United States Air Force
Installation Restoration Program

Building 2612 (SS-041) (Formerly SD-041)

Proposed Plan

Former Plattsburgh Air Force Base
Clinton County, New York

Draft - Final
May 2011

G3731G

BUILDING 2612
SPILL SITE SS-041
(FORMERLY SITE SD-041)
SOIL AND SEDIMENT OPERABLE UNIT

PROPOSED PLAN

FORMER PLATTSBURGH AIR FORCE BASE
CLINTON COUNTY, NEW YORK

UNITED STATES DEPARTMENT OF THE AIR FORCE
INSTALLATION RESTORATION PROGRAM

Prepared by:

URS GROUP, INC.

DRAFT-FINAL
MAY 2011

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ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
Air Force	United State Air Force
ARARs	applicable and/or relevant and appropriate requirements
BCT	BRAC Cleanup Team
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EBS	Environmental Baseline Survey
ERA	Screening Level Ecological Risk Assessment
FS	feasibility study
FT-002	Fire Training Area
HRA	health risk assessment
HQ	hazard quotient
IA	Industrial Area
IC	Institutional Control
IRIS	Integrated Risk Information System
ICBM	Intercontinental ballistic missile
IRP	Installation Restoration Program
kg	kilogram
L	liter
LOX	liquid oxygen
mg	milligram
NCP	National Contingency Plan
NYSDEC	New York State Department of Environmental Conservation
O&M	operation and maintenance

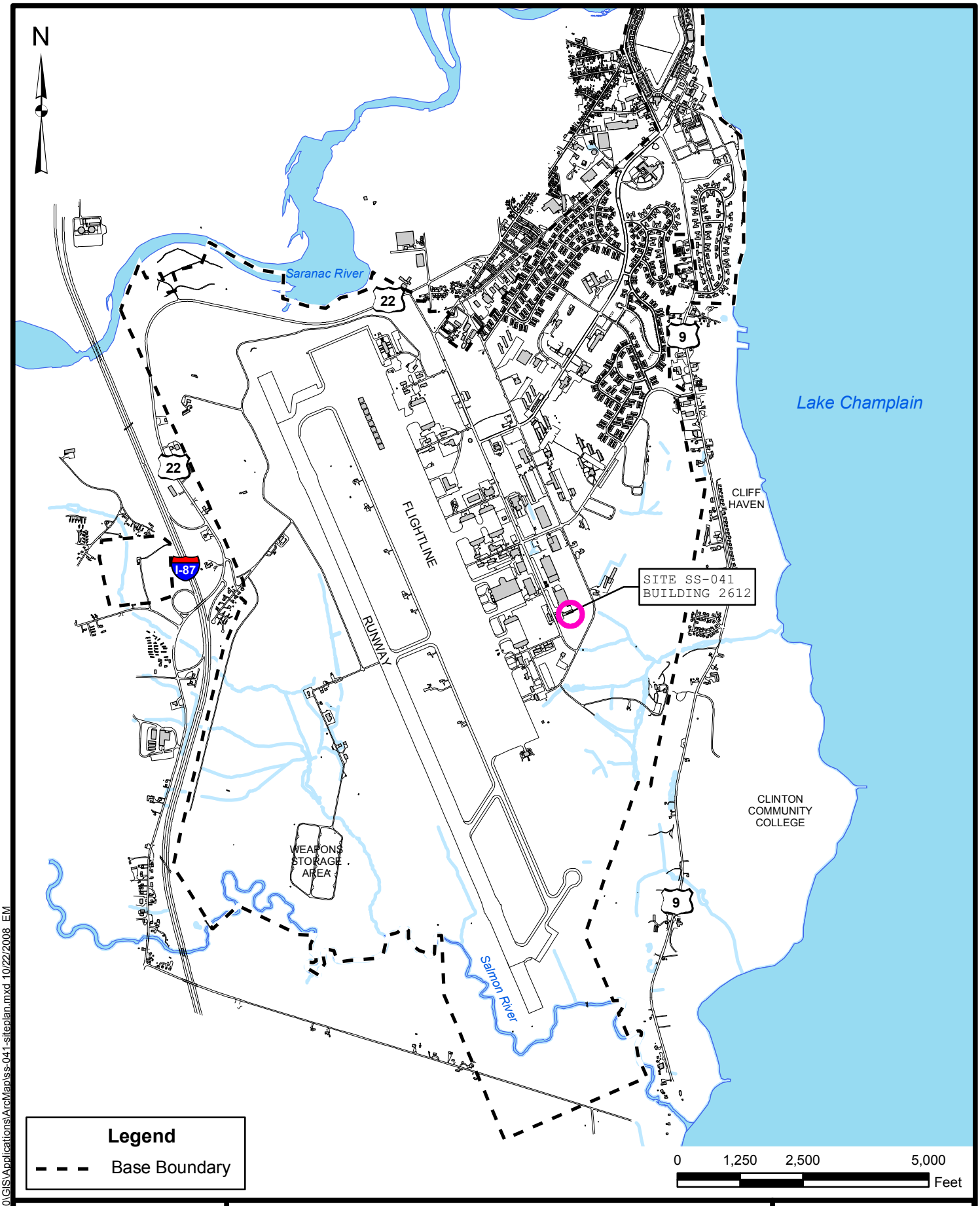
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PARC	Plattsburgh Airbase Redevelopment Corporation
PCB	polychlorinated biphenyl
RAB	Restoration Advisory Board
RI	remedial investigation
ROD	Record of Decision
SS-041	Building 2612 investigation area (formerly SD-041)
SEBS	Supplemental Evaluation to the EBS
SVOC	semi-volatile organic compound
TCE	trichloroethene
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

1.0 INTRODUCTION

This Proposed Plan presents the proposed remedial action for the soil/sediment operable unit (OU) at the Building 2612 site, also known as Site SS-041 and formerly called SD-041. This site is located on the former Plattsburgh Air Force Base (AFB), in Plattsburgh, New York (see Figure 1). The United States Air Force (Air Force) is proposing this plan to address contaminated sediment located in a wetland south of the building that is present because of chemical releases from inside building drains. Soils elsewhere at the site do not pose an unacceptable risk to human health or the environment. Groundwater contamination at SS-041, including potential soil vapor intrusion into buildings from groundwater, is being addressed as part of the Fire Training Area/Industrial Area (FT-002/IA) Groundwater OU and is not addressed here. Institutional Controls (ICs) required by the FT-002/IA Groundwater OU, however, also apply to Site SS-041 and they are discussed in Section 8.0 of this Proposed Plan. The recommended alternative includes excavation of contaminated wetland sediments to a depth of two feet below ground surface, off-site disposal, confirmatory sampling, backfilling the excavation with clean soil, grading, seeding, and ICs. Technical terms referenced in this document are defined in the Glossary.

This Proposed Plan is being published in accordance with section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Its purpose is to summarize information that can be found in greater detail in the Remedial Investigation (RI) Report and other related documents for this site. Additionally, it provides information for public review and comment on the remedial alternative being considered. The Air Force, in conjunction with the United States Environmental Protection Agency (USEPA) and in consultation with the New York State Department of Environmental Conservation (NYSDEC), will consider public input while selecting the final response action for Site SS-041. Therefore, the public is encouraged to review and comment on all the alternatives identified in this Proposed Plan.

The Administrative Record, which contains the information upon which the selection of the response action will be based, is available on-line at: https://afrpaar.lackland.af.mil/ar/docsearch.aspx.



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FORMER PLATTSBURGH AFB, NY
SS-041 BUILDING 2612
SITE LOCATION

FIGURE 1

Building 2612 is located in the central-eastern portion of Plattsburgh AFB on the east side of Arizona Avenue approximately 600 feet north of the intersection of Arizona and Idaho Avenues (see Figures 2 and 3). The site consists of Building 2612, the adjacent areas including the wetlands to the south, and the area between Buildings 2612 and 2616. Building 2612 was used in the early 1960's in support of the Atlas Intercontinental Ballistic Missile (ICBM) program. From 1970 until Base closure in 1995, the building was used as an unheated base equipment and supply warehouse. Its use as an unheated warehouse continues under its current tenant. In July 2009, ownership of the parcel containing SS-041 was transferred from the Air Force to the Plattsburgh Airbase Redevelopment Corporation (PARC).

