22 (Duplicate)	BW-PZ006-02
Metals (µg/L)								
Aluminum	--	--	2000	600	2600	230	240	330
Arsenic	25	50 [d]	ND	ND	ND	ND	ND	7.1
Barium	--	2000	21	62	19	8.1	8.1	13 E
Cadmium	10	5.0	ND	ND	ND	ND	ND	ND
Calcium	--	--	12,000	11,000	8200	12,000	11,000	27,000
Chromium	50	100	8.9	2.7	12	ND	ND	2.3
Cobalt	--	--	ND	ND	ND	ND	ND	ND
Copper	--	1300 [e]	ND	ND	ND	ND	ND	ND
Iron	--	--	4000	2600	4600	220	260	570 E
Lead	25	15 [e]	ND	ND	ND	ND	ND	ND
Magnesium	--	--	2600	1600	2400	2900	2700	1700
Manganese	--	--	150	120	220	19	18	300
Nickel	--	--	ND	ND	ND	ND	ND	ND
Potassium	--	--	1400	2700	2100	1400	1300	1700
Silver	50	100 [f]	ND	ND	ND	ND	ND	3.0
Sodium	--	--	7700	42,000	12,000	23,000	22,000	3700
Vanadium	--	--	7.0	ND	5.6	ND	ND	ND
Zinc	--	--	54	28	130	ND	ND	28

Notes:
E Estimated value or not reported due to the presence of interferences.
ND Not detected.
-- No applicable action level.

Shading and bolding indicates exceedance of action level.

(a) "SDW" refers to small-diameter well; "SW" refers to Stone & Webster well; "-01" refers to Round 1 sampling, February –March 2001; "02" refers to round 2 sampling, May – June 2001.

(b) New York State (NYS), Class GA Groundwater; NYSDEC TAGM #4046.

(c) Maximum Contaminant Level (MCL), United States Environmental Protection Agency.

(d) Federal MCL is under review.

(e) Treatment Technique Action Level. Federal MCL is concentration in water collected from tap.

(f) Secondary Federal MCL.

Table 4.5
Site 5 Soil Analytical Results – 2007 Data Gap Investigation
106th Rescue Wing
Westhampton Beach, New York

Analyte	Action Level(1)	Concentration							
		SS5-01-1 (0.5-1 ft)	SS5-01-1D (Duplicate)	SS5-01-2 (1-2 ft)	SS5-02-1 (0.5-1 ft)	SS5-02-2 (1-2 ft)	SS5-03-1 (0.5-1 ft)	SS5-03-2 (1-2 ft)	SS5-04-1 (0.5-1 ft)
Volatile Organics (mg/kg)									
Benzene	0.06	<0.054	<0.053	<0.053	<0.052	<0.053	<0.053	<0.055	<0.053
Ethylbenzene	1	<0.054	<0.053	<0.053	<0.052	<0.053	<0.053	<0.055	<0.053
Toluene	0.7	<0.054	<0.053	<0.053	<0.052	<0.053	<0.053	<0.055	<0.053
Xylenes	0.26	<0.11	<0.11	<0.11	<0.10	<0.11	<0.11	<0.11	<0.11
Polyaromatic Hydrocarbons (mg/kg)									
Acenaphthene	20	<0.018	<0.018	<0.018	<0.017	<0.018	<0.018	<0.018	<0.018
Acenaphthylene	100	<0.018	<0.018	<0.018	<0.017	<0.018	<0.018	<0.018	<0.018
Anthracene	100	<0.018	<0.018	<0.018	<0.017	0.037	<0.018	<0.018	<0.018
Benzo(a)anthracene	1	0.024	<0.018	<0.018	0.05	0.16	0.035	<0.018	0.04
Benzo(a)pyrene	1	0.03	0.025	<0.018	0.078	0.25	0.045	<0.018	0.056
Benzo(b)fluoranthene	1	0.029	0.027	<0.018	0.077	0.41	0.045	<0.018	0.06
Benzo(g,h,i)perylene	100	0.019	<0.018	<0.018	0.032	0.21	0.03	<0.018	0.034
Benzo(k)fluoranthene	0.8	0.029	0.022	<0.018	0.078	0.39	0.041	<0.018	0.048
Chrysene	1	0.029	0.023	<0.018	0.062	0.16	0.04	0.019	0.05
Dibenz(a,h)anthracene	0.33	<0.018	<0.018	<0.018	<0.017	0.1	<0.018	<0.018	<0.016
Fluoranthene	100	0.05	0.037	<0.018	0.099	0.5	0.064	0.037	0.057
Fluorene	30	<0.018	<0.018	<0.018	<0.017	<0.018	<0.018	<0.018	<0.018
Indeno(1,2,3-cd)pyrene	0.5	0.019	<0.018	<0.018	0.036	0.027	0.026	<0.018	0.034
Naphthalene	12	<0.018	<0.018	<0.018	<0.017	<0.018	<0.018	<0.018	<0.018
Phenanthrene	100	<0.018	<0.018	<0.018	0.025	0.1	0.026	<0.018	0.02
Pyrene	100	0.040	0.029	<0.018	0.077	0.32	0.055	0.031	0.048
Metals (mg/kg)									
Arsenic	13	1.1	<1.1	<1.1	<1000	1.3	<1.1	1.1	<1.1
Beryllium	7.2	<0.21	<0.21	<0.21	<210	<0.21	<0.21	<0.22	<0.21
Cadmium	2.5	<0.27	<0.27	0.36	<260	**6.4**	<0.27	<0.27	<0.27
Chromium	30	9.1	4.7	7.2	**3500**	**110**	7.9	3.7	2.5
Copper	50	6.6	2.1	1.9	**2600**	26	2.7	3.0	1.5
Lead	63	14	10	11	12	**350**	46	55	5.2
Mercury	0.18	**0.45**	**0.35**	0.12	<0.010	**1.3**	0.02	0.023	<0.011
Nickel	30	5	1.4	1.5	1.6	5.4	1.2	1.4	1.1
Silver	2	<0.54	<0.53	<0.53	<520	<0.53	<0.53	<0.55	<0.53

Notes:
(1) Soil sample results compared to Soil Cleanup Objectives (SCOs) of 6 New York Codes, Rules and Regulations (NYCRR) Part 375 for unrestricted usage.
(2) Sample "SS5-XX-X" refers to Site 5 hand auger sample location XX-X at a specified depth below ground surface (bgs). For example, SS5-01-1 is the first hand auger sample at location 01 at 0.5 to 1 ft bgs. SS5-01-2 is the second hand auger sample from location 01 at 1 to 2 ft bgs.

Bolding and shading indicate that sample result exceeds the Action Level.

Table 4.5 (Continued)
Site 5 Soil Analytical Results – 2007 Data Gap Investigation
106th Rescue Wing
Westhampton Beach, New York

Analyte	Action Level(1)	Concentration							
		SS5-04-2 (1-2 ft)	SS5-04-2D (Duplicate)	SS5-05-1 (0.5-1 ft)	SS5-05-2 (1-2 ft)	SS5-06-1 (0.5-1 ft)	SS5-06-2 (1-2 ft)	SS5-07-1 (0.5-1 ft)	SS5-07-2 (1-2 ft)
Volatile Organics (mg/kg)									
Benzene	0.06	<0.053	<0.053	<0.053	<0.055	<0.053	<0.052	<0.054	<0.054
Ethylbenzene	1	<0.053	<0.053	<0.053	<0.055	<0.053	<0.052	<0.054	<0.054
Toluene	0.7	<0.053	<0.053	<0.053	<0.055	<0.053	<0.052	<0.054	<0.054
Xylenes	0.26	<0.11	<0.11	<0.11	<0.11	<0.11	<0.10	<0.11	<0.11
Polyaromatic Hydrocarbons (mg/kg)									
Acenaphthene	20	<0.018	<0.018	<0.018	<0.036	<0.088	1.4	0.047	<0.018
Acenaphthylene	100	<0.018	<0.018	<0.018	<0.036	<0.088	<0.87	<0.018	<0.018
Anthracene	100	<0.018	<0.018	<0.018	0.07	<0.088	1.5	0.095	<0.018
Benzo(a)anthracene	1	0.021	0.064	0.053	0.3	0.4	**2.1**	0.17	<0.018
Benzo(a)pyrene	1	0.023	0.043	0.075	0.49	**1.4**	**1.9**	0.19	<0.018
Benzo(b)fluoranthene	1	0.026	0.06	0.073	0.53	**1.4**	**1.5**	0.2	<0.018
Benzo(g,h,i)perylene	100	<0.018	0.022	0.054	0.27	0.81	1.0	0.064	<0.018
Benzo(k)fluoranthene	0.8	0.023	0.048	0.074	0.41	**1.1**	**1.9**	0.17	<0.018
Chrysene	1	0.027	0.087	0.064	0.39	0.710	**2.3**	0.17	<0.018
Dibenz(a,h)anthracene	0.33	<0.018	<0.018	0.021	0.12	**0.35**	<0.87	0.028	<0.018
Fluoranthene	100	0.047	0.13	0.096	0.71	0.38	6.8	0.53	<0.018
Fluorene	30	<0.018	<0.018	<0.018	<0.036	<0.088	2.3	0.046	<0.018
Indeno(1,2,3-cd)pyrene	0.5	<0.018	0.023	0.047	0.27	**0.83**	**0.96**	0.066	<0.018
Naphthalene	12	<0.018	<0.018	<0.018	<0.036	<0.088	3.1	0.05	<0.018
Phenanthrene	100	<0.018	<0.018	0.031	0.39	0.9	10	0.42	<0.018
Pyrene	100	0.046	0.24	0.084	0.55	0.36	5.5	0.37	<0.018
Metals (mg/kg)									
Arsenic	13	<1.1	<1.1	<1.1	<1.1	1.8	<1.1	<1.1	1.2
Beryllium	7.2	<0.21	<0.21	<210	<0.22	<0.21	<0.21	<0.21	<0.22
Cadmium	2.5	<0.26	<0.26	<270	<0.27	<0.26	<0.26	<0.27	<0.27
Chromium	30	3.0	2.3	**4400**	5.6	4.7	3.8	4.3	5.1
Copper	50	1.5	1.5	**2700**	3.7	3.9	2.0	2.7	2.8
Lead	63	5.2	4.5	**12000**	29	16	9.1	21	16
Mercury	0.18	0.014	<0.011	<0.011	0.014	<0.01	<0.010	<0.011	0.018
Nickel	30	1.0	0.98	**1800**	1.5	2.3	1.4	1.3	1.7
Silver	2	<0.53	<0.53	<0.53	<0.55	<0.53	<0.52	<0.54	<0.54

Notes:
(1) Soil sample results compared to Soil Cleanup Objectives (SCOs) of 6 New York Codes, Rules and Regulations (NYCRR) Part 375 for unrestricted usage.
(2) Sample "SS5-XX-X" refers to Site 5 hand auger sample location XX-X at a specified depth below ground surface (bgs). For example, SS5-01-1 is the first hand auger sample at location 01 at 0.5 to 1 ft bgs. SS5-01-2 is the second hand auger sample from location 01 at 1 to 2 ft bgs.

Bolding and shading indicate that sample result exceeds the Action Level.

Table 4.5 (Continued)
Site 5 Soil Analytical Results – 2007 Data Gap Investigation
106th Rescue Wing
Westhampton Beach, New York

Analyte	Action Level(1)	Concentration							
		SS5-08-1 (0.5-1 ft)	SS5-08-2 (1-2 ft)	SS5-09-1 (0.5-1 ft)	SS5-09-2 (1-2 ft)	SS5-10-1 (0.5-1 ft)	SS5-10-2 (1-2 ft)	SS5-10-2D (Duplicate)	SS5-11-1 (0.5-1 ft)
Volatile Organics (mg/kg)									
Benzene	0.06	<0.054	<0.054	<0.055	<0.053	<0.052	<0.053	<0.053	<0.052
Ethylbenzene	1	<0.054	<0.054	<0.055	<0.053	<0.052	<0.053	<0.053	<0.052
Toluene	0.7	<0.054	<0.054	<0.055	<0.053	<0.052	<0.053	<0.053	<0.052
Xylenes	0.26	<0.11	<0.11	<0.11	<0.11	<0.10	<0.11	<0.11	<0.10
Polyaromatic Hydrocarbons (mg/kg)									
Acenaphthene	20	<0.018	0.037	<0.018	<0.018	<0.017	<0.018	<0.018	<0.017
Acenaphthylene	100	<0.018	<0.036	<0.018	<0.018	<0.017	<0.018	<0.018	<0.017
Anthracene	100	0.035	0.064	<0.018	<0.018	<0.017	<0.018	<0.018	<0.017
Benzo(a)anthracene	1	0.19	0.26	0.067	<0.018	0.084	0.021	<0.018	<0.017
Benzo(a)pyrene	1	0.4	0.36	0.085	<0.018	0.12	0.026	0.02	<0.017
Benzo(b)fluoranthene	1	0.57	0.36	0.083	<0.018	0.13	0.025	0.021	<0.017
Benzo(g,h,i)perylene	100	0.19	0.19	0.028	<0.018	0.053	<0.018	<0.018	<0.017
Benzo(k)fluoranthene	0.8	0.49	0.32	0.088	<0.018	0.12	0.023	0.019	<0.017
Chrysene	1	0.33	0.32	0.072	<0.018	0.10	0.025	0.019	<0.017
Dibenz(a,h)anthracene	0.33	0.089	0.085	<0.018	<0.018	0.025	<0.018	<0.018	<0.017
Fluoranthene	100	0.380	0.7	0.14	<0.018	0.17	0.039	0.03	0.022
Fluorene	30	<0.018	0.041	<0.018	<0.018	<0.017	<0.018	<0.018	<0.017
Indeno(1,2,3-cd)pyrene	0.5	0.19	0.19	0.03	<0.018	0.06	<0.018	<0.018	<0.017
Naphthalene	12	<0.018	<0.036	<0.018	<0.018	<0.017	<0.018	<0.018	<0.017
Phenanthrene	100	0.13	0.38	0.051	<0.018	0.045	<0.018	<0.018	<0.017
Pyrene	100	0.31	0.53	0.11	<0.018	0.13	0.032	0.024	0.02
Metals (mg/kg)									
Arsenic	13	<1.1	<1.1	1.5	<1.1	<1.0	<1.1	<1.1	2.1
Beryllium	7.2	<0.22	<0.22	<0.22	<0.21	<0.21	<0.21	<0.21	<0.21
Cadmium	2.5	0.35	<0.27	<0.27	<0.27	<0.26	<0.26	<0.27	<0.26
Chromium	30	6.1	7.2	4.7	2.8	5.2	1.9	2.5	4.2
Copper	50	3.1	3.0	3.4	1.3	2.1	1.1	1.4	1.6
Lead	63	30	31	30	5.3	12	3.6	3.5	3.2
Mercury	0.18	0.012	0.017	0.022	0.014	<0.010	<0.011	<0.011	<0.010
Nickel	30	1.6	1.7	1.8	0.78	1.3	0.95	1.0	1.3
Silver	2	<0.54	<0.54	<0.55	<0.53	<0.52	<0.53	<0.53	<0.52

Notes:
(1) Soil sample results compared to Soil Cleanup Objectives (SCOs) of 6 New York Codes, Rules and Regulations (NYCRR) Part 375 for unrestricted usage.
(2) Sample "SS5-XX-X" refers to Site 5 hand auger sample location XX-X at a specified depth below ground surface (bgs). For example, SS5-01-1 is the first hand auger sample at location 01 at 0.5 to 1 ft bgs. SS5-01-2 is the second hand auger sample from location 01 at 1 to 2 ft bgs.