During the course of investigating this site, the Air Force has cleaned, and sealed in place, or removed all of the equipment and piping believed to be potential sources and/or pathways for contaminant migration from Building 2612. In addition, contaminated soils and a portion of the contaminated wetland sediments believed to pose a potential threat to human health or the environment were excavated and removed during the course of investigating the site (see Figures 4 and 6).

Contamination remaining at the site consists of wetland sediments with concentrations of cadmium and chromium that present an unacceptable potential ecological risk to terrestrial receptors (land dwelling animals). The metals contamination appears to have originated at a storm sewer discharge point in the wetland and the contamination follows depression contours within the low-lying wetland area. Floor drains and sink drains from the building discharged into this storm sewer. Due to the low drainage gradient and plant cover, contamination did not travel far from the discharge point. An ecological risk assessment (see Section 3.2) found sediment to be a significant potential risk to ecological receptors. Current data indicate that sediment requiring remediation is present in the wetland to a depth of approximately two feet over an area of about 3,400 square feet (see Figure 10).

For soils elsewhere on site, a human health risk assessment (see Section 3.1) concluded that the potential cancer risk due to exposure to the remaining site soil in a residential reuse scenario fell within the range of risk (10^{-4} to 10^{-6} excess cancer risk) that is acceptable under current USEPA regulations (USEPA 1990). Non-cancer risk for the soil pathway fell below the

USEPA specified hazard index of one. A potential non-cancer risk is indicated if the hazard index exceeds one (USEPA 1991).

This Proposed Plan addresses cleanup of the sediment contamination in the wetland resulting from past activities at Site SS-041. The remedial objective for this site is to reduce cadmium and chromium concentrations in the wetland sediments to levels that do not pose a potentially significant threat to ecological receptors. These remediation goals were developed during the RI and are considered protective of terrestrial species. As described further in Section 3.1, they are also considered protective of human health. Remediation goals that are chemical-specific targets for the remediation and are consistent with the remedial objective are shown below:

SEDIMENT REMEDIATION GOALS

COMPOUND	MAXIMUM ALLOWABLE CONCENTRATION (mg/kg)
Cadmium	2.5
Chromium	150

mg/kg = milligram/kilogram

The Air Force, in consultation with the USEPA and NYSDEC, may modify the proposed remedial action presented in this Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on the alternative identified herein.

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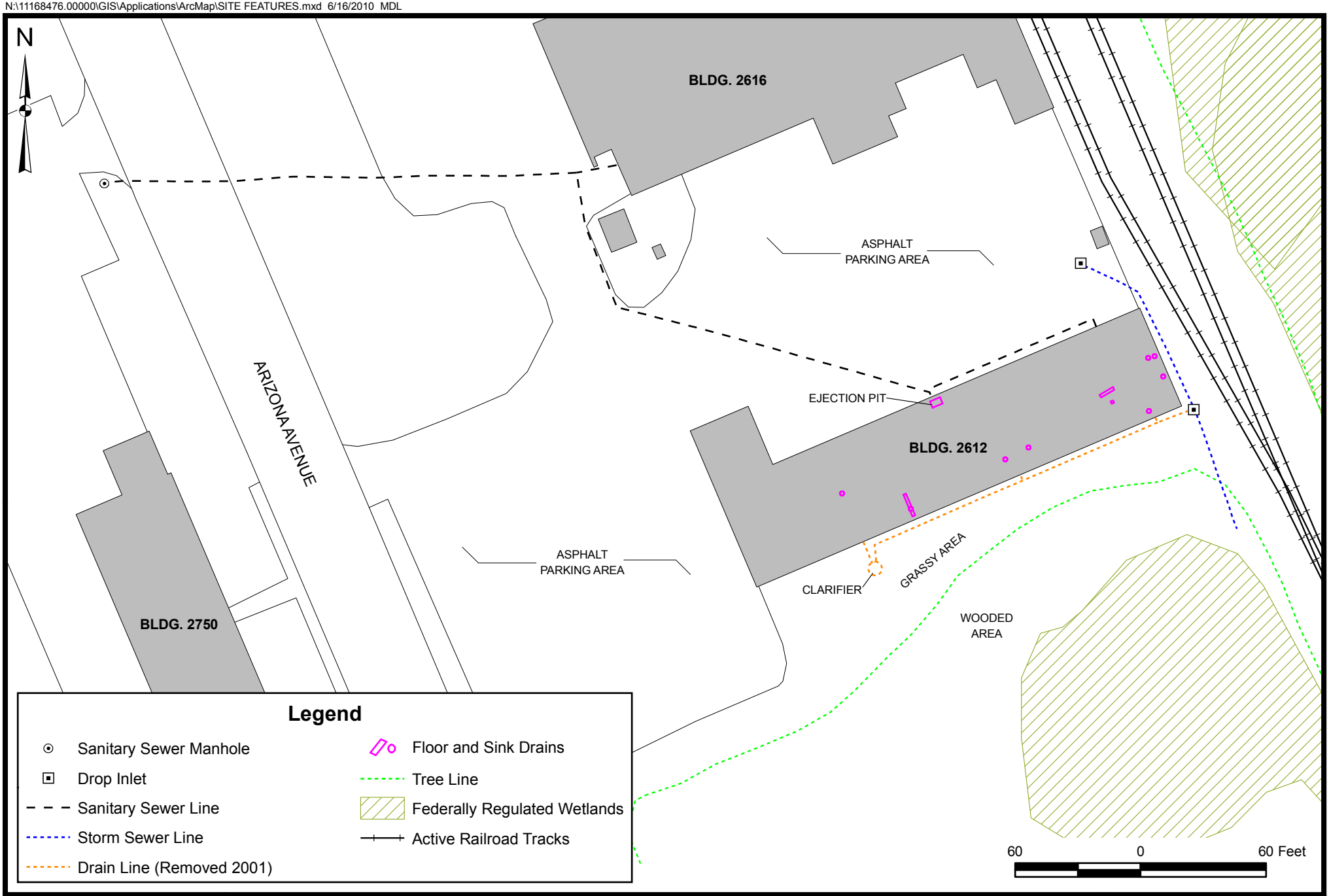

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PLATTSBURGH AFB - BUILDING 2612 - SITE SS-041
SITE FEATURES

FIGURE 2

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Legend

- Topographic Contour (ft. amsl)
- Drainage Swale
- Sanitary Sewer Line
- Storm Sewer Line
- Drain Line (Removed 2001)
- Drop Inlet
- Manhole
- Surface Water Feature
- Railroad Tracks

SOURCE: NYS GIS Clearinghouse Orthoimagery, Clinton County, 2008

100 0 100 Feet

BUILDING 2612 - SITE SS-041
SURFACE FEATURES

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FIGURE 3

Figure 2 - Site Features

Figure 3 - Surface Features

2.0 SITE BACKGROUND

2.1 Site Description and Background

Plattsburgh AFB, located in Clinton County in northeastern New York State, is bordered on the north by the City of Plattsburgh, the south by the Salmon River, on the west by Interstate 87, and on the east by Lake Champlain. The base is approximately 26 miles south of the Canadian border and 167 miles north of Albany.

Plattsburgh AFB was closed on September 30, 1995 in the third round of base closures mandated under the Defense Base Closure and Realignment Act of 1993. Its reuse is being administered by PARC, which is responsible for maintaining base property, marketing and controlling base reuse, leasing and managing property, and developing base facilities, as necessary, to promote advantageous reuse. According to land use plans (PARC 1995), the planned reuse of Site SS-041 is industrial and commercial. The planned reuse surrounding the site includes recreational to the east/southeast and commercial/industrial to the west/northwest (TetraTech 1995).

As part of the its Installation Restoration Program (IRP) and the Base Realignment and Closure (BRAC) Program, the Air Force has initiated activities to identify, evaluate, and restore identified hazardous material disposal and spill areas. The IRP at Plattsburgh AFB is being implemented according to a Federal Facilities Agreement (Docket No.: II-CERCLA-FFA-10201) signed by the Air Force, USEPA, and NYSDEC on July 10, 1991. Plattsburgh AFB was placed on the National Priorities List on November 21, 1989. The Air Force is funding cleanup.

The Air Force has kept the community informed regarding progress at Site SS-041 and other base IRP sites during Restoration Advisory Board (RAB) meetings that are open to the public. This board consists of the BRAC Cleanup Team (BCT) members (key representatives from the Air Force, USEPA, and NYSDEC) and several representatives from municipalities, community organizations, and associations including community members with environmental/engineering expertise. The RAB, which was chartered in 1995, serves as a forum

for the community to become familiar with the restoration activities ongoing at Plattsburgh AFB and to provide input to the BCT.

Building 2612 (Site SS-041) is located in the central-eastern portion of Plattsburgh AFB on the east side of Arizona Avenue approximately 600 feet north of the intersection of Arizona and Idaho Avenues (see Figure 1). Between 1961 and 1963, 12 Atlas F ICBM sites were constructed by the Air Force within a 50-mile radius of Plattsburgh AFB (Broyhill 2011). In October 1961, the 556th Strategic Missile Squadron was assigned to Plattsburgh AFB; the squadron became fully operational in December 1962.

Building 2612, originally called the Liquid Oxygen (LOX) Cleaning Plant, was constructed in 1963 to support the ICBM program (Air Force 1997). The building housed a laboratory, fuel test area, hydraulic cleaning area, drying oven, parts storage, and a number of above ground process tanks: a vapor degreaser, an alkali cleaning tank, four "pickling" tanks, an acid rinse tank, and a hot water tank (URS 2008). What actually occurred in the building is not known.

At the end of June 1965, the 556th Strategic Missile Squadron was deactivated (Broyhill 2011), and the use of Building 2612 as a LOX Cleaning Plant most likely ended. The equipment in the building was removed at some point between 1965 and 1970, when the Air Force began using Building 2612 as an unheated base equipment and supply warehouse. Its use as a warehouse continued until the base was closed in 1995. Materials stored at this facility included motor oil, lubricants, miscellaneous solvents, propylene and ethylene glycol, corrosion inhibitor, degreasers, aircraft cleaning compounds, hydraulic fluids, and electrical transformers.

From 1995 to early 1999, Building 2612 was used to store caretaker (PARC) building materials and grounds equipment (e.g., tractors, yard equipment, mulch, snow plow parts, street sweeper brushes, and gypsum board). In the spring of 1999, the building was leased to a tenant for use as an equipment storage warehouse. In July 2009, ownership of the parcel containing SS-041 was transferred from the Air Force to PARC. Building 2612 continues to be used as a warehouse.

2.2 Summary of Previous Site Activities

2.2.1 Basewide Environmental Baseline Survey

A Basewide Environmental Baseline Survey (EBS) was performed in 1994 to evaluate and classify real property for potential environmental issues (Air Force 1997). The EBS classified Building 2612 as a "Category 7" site with environmental factors that required additional investigation. Based upon this finding, the Air Force performed a Supplemental Evaluation to the EBS (SEBS) at the site.

2.2.2 Supplemental Evaluation to the Environmental Baseline Survey and Associated Removals

The SEBS began with site inspections and reconnaissance at Building 2612 in 1996 and 1997. Record drawings indicated that the floor and sink drains discharged into the storm sewer system on the east side of the building and ultimately to the federally–regulated wetland to the south. An ejection pit, an open top concrete-walled sump with associated submersible pump and piping, were also noted on the record drawings. This ejection pit, which was three feet by five feet and eight feet deep, collected sanitary wastewater and floor drain water from the building and discharged it to a sanitary manhole on the west side of Arizona Avenue.

In the summer of 1998, environmental samples were collected from inside the building and from three groundwater monitoring wells adjacent to the building. Interior samples included drain sediment, wastewater in the ejection pit, and concrete chip samples. Sample analyses reported volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and metals as present in the floor drain and ejection pit sediments. The analytical data were used to perform an evaluation of human health risk for the building which concluded that Building 2612 was suitable for leasing in its November 1998 condition (URS 1998). It was also recommended that the floor drains, ejection pit, and associated piping inside the building be abandoned and sealed in place.

The recommendations were executed in January 1999. A drain snake was used to loosen material in the two center floor drains, two floor drains located near the southeast corner of the building, eight other openings (e.g., electrical conduits) in the floor, and one slit drain located along the south wall of the building. Loose material was vacuumed from the drains and other openings, and then the drains and openings were capped with cement. About 30 pounds of debris were removed from the drains and openings. Following the cleaning and closure of the drains, a submersible pump was lowered into the ejection pit located near the overhead door on the north side of the building and fluid was evacuated from the pit. A total of 200 gallons of water was removed and 50 gallons of sediment were recovered from the sump. The equipment in the ejection pit sump also was removed. One to two feet of groundwater seeped into the empty sump pit indicating that the sump probably was not watertight. The sump and the salvaged equipment were rinsed with a pressure washer. The salvaged equipment and all drums of liquids and solids generated during the floor drain and sump decontamination were removed. The ejection pit sump was filled to within six inches of the floor surface with compacted sand and then the top of the sump was capped with six inches of concrete. Groundwater samples and one sediment sample also were collected in 1999.

In consultation with the NYSDEC and USEPA, the Air Force determined that further investigation and action for Building 2612 should be undertaken according to the CERCLA Remedial Investigation (RI) process.

2.2.3 Remedial Investigation

The RI was performed between July 2001 and August 2002. Investigative tasks completed included: a geophysical survey to locate buried drain piping; test trenching along drainage lines and geophysical anomalies; pressure testing of drainage lines inside Building 2612; sampling, removal and disposal of buried drain lines on the south side of the building; removal of a buried drainage clarifier discovered during the test trenching; and collecting and testing of subsurface soil and sediment samples. The findings of the RI, including a human health risk assessment (HRA) and a screening-level ecological risk assessment (ERA), are detailed in the RI Report (URS 2003).

For groundwater, the RI concluded that: 1) groundwater at the site was contaminated with chlorinated hydrocarbons and metals from an upgradient source; 2) under a hypothetical future residential use scenario, groundwater presented a cancer and non-cancer risk greater than the USEPA thresholds 10^{-4} and 1 respectively; 3) there were no significant continuing contaminant sources to groundwater at Building 2612; 4) drainage features that could potentially serve as sources of contamination had been cleaned and abandoned or removed; and 5) groundwater contamination at the site would be addressed as part of the FT-002/IA Groundwater OU. Given that the groundwater is being addressed as part of the FT-002/IA Groundwater OU, groundwater contamination will not be discussed further in this SS-041 Proposed Plan.

For soils the RI concluded that: 1) sporadic low level detections of VOCs, SVOCs and PCBs may have resulted from spills inside the building that migrated to the soil via leaky drainage features; however, the concentrations were below New York State soil cleanup guidance (NYSDEC 1994) and were not of concern; 2) the concentration of metals that exceed the New York State soil clean up guidelines were not widespread and did not appear to be a significant source of contamination to groundwater; 3) soils in the vicinity of Building 2612 do not pose a significant risk to human health; 4) high concentrations of polycyclic aromatic hydrocarbons (PAHs) in soil samples collected adjacent to Building 2616, to the north of Building 2612, were most likely from asphalt pieces in the soil samples and not associated with Building 2612 (see Section 2.2.4). A summary of the compounds detected in soil samples, as well as the maximum and minimum concentrations, is provided in Table 1. Figure 4 shows the locations of the soil samples and Section 2.3.4 describes the significance of the soil sample results.

Sediment samples from the wetland south of Building 2612 contained VOCs, PAHs, the PCB Aroclor 1260, and metals. Chemicals most likely mixed with water in the building floor drains and then were discharged into the wetlands. A variety of the contaminants detected exceeded New York State sediment screening criteria (NYSDEC 1999a). Table 2 is a summary of analytes detected in sediment samples collected at the site. Figures 5 through 8 show the locations of the sediment samples and Section 2.3.5 discusses the significance of the sediment sample results. The screening-level ERA estimated that there was a potential risk from exposure to site sediments to species represented by the short-tailed shrew and the American woodcock. The contaminants that contributed most to the potential ecological risk were cadmium, chromium, lead and mercury (see Section 3.2).

The RI Report (URS 2003) recommended using test trenching to further evaluate the extent of sediment contamination in the southern wetland as well as the extent of PAH contamination in soil north of Building 2612.