Table 4.5 (Continued)
Site 5 Soil Analytical Results – 2007 Data Gap Investigation
106th Rescue Wing
Westhampton Beach, New York

Analyte	Action Level(1)	Concentration							
		SS5-11-2 (1-2 ft)	SS5-12-1 (0.5-1 ft)	SS5-12-2 (1-2 ft)	SS5-12-2D (Duplicate)	SS5-13-1 (0.5-1 ft)	SS5-13-2 (1-2 ft)	SS5-14-1 (0.5-1 ft)	SS5-14-2 (1-2 ft)
Volatile Organics (mg/kg)									
Benzene	0.06	<0.054	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	1	<0.054	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toluene	0.7	<0.054	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Xylenes	0.26	<0.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Polyaromatic Hydrocarbons (mg/kg)									
Acenaphthene	20	<0.06	0.100	0.074	0.095	0.052	<0.018	0.055	<0.018
Acenaphthylene	100	<0.06	0.065	<0.018	<0.036	<0.037	<0.018	<0.037	<0.018
Anthracene	100	0.072	0.27	0.11	0.13	0.093	<0.018	0.12	0.033
Benzo(a)anthracene	1	0.64	0.71	0.27	0.3	0.3	<0.018	0.34	0.088
Benzo(a)pyrene	1	0.72	0.78	0.3	0.32	0.36	<0.018	0.39	0.11
Benzo(b)fluoranthene	1	0.79	0.84	0.33	0.34	0.42	<0.018	0.45	0.13
Benzo(g,h,i)perylene	100	0.47	0.46	0.14	0.16	0.18	<0.018	0.19	0.039
Benzo(k)fluoranthene	0.8	0.70	**0.8**	0.28	0.3	0.35	<0.018	0.4	0.1
Chrysene	1	0.74	0.88	0.31	0.34	0.39	<0.018	0.43	0.092
Dibenz(a,h)anthracene	0.33	0.19	0.18	0.056	0.066	0.068	<0.018	0.072	<0.018
Fluoranthene	100	1.3	1.5	0.74	0.76	0.84	<0.018	0.98	0.22
Fluorene	30	<0.06	0.1	0.041	0.056	<0.037	<0.018	0.041	<0.018
Indeno(1,2,3-cd)pyrene	0.5	0.42	0.41	0.14	0.14	0.16	<0.018	0.170	0.043
Naphthalene	12	<0.06	<0.061	0.018	0.037	<0.037	<0.018	<0.037	<0.018
Phenanthrene	100	0.35	1.0	0.44	0.5	0.37	<0.018	0.49	0.1
Pyrene	100	1.0	1.4	0.54	0.57	0.64	<0.018	0.76	0.17
Metals (mg/kg)									
Arsenic	13	<1.1	1.6	<1.1	<1.1	1.6	1.5	1.8	<1.1
Beryllium	7.2	<0.22	<0.22	<0.21	<0.22	<0.22	<0.22	<0.22	<0.21
Cadmium	2.5	<0.27	1.1	0.32	0.33	<0.28	<0.27	0.42	<0.27
Chromium	30	4.5	14	5.1	5.0	4.9	6.0	6.9	3.2
Copper	50	2.2	**89**	16	15	20	7.2	34	6.5
Lead	63	19	47	29	24	22	16	26	5.1
Mercury	0.18	0.011	0.091	0.022	<0.011	0.020	0.021	0.025	<0.011
Nickel	30	1.3	4.3	1.4	1.6	1.9	2.4	2.6	1.4
Silver	2	<0.54	<0.55	<0.54	<0.54	<0.55	<0.55	<0.56	<0.53

Notes:
(1) Soil sample results compared to Soil Cleanup Objectives (SCOs) of 6 New York Codes, Rules and Regulations (NYCRR) Part 375 for unrestricted usage.
(2) Sample "SS5-XX-X" refers to Site 5 hand auger sample location XX-X at a specified depth below ground surface (bgs). For example, SS5-01-1 is the first hand auger sample at location 01 at 0.5 to 1 ft bgs. SS5-01-2 is the second hand auger sample from location 01 at 1 to 2 ft bgs.

Bolding and shading indicate that sample result exceeds the Action Level.
N/A Not applicable, or not analyzed.

Table 4.5 (Continued)
Site 5 Soil Analytical Results – 2007 Data Gap Investigation
106th Rescue Wing
Westhampton Beach, New York

Analyte	Action Level(1)	Concentration							
		SS5-15-1 (0.5-1 ft)	SS5-15-2 (1-2 ft)	SS5-16-1 (0.5-1 ft)	SS5-16-2 (1-2 ft)	SS5-17-1 (0.5-1 ft)	SS5-17-2 (1-2 ft)	SS5-18-1 (0.5-1 ft)	SS5-18-2 (1-2 ft)
Polyaromatic Hydrocarbons (mg/kg)									
Acenaphthene	20	0.22	0.066	0.026	<0.018	<380	<0.018	1.7	0.17
Acenaphthylene	100	<0.06	<0.018	<0.018	<0.018	<380	<0.018	<0.36	<0.036
Anthracene	100	0.28	0.079	0.022	<0.018	0.46	0.02	1.9	0.25
Benzo(a)anthracene	1	0.66	0.15	0.1	0.037	**1.6**	0.063	**3.4**	0.63
Benzo(a)pyrene	1	0.67	0.16	0.12	0.054	**1.8**	0.083	**3.7**	0.67
Benzo(b)fluoranthene	1	0.59	0.17	0.12	0.052	**1.9**	0.08	**3.5**	0.65
Benzo(g,h,i)perylene	100	0.42	0.047	0.045	0.019	0.78	0.028	1.4	0.32
Benzo(k)fluoranthene	0.8	0.61	0.14	0.13	0.054	**1.9**	0.084	**3.6**	0.61
Chrysene	1	0.69	0.14	0.12	0.045	**1.8**	0.069	**3.6**	0.69
Dibenz(a,h)anthracene	0.33	0.16	0.023	0.022	<0.018	<0.38	<0.018	**0.66**	0.13
Fluoranthene	100	1.7	0.38	0.3	0.1	4.0	0.16	9.6	1.8
Fluorene	30	0.12	0.037	<0.018	<0.018	<0.38	<0.018	1.2	0.11
Indeno(1,2,3-cd)pyrene	0.5	0.36	0.054	0.049	0.021	**0.74**	0.032	**1.4**	0.3
Naphthalene	12	<0.06	0.038	<0.018	<0.018	<0.38	<0.018	0.67	0.046
Phenanthrene	100	1.2	0.3	0.11	0.083	2.0	0.079	8.7	1.1
Pyrene	100	1.3	0.27	0.22	0.078	3.0	0.12	7.0	1.3
Metals (mg/kg)									
Arsenic	13	1.2	<1.1	<1.1	<1.1	1.7	1.5	<1.1	<1.1
Beryllium	7.2	<0.21	<0.21	<0.21	<0.21	<0.23	<0.22	<0.22	<0.22
Cadmium	2.5	0.3	<0.26	<0.27	<0.26	0.85	<0.27	<0.27	0.34
Chromium	30	7.5	3.9	3.3	0.94	8.5	5.6	4.3	3.0
Copper	50	8.6	5.4	11	1.7	41	7.4	22	21
Lead	63	15	9.1	18	4.5	**81**	10	46	15
Mercury	0.18	0.039	<0.011	0.012	<0.011	0.074	0.023	0.096	0.049
Nickel	30	2.0	1.5	1.6	<0.53	3.3	2.4	1.9	1.7
Silver	2	<0.54	<0.53	<0.54	<0.53	<0.56	<0.55	<0.54	<0.55

Notes:
(1) Soil sample results compared to Soil Cleanup Objectives (SCOs) of 6 New York Codes, Rules and Regulations (NYCRR) Part 375 for unrestricted usage.
(2) Sample "SS5-XX-X" refers to Site 5 hand auger sample location XX-X at a specified depth below ground surface (bgs). For example, SS5-01-1 is the first hand auger sample at location 01 at 0.5 to 1 ft bgs. SS5-01-2 is the second hand auger sample from location 01 at 1 to 2 ft bgs.

Bolding and shading indicate that sample result exceeds the Action Level.

Table 4.5 (Continued)
Site 5 Soil Analytical Results – 2007 Data Gap Investigation
106th Rescue Wing
Westhampton Beach, New York

Analyte	Action Level(1)	Concentration							
		SS5-19-1 (0.5-1 ft)	SS5-19-2 (1-2 ft)	SS5-20-1 (0.5-1 ft)	SS5-20-2 (1-2 ft)	SS5-21-1 (0.5-1 ft)	SS5-21-2 (1-2 ft)	SS5-22-1 (0.5-1 ft)	SS5-22-2 (1-2 ft)
Polyaromatic Hydrocarbons (mg/kg)									
Acenaphthene	20	<0.018	<0.018	<0.018	<0.018	<0.018	<0.036	<0.018	<0.018
Acenaphthylene	100	<0.018	<0.018	<0.018	<0.018	<0.018	0.052	0.026	<0.018
Anthracene	100	<0.018	<0.018	<0.018	0.02	<0.018	0.15	0.081	<0.018
Benzo(a)anthracene	1	0.045	0.033	0.046	0.066	0.08	0.51	0.26	0.052
Benzo(a)pyrene	1	0.061	0.043	0.068	0.091	0.11	0.58	0.29	0.067
Benzo(b)fluoranthene	1	0.065	0.047	0.068	0.097	0.11	0.56	0.28	0.064
Benzo(g,h,i)perylene	100	0.023	0.019	0.025	0.041	0.041	0.26	0.11	0.03
Benzo(k)fluoranthene	0.8	0.063	0.041	0.064	0.083	0.096	0.5	0.3	0.068
Chrysene	1	0.051	0.037	0.052	0.074	0.09	0.54	0.28	0.059
Dibenz(a,h)anthracene	0.33	<0.018	<0.018	<0.018	0.021	0.018	0.11	0.048	<0.018
Fluoranthene	100	0.07	0.053	0.08	0.11	0.13	0.92	0.55	0.99
Fluorene	30	<0.018	<0.018	<0.018	<0.018	<0.018	<0.036	<0.018	<0.018
Indeno(1,2,3-cd)pyrene	0.5	0.023	<0.018	0.026	0.039	0.044	0.23	0.1	0.027
Naphthalene	12	<0.018	<0.018	<0.018	<0.018	<0.018	<0.036	<0.018	<0.018
Phenanthrene	100	<0.018	<0.018	0.02	0.025	0.028	0.21	0.19	0.038
Pyrene	100	0.075	0.059	0.073	0.11	0.11	0.83	0.5	0.91
Metals (mg/kg)									
Arsenic	13	1.2	1.3	1.2	1.1	<1.1	1.3	1.3	1.2
Beryllium	7.2	<0.21	<0.22	<0.21	<0.21	<0.21	<0.22	<0.21	<0.22
Cadmium	2.5	<0.26	<0.27	<0.27	<0.27	<0.26	<0.27	<0.27	<0.27
Chromium	30	3.8	3.8	3.8	4.3	4.7	3.5	3.7	4.0
Copper	50	2.5	2.6	2.6	2.9	4.0	8.4	2.6	2.8
Lead	63	8.0	8.1	7.8	7.0	13	8.7	8.4	8.5
Mercury	0.18	0.022	0.017	0.017	0.016	0.017	0.022	0.023	0.023
Nickel	30	1.5	1.7	1.6	1.5	3.4	2.1	1.5	1.5
Silver	2	<0.53	<0.55	<0.54	<0.54	<0.53	<0.54	<0.53	<0.54

Notes:
(1) Soil sample results compared to Soil Cleanup Objectives (SCOs) of 6 New York Codes, Rules and Regulations (NYCRR) Part 375 for unrestricted usage.
(2) Sample "SS5-XX-X" refers to Site 5 hand auger sample location XX-X at a specified depth below ground surface (bgs). For example, SS5-01-1 is the first hand auger sample at location 01 at 0.5 to 1 ft bgs. SS5-01-2 is the second hand auger sample from location 01 at 1 to 2 ft bgs.