2.2.4 Supplemental Remedial Investigation and Soil/Sediment Removals

In October 2003, test trenching was performed in response to the recommendations made in the RI to further evaluate the extent of chromium and cadmium concentrations in sediments south of Building 2612 and the anomalous PAH concentrations in soils at the southwest corner of Building 2616.

Approximately 14 cubic yards of sediments were removed from the wetland in two areas with metals concentrations that indicated an unacceptable ecological risk. The excavated sediments were characterized and transported off site to a permitted disposal facility. Ten confirmatory samples were collected from the perimeter of the excavation and submitted for laboratory analysis, and then the excavation was backfilled with clean soil. After backfilling the excavations, twenty additional sediment samples were collected in a grid pattern. The results of all the confirmatory sampling indicated that there were still concentrations of cadmium and chromium in the remaining sediments that represented an unacceptable ecological risk.

The area containing elevated cadmium (>2.5 mg/kg) and chromium (>150 mg/kg) concentrations is on the order of 3,400 square feet and approximately 2 feet deep (see Figure 10). The RI Addendum Report (URS 2007) recommended that sediments in this area of the site, about 250 cubic yards, be removed to mitigate the potential ecological risks, and the site restored.

Test trenching and soil sampling adjacent to Building 2616, also conducted in October 2003, demonstrated that the PAH contamination found in soil samples collected near Building 2616 was most likely due to asphalt pieces present in the soil caused by previous repeated excavating/backfilling activities through the surficial asphalt pavement. No further action appears warranted for the area of PAH contaminated soil. During the test trenching, approximately three cubic yards of soil were removed and disposed of off-site.

In February 2004, three Geoprobe soil samples were collected near the former ejection pit (see Figure 2). The samples were collected from eight to ten feet below ground surface to characterize soils below the bottom of the pit. Each sample was analyzed for VOCs, SVOCs, PCBs, and metals. No compounds were detected at concentrations greater than their respective New York State soil cleanup guidance values (NYSDEC 1994).

In 2008, the RI Report (URS 2003) and the RI Addendum Report (URS 2007a) were consolidated into a single Final RI Report (URS 2008).

2.2.5 Soil Vapor Intrusion Investigation and Groundwater Plume

A groundwater contaminant plume originating at the former Fire Training Area (FT-002), located approximately one mile to the west-northwest of Site SS-041, has migrated into the Industrial Area east of the flightline. The plume raised concerns about the potential for vapor intrusion into buildings caused by volatilization of chemical contaminants in the groundwater. Consequently, in 2006, a study was initiated to evaluate soil vapor intrusion into 14 of the Industrial Area buildings. Building 2612, located on Site SS-041, was included in the study. A description of the investigation and recommendations related to the potential for vapor intrusion from groundwater appears in documents for the FT-002/IA Groundwater OU; in connection with the investigation and remedial decisions resulting therefrom, a building occupancy restriction was placed on Building 2612 due to the potential for soil vapor intrusion from a possible unknown soil source (see Section 8.0 for more detail).

2.3 Site Characteristics

2.3.1 Surface Water Hydrology

Plattsburgh AFB lies within the Lake Champlain drainage basin. The dominant surface water features in the vicinity of Plattsburgh AFB are the Saranac River to the north, the Salmon River to the south, and Lake Champlain to the east. The Saranac and Salmon Rivers, which discharge into Lake Champlain, originate west of Plattsburgh AFB in the Adirondack Mountains.

A network of drainage ways carries surface water runoff from the base into sewers and streams that lead to off base areas.

2.3.2 Site Drainage

The surface drainage at SS-041 is controlled by topography and by drainage features engineered during the base's construction. Areas to the west and north of Building 2612 are paved and relatively flat (see Figure 2). Precipitation either puddles on the pavement until it evaporates, or runs off to the grassy medians surrounding the pavement and infiltrates to groundwater. Storm drain drop inlets are present on the eastern side of the building and carry any collected water to the depressional wetland area south of the building. Heavy surface runoff would also flow to this depressional area. The depressional wetland area is connected to a southward trending drainage ditch that leads to the Golf Course drainage system; however, grades in the ditch have not been maintained and surface water probably leaves the depressional wetland area mainly by evapo-transpiration or infiltration to groundwater, except during extreme storm events.

If surface water drainage from the site did reach the Golf Course drainage system, it would be carried eastward to Lake Champlain. The Golf Course streams are classified by NYSDEC as Class D water bodies. Class D water bodies are characterized as suitable for fishing and for primary and secondary contact recreation, even though other factors may limit their use for these purposes (NYSDEC 1999).

2.3.3 Hydrogeologic Setting

Stratigraphy in the SS-041 area generally consists of five units from top to bottom: sandy fill and re-graded surficial deposits; native fine sand; silt and clay; glacial till; and bedrock. Groundwater at SS-041 occurs in both the overburden deposits and bedrock. Hydrologically, the stratigraphic column can be divided into the following units: the vadose (unsaturated) zone, present in the fill/regraded material and the sand unit; the unconfined water table aquifer, also present in the fill/regraded material and the sand unit; a confining layer (aquitard) formed by the silt and clay unit; the confined till water-bearing zone; and the confined bedrock aquifer.

The unsaturated vadose zone is between the ground surface and water table. Its thickness in the vicinity of Building 2612 is generally on the order of 4 to 5 feet, although the vadose zone can be absent in depressional areas such as the wetlands south and east of Building 2612.

The morphology of the water table surface is similar to surface topography. Groundwater in the area flows to the east-southeast at horizontal gradients ranging from 0.010 foot/foot west of the site to 0.030 foot/foot east of the site. The aquifer thickness in the site area ranges from about 10 to 20 feet, thinning from west to east and eventually disappearing farther to the east. Groundwater appears to discharge to streams running through the Barracks Golf Course, east of the site.

The silt and clay unit forms a confining layer (aquitard) that separates the water table aquifer from the underlying till water-bearing zone and the bedrock aquifer. The silt and clay unit, about 15 to 20 feet thick, is continuous beneath and in the vicinity of SS-041. This unit effectively confines the underlying units and restricts groundwater movement between the water table aquifer and the till water-bearing zone/bedrock aquifer.

Water elevation measurements indicate an eastward to southeastward horizontal groundwater flow direction in the southeastern portion of the base. Vertical gradients between the till water-bearing zone and the unconfined aquifer appear to be upward west of the base, in the vicinity of the golf course, and at the southern end of the runway, but the gradient is downward in the flightline industrial corridor.

The bedrock aquifer is isolated from the unconfined sand aquifer by the overlying silt and clay unit. Groundwater movement in the bedrock is controlled by physical characteristics of the rock such as porosity, fractures, faults, bedding planes, joints, and solution cavities. Regionally, fractured bedrock groundwater flow is controlled by the potentiometric surface, which slopes east-southeastward toward Lake Champlain.

2.3.4 Nature and Extent of Soil Contamination

The nature and extent of analytes in soil has been identified in the RI (URS 2003) and the RI Addendum (URS 2007a). Detected parameters in soil included VOC, SVOCs, PCBs and metals. Table 1 summarizes the detected concentrations of analytes, and Figure 4 shows the soil sample locations. Note that during excavations to remove buried piping and associated features, and also during investigative test trenching, some of the soils represented by these samples were removed and disposed of off-site. As discussed in Section 3.0, contaminants in soil do not represent an unacceptable risk to human health and the environment.

During the RI, concentrations of compounds detected in soil samples were compared to the recommended soil cleanup objectives presented in NYSDEC's *Technical and Administrative Guidance Memorandum (TAGM) 4046* (NYSDEC 1994). Recently, NYSDEC rescinded the TAGM 4046 soil cleanup objectives (NYSDEC 2010a) and replaced them with new soil cleanup objectives presented in *Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Part 375* (NYSDEC 2006). The 6 NYCRR Part 375 soil cleanup objectives are dependent upon the intended use of the site, which for SS-041 is commercial/industrial; residential use has been prohibited (see Section 8.0). It is not necessary to re-evaluate the RI soil data relative to 6 NYCRR Part 375 because the revised soil cleanup objectives in Part 375 for the intended use of the property (i.e., commercial/industrial) are less stringent (higher) than those in TAGM 4046 (NYSDEC 2010b).