Table 4.5 (Continued)
Site 5 Soil Analytical Results – 2007 Data Gap Investigation
106th Rescue Wing
Westhampton Beach, New York

Analyte	Action Level(1)	Concentration							
		SS5-23-1 (0.5-1 ft)	SS5-23-2 (1-2 ft)	SS5-24-1 (0.5-1 ft)	SS5-24-1D (Duplicate)	SS5-24-2 (1-2 ft)	SS5-25-1 (0.5-1 ft)	SS5-25-2 (1-2 ft)	SS5-26-1 (0.5-1 ft)
Polyaromatic Hydrocarbons (mg/kg)									
Acenaphthene	20	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Acenaphthylene	100	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Anthracene	100	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Benzo(a)anthracene	1	0.021	0.021	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Benzo(a)pyrene	1	0.035	0.026	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Benzo(b)fluoranthene	1	0.046	0.023	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Benzo(g,h,i)perylene	100	0.02	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Benzo(k)fluoranthene	0.8	0.04	0.028	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Chrysene	1	0.037	0.03	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Dibenz(a,h)anthracene	0.33	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Fluoranthene	100	0.066	0.036	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Fluorene	30	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Indeno(1,2,3-cd)pyrene	0.5	0.019	0.019	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Naphthalene	12	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Phenanthrene	100	0.024	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Pyrene	100	0.054	0.037	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Metals (mg/kg)									
Arsenic	13	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0
Beryllium	7.2	<0.20	<0.20	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
Cadmium	2.5	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Chromium	30	4.4	4.7	3.6	2.6	1.5	3.9	3.2	3.2
Copper	50	2.6	0.69	1.8	1.7	0.74	1.3	0.76	1.3
Lead	63	10	8.9	4.3	2.2	1.2	1.8	1.0	2.6
Mercury	0.18	<0.010	<0.010	<0.010	<0.01	<0.01	0.014	<0.01	0.023
Nickel	30	1.2	0.65	1.0	0.93	0.67	1.1	0.56	1.2
Silver	2	<0.51	<0.51	<0.51	<0.52	<0.52	<0.52	<0.52	<0.52

Notes:
(1) Soil sample results compared to Soil Cleanup Objectives (SCOs) of 6 New York Codes, Rules and Regulations (NYCRR) Part 375 for unrestricted usage.
(2) Sample "SS5-XX-X" refers to Site 5 hand auger sample location XX-X at a specified depth below ground surface (bgs). For example, SS5-01-1 is the first hand auger sample at location 01 at 0.5 to 1 ft bgs. SS5-01-2 is the second hand auger sample from location 01 at 1 to 2 ft bgs.

Table 4.5 (Continued)
Site 5 Soil Analytical Results – 2007 Data Gap Investigation
106th Rescue Wing
Westhampton Beach, New York

Analyte	Action Level(1)	Concentration							
		SS5-26-2 (1-2 ft)	SS5-26-2D (Duplicate)	SS5-27-1 (0.5-1 ft)	SS5-27-2 (1-2 ft)	SS5-28-1 (0.5-1 ft)	SS5-28-2 (1-2 ft)	SS5-29-1 (0.5-1 ft)	SS5-29-2 (1-2 ft)
Polyaromatic Hydrocarbons (mg/kg)									
Acenaphthene	20	<0.017	<0.017	<0.018	<0.018	<0.017	<0.017	<0.018	<0.017
Acenaphthylene	100	<0.017	<0.017	<0.018	<0.018	<0.017	<0.017	<0.018	<0.017
Anthracene	100	<0.017	<0.017	<0.018	<0.018	<0.017	<0.017	<0.018	<0.017
Benzo(a)anthracene	1	<0.017	<0.017	0.2	<0.018	0.045	<0.017	0.043	<0.017
Benzo(a)pyrene	1	<0.017	<0.017	0.24	<0.018	0.087	<0.017	0.082	<0.017
Benzo(b)fluoranthene	1	<0.017	<0.017	0.27	<0.018	0.081	<0.017	0.083	<0.017
Benzo(g,h,i)perylene	100	<0.017	<0.017	0.1	<0.018	0.045	<0.017	0.049	<0.017
Benzo(k)fluoranthene	0.8	<0.017	<0.017	0.25	<0.018	0.08	<0.017	0.089	<0.017
Chrysene	1	<0.017	<0.017	0.25	<0.018	0.06	<0.017	0.062	<0.017
Dibenz(a,h)anthracene	0.33	<0.017	<0.017	0.046	<0.018	0.02	<0.017	0.024	<0.017
Fluoranthene	100	<0.017	<0.017	0.49	<0.018	0.045	<0.017	0.083	<0.017
Fluorene	30	<0.017	<0.017	<0.018	<0.018	<0.017	<0.017	<0.018	<0.017
Indeno(1,2,3-cd)pyrene	0.5	<0.017	<0.017	0.1	<0.018	0.047	<0.017	0.046	<0.017
Naphthalene	12	<0.017	<0.017	<0.018	<0.018	<0.017	<0.017	<0.018	<0.017
Phenanthrene	100	<0.017	<0.017	0.04	<0.018	<0.017	<0.017	0.025	<0.017
Pyrene	100	<0.017	<0.017	0.38	<0.018	0.038	<0.017	0.066	<0.017
Metals (mg/kg)									
Arsenic	13	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	1.1	<1.0
Beryllium	7.2	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.22	<0.21
Cadmium	2.5	<0.26	<0.26	<0.27	<0.26	0.33	<0.26	0.35	<0.26
Chromium	30	3.5	2.9	6.4	2.3	3.3	2.6	17	1.8
Copper	50	1.1	1.1	3.3	0.68	3.1	1.1	6.0	1.0
Lead	63	1.8	2.1	18	1.0	3.7	1.4	41	1.5
Mercury	0.18	<0.01	<0.01	0.016	<0.01	<0.01	<0.01	0.015	<0.01
Nickel	30	1.1	1.1	2.3	0.89	1.7	<0.52	3.7	0.66
Silver	2	<0.52	<0.52	<0.53	<0.52	<0.52	<0.52	<0.54	<0.52

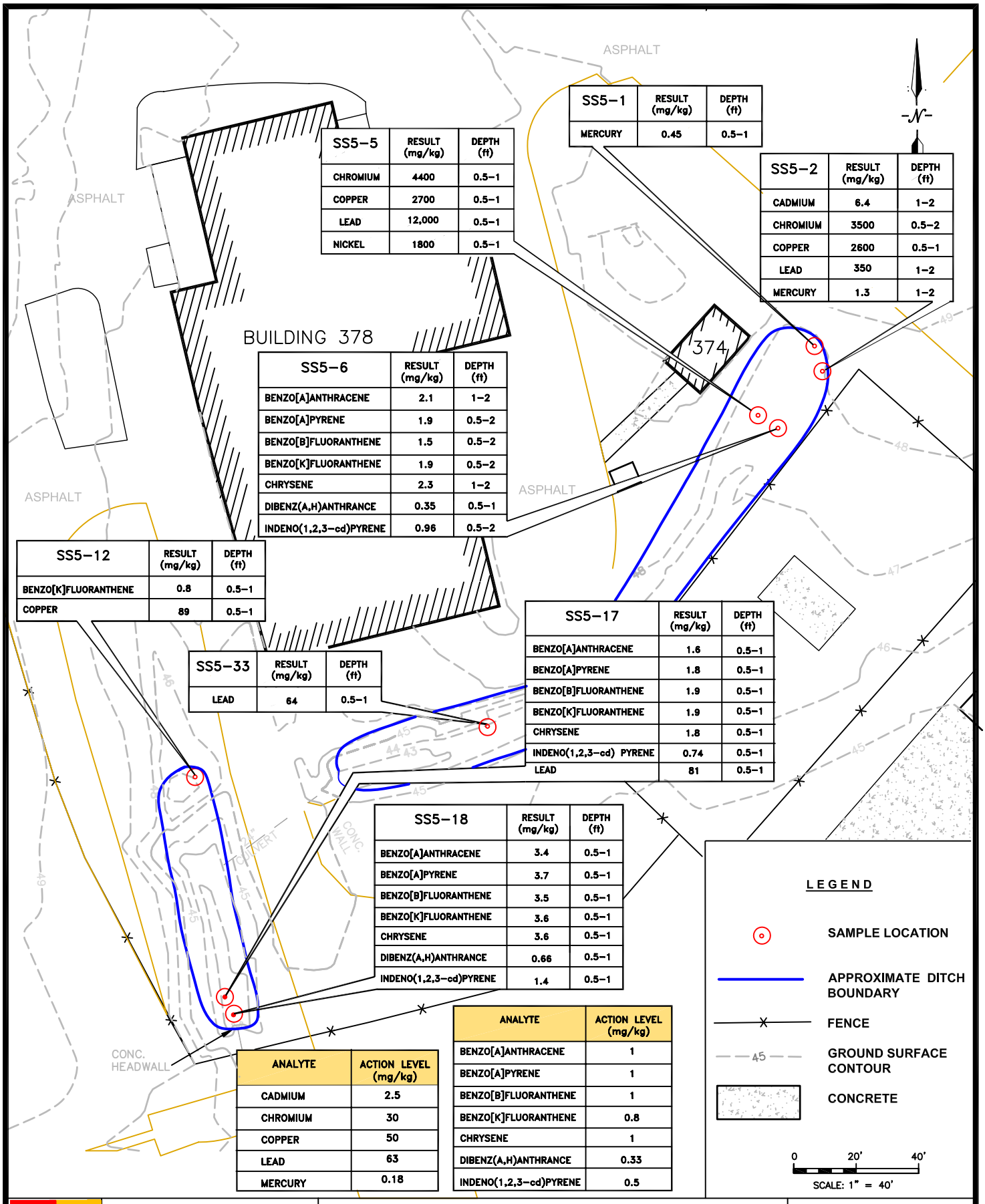
Notes:
(1) Soil sample results compared to Soil Cleanup Objectives (SCOs) of 6 New York Codes, Rules and Regulations (NYCRR) Part 375 for unrestricted usage.
(2) Sample "SS5-XX-X" refers to Site 5 hand auger sample location XX-X at a specified depth below ground surface (bgs). For example, SS5-01-1 is the first hand auger sample at location 01 at 0.5 to 1 ft bgs. SS5-01-2 is the second hand auger sample from location 01 at 1 to 2 ft bgs.

Table 4.5 (Continued)
Site 5 Soil Analytical Results – 2007 Data Gap Investigation
106th Rescue Wing
Westhampton Beach, New York

Analyte	Action Level(1)	Concentration								
		SS5-30-1 (0.5-1 ft)	SS5-30-2 (1-2 ft)	SS5-31-1 (0.5-1 ft)	SS5-31-2 (1-2 ft)	SS5-32-1 (0.5-1 ft)	SS5-32-1D (Duplicate)	SS5-32-2 (1-2 ft)	SS5-33-1 (0.5-1 ft)	SS5-33-2 (1-2 ft)
Volatile Organics (mg/kg)										
Benzene	0.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<0.053
Ethylbenzene	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<0.053
Toluene	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<0.053
Xylenes	0.26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<0.11
Polyaromatic Hydrocarbons (mg/kg)										
Acenaphthene	20	<0.061	<0.017	<0.018	<0.017	<0.017	<0.017	<0.017	0.1	<0.018
Acenaphthylene	100	<0.061	<0.017	<0.018	<0.017	<0.017	<0.017	<0.017	<0.037	<0.018
Anthracene	100	0.066	<0.017	<0.018	<0.017	<0.017	<0.017	<0.017	0.19	<0.018
Benzo(a)anthracene	1	0.029	0.052	0.059	0.036	0.018	0.02	<0.017	0.58	0.021
Benzo(a)pyrene	1	0.41	0.085	0.11	0.057	0.037	0.043	<0.017	0.65	0.026
Benzo(b)fluoranthene	1	0.42	0.078	0.14	0.065	0.042	0.049	<0.017	0.7	0.025
Benzo(g,h,i)perylene	100	0.18	0.045	0.063	0.043	0.023	0.027	<0.017	0.26	<0.018
Benzo(k)fluoranthene	0.8	0.46	0.070	0.13	0.056	0.04	0.049	<0.017	0.64	0.025
Chrysene	1	0.36	0.054	0.1	0.056	0.029	0.032	<0.017	0.64	0.022
Dibenz(a,h)anthracene	0.33	0.078	0.021	0.027	<0.017	<0.017	<0.017	<0.017	0.12	<0.018
Fluoranthene	100	0.69	0.058	0.15	0.073	0.038	0.044	<0.017	1.6	0.046
Fluorene	30	<0.061	<0.017	<0.018	<0.017	<0.017	<0.017	<0.017	0.077	<0.018
Indeno(1,2,3-cd)pyrene	0.5	0.18	0.047	0.061	0.041	0.02	0.024	<0.017	0.25	<0.018
Naphthalene	12	<0.061	<0.017	<0.018	<0.017	<0.017	<0.017	<0.017	<0.037	<0.018
Phenanthrene	100	0.330	<0.017	0.046	<0.017	<0.017	<0.017	<0.017	0.85	0.021
Pyrene	100	0.55	0.054	0.14	0.057	0.035	0.041	<0.017	1.2	0.034
Metals (mg/kg)										
Arsenic	13	1.6	<1.0	1.1	<1.0	<1.0	2.1	<1.0	2.2	<1.1
Beryllium	7.2	<0.22	<0.21	<0.22	<0.21	<0.21	<0.21	<0.21	<0.22	<0.21
Cadmium	2.5	<0.27	<0.26	0.63	<0.26	<0.26	<0.26	<0.26	0.88	<0.26
Chromium	30	6.7	1.0	8.1	2.6	3.5	4.7	1.1	9.5	2.4
Copper	50	4.6	0.8	5.2	0.72	2.5	2.4	0.73	34	2.3
Lead	63	18	1.0	31	1.4	10	10	1.9	**64**	3.7
Mercury	0.18	0.017	<0.01	<0.011	<0.01	<0.01	<0.01	<0.01	0.056	<0.011
Nickel	30	2.8	<0.52	3.1	<0.52	1.2	1.6	<0.52	3.5	<0.53
Silver	2	<0.55	<0.52	<0.54	<0.52	<0.52	<0.52	<0.52	<0.55	<0.53

Notes:
(1) Soil sample results compared to Soil Cleanup Objectives (SCOs) of 6 New York Codes, Rules and Regulations (NYCRR) Part 375 for unrestricted usage.
(2) Sample "SS5-XX-X" refers to Site 5 hand auger sample location XX-X at a specified depth below ground surface (bgs). For example, SS5-01-1 is the first hand auger sample at location 01 at 0.5 to 1 ft bgs. SS5-01-2 is the second hand auger sample from location 01 at 1 to 2 ft bgs.

N/A Not applicable, or not analyzed.



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GAB/WORK PLAN/FIG4.3

SITE 5 – 2007 DATA GAP INVESTIGATION
SOIL SAMPLE RESULTS
106th RESCUE WING
WESTHAMPTON BEACH, NEW YORK

FIGURE
4.3

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5.0 INTERIM REMEDIAL ACTION OPERATIONS ACTIVITIES

The activities to be conducted for Site 5 include:

- providing oversight of soil excavation activities;
- characterizing excavated soils;
- collecting confirmation soil samples from the sidewalls and floors of the five excavations;
- transporting and disposing of the excavated soils; and
- presenting the results, conclusions and closure recommendations in an NFRAP DD

The planned remedial action activities (i.e., soil excavation, sampling) to be conducted at Site 5 and the purposes for the proposed activities are summarized in Table 5.1. The locations and planned extents of the areas to be excavated are shown on Figure 5.1. The work will be conducted in accordance with this *Work Plan*, the *Site-Specific Health and Safety Plan* (HASP) (Appendix A) and the *Site-Specific Quality Assurance Project Plan* (QAPP) (Appendix B). Additionally, work will be conducted in accordance with ANG *Environmental Restoration Program Investigation Guidance* (ANG 2005).

Table 5.1
Planned Remedial Action Activities at Site 5
106th Rescue Wing
Westhampton Beach, New York

Planned Activity	Quantity	Field Methods	Laboratory Analysis	Purpose
Post Survey	1	N/A	N/A	To establish the location and extent of excavations
Oversight of Soil Excavation	Estimated Maximum of 330 Tons (200 yd^3)	Backhoe	N/A	To ensure that all of the contaminated soil is removed from the five areas of the ditch
Sampling of Excavated/Stockpiled Soil	1 per 100 yd^3	Composite	TPH, VOCs,(1) Metals, TCLP Metals, Paint Filter, PCBs and PAHs	To provide the requested data to the treatment/disposal facility (2)
Soil Treatment and Disposal	Estimated Maximum of 330 Tons (200 yd^3)	N/A	N/A	To dispose of/treat contaminated soil in accordance with local, state and federal requirements.
Sampling Excavation Area 1	5 (24 hr TAT)	Composite	Metals	To confirm removal of contaminated soil in the vicinity of Area 1
Sampling Excavation Area 2	5 (24 hr TAT)	Composite	PAHs and Metals	To confirm removal of contaminated soil in the vicinity of Area 2
Sampling Excavation Area 3	5 (24 hr TAT)	Composite	Benzo(k)fluoranthene and Copper	To confirm removal of contaminated soil in the vicinity of Area 3
Sampling Excavation Area 4	5 (24 hr TAT)	Composite	PAHs and Lead	To confirm removal of contaminated soil in the vicinity of Area 4
Sampling Excavation Area 5	5 (24 hr TAT)	Composite	Lead	To confirm removal of contaminated soil in the vicinity of Area 5

Notes:
(1) Volatile organic compounds (VOCs) will not be composited.
(2) The disposal facility requires that one sample be collected for characterization purposes for every 100 yd^3 of soil. The first 100 yd^3 requires the full suite of analyses as listed in the table while the second 100 yd^3 requires only TPH.

N/A	not applicable	PAHs	polyaromatic hydrocarbons
PCBs	polychlorinated biphenyls	TAT	turnaround time
TCLP	Toxicity Characteristic Leaching Procedure	TPH	total petroleum hydrocarbons

5.1 SITE PREPARATION

5.1.1 Utility Identification

Although no underground utilities are anticipated in the areas to be excavated, they will be located and marked prior to beginning any excavation activities. The base will be responsible for utility locating activities and ensuring that underground utilities are not damaged during the excavation process. PEER will assist the 106th RQW and coordinate all utility locating activities with the public utility companies as necessary. Precautions will also be taken as to not damage overhead utility lines. Underground utilities will be located by calling the New York/Long Island One-Call System at 1-800-272-4480 at least 48 hours prior to beginning work.

5.1.2 Clearing and Grubbing

Light clearing, but no significant grubbing is anticipated at Site 5. Clearing will only be conducted within the site work areas.

5.1.3 Waste Management

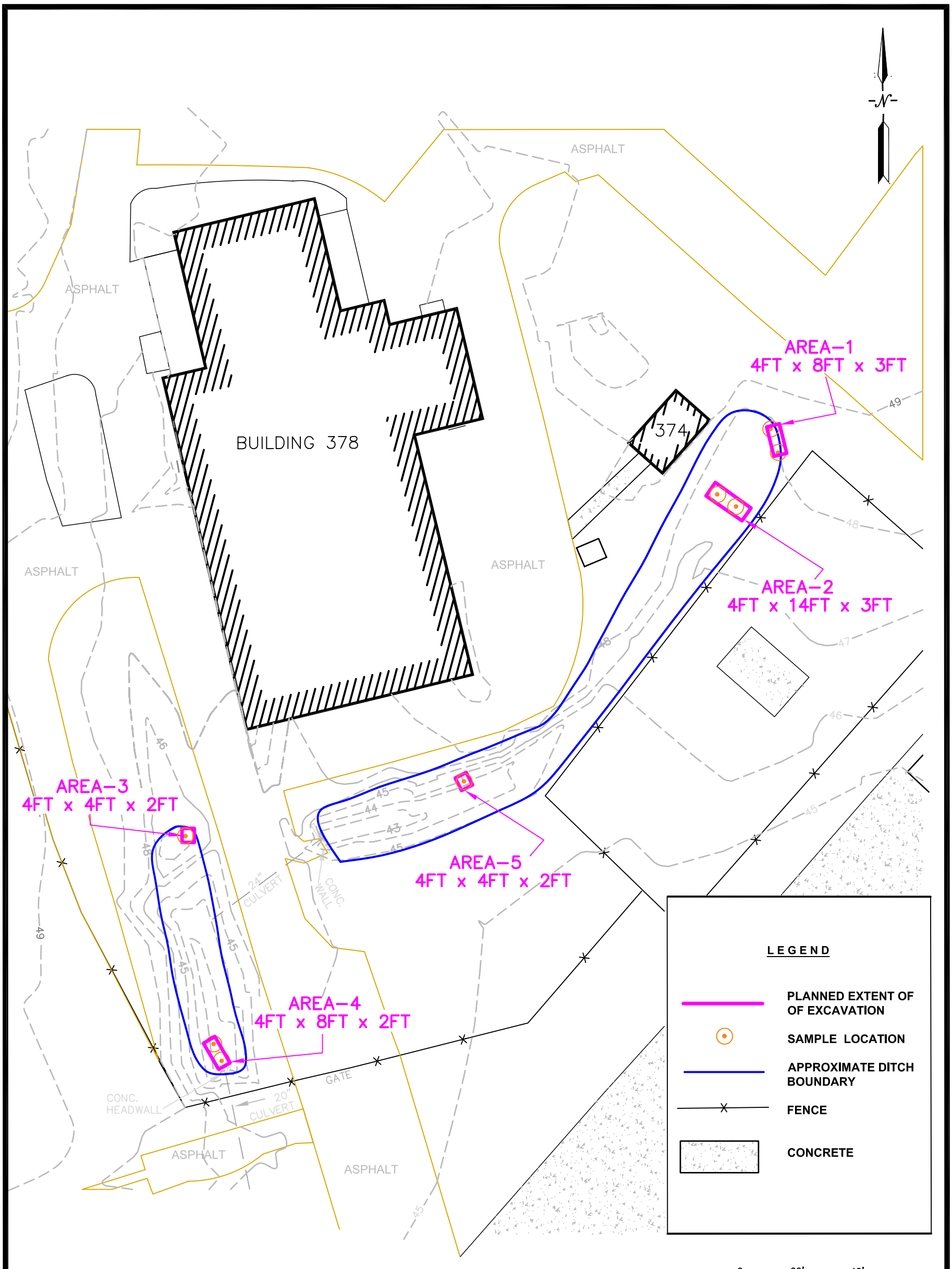
Waste generated during the excavation activities will consist of solid waste (e.g., latex gloves, trash, and debris) and excavated soil.

5.2 SOIL EXCAVATION ACTIVITIES

Excavation activities will be conducted at five areas. The initial quantity of soil to be removed from the five areas is discussed in the following bullets. Additional soil may be removed from the excavations depending upon the results of the confirmation samples. In all, up to 330 tons (200 yd^3) of soil may be excavated from the site.

- Area-1 consisting of an area of approximately 4 ft by 8 ft to a maximum depth of 3 ft (approximately 6 tons);
- Area-2 consisting of an area of approximately 4 ft by 14 ft to a maximum depth of 3 ft (approximately 11 tons);
- Area-3 consisting of an area of approximately 4 ft by 4 ft to a maximum depth of 2 ft (approximately 2 tons);
- Area-4 consisting of an area of approximately 4 ft by 8 ft to a maximum depth of 2 ft (approximately 4 tons);
- Area-5 consisting of an area of approximately 4 ft by 4 ft to a maximum depth of 2 ft (approximately 2 tons);

The locations and the excavation limits were previously shown on Figure 5.1. The contaminants of concern (COCs) at Area-1 are metals. COCs at Area-2 include PAHs and metals. COCs at Area-3 include benzo(k)fluoranthene and copper. COCs at Area-4 include PAHs and lead, and the COC at Area-5 is lead.



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GAB/WORK PLAN/FIG 5.1

SITE 5 – PLANNED EXTENT OF EXCAVATIONS

106th RESCUE WING

WESTHAMPTON BEACH, NEW YORK

FIGURE

5.1

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5.2.1 Excavation Procedures

The preliminary extent of the excavations will be based on the excavation limits as previously shown on Figure 5.1 and field observations. Procedures for excavating the soils are listed below.

Excavation at Area-1

1. Locate Area-1 as shown on Figure 5.1. No clearing will be necessary in the vicinity of Area-1.
2 Measure and mark off an area of approximately 4 ft x 8 ft in size using either tape or surveyor's flags as shown on Figure 5.1.
3. Excavate the soils in the marked area with a backhoe to a depth of approximately 3 ft bgs.
4. Check soils in the backhoe bucket for visual indications of contamination (i.e., staining or odors). Contaminated soils will be stockpiled or placed directly onto dump trucks for transport.
5. Once the soil in the marked off area is removed, collect one (1) confirmatory soil sample from the floor and one (1) sample from each side wall of the excavation for a total of five (5) samples. Confirmatory soil samples from Area-1 will be submitted for analysis of metals. Refer to Sections 5.2.6 and 5.2.7 for soil sampling procedures.

Excavation at Area-2

1. Locate Area-2 as shown on Figure 5.1. No clearing will be necessary in the vicinity of Area-2.
2 Measure and mark off an area of approximately 4 ft x 14 ft in size using either tape or surveyor's flags as shown on Figure 5.1.
3. Excavate the soils in the marked area with a backhoe to a depth of approximately 3 ft bgs.
4. Check soils in the backhoe bucket for visual indications of contamination (i.e., staining or odors). Contaminated soils will be stockpiled or placed directly onto dump trucks for transport.
5. Once the soil in the marked off area is removed, collect one (1) confirmatory soil sample from the floor and one (1) sample from each side wall of the excavation for a total of five (5) samples. Confirmatory soil samples from Area-2 will be submitted for analysis of PAHs and metals. Refer to Sections 5.2.6 and 5.2.7 for soil sampling procedures.

Excavation at Area 3

1. Locate Area-3 as shown on Figure 5.1. Minor clearing may be necessary in the vicinity of Area-3.
2 Measure and mark off an area of approximately 4 ft x 4 ft in size using either tape or surveyor's flags as shown on Figure 5.1. Observe the location of overhead power lines in the vicinity of Area-3.
3. Excavate the soils in the marked area with a backhoe to a depth of approximately 2 ft bgs. Avoid the overhead power lines during the excavation activities.

4. Check soils in the backhoe bucket for visual indications of contamination (i.e., staining or odors). Contaminated soils will be stockpiled or placed directly onto dump trucks for transport.
5. Once the soil in the marked off area is removed, collect one (1) confirmatory soil sample from the floor and one (1) sample from each side wall of the excavation for a total of five (5) samples. Confirmatory soil samples from Area-3 will be submitted for analysis of benzo(k)fluoranthene and copper. Refer to Sections 5.2.6 and 5.2.7 for soil sampling procedures.

Excavation at Area-4

1. Locate Area-4 as shown on Figure 5.1. Minor clearing may be necessary in the vicinity of Area-4.
2 Measure and mark off an area of approximately 4 ft x 8 ft in size using either tape or surveyor's flags as shown on Figure 5.1. The excavated area will likely extend up to a concrete tile/drainage pipe. Observe the location of overhead power lines in the vicinity of Area-4.
3. Excavate the soils in the marked area with a backhoe to a depth of approximately 2 ft bgs. Avoid the overhead power lines and ensure that the concrete tile/drainage pipe is not damaged during the excavation activities.
4. Check soils in the backhoe bucket for visual indications of contamination (i.e., staining or odors). Contaminated soils will be stockpiled or placed directly onto dump trucks for transport.
5. Once the soil in the marked off area is removed, collect one (1) confirmatory soil sample from the floor and one (1) sample from each side wall of the excavation for a total of five (5) samples. Confirmatory soil samples from Area-4 will be submitted for analysis of PAHs and lead. Refer to Sections 5.2.6 and 5.2.7 for soil sampling procedures.