Subsurface soil samples were collected during the RI at or near potential sources for chlorinated hydrocarbon and metals contamination in groundwater that included: 1) the ejection pit sump situated along the north wall of Building 2612; 2) floor drains and underground piping beneath the floor of Building 2612; 3) the storm sewer line running outside of the southern wall of Building 2612 (which drained to wetlands south of the building); and 4) the sanitary sewer line that connected the ejection pit sump to a manhole west of Arizona Avenue. Sporadic low level detections of VOCs, SVOCs, and PCBs in samples collected in the immediate vicinity of Building 2612 indicated that the soils may have been impacted by spills reaching leaky drainage features. However, the detected concentrations of these compounds were below the more

stringent New York State TAGM 4046 soil cleanup objectives (NYSDEC 1994) and were not of concern.

The concentrations of several metals detected in the soil samples (cadmium, calcium, chromium, mercury, selenium, and zinc) did exceed their respective New York State soil cleanup guideline values. These same metals were also detected in the floor drain and ejection pit sediment samples. Most of the metals exceedances of soil cleanup objectives were collected from the pipeline excavation along the southern wall of Building 2612, which was subsequently removed. Two other locations (i.e., GB-2612-02 and -06) showed three (3) metals exceedances, but one exceedance (chromium in GB-2612-06) could not be reproduced in its duplicate sample. Therefore, there does not appear to be a widespread pattern of metals contamination in soils beneath or in the vicinity of Building 2612 due to leaky drainage features. Soils at the site do not appear to represent a significant source, if any, for groundwater contamination.

Some of the maximum detected concentrations for VOCs, SVOCs, and metals listed in Table 1 were from soil samples collected inside the concrete clarifier tank (i.e., CL-2612-01 and CL-2612-03). These soils were removed from the clarifier and disposed of off-site when the clarifier was removed in August 2001 (URS 2003).

In the course of investigating the sanitary sewer north of Building 2612, high levels of PAHs were detected near the juncture of two lines located near Building 2616, specifically at sample location GB-2612-05 (see Figure 4). Most of the maximum detected concentrations of SVOCs shown in Table 1 were found at this sample location, but in October 2003, during test trenching around sample location GB-2612-05, approximately three cubic yards of soil were removed and disposed of off-site. Confirmatory soil samples collected from the sides and the bottom of the excavation still showed high levels of PAHs; however, based on observations made during the test trenching, it is believed that small asphalt pieces in the fill material were the source of the elevated PAH concentrations in soil samples collected from this area (URS 2007). As a result, significant residual soil contamination is not believed to be an issue in this area.

2.3.5 Nature and Extent of Wetland Sediment Contamination

Several sediment sampling events occurred at SS-041 to identify and evaluate the extent of contamination. These events, which occurred in 1999, 2001, 2002, and 2003, are discussed in detail in Section 2.2. A variety of VOCs, SVOCs, PCBs, and metals have been detected in sediments at SS-041. Sediment contamination likely originated from chemical spills on the floor of the building, which were washed into floor drains and ultimately were discharged to the wetland, thereby impacting sediment quality.

NYSDEC's *Technical Guidance for Screening Contaminated Sediments* (NYSDEC 1999a) was used to initially screen the wetland sediment data; the soil cleanup objectives listed in 6 NYCRR Part 375 are not applicable to wetland sediments (NYSDEC 2010b). The initial screening identified the PCB Aroclor 1260 plus eight metals (antimony, cadmium, chromium, copper, iron, lead, mercury, and zinc) as potential contaminants of concern to ecological receptors in the wetland south of Building 2612; however, NYSDEC's sediment guidance values for metals are for benthic organisms that are not viable in the intermittent surface water environment of this wetland. Therefore, to further evaluate the sediment contamination for these contaminants of concern, a screening level ecological risk assessment was performed for terrestrial species that could be exposed to the sediments. Consequently, the extent of sediment contamination in the wetland is defined as those areas where concentrations of cadmium and chromium exceed two ecological risk-based screening criteria, 2.5 mg/kg for cadmium and 150 mg/kg for chromium (URS 2007). Sediments containing these two compounds at concentrations higher than these screening levels represent a risk to terrestrial receptors (see also Section 3.2).

Table 2 summarizes the detected concentrations of analytes in wetland sediment samples from Site SS-041. Sediment sample locations are shown on Figures 5 through 9. Many of the maximum concentrations occurred at sediment sample locations SED-2612-3, -4, and –6; however, sediments were removed at these locations in October 2003.

Test trenches were excavated around these three previous sampling locations (see Figure 6). One test trench was excavated at sample locations SED-2612-3 and SED-2612–4 to investigate the extent of lead concentrations above PAFB background levels, and a second test

trench was made at location SED-2612–6 to investigate the extent of elevated cadmium and chromium concentrations. All of the excavated sediments were taken off site for disposal. Confirmatory samples taken around the excavation at sample SED-2612-6 still contained elevated concentrations of cadmium and chromium. Therefore, in late October 2003, 20 additional samples were collected in a grid pattern to evaluate the extent of cadmium and chromium in the wetland. The sample locations are shown on Figure 7.

Figures 8 and 9 show concentrations of cadmium and chromium respectively that were found in sediment samples collected after the October 2003 excavations. Concentrations from historical samples collected in areas not affected by excavation activities are also shown. The most elevated concentrations appear to occur in the top two feet of sediment. The figures include an estimate of the extent of sediment contamination at levels higher than the screening levels noted above.

TABLE 1

SUMMARY OF ANALYTES DETECTED IN SOIL SAMPLES

PARAMETER	NO. OF SAMPLES	NO. OF DETECTIONS	MAXIMUM DETECTED VALUE	MINIMUM DETECTED VALUE	LOCATION OF MAXIMUM VALUE	AVERAGE VALUE	RECOMMENDED SOIL CLEANUP OBJECTIVE	SOURCE [1]
VOLATILE ORGANIC COMPOUNDS (µg/kg)								
1,2-Dichlorobenzene	20	3	12.12	0.56	GB-2612-03	1.0	7,900	A
1,2-Dichloroethene (cis)	21	5	38.5	0.65	CL-2612-03	3.1	NV	NA
1,2-Dichloroethene (trans)	21	4	2.4	0.44	CL-2612-03	0.3	300	A
1,4-Dichlorobenzene	20	1	0.57	0.57	GB-2612-02	0.04	8,500	A
Acetone	21	4	19.8	12.7	GB-2612-01	3.7	200	A
Cyclohexane	21	1	4.63	4.63	PE-2612-04	0.3	NV	NA
Methyl ethyl ketone (2-Butanone)	21	4	5.2	1.7	GB-2612-04	0.7	300	A
Methylcyclohexane	21	1	17.5	17.5	PE-2612-04	1.0	NV	NA
Methylene chloride	21	3	1.09	0.6	GB-2612-03	0.2	100	A
Tetrachloroethene	21	1	3.09	3.09	GB-2612-03	0.2	1,400	A
Toluene	21	4	4.0	0.57	PE-2612-04	0.4	1,500	A
Trichloroethene	21	5	75.4	4.3	CL-2612-03	7.2	700	A
Vinyl chloride	21	2	33.9	10.4	CL-2612-03	2.6	200	A
SEMI-VOLATILE ORGANIC COMPOUNDS (µg/kg)								
2-Methylnaphthalene	28	4	2,622	57	GB-2612-05	132.4	36,400	A
Acenaphthene	32	8	24,849	56.8	GB-2612-05-CN	2,008	50,000	A
Acenaphthylene	32	1	72.5	72.5	GB-2612-05-CS	2.8	41,000	A

TABLE 1 (Continued)