Excavation at Area-5

1. Locate Area-5 as shown on Figure 5.1. Minor clearing may be necessary in the vicinity of Area-5.
2 Measure and mark off an area of approximately 4 ft x 4 ft in size using either tape or surveyor's flags as shown on Figure 5.1.
3. Excavate the soils in the marked area with a backhoe to a depth of approximately 2 ft bgs.
4. Check soils for visual indications of contamination (i.e., staining or odors).
5. Once the soil in the marked off area is removed, collect one (1) confirmatory soil sample from the floor and one (1) sample from each side wall of the excavation for a total of five (5) samples. Confirmatory soil samples from Area-5 will be submitted for analysis of lead. Refer to Sections 5.2.6 and 5.2.7 for soil sampling procedures.

5.2.2 Field Screening

Although volatile constituents are not anticipated, excavated soils will be scanned with a calibrated photoionization detector (PID) as a part of the remedial action process. Soil in the backhoe bucket will be continuously scanned with the PID after being removed from the excavations. In addition, the sidewalls and floors of the excavations will be periodically scanned

with the PID. The periodic scanning with the PID along with visual and olfactory observations (e.g., staining and/or odors) will be employed to indicate the need for additional excavation in a particular area.

5.2.3 Soil Transport and Staging

Work-related staging and handling of contaminated soil at Site 5 will be conducted only at approved work area locations. Upon being excavated, soils may be stockpiled or placed in roll-offs. Soil stockpiles will be handled by the 106th RQW in accordance with New York Department of Transportation guidelines as specified in *Segregation and Stockpiling of Petroleum Contaminated Soil* (Item 15203.9903M). Route of ingress and egress from the site will be discussed prior to beginning the field activities to ensure the safety of field and base personnel. Excavated soils will be transported and disposed of at Soil Safe, Inc., a recycling facility. The soils will be characterized (profiled) for the facility by collecting a composite sample (Section 5.2.7) for every 100 yd^3 of soil prior to transport. The first 100 yd^3 of soil requires the full suite of analyses as previously listed in Table 5.1, while the second 100 yd^3 requires only TPH. The soil will be placed in lined dump trucks or roll-offs as necessary to prevent leakage during transport. Soils will only be transported during daylight hours.

5.2.4 Air Monitoring

Periodic monitoring for exposure to volatile constituents will be conducted using a PID during the excavation activities. The monitoring will be conducted by the Site Health and Safety Manager (Site Manager).

5.2.5 Fugitive Dust Control

Construction activities will be conducted so as to minimize dust generation. Dust generation control measures may include (as necessary):

- Covering stockpiles/roll-offs if extremely dry, dusty and windy conditions occur;
- Spraying potable water over the excavation and/or stockpiles; or
- Suspending site operations in the event of extreme wind conditions.

If stockpiles are sprayed, water runoff will be controlled and/or captured (and disposed of) as necessary to prevent spread of contamination.

5.2.6 Confirmation Soil Sampling

Once all of the contaminated soil is believed to be removed, confirmation soil samples will be collected from the sidewalls and floors of the excavations. Confirmation samples from the sidewalls of the excavations will be submitted to the laboratory for expedited analysis [24-hour turnaround time (TAT)]. Sampling procedures are provided in Section 5.2.7.

Five samples will be collected from the sidewalls and floor (one sample from each sidewall and one from the floor) at each excavation.

5.2.7 Soil Sample Handling Procedures

Soil samples will be collected from the floors and sidewalls of the excavations using decontaminated stainless-steel spoons. Soil for analysis of PAHs and metals will be composited by mixing in decontaminated stainless-steel bowls, and placed into 4- or 8-oz jars. Soil will be free of grass, twigs, and gravel.

Soil samples will also be collected to characterize (profile) the soils for the disposal facility prior to transport. The characterization sample for analysis of VOCs will be collected using a decontaminated stainless-steel spoon or scoop and placed directly in a 4-oz jar leaving no headspace. The characterization samples for analysis of total petroleum hydrocarbons (TPH), PAHs, PCBs, metals and Toxicity Characteristic Leaching Procedure (TCLP) metals will be composited by mixing in a decontaminated stainless-steel bowl, and placed into 4 or 8-oz jars. Soil will be free of grass, twigs and gravel.

After collection, the outside of the sample containers will be wiped clean with a paper towel and packed in a cooler with bagged ice, and cooled to 4ºC. The samples will either be shipped by an overnight service (i.e., FedEx) or delivered by local courier to a New York-certified laboratory for analysis. Chain-of-Custody will be maintained on all samples from the time of collection through laboratory analysis.

5.2.8 Analytical Methods

The intended use of the analytical data for the excavation activities requires Environmental Protection Agency (EPA) Level III analyses. Sample quantities, analytical methods and sample containers are listed in Table 5.2.

Soil samples will be analyzed for PAHs using EPA Method 8270 selective ion method (SIM). Samples for metals will be analyzed using EPA Method 6010C. Soil characterization samples will be analyzed using EPA Method 8260B for VOCs, Method 8015 for TPH, 6010C for metals, 8082 for PCBs, 8270SIM for PAHs, 1311/6010 for TCLP metals, and 9095B for paint filter liquids.

5.2.9 Field Quality Control Samples

Field quality control (QC) samples will be collected during the excavation sampling activities as specified in the Site-Specific QAPP (Appendix B), and will consist of the following:

Trip Blanks: Trip blanks will be prepared by the laboratory with American Society for Testing Materials (ASTM) Type II deionized water, and shipped to the sampling site. One trip blank will be included in each shipping cooler containing samples for analysis of VOCs (characterization samples only). Trip blanks are used to detect cross-contamination by volatile organics during sample shipping and handling.

Duplicates: Field duplicates are used to assess the variability of sample handling, preservation, storage, and the analytical process. Duplicate samples will be collected at a rate of 10% and will be submitted to the laboratory for analysis of PAHs and metals.

Matrix Spike/Matrix Spike Duplicates: MS/MSD samples will be collected at a rate of 5% and submitted to the laboratory for analysis of PAHs and metals. MS/MSD samples are spiked with known concentrations of analytes. The results are evaluated to indicate matrix interference by measuring recoveries of the spike concentrations.

Rinsate Sample: Equipment rinsates are samples of ASTM Type II deionized water passed through decontaminated sampling equipment. A Rinsate sample will be collected and analyzed for PAHs and metals.

Field Blank: Field blanks are samples of water used in the decontamination process, and are used to evaluate possible sources of contamination. Two field blank samples will be collected: one containing ASTM Type II water, and the second containing tap water, and submitted for analysis of PAHs and metals.

Table 5.2
Summary of Sample Quantities and Analytical Methods for the Excavation Activities at Site 5
106th Rescue Wing
Westhampton Beach, New York

Location	Sample Matrix/Type	Parameter	EPA Method	Container	Preservative/ Cool 4°C	Quantity	Dupe	MS/ MSD
Area-1	Soil	Metals	6010C	4 oz glass jar	Cool 4°C	5	N/A	N/A
Area-2	Soil	PAHs	8270SIM	4 oz glass jar	Cool 4°C	5	1	1/1
		Metals	6010C	4 oz glass jar	Cool 4°C	5	1	1/1
Area-3	Soil	Benzo(k)fluoranthene	8270SIM	4 oz glass jar	Cool 4°C	5	N/A	N/A
		Copper	6010C	4 oz glass jar	Cool 4°C	5	N/A	N/A
Area-4	Soil	PAHs	8270SIM	4 oz glass jar	Cool 4°C	5	1	N/A
		Lead	6010C	4 oz glass jar	Cool 4°C	5	1	N/A
Area-5	Soil	Lead	6010C	4 oz glass jar	Cool 4°C	5	N/A	N/A
Characterization Samples(1)	Soil	VOCs	8260B	4 oz glass jar	Cool 4°C	1	N/A	N/A
		Metals	6010C	4 oz glass jar	Cool 4°C	1	N/A	N/A
		TCLP Metals	1311	4 oz glass jar	Cool 4°C	1	N/A	N/A
		PCBs	8082	4 oz glass jar	Cool 4°C	1	N/A	N/A
		PAHs	8270SIM	4 oz glass jar	Cool 4°C	1	N/A	N/A
		TPH	8015	4 oz glass jar	Cool 4°C	1	N/A	N/A
		Paint Filter	9095B	4 oz glass jar	N/A	1	N/A	N/A
All (QA/QC)	Trip Blanks	VOCs	8260B	40-mL vials	HCl	1	N/A	N/A
	Rinsate	PAHs	8270SIM	40-mL vials	HCl	1	N/A	N/A
		Metals	6010C	250-mL Poly	HNO_3	1	N/A	N/A
	Field Blanks (Tap and ASTM water)	PAHs	8270SIM	(3) 40-mL vials	HCl	2	N/A	N/A
		Metals	6010C	250-mL Poly	HNO_3	2	N/A	N/A

Notes:
(1) One set of characterization (profile) samples will be collected for the disposal facility. If over 100 yd^3 of soil are excavated, then an additional total petroleum hydrocarbon (TPH) sample will be collected for characterization purposes.

ASTM American Society of Testing and Materials
N/A Not applicable
TCLP Toxicity Characteristic Leaching Procedure
PAH Polyaromatic hydrocarbons
QA/QC Quality Assurance/Quality Control
VOCs Volatile organic compounds
PCBs Polychlorinated biphenyls
SIM selective ion method

5.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Confirmation soil sample results (PAHs and metals) will be compared to the SCOs of 6 New York Codes, Rules and Regulations (NYCRR) Part 375 for unrestricted usage. The action levels for the soil samples are presented in Table 5.3.

Table 5.3
Soil Cleanup Objectives
106th Rescue Wing
Westhampton Beach, New York

Parameter	SCO (mg/kg)	Parameter	SCO (mg/kg)
Metals		**Polyaromatic Hydrocarbons (continued)**	
Arsenic	13	Benz(a)anthracene	1
Beryllium	7.2	Benzo(a)pyrene	1
Cadmium	2.5	Benzo(b)fluoranthene	1
Chromium (Trivalent)	30	Benzo(g,h,i)perylene	100
Copper	50	Benzo(k)fluoranthene	0.8
Lead	63	Chrysene	1
Mercury (Total)	0.18	Dibenz(a,h)anthracene	0.33
Nickel	30	Fluoranthene	100
Silver	2	Fluorene	30
Polyaromatic Hydrocarbons		Indeno(1,2,3-cd)pyrene	0.5
Acenaphthene	20	Naphthalene	12
Acenapthylene	100	Phenanthrene	100
Anthracene	100	Pyrene	100

SCO Soil Cleanup Objective

5.4 SITE RESTORATION

The areas to be excavated are located in the direct vicinity of a major construction project at the base. Therefore, after the confirmation samples indicate that all of the contaminated soil has been removed, the base will determine the final course of action to be conducted at the excavations (e.g., backfill).

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6.0 SPILL PREVENTION CONTROL AND COUNTERMEASURES PLAN

This Spill Prevention Control and Countermeasures Plan (SPCC) provides a means for minimizing, controlling, and containing potential spills and discharges during the excavation activities.

6.1 SURFACE WATER DRAINAGE

Surface water from Site 5 flows toward the south and eventually to drains to Aspatuck Creek which is located near the southeast corner of the installation.

6.2 IDENTIFICATION OF POTENTIAL SPILL HAZARDS

Site-specific potential spill hazards include contaminated soil during transport, diesel fuel during refueling activities, and the loss of fluids from construction equipment (i.e., diesel fuel, hydraulic fluid, etc.).

6.3 SPILL PREVENTION MEASURES

Care will be taken not to overfill equipment and vehicles during fueling operations, or leaving vehicles unattended while fueling. All fueling operations will be supervised by the PEER Site Manager. Construction equipment will be inspected daily for leaks, worn hoses, loose fittings, etc. Leaking equipment will be repaired or removed from the site immediately. Loading and hauling trucks will not exceed their capacities to avoid spills during transport.

6.4 EMERGENCY REPSONSE PROCEDURES

In the event of a significant liquid spill (e.g. fuel or hydraulic fluid) (>25 gal):

1. Initiate evacuation, if necessary.
2. If spill occurs, notify Suffolk County Fire Department (911).
3. Notify Base EM Lt. Col. Jerry Webb [(631) 723-7349].
4. Stop spill flow when possible without risk of personal injury.
6. Restrict all sources of ignition.
7. Ensure that the spill scene is off-limits to unauthorized personnel.

The procedures of cleanup of incidental liquid spills (< 25 gal) will be as follows:

1. Shut down equipment.
2. Locate source of spill and stop the flow.
3. Apply absorbent material and/or booms.
4. Place absorbent material in dry containers and cover.
5. Label containers and dispose of according to applicable regulatory standards.

In the event of a solid waste spill, the contaminated soil will be handled as other contaminated soil on site. The Field Manager will ensure that the solids are removed and placed in the appropriate transport vehicle.

6.5 SPILL CONTROL EQUIPMENT

The following equipment will be available on site under the SPCC Plan:

- Cellular telephone;
- Shovel, and hand tools; and
- Boots, gloves, hard hats and safety glasses.

The base will ensure that the excavation contractor has spill control equipment including pigs, booms and pads.

6.6 SPILL REPORTING

The Site Manager is responsible for responding to and correcting a spill or discharge. The Site Manger will notify emergency personnel, if necessary, as previously discussed.

The Site Manager will prepare a written report detailing the events of a liquid (e.g., fuel or hydraulic fluid) spill or discharge of over 25 gallons. The report will include the cause and resolution of the incident and any outside agencies involved. The report will be submitted to the Base EM and a copy of the report will be included in the project report.

7.0 SOIL EROSION AND STORMWATER CONTROL PLAN

This Soil Erosion and Storm Water Control Plan defines the preventative measures required to protect the environment from pollution associated with the excavation activities. This will be accomplished by preventing the migration of sediment from any stockpiled soils to adjacent areas and waterways.

7.1 NATURE OF EXCAVATION ACTIVITIES

The work will consist of light clearing of areas to be excavated and excavating contaminated soil. Backfilling of the areas may be conducted at the discretion of the base.

7.1.1 Erosion and Sediment Controls

Stabilization Practices. Stabilization practices usually include permanent seeding and mulching. However, the areas to be excavated are located in the direct vicinity of a major construction project at the base. Therefore, the base will determine if seeding and mulching are required and stabilization practices will be implemented at the discretion of the base.

Structural Practices. Structural practices may be implemented (as necessary and at the discretion of the base) to divert flows from exposed soil, or otherwise limit runoff and discharge of sediment from exposed areas of the site to the degree attainable. Structural practices will be implemented in a timely manner as needed during the construction process. Stockpiled will be placed on 10 mil ground cloth (or equivalent) and covered by 6 mil polyethylene sheeting (or equivalent) to protect against leaching or runoff of contaminants into storm water and/or surface water. If soil is placed in trucks or roll-offs, they will be covered with tarpaulins. The tarpaulins will be secured and maintained throughout storage.

Barriers such as silt fencing and straw bales may be used as temporary structural practices as needed to minimize erosion and sediment runoff. Other controls may be implemented as necessary.

Installation of Erosion and Sediment Controls. This activity may include installation of erosion and sediment controls at the discretion of the base. If silt fence is installed the following tasks will be required:

- Installation of either wooden stakes or steel posts for silt fence construction at the locations.
- Straw bale dikes will be constructed adjacent to the silt fencing as needed to further prevent sediment-laden storm water from migrating off site.

7.1.2 Stormwater Management

Establishing turf on disturbed areas is usually a part of the storm water management practices taken during restoration of the site. However, the soils will excavated in an area that will undergo major construction activities, and no turf will be established.

7.1.3 Other Controls

The following controls will be implemented, as well as additional controls, as deemed necessary to prevent the discharge of pollutants to waters of the state:

1. Off-site vehicle tracking of soil and sediment will be minimized.
2. Generation of dust will be minimized.

7.2 MAINTENANCE

PEER provide oversight and help maintain the temporary erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness.

7.3 INSPECTIONS

PEER will inspect disturbed areas of the excavation site and areas used for storage of materials that are exposed to precipitation.

Disturbed areas and areas used for material storage that are exposed to precipitation will be inspected for evidence of, or the potential for, pollutants entering the off-base drainage system. Any erosion and sediment control measures implememented will be inspected to ensure that they are operating correctly. Locations were vehicles enter or exit the site will be inspected for evidence of off-site sediment tracking.

7.4 LAND SURVEYING

Following the excavation activities, the site will be surveyed by a state-registered land surveyor. The general civil survey will include locations and elevations of the excavations. All plane and vertical surveys will be of third-order accuracy (vertical control 0.01 ft and horizontal control 0.1 ft). All elevations will be referenced to the national Geodetic Vertical Datum and reported in ft above sea level.

7.5 INVESTIGATION DERIVED WASTE MANAGEMENT

Investigation derived waste (IDW) consisting of personal protective equipment (PPE) such as latex gloves, and plastic sheeting and trash will be placed in the proper receptacles (i.e., dumpsters) at the106th RQW. Excavated soils will be disposed of at Soil Safe, Inc., a recycling facility in Logan, New Jersey.

8.0 REFERENCES

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APPENDIX A

SITE-SPECIFIC HEALTH AND SAFETY PLAN FOR THE TECHNCIAL MEMORANDUM WORK PLAN FOR REMEDIAL ACTION AT SITE 5

AT THE 106TH RESCUE WING FRANCIS S. GABRESKI AIRPORT WESTHAMPTON BEACH, NEW YORK

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AT THE
106TH RESCUE WING
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON BEACH, NEW YORK

1.0 SITE HEALTH AND SAFETY PLAN

1.1 PURPOSE AND POLICY

This Health and Safety Plan (HASP) covers the health and safety practices, procedures, and policies that will be followed for soil excavation, sampling and disposal, and other field activities to be conducted at Site 5. This site-specific HASP also covers personnel responsibilities, personal air monitoring, site air monitoring, personal protective equipment (PPE), and contingency plans. An emergency contact list is provided in Table 1.1.

Table 1.1
Emergency Contact List
106th Rescue Wing
Westhampton Beach, New York

1.	Base Environmental Manager (Lt. Col. Jerry Webb)....	(631) 723-7349
2.	Base EM Assistant (Anthony Vasell).....	(631) 723-7112

1.2 APPLICABILITY

1.2.1 Modification of Plan

Any changes to this HASP must be approved by the PEER Project Manager and the ANG Program Manager.

1.2.2 Subcontractor Responsibilities

The PEER Site Manager/Site Health and Safety Officer (SHSO) will be the designated incident manager and will monitor site safety and health, and has the responsibility to implement, monitor, and enforce the HASP. The SHSO will have a sound working knowledge of federal and state occupational safety and health regulations.

1.3 SITE LOCATION

Site 5, the Southwest Drainage Ditch, runs for several hundred feet at the southern end of the base and originates as a subsurface outfall on the southwest side of Building 370. A map which

depicts the location of the site (and the emergency route to the nearest hospital) is provided in Attachment 1.

1.4 SCOPE OF WORK

The field activities to be conducted at Site 5 include:

- Providing oversight during excavating and loading/stockpiling of contaminated soil;
- Collecting confirmation samples from the excavations to ensure that all of the contaminated soil has been removed; and
- Characterizing the soils in accordance with disposal facility requirements.

The base will be responsible for backfilling the excavations and restoring the site.

1.5 HEALTH AND SAFETY PLANNING

This project may involve handling of soil that may have been impacted by polyaromatic hydrocarbons (PAHs), and metals (lead). The work will involve oversight of soil excavation activities and soil sampling. Known risks to the health and safety of personnel include contamination by PAHs and/or metals; fire; electrocution; and crushing. All underground utilities (including water, gas, electric, sewer, and telephone) will be located and marked prior to excavation activities. All overhead utilities will be clearly noted.

1.6 RESPONSIBILITIES

Supervisory personnel are directly responsible for ensuring the health and safety of individuals under their direction by requiring compliance with HASP provisions. In addition, the PEER Site Manager/SHSO will ensure that all operations are performed with the utmost regard for the health and safety of all personnel involved. Supervisors are required to ensure that all employees are properly trained, are provided with appropriate health and safety equipment, are medically qualified, and are made aware of any potential hazards associated with the work.

Field team members are also responsible for the prevention of accidents by following all health and safety procedures necessary to perform the assigned work without injury. All field team members are required to follow the provisions of the HASP.

1.7 PROJECT TEAM ORGANIZATION

1.7.1 PEER Field Manager

The PEER Site Manager/SHSO is directly responsible for ensuring that all requirements of the site-specific HASP are adhered to and that all PEER field team members and PEER subcontractors exercise their particular duties safely.

1.7.2 Site Health and Safety Officer

The PEER Site Manager/SHSO has the following responsibilities:

- selects PPE;
- periodically inspects PPE;
- monitors PPE storage;
- coordinates entry and exit at control points;
- confirms each team member's suitability;
- helps monitor the team members for signs of stress, such as cold exposure, heat stress, and fatigue;
- monitors on-site hazards and changing conditions;
- determines if site-specific HASP is being followed;
- knows emergency procedures, evacuation routes, and emergency telephone numbers; and
- coordinates emergency medical care.

1.7.3 Field Team

All field team members, support personnel and subcontractors are individually responsible for their health and safety and complying with the HASP. In addition, each individual working on-site must notify the SHSO of any unsafe conditions. Prior to the start of field activities, all field personnel will read and sign a form indicating that they have read and will comply with the HASP. Copies of the forms are provided in Attachment 2.

1.8 SUBCONTRACTOR'S SAFETY REPRESENTATIVE

The Subcontractor's SHSO will ensure that all of their personnel comply with the HASP, and that they will also sign a log that they have read and will comply with the HASP.

2.0 SAFETY AND HEALTH RISK ANALYSIS

2.1 CHEMICAL HAZARDS

Several of the tasks to be conducted may involve potential contact with PAHs and metals, and their corresponding health effects and symptoms, and human exposure limits is provided in Table A-1 of Attachment 3. Table A-2 of Attachment 3 provides a summary of potential exposure results and corresponding protective measures. Material Safety Data Sheets for PAHs, and lead, are provided in Attachment 4.

2.2 PHYSICAL HAZARDS

2.2.1 Heavy Equipment

Motor vehicles and heavy equipment such as dump trucks and backhoes will be in use at the site. The safety hazards associated with the operation of heavy equipment can be effectively prevented by constant awareness on the part of the field personnel, and continuing oversight and

supervision by the Site Manager/SHSO. The SHSO will inspect all heavy equipment upon arrival of the site and require repair or replacement of any defects. Field personnel will be reminded to not walk behind or alongside the immediate vicinity of heavy equipment.

2.2.2 Noise Hazards

Hearing protection will not be necessary for this field effort.

2.2.3 Explosive Hazards

All underground utilities will be clearly marked before excavation activities begin. PEER will coordinate all utility locating activities with the 106th Rescue Wing and the public utility company. Smoking will not be allowed in close proximity to any fuel storage, or within areas where field work is being conducted.

2.2.4 Heat/Cold-Related Stress/Illness

The field work will occur in the winter or early spring of 2009. High temperatures will not be encountered during the field activities and heat stress will not be a issue. Cold stress (hypothermia) will potentially be a significant factor impacting the planned work.

The following are typical symptoms of hypothermia:

- Uncontrollable shivering (shivering may stop at extremely low temperatures);
- Weakness and loss of coordination (i.e., stumbling);
- Confusion or slurred speech;
- Pale and cold skin;
- Drowsiness – especially in more severe stages; and
- Slowed breathing or heart rate.

If not treated promptly, lethargy, cardiac arrest, shock and coma can set in. Hypothermia usually occurs gradually. Often, people are not aware that they are suffering from hypothermia or that they need medical help. Therefore, personnel should dress warmly in layered clothing designed to reduce the effects of sweating. In addition, personnel should take periodic breaks to "warm up" on particularly cold days.

2.2.5 Biological Hazards

Biological hazards that may include:

- Noxious plants, such as poison ivy or poison oak;
- Stinging/biting insects, such as mosquitoes, spiders, ticks, and bees; and
- Venomous and non-venomous snakes.

Cold weather conditions will preclude concerns associated with biological hazards during this field effort.

3.0 PERSONNEL PROTECTION AND MONITORING

Project field personnel will have received the proper training in accordance with the Occupational Safety and Health Act (OSHA) 29 Code of Federal Regulations (CFR) 1910.120.

3.1 MEDICAL SURVEILLANCE

The project field personnel will be in a medical surveillance program that meets, at a minimum, the requirements specified in OSHA 29 CFR 1910.120.

3.2 SITE-SPECIFIC TRAINING

To maintain a high level of health and safety awareness on the part of all field team members, daily tailgate health and safety briefings shall be conducted on-site by the Site Manager/SHSO. A safety briefing will be held prior to beginning each day's activities. Topics to be discussed during the safety briefing include: the location of the nearest telephone, locations of fire extinguishers, location of safe haven/evacuation assembly points, location of the nearest hospital, and safety procedures pertinent to the day's planned activities.

3.3 PERSONAL PROTECTIVE EQUIPMENT AND ACTION LEVELS

All field team personnel will wear a minimum of Level D protective equipment at all times when heavy equipment is in use. Level D PPE consists of:

- Hard Hats;
- Steel-toed shoes or boots;
- Safety glasses or goggles; and
- Gloves.

Hard hats will only be required when heavy equipment is in operation, or overhead work is occurring. When conducting field activities other than the above, all other PPE must be worn by field personnel.

3.4 MONITORING REQUIREMENTS

Routine Monitoring for Organic Vapors

The background levels of photoionizable hydrocarbons will be determined by the SHSO taking periodic readings in the breathing zone with a PID. The background level of hydrocarbons will be determined by taking readings prior to beginning work, and at periodic intervals away from the areas of suspected contamination.

Subsequent readings will be taken in the breathing zone where excavation activities are being conducted. A PID reading of 5 ppmv above background will be cause to upgrade from Level D PPE to level C PPE. PID readings in excess of 10 ppmv above background for longer than 15 minutes will be cause to stop work, depart the immediate area (where work is being conducted)

until the levels drop. If elevated levels do not dissipate, the SHSO will notify the PEER Project Manager, the Base EM, and the ANG Program Manager.

3.5 BACKGROUND READINGS

Obtaining background readings for organic vapors is not required for this field effort.

3.6 DATA LOGGING

Any unusual occurrences, such as injuries requiring first aid, or the field determination that Level C protection is required, will be documented in the field logbook.

3.7 DUST CONTROL

Excavation and soil sampling activities may result in generation of dust in the event that dry soil conditions are encountered. The Site Manager/SHSO will be responsible for observing activities for any dust generation and requiring the use of dust control measures (i.e., wetting, etc.).

4.0 SITE CONTROLS, MEASURES, ACCIDENT PREVENTION, AND CONTINGENCY PLAN

4.1 SITE CONTROL MEASURES

The base has controlled access to prevent entry by unauthorized personnel.