PARAMETER	NO. OF SAMPLES	NO. OF DETECTIONS	MAXIMUM DETECTED VALUE	MINIMUM DETECTED VALUE	LOCATION OF MAXIMUM VALUE	AVERAGE VALUE	RECOMMENDED SOIL CLEANUP OBJECTIVE	SOURCE [(1)]
Acetophenone	22	1	163	163	CL-2612-01	9.3	NV	A
Anthracene	33	8	23,381	17.5	GB-2612-05	1,788	50,000	A
Benzo(a)anthracene	33	11	31,049	49	GB-2612-05	2,597	224	A
Benzo(a)pyrene	33	12	26,251	51	GB-2612-05	2,349	61	A
Benzo(b)fluoranthene	33	12	22,810	49.6	GB-2612-05	2,071	1,100	A
Benzo(g,h,i)perylene	33	9	21,424	61	GB-2612-05	1,299	50,000	A
Benzo(k)fluoranthene	33	9	23,308	42.2	GB-2612-05	1,437	1,100	A
bis(2-Ethylhexyl)phthalate	29	8	5,801	42	CL-2612-01	307.7	50,000	A
Carbazole	28	4	10,079	66	GB-2612-05	527.29	NV	NA
Chrysene	33	12	30,522	43	GB-2612-05	2,558	400	A
Dibenz(a,h)anthracene	32	2	1,428	173	GB-2612-05	62.5	14	A
Dibenzofuran	28	3	6,710	208	GB-2612-05	352.0	6,200	A
Di-n-butyl phthalate	28	1	36.6	36.6	CL-2612-01	1.6	8,100	A
Fluoranthene	33	14	68,316	43	GB-2612-05	6,049	50,000	A
Fluorene	32	3	13,319	505	GB-2612-05	638.8	50,000	A
Indeno(1,2,3-cd)pyrene	33	8	19,236	40.6	GB-2612-05	1,250	3,200	A
Naphthalene	32	4	7,255	44.9	GB-2612-05	438.0	13,000	A
Phenanthrene	33	10	70,877	40.6	GB-2612-05	5,173	50,000	A
Pyrene	33	13	55,372	51	GB-2612-05	4,485	50,000	A
PCBs (µg/kg)								
Aroclor 1260	19	3	14.7	8.4	GB-2612-11	2.4	10,000	A
METALS (mg/kg)								
Aluminum	21	21	2,473	356	GB-2612-10	1,969	8,510	B
Antimony	21	3	1.2	0.58	CL-2612-01	0.1	12.6	B
Arsenic	20	9	1.6	0.47	GB-2612-06	0.5	7.5	A
Barium	21	21	36.9	2.3	CL-2612-01	14.4	300	A
Beryllium	21	18	0.42	0.1	GB-2612-01	0.2	0.74	B

TABLE 1 (Continued)

PARAMETER	NO. OF SAMPLES	NO. OF DETECTIONS	MAXIMUM DETECTED VALUE	MINIMUM DETECTED VALUE	LOCATION OF MAXIMUM VALUE	AVERAGE VALUE	RECOMMENDED SOIL CLEANUP OBJECTIVE	SOURCE [1]
Cadmium	21	1	2.8	2.8	PE-2612-02	0.2	1.3	B
Calcium	21	21	45,961	250	GB-2612-02	7,267	30,200	B
Chromium (Total)	21	21	378	0.7	CL-2612-01	32.6	19.5	B
Cobalt	21	21	1.9	0.29	GB-2612-01	1.6	30	A
Copper	21	21	18.3	0.48	CL-2612-01	4.3	44.1	B
Iron	21	21	20,895	1,065	CL-2612-01	6,200	36,700	B
Lead	21	21	76.8	0.22	CL-2612-01	6.9	79.4	B
Magnesium	21	21	1,996	183	GB-2612-02	1,202	3,340	B
Manganese	21	21	201	15.7	GB-2612-07	81.5	474	B
Mercury	21	7	0.28	0.02	PE-2612-01	0.03	0.1	A
Nickel	21	21	4.9	0.54	CL-2612-01	3.0	13	A
Potassium	21	21	454	30.8	GB-2612-07	316	929	B
Selenium	21	2	6.8	2.7	GB-2612-02	0.6	2	A
Sodium	21	20	85.3	10.9	CL-2612-01	53.2	520	B
Vanadium	21	21	19.4	1.6	CL-2612-01	8.5	150	A
Zinc	21	21	96.6	2.5	PE-2612-05	28.1	63.4	B

References:

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

B: URS Consultants, Inc. (URS), 1996. *Final Background Surface Soil and Groundwater Study for Plattsburgh Air Force Base*; January.

NA = Not Applicable
NV = No Value
Shading indicates concentration exceeds Recommended Soil Cleanup Objective

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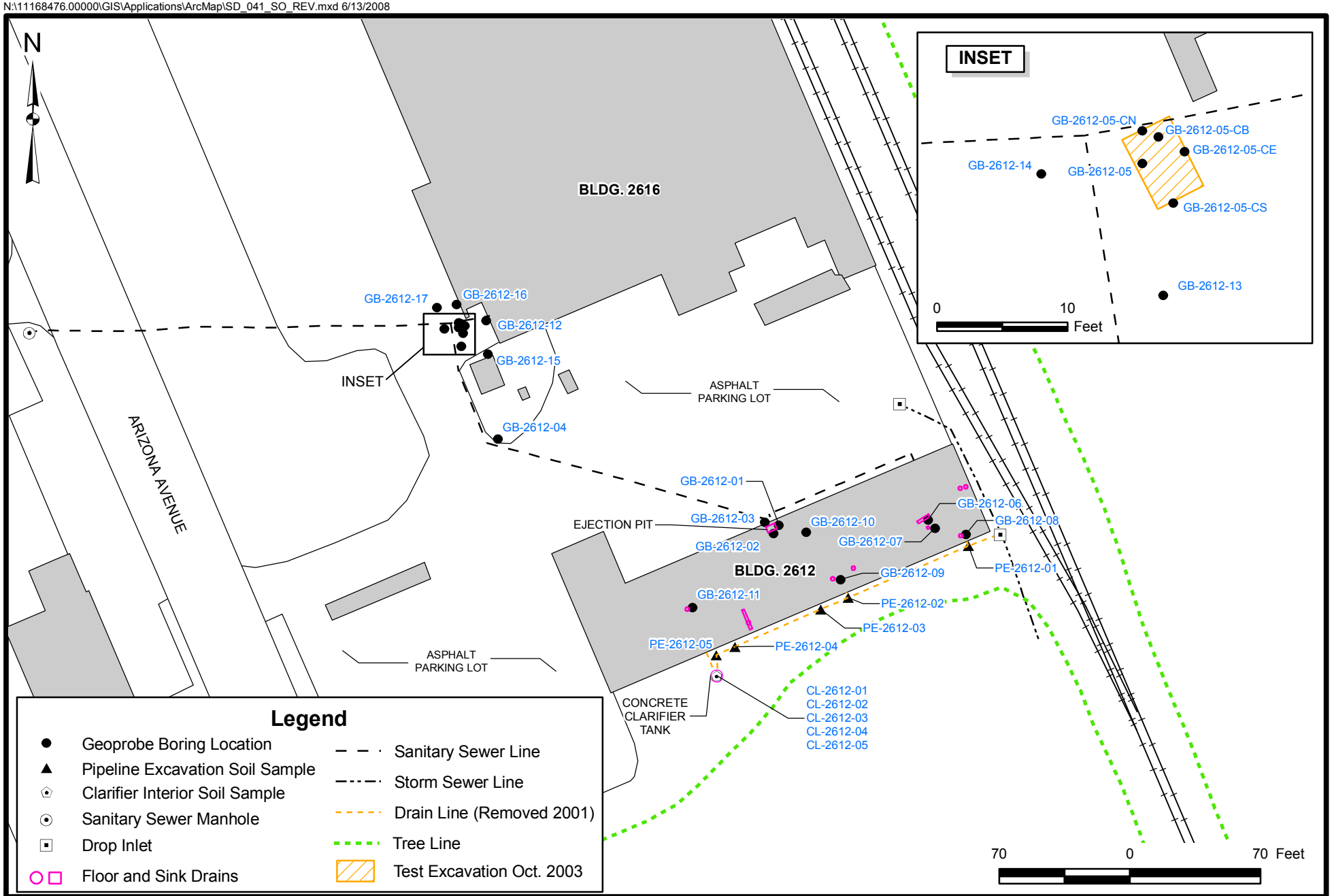


URS

BUILDING 2612 - SITE SS-041
SOIL SAMPLING LOCATIONS

FIGURE 4

TABLE 2

SUMMARY OF ANALYTES DETECTED IN SEDIMENT SAMPLES [(1)]

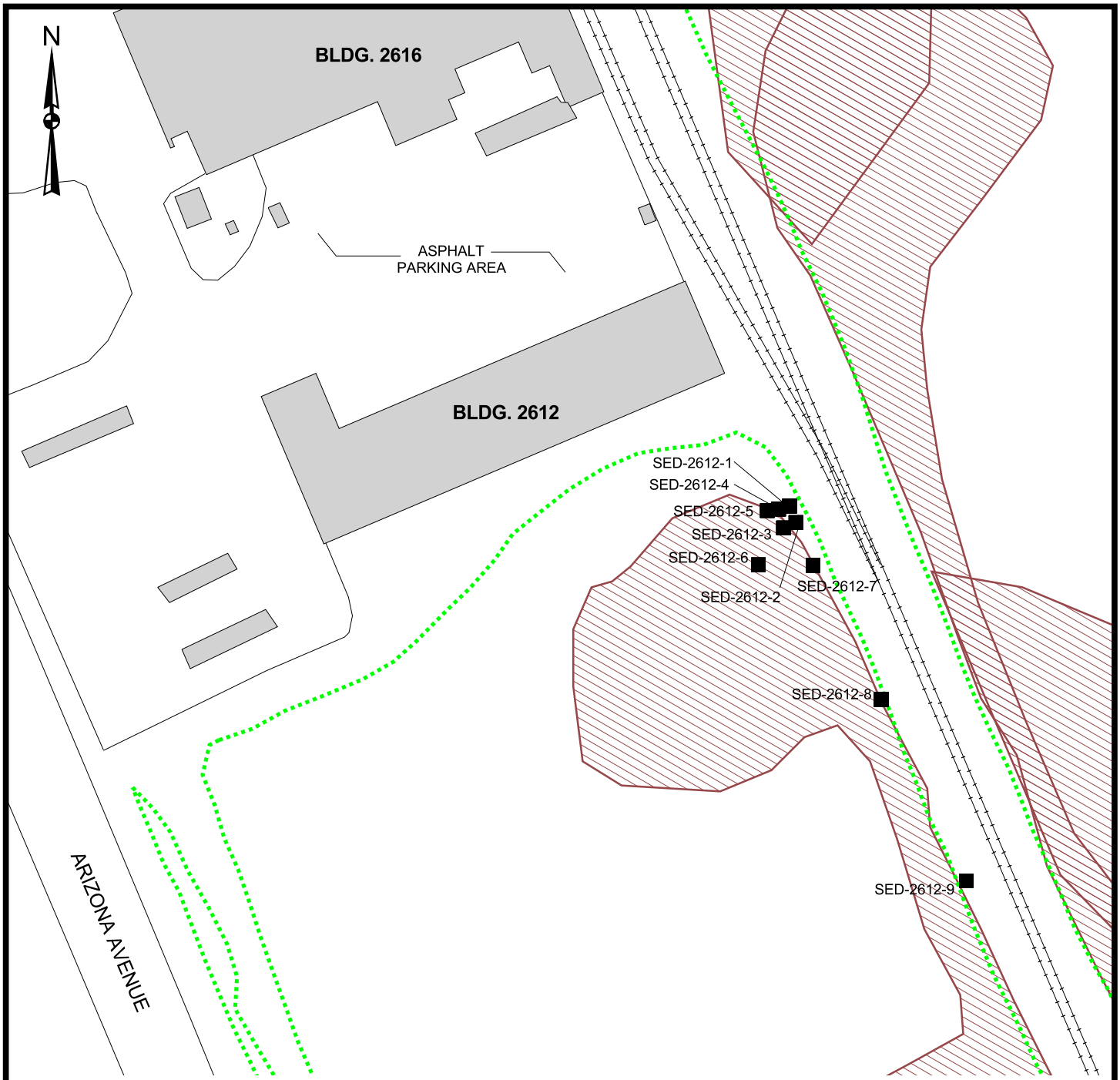
PARAMETER	NO. OF SAMPLES	NO. OF DETECTIONS	MAXIMUM DETECTED VALUE	MINIMUM DETECTED VALUE	LOCATION OF MAXIMUM VALUE	AVERAGE VALUE
VOLATILE ORGANIC COMPOUNDS (µg/kg)						
1,2-Dichloroethene (cis)	10	3	5.9	3.1	SED-2612-3	1.6
1,2-Dichloroethene (trans)	10	1	3.6	3.6	SED-2612-5	0.9
Acetone	10	2	191	12.1	SED-2612-5	22.4
Methyl ethyl ketone (2-Butanone)	10	1	54.9	54.9	SED-2612-5	6.4
Trichloroethene	10	6	26.7	3.4	SED-2612-1	6.2
SEMI-VOLATILE ORGANIC COMPOUNDS (µg/kg)						
Acenaphthene	10	4	149	34.1	SED-2612-4	40.7
Acetophenone	10	1	206	206	SED-2612-4	50.2
Anthracene	10	5	180	49.3	SED-2612-4	59
Benzaldehyde	10	2	106	70.6	SED-2612-5	41.4
Benzo(a)anthracene	10	6	468	55.1	SED-2612-4	142.4
Benzo(a)pyrene	10	6	520	58	SED-2612-4	150
Benzo(b)fluoranthene	10	7	828	38.4	SED-2612-4	194.5
Benzo(g,h,i)perylene	10	5	156	56.1	SED-2612-4	56.4
Benzo(k)fluoranthene	10	6	692	73.5	SED-2612-4	187.2
bis(2-Ethylhexyl)phthalate	10	9	9941	112	SED-2612-3	1967
Carbazole	10	5	161	48.2	SED-2612-4	51.7
Chrysene	10	6	550	69.1	SED-2612-4	168.6
Dibenz(a,h)anthracene	10	2	59.8	39	SED-2612-4	20.2
Dibenzofuran	10	1	58	58	SED-2612-4	23.6
Fluoranthene	10	7	1765	46.6	SED-2612-4	463.9
Fluorene	10	3	134	33	SED-2612-4	35.1
Indeno(1,2,3-cd)pyrene	10	5	122	35.9	SED-2612-1	51.9
Naphthalene	10	1	65.9	65.9	SED-2612-4	17.3
Phenanthrene	10	6	770	97.2	SED-2612-4	229.7
Pyrene	10	6	771	59.9	SED-2612-4	190.9
METALS (mg/kg)						
Aluminum	10	10	4,419	577	SED-2612-5	2000
Antimony	10	6	1.2	0.52	SED-2612-3	0.6
Arsenic	10	8	2.4	0.79	SED-2612-2	1.4
Barium	10	10	173	11.6	SED-2612-4	54.4
Beryllium	9	9	0.69	0.12	SED-2612-5	0.3
Cadmium	33	23	8.59	0.46	SED-2612-6	1.6
Calcium	10	10	9,325	693	SED-2612-3	4219
Chromium (Total)	33	33	1,947	4.4	SED-2612-6	236.2
Cobalt	10	10	3.8	0.26	SED-2612-4	1.9
Copper	10	10	39.4	2.9	SED-2612-4	13.4
Iron	10	10	61,608	2,289	SED-2612-3	23,571
Lead	16	16	104	7.4	SED-2612-3	43.3
Magnesium	10	10	1,483	119	SED-2612-4	883

TABLE 2 (Continued)

PARAMETER	NO. OF SAMPLES	NO. OF DETECTIONS	MAXIMUM DETECTED VALUE	MINIMUM DETECTED VALUE	LOCATION OF MAXIMUM VALUE	AVERAGE VALUE
Manganese	10	10	345	12.1	SED-2612-3	150.4
Mercury	16	16	1.5	0.049	SED-2612-4	0.3
Nickel	10	10	12.2	0.9	SED-2612-4	5.1
Potassium	10	10	298	122	SED-2612-4	206.8
Sodium	10	10	129	43.4	SED-2612-3	75.1
Vanadium	10	10	56.8	5.6	SED-2612-5	29.2
Zinc	10	10	633	36.9	SED-2612-2	348.7
PCBs (µg/kg)						
Aroclor 1254	29	6	389	13.6	SED-2612-2	38
Aroclor 1260	29	17	335	9.2	SED-2612-1	53

Notes:

1. New York State sediment guidance values (NYSDEC 1999a) for VOCs, SVOCs and PCBs are a function of total organic carbon and are determined on a sample-by-sample basis. There are also four sets of criteria: human health, benthic aquatic life acute and chronic toxicity, and wildlife bioaccumulation. Metals have two criteria, a lowest effect level and a severe effect level. Consequently the sediment guidance values cannot be listed in this table.