4.2 SITE ORGANIZATION-OPERATION ZONE

If necessary, work zones will be designated in order to prevent the spread of contamination from the site. The work zones that may be delineated include: the exclusion zone, the contaminant reduction zone, and the support zone.

If any work zones are designated by the Site Manager/SHSO, the will be defined in accordance with the levels of PPE required to perform the work. The SHSO will monitor the operations in any work zones and ensure that only trained and properly equipped Field Team members are allowed to enter each zone.

4.4 SAFETY WORK PRACTICES

All field personnel will be responsible for practicing safe work.

4.5 HEALTH AND SAFETY EQUIPMENT CHECKLIST

The Site Manager/SHSO will be responsible for checking and maintaining safety equipment.

4.6 ACCIDENT PREVENTION

4.6.1 Heavy Equipment Operation

Heavy equipment, such as backhoes and dump trucks will be used during the field activities. All equipment will be inspected by the Site Manager/SHSO before use at the site. Any defects will be repaired or replaced prior to use. Field Team members will exercise caution around operating equipment, and will not walk behind operating equipment.

4.6.2 Sampling Practices

All Field Team members will exercise safe work procedures during developing/purging of wells, and during soil and groundwater sampling activities.

4.7 SITE SECURITY

Site 5 is located within the fenced area of the base and site access is controlled. While field activities are being conducted at the site (especially excavation and loading of soils), the Site Manager/SHSO will ensure that access to the work areas is limited to authorized personnel only.

4.8 COMMUNICATION

The Site Manager/SHSO will be responsible for communicating with base personnel, the ANG, and all subcontractor personnel.

4.9 CONTINGENCY PLAN

In the event of a minor injury, the injured person may be transported directly to the Central Suffok Hospital by field personnel. Serious injuries will require an ambulance service for transport. The Site Manager/ SHSO will determine whether or not the injury requires an ambulance. A map showing the emergency route to the Central Suffolk Hospital is provided in Attachment 1. Directions to the hospital are as follows:

- Depart the base and turn Right onto Old Riverhead Road (CR-31)
- Go approximately 3.0 miles and turn Left onto Quogue Riverhead Road (CR-104)
- Go approximately 2.0 miles and keep Left to stay on CR-104 (Riverleigh Avenue)
- At roundabout, take 2nd Exit onto Peconic Avenue (CR-63)
- Turn Right onto West Main Street (SR-25) and then immediately turn Left onto
- Roanoke Avenue (CR-73)
- At roundabout, take 2nd Exit
- Arrive at 1300 Roanoke Avenue

Hospital address/contact information:

Central Suffolk Hospital
1300 Roanoke Avenue
Riverhead, New York
(631) 548-6000

Field personnel will have cellular phones available on-site during the field activities.

A first aid kit and fire extinguisher will be maintained at the site during excavation activities. The locations of the first aid kit and fire extinguisher will be discussed during the daily safety briefing.

The telephone numbers of emergency response personnel and the location of the hospital will be discussed during the daily safety briefings.

4.9.1 Chemical Exposure

Any worker exposed to chemicals will be removed from the work zone. The SHSO will determine proper decontamination procedures prior to removing the worker.

4.9.2 Personal Injury

The SHSO will be responsible for determining the need for calling medical personnel to the site, or for removing personnel to a medical facility.

4.9.3 Evacuation Procedures

The presence of harmful and/or hazardous concentrations of petroleum vapors is not expected. If such concentrations do occur (as indicated by the environmental surveillance program), the site will be evacuated, or Level C protective clothing will be donned. Workers affected by petroleum vapors will be removed from the work area into fresh air, and medical treatment will be obtained as necessary.

4.10 DECONTAMINATION PROCEDURES

Decontamination of personnel is done to protect workers from hazardous contaminants, and to prevent the spread of hazardous contaminants to clean areas on or around the site. The complexity of the decontamination process at a particular site will hinge primarily on the types of contaminants encountered and their concentrations.

Currently, it is expected that all personnel will be in a maximum of Level D PPE, and that no decontamination of personnel will be necessary. Prior to leaving the work areas, workers will conduct a visual examination of their boots and, if necessary, use a scrub brush to clean them.

4.10.1 Decontamination-Medical Emergencies

If a worker dressed in PPE has certain types of illnesses or injuries, the decontamination process may exacerbate their seriousness. In deciding the aid to be delivered to the worker, it is important to weigh the risk of exposure to contaminants against the risks of proceeding through decontamination. **Generally, if immediate, life-saving first aid and emergency medical services are necessary, the decontamination process should be passed over to allow prompt treatment of the worker**. Appropriate site personnel should be able to provide attending medical personnel with any needed information on contaminant exposure, personal protection, and decontamination.

Physical Injury

Physical injuries can range from minor cuts to massive trauma. Many minor injuries can be treated on-site by properly trained personnel. Serious or critical injuries may require emergency medical assistance at the site and transportation of the victim to the nearest emergency medical facility. When a person appears to be seriously or critically injured, life-saving actions must be taken immediately without decontamination. Respiratory equipment should be removed immediately, as long as removal will not further endanger the victim's life or health. This might require moving the injured person to a safer area. Normally, it is unwise to move an injured person, and such a decision should be made only when it is clear that not moving the victim presents a greater danger to their life or health. Unless a worker is contaminated with an extremely toxic or corrosive material that threatens them with severe injury or death, no attempt should be made to wash or rinse the victim on-site. If necessary, protective clothing may be cut from the victim. When it is not possible or advisable to remove protective clothing, the victim should be covered in plastic, rubber, or blankets to prevent contamination of other site workers, emergency medical personnel, and emergency vehicles. Personnel at the emergency medical facility will then remove the protective clothing. Workers with minor injuries and illnesses will go through normal decontamination procedures.

Exposure to Hazardous Chemicals

Although properly dressed in protective clothing and equipment, workers may still have accidents that would expose them to hazardous chemicals. In such an accident, protective clothing that is heavily contaminated with hazardous chemicals may pose a risk of severe injury or death to the victim and attending personnel. In such instances, protective clothing should be quickly washed and carefully removed before transporting the exposed worker to an emergency medical facility.

Cold Stress

Hypothermia may cause comma and death. Hypothermia victims must be kept dry to alleviate symptoms. Therefore, decontamination should be bypassed or held to an absolute minimum. A possible exception requiring the best judgment of the Site Manager/SHSO would be a situation in which contamination of the victim’s clothing presents a similar threat of injury or death.

4.10.2 Decontamination of Tools

Decontamination of sampling equipment is addressed in the Work Plan.

4.10.3 Heavy Equipment Decontamination

Decontamination of heaving equipment will not be necessary for this field effort.

4.11 PLACES OF REFUGE

The Site Manager/SHSO will determine safe places of refuge in conjunction with recommendations from the Base EM. Site workers will evacuate to places of refuge during storms or other adverse weather conditions. Places of refuge may include buildings near sites where field work is being conducted, or vehicles being used during the field work.

4.12 FIRE

All field team members shall perform all work in a fire-safe manner and shall supply and maintain at each work area adequate firefighting equipment capable of extinguishing incipient fires. This equipment shall include ABC-type dry chemical fire extinguishers placed at readily accessible locations about the work site.

4.13 SAFETY EYEWASH

A portable safety eyewash kit will be maintained on-site.

4.14 INCIDENT REPORT

Any unusual events will be recorded in the logbook and entered on an incident form.

4.15 OPERATION SHUTDOWN

The Site Manager/SHSO will make the determination for work shutdown.

4.16 SPILL OR HAZARDOUS MATERIALS RELEASE

Any spill or release of a hazardous chemical shall be addressed as described in Section 5.0. The Site Manager/SHSO will notify the Base EM for all spills of hazardous materials occurring on the site.

4.17 COMMUNITY SAFETY

The Site Manager/SHSO will immediately notify the Base EM of any conditions that may put the safety of base personnel or the general public in jeopardy.

4.18 TRAINING AND MEDICAL SURVEILLANCE

All PEER Field Team members and subcontractors will have completed 40 hours of training as required by OSHA 29 CFR 1910.120, with annual updates, and be part of an approved occupational medical surveillance program.

4.19 RECORD KEEPING

Medical and Training Records

Subcontractors will be required to provide a letter of certification that all employees to work on-site will have completed 40 hours of training as required by OSHA 29 CFR 1910.120, with annual updates, and be part of an approved occupational medical surveillance program.

Material Safety Data Sheets

MSDSs are provided in Attachment 4.

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ATTACHMENT 1

FIGURES

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FIGURE A – 1
MAP AND DIRECTIONS TO HOSPITAL

Directions to Central Suffolk Hospital (631) 548-6000

1. Depart the base and turn Right onto Old Riverhead Road (CR-31)
2. Go approximately 3.0 miles and turn Left onto Quogue Riverhead Road (CR-104)
3. Go approximately 2.0 miles and keep Left to stay on CR-104 (Riverleigh Avenue)
4. At roundabout, take 2nd Exit onto Peconic Avenue (CR-63)
5. Turn Right onto West Main Street (SR-25) and then immediately turn Left onto
6. Roanoke Avenue (CR-73)
7. At roundabout, take 2nd Exit
8. Arrive at 1300 Roanoke Avenue

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ATTACHMENT 2

HEALTH AND SAFETY FORMS

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PROJECT HEALTH AND SAFETY PLAN
ACCEPTANCE FORM

The undersigned has read and has agreed to abide by the requirements as described in this Health and Safety Plan for all site investigation activities at the following project area:

SITE 5 – SOUTHWEST STORM DRAINAGE DITCH
106TH RESCUE WING
WESTHAMPTON BEACH, NEW YORK

_____
Name (Please Print)

_____
Signature

_____
Date

This signed and dated acceptance form must be returned to the site Health and Safety Officer **BEFORE** entering any work areas.

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ACCIDENT AND/OR INJURY REPORT FORM

Please print

Project: _____

ILL OR INJURED EMPLOYEE

Name: _____

Mail Address: _____
No. and Street City State Zip

Street Address, if different from mailing address: _____

_____

Social Security No.: _____ Age: _____ Sex: Male/Female
(*circle one*)

Occupation or job title: _____

Department: _____
Enter only the name of the department in which the injured person is employed.

EMPLOYER

Name: _____

Mail Address: _____
No. and Street City State Zip

Street Address, if different from mailing address: _____

_____

THE ACCIDENT OF EXPOSURE TO OCCUPATIONAL ILLNESS

Address where accident occurred: _____
No. and Street City State Zip

Did the accident occur on employer's premises? Yes/No (*circle one*)

What was the employee doing when injured or exposed to illness? _____

_____

How did the accident or exposure to illness occur? _____
Describe fully the events leading up to the accident or

_____
injury. Give precise details. A separate sheet may be used for additional space.

_____

_____

ACCIDENT AND/OR INJURY REPORT FORM (Continued)

Time of accident or illness: _____

Witnesses to accident or illness:

Name	Affiliation	Phone No.
Name	Affiliation	Phone No.
Name	Affiliation	Phone No.

INJURY OR OCCUPATIONAL ILLNESS

Describe the injury or illness in complete detail and indicate the affected body part(s).

_____

_____

_____

Identify the object or substance that directly injured the employee (i.e., vapor or poison inhaled or swallowed; object that struck or fell on employee; or the object the employee was lifting, pulling, etc., when the injury occurred). _____

_____

_____

_____

Date of injury or initial diagnosis of occupational illness: _____

Did the accident or occupational illness result in employee fatality? Yes/No (*circle one*)

OTHER

Name and address of physician: _____

Hospital name and address, if hospitalized: _____

_____

Prepared by: _____ Official Position _____
Date: _____

ATTACHMENT 3

TABLES

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Table A-1
Health Hazards of Potential Contaminants

Compound/ Element	PEL	TLV-TWA	IDLH	Chemical Properties	Health Effects/ Symptoms
Benzo(a)pyrene	0.2 mg/m^3	0.1 mg/m^3	80 mg/m^3	IP = None FP = None VP = None	Eye, skin and respiratory system irritant, carcinogenic
Lead	0.05 mg/m^3	0.15 mg/m^3	100 mg/m^3	IP = None FP = None VP = None	Lassitude; insomnia; pallor constipation; abdominal pain; colic; hypotension; anemic

Notes: Quantities for polyaromatic hydrocarbons (PAHs) are represented by those provided for benzo(a)pyrene, a common PAH.

KEY:

PEL = Permissible Exposure Limit - OSHA maximum average concentration of an airborne chemical to which a worker may be exposed for an 8-hour workday without harm.
TLV-TWA = Threshold Limit Value - Time-weighted average concentration for a normal 8-hour workday and a 40-hour work week to which nearly all workers may be exposed day after day without adverse effect.
IDLH = Immediately Dangerous to Life or Health - Maximum airborne chemical concentration from which a person could escape at the time of respirator failure without impairment or irreversible health effects.
STEL = Short-term exposure limit.
ppm = Parts per million.
IP = Ionization potential.
VP = Vapor pressure at 68°F.
FP = Flash point.
eV = Electron volt.

Source: National Institute for Occupational Safety and Health (NIOSH) June 1997.

Table A-2
Summary of Potential Exposure Routes and Protective Measures

Exposure Route	Potential Contaminants	Source	Protective Measures
Inhalation	PAHs, Lead	Potential site contaminants	Avoid dust generation
Dermal Contact/ Adsorption	PAHs	Potential site contaminant	Gloves Safety Glasses
	Lead	Potential site contaminant	Gloves

ATTACHMENT 4

MATERIAL SAFETY DATA SHEETS

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Material Safety Data Sheet

Benzo[a]pyrene, 98%

ACC# 37175

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzo[a]pyrene, 98%
Catalog Numbers: AC105600000, AC105600010, AC105601000, AC377200000, AC377200010, AC377201000 AC377201000
Synonyms: 3,4-Benzopyrene; 3,4-Benzpyrene; Benzo[def]chrysene.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
50-32-8	Benzo[a]pyrene	>96	200-028-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown powder.
Danger! May cause harm to the unborn child. May impair fertility. May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Cancer hazard. May cause allergic skin reaction. May cause heritable genetic damage.
Target Organs: Reproductive system, skin.

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation. May be harmful if absorbed through the skin. May cause an allergic reaction in certain individuals.
Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.
Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. May be harmful if inhaled.
Chronic: May cause cancer in humans. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce

vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.
Flash Point: Not available.
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Benzo[a]pyrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Benzo[a]pyrene: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: yellow to brown
Odor: faint aromatic odor
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 495 deg C @ 760 mm Hg
Freezing/Melting Point:175 - 179 deg C
Decomposition Temperature: Not available.
Solubility: 1.60x10-3 mg/l @25°C
Specific Gravity/Density: Not available.
Molecular Formula:C20H12
Molecular Weight:252.31

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 50-32-8: DJ3675000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 50-32-8:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in humans.Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 50-32-8: waste number U022.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Benzo{a} pyrene)
Hazard Class:		9
UN Number:		UN3077
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 50-32-8 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 50-32-8: 1 lb final RQ; 0.454 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 50-32-8: immediate, delayed.
Section 313
This material contains Benzo[a]pyrene (CAS# 50-32-8, >96%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR
Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 50-32-8 is listed as a Priority Pollutant under the Clean Water Act.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 50-32-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Benzo[a]pyrene, a chemical known to the state of California to cause cancer.
California No Significant Risk Level: CAS# 50-32-8: 0.06 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 43 May cause sensitization by skin contact.
R 45 May cause cancer.
R 46 May cause heritable genetic damage..
R 60 May impair fertility.
R 61 May cause harm to the unborn child.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 60 This material and its container must be disposed of as hazardou s waste.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 50-32-8: No information available.

Canada - DSL/NDSL

CAS# 50-32-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 50-32-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997
Revision #7 Date: 6/30/2006

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

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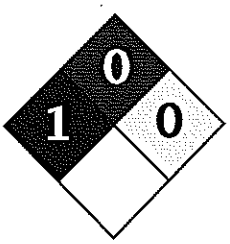

Health	1
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Lead MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lead

Catalog Codes: SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

CAS#: 7439-92-1

RTECS: OF7525000

TSCA: TSCA 8(b) inventory: Lead

CI#: Not available.

Synonym: Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

Chemical Name: Lead

Chemical Formula: Pb

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Lead	7439-92-1	100

Toxicological Data on Ingredients: Lead LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (permeator).
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to blood, kidneys, central nervous system (CNS).
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Non-flammable in presence of open flames and sparks, of shocks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes of lead.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not

present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.05 (mg/m3) from ACGIH (TLV) [United States]
TWA: 0.05 (mg/m3) from OSHA (PEL) [United States]
TWA: 0.03 (mg/m3) from NIOSH [United States]
TWA: 0.05 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 207.21 g/mole

Color: Bluish-white. Silvery. Gray

pH (1% soln/water): Not applicable.

Boiling Point: 1740°C (3164°F)

Melting Point: 327.43°C (621.4°F)

Critical Temperature: Not available.

Specific Gravity: 11.3 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials.
Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.
May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential:
Skin:
Lead metal granules or dust: May cause skin irritation by mechanical action.
Lead metal foil, shot or sheets: Not likely to cause skin irritation
Eyes:
Lead metal granules or dust: Can irritate eyes by mechanical action.

Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation.
Inhalation:
In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes.
Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungsby mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually abssorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, deliriuim, convulsions/seizures, coma, and death.
Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count.
Ingestion:
Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead cholic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases.
Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to

cause reproductive harm (male) which would require a warning under the statute: Lead
California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value)
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead
Connecticut hazardous material survey.: Lead
Illinois toxic substances disclosure to employee act: Lead
Illinois chemical safety act: Lead
New York release reporting list: Lead
Rhode Island RTK hazardous substances: Lead
Pennsylvania RTK: Lead

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R20/22- Harmful by inhalation and if swallowed.
R33- Danger of cumulative effects.
R61- May cause harm to the unborn child.
R62- Possible risk of impaired fertility.
S36/37- Wear suitable protective clothing and gloves.
S44- If you feel unwell, seek medical advice (show the label when possible).
S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:21 PM

Last Updated: 10/10/2005 08:21 PM

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APPENDIX B

SITE-SPECIFIC QUALITY ASSURANCE PROJECT PLAN

FOR THE
TECHNCIAL MEMORANDUM WORK PLAN
FOR REMEDIAL ACTION AT SITE 5

AT THE
106TH RESCUE WING
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON BEACH, NEW YORK

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LIST OF TABLES

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SITE-SPECIFIC QUALITY ASSURANCE PROJECT PLAN FOR THE TECHNCIAL MEMORANDUM WORK PLAN FOR REMEDIAL ACTION AT SITE 5

AT THE 106TH RESCUE WING FRANCIS S. GABRESKI AIRPORT WESTHAMPTON BEACH, NEW YORK

1.0 INTRODUCTION

This Site-Specific Quality Assurance Project Plan (QAPP) presents specific requirements for quality control (QC) of the Site 5 confirmation and characterization samples, and sample custody.

2.0 FIELD QUALITY CONTROL

2.1 SAMPLE NUMBERING SYSTEM

Confirmation and soil samples will be assigned a unique sample number as described below:

- a 3-character code representing the PEER project name (e.g., GAB - Gabreski);
- a 2-character code representing the excavation location (e.g., A1 = excavation Area-1; A2 = excavation Area-2);
- a 1 or 2-character code representing the location of the sample (e.g., N = north wall; S = south wall; E = east wall, SW = southwest wall, NE = northeast wall); and
- a 1-digit character code representing the sample sequence (e.g., N-1 = first sample collected from the north wall).
- duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples will be identified by appending a “D” for duplicate, “MS” for matrix spike, or an “MSD” for matrix spike duplicate to the end of the sample number.

For example, GAB-A1-N-1 represents the first confirmation sample collected from the north wall of excavation Area-1. GAB-A3-SW-2 represents the second confirmation sample collected from the southwest wall of excavation Area-3. Additionally, GAB-A1-SE-1D represents a duplicate of the first confirmation sample collected from the southeast wall of excavation Area-1. GUL-HS1-SE-1MS represents a matrix spike of the first confirmation sample collected from the southeast wall of excavation HS-1.

Characterization soil samples will be identified using GAB-SC-1 which will represent the first set of soil characterization samples. If over 100 yd^3 of soil are excavated, then an additional total petroleum hydrocarbon sample will be collected for characterization purposes and identified using GAB-SC-2.

Rinsate and blank samples will be assigned a unique sample number as described below:

- a 3-character code representing the PEER project name (e.g., GAB - Gabreski);
- a 2-character code representing the type of sample (e.g., FB = field blank and RS = rinsate); and
- For field blanks, a 3 or 4-digit character code representing the water source (e.g., TAP = tap water, ASTM = ASTM Type II water).

For example, GAB-FB-TAP represents a field blank sample collected from the tap water source. GAB-FB-ASTM represents a field blank sample collected from the ASTM Type II deionized water source. GAB-RS represents the rinsate sample.

2.2 INSTRUMENT CALIBRATION

The photoionization detector (PID) will be calibrated daily in accordance with manufacturer's instructions.

2.3 SAMPLE CONTAINERS AND LABELS

Sample containers will be purchased new and pre-cleaned from the analytical laboratory. Sample volume requirements, preservation techniques, maximum holding times, and container material requirements are dictated by the medium being sampled and the analyses to be performed. Field personnel will collect a sufficient volume of each sample in appropriate containers, properly preserved, to allow for all the analyses that are scheduled to be performed.

The sample labels will be supplied along with the bottles. The labels will be placed upon the containers prior to sample collection, and immediately upon collection, a unique sample number will be assigned to each sample in waterproof ink.

2.4 FIELD LOGBOOK

During the field work, a field logbook will be maintained to record field data and observations of both PEER and Subcontractor activities. The field logbook will be bound and contain sequentially numbered pages, and all entries will be written in waterproof black ink. The following information will be included in the field logbook:

1. date and time task started, weather conditions, names of PEER personnel and subcontractor personnel performing the task;

2. name of subcontractor company, type of heavy equipment, equipment condition, and names of subcontractor personnel;

3. a description of site activities as they occur in specific detail including date, time, name of any visitors, phone calls to PEER, and results, and sampling;

4. a description of field screening activities in detail, including instrument calibration;

5. a description in specific detail of samples collected, odor, and date and time collected, sample identification numbers, Chain-of-Custody form numbers, and airbill number or other shipping identification number for samples shipped;

6. a list of the time, equipment type, and decontamination procedures followed;

7. documentation of equipment failures or breakdowns, reasons, time resolved, and description of repairs; and

8. any field changes made to the *Work Plan*.

Each page shall be dated and signed by the person making the entry. Incorrect entries will be corrected by drawing a single line through the error, and initialing it.

2.5 SAMPLE PACKAGING AND SHIPMENT

Samples will be place in coolers with water ice and picked up (by laboratory courier service) or shipped within 24 hours of collection. Immediately upon collection, samples will be placed in a shipping container at the point of collection and surrounded with bagged water ice so that the temperature of the samples is maintained at 4°C. Packing material will be used to secure the samples in the shipping container to help prevent breakage of glass containers. Enough packing material shall be placed in the cooler so that the samples do not rattle or shake inside the shipping container.

Coolers or other shipping containers will be either shipped by a next-day delivery service to the laboratory or hand-delivered to the laboratory by laboratory personnel. If the samples are shipped to the laboratory via next-day delivery service, the Chain-of-Custody Form will be placed in a plastic cover and taped inside the lid of the shipping container. The lid of the container will then be closed, secured using clear or nylon strapping tape, and custody sealed to ensure that samples will not be disturbed during shipment. Notification of shipment, including airbill number, will be telephoned to the laboratory the day of sample collection. Receipt of the previous day's shipment will be confirmed daily. If the samples are picked up by laboratory personnel, then the samples will be relinquished to the laboratory and no taping or sealing of the cooler will be necessary. All sample containers, preservatives, and shipping crates/coolers will be supplied by the designated analytical laboratory.

2.6 CHAIN-OF-CUSTODY

Chain-of-Custody will be maintained from the time of sample collection through analysis. All samples collected for laboratory analyses will be documented on a chain-of-custody form. The original chain-of-custody form will accompany all samples from the time of collection through laboratory receipt. Copies of the chain-of-custody forms will be maintained by the PEER Site Manager. Each custody transfer by hand delivery shall be documented by signature of the relinquishing and receiving individuals and the date and time of transfer. The chain-of-custody form for samples to be shipped will be placed in a sealing plastic bag inside the coder or shipping container; the airbill number (or other shipment identification number) will be entered on the chain-of-custody form.

The chain-of-custody form will document the following information: project name, sampler names, sample number, date and time of sample collection, grab or composite designation, matrix, preservatives, analyses requested, and signatures of individuals involved in sample transfer.

This procedure will be used throughout the field activities to guide the transmittal of information regarding collected samples to the analytical laboratory, and other necessary parties. Samples are considered to be under custody if:

- they are in the sampler's possession, or
- they are in the sampler's line of sight after being in possession, or
- they are in a designated controlled secure area.

The Site Manager will have overall responsibility for ensuring the care and custody of the samples collected is maintained until they are transferred or properly dispatched to the laboratory. Each individual who collects a sample is responsible for sample custody until transferred to someone else via the chain-of-custody form.

2.7 PREVENTION OF CROSS-CONTAMINATION

Cross-contamination will be prevented by decontaminating all reusable sampling equipment before each use. Additionally, during sampling events, personnel will wear new disposable gloves which will be changed between sampling points. Sampling equipment will not be placed directly on the ground, but will be placed on clean plastic sheeting.

2.8 FIELD QUALITY CONTROL SAMPLES

To enhance the reliability of field sampling procedures and materials, field QC samples will be collected or prepared during each round of sampling as described in the following sections and shown on Table 2.1. A summary of analytical methods and collection requirements is provided in Table 5.2 in the Work Plan.

Table 2.1
Summary of Quality Control Samples
106th Rescue Wing
Westhampton Beach, New York

Sample Type	Sample Frequency	Estimated Number of Samples	Analyses
Equipment Rinsate	1	1	PAHs and Metals
Soil Duplicate	10%	2	PAHs and Metals
Matrix Spike/Matrix Spike Duplicate (Soil)	5%	1/1	PAHs and Metals
Field Blanks	(1) Tap Water & (1) ASTM Type II Water	2	PAHs and Metals
Trip Blank	N/A	1	Volatile Organics

Duplicates. Duplicate soil samples will be analyzed for PAHs and metals.

Trip Blank. One trip blank will be shipped with the volatile organics sample during characterization (profile) sampling.

Equipment Rinsate. Decontamination rinsate samples will be collected from the final deionized water rinse from the decontamination of sampling equipment and analyzed for PAHs and metals.

Matrix Spike/Matrix Spike Duplicate. Additional volume of soil will be collected and submitted to the analytical laboratory for analysis of PAHs and metals.

Field Blanks. Field blank samples will be collected from the potable water source (tap water) and ASTM Type II water used for decontamination and submitted for analysis of PAHs and metals.

2.9 FIELD CHANGES

All field activities will be conducted in accordance with the *Work Plan*, with the exception of changes which may occur in response to unanticipated site conditions encountered during actual field work. Any changes made in the field will be approved and documented and will require approval of the PEER Project Manager and the ANG Program Manager prior to initiation. All changes will be documented in the field logbook and on PEER Field Change Request Forms. Any changes possibly affecting the cost or performance of this contract must also be approved be the National Guard Bureau (NGB) Contract Officer prior to initiation. Such changes that would be affected may include elimination or addition of analytical samples or excavation of soil over the initial estimated quantity.

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