SAMPLE SED-2612-	Sample Date
5	July 1999
1-5	July/August 2001
1-9	April 2002

Legend

- Sediment Sample Location
- Federal Wetland

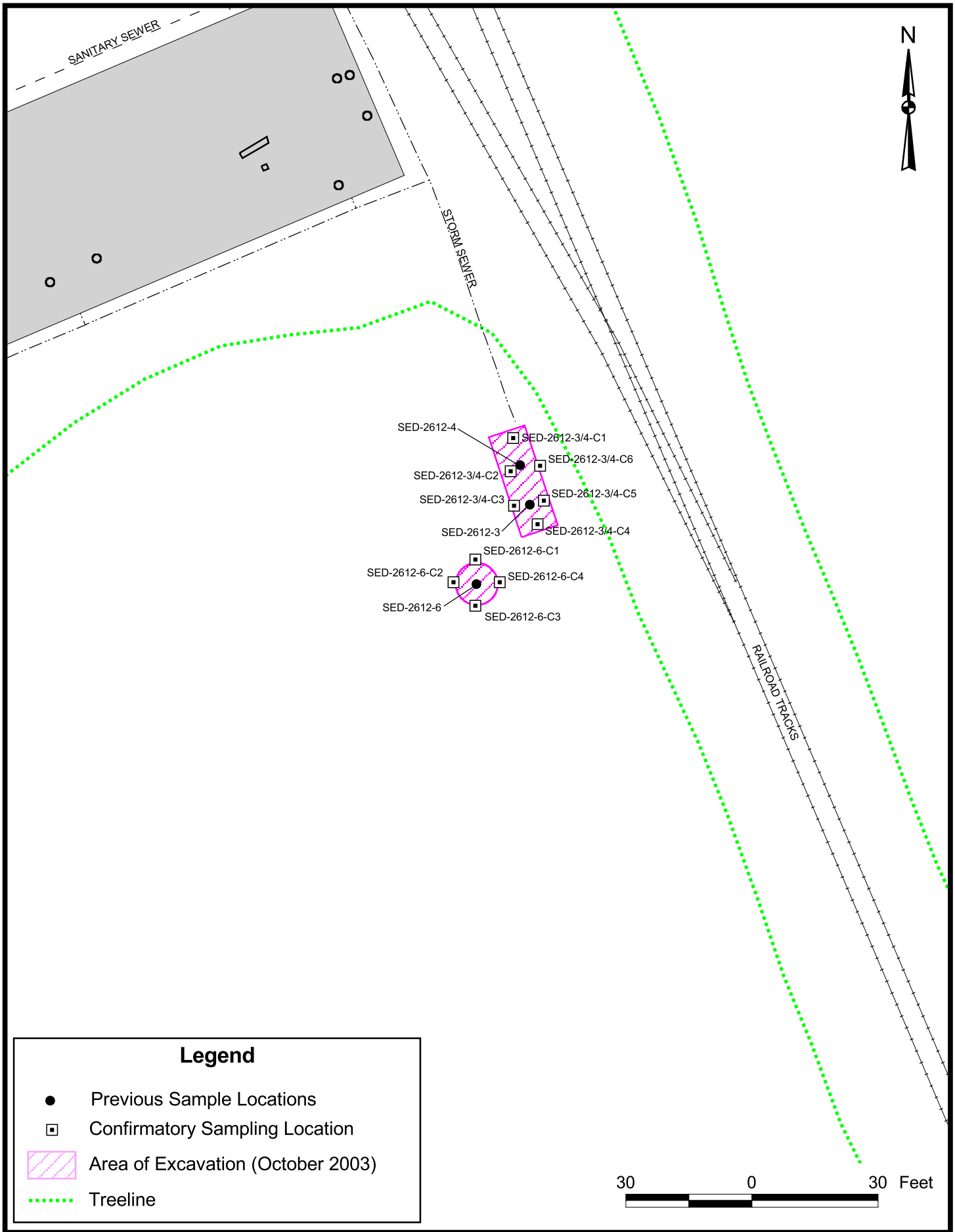
80 0 80 Feet

URS

BUILDING 2612 - SITE SS-041
WETLAND SEDIMENT SAMPLE LOCATIONS
1999, 2001 & 2002

FIGURE 5

N:\11168476.00000\GIS\Applications\Sd-041.apr SEDIMENT SAMPLE LOCATIONS

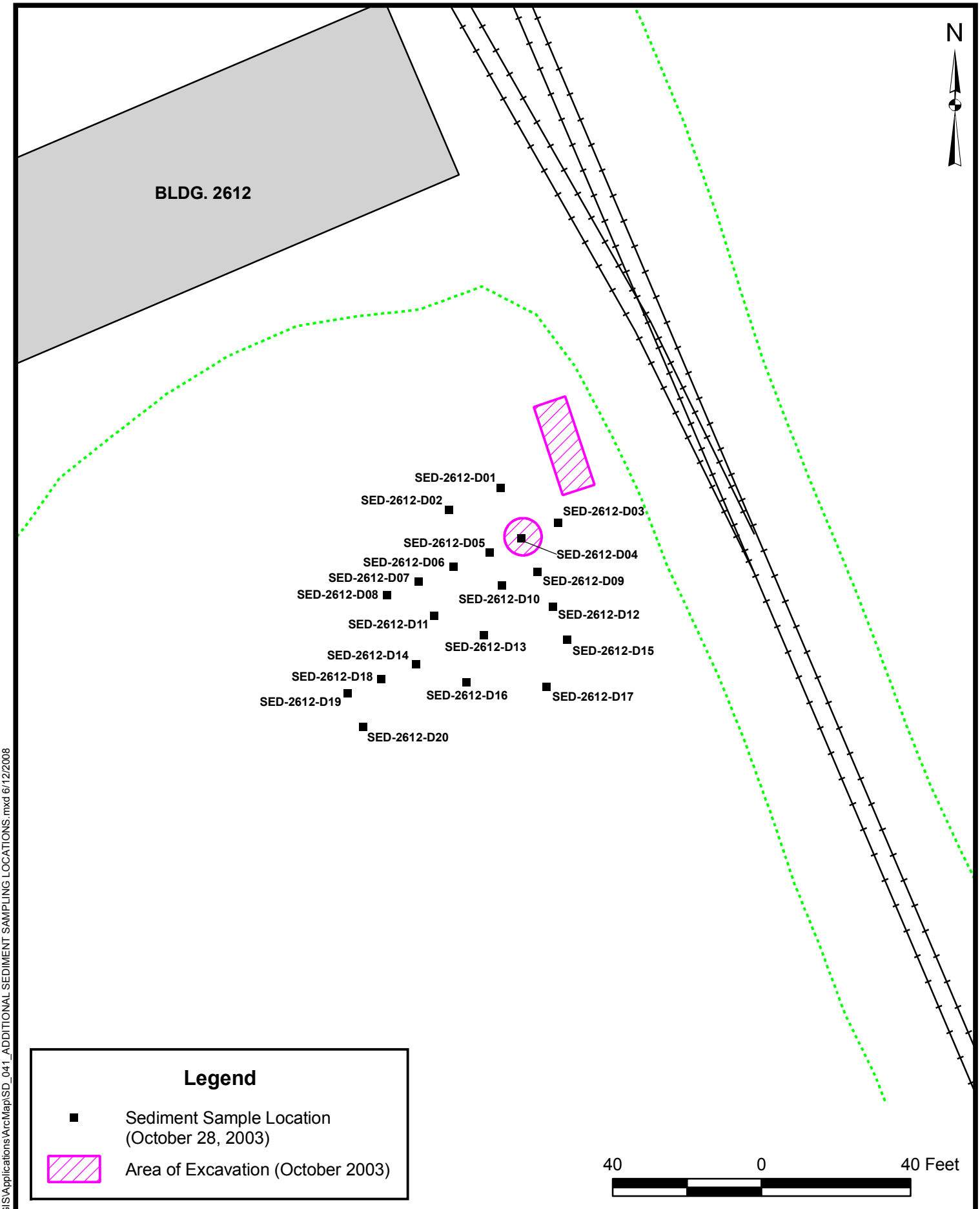


N:\11168476.00000\GIS\Applications\Sd-041.apr TEST TRENCH AND CONFIRMATORY SAMPLING LOCATIONS IN WETLAND AREA
6/12/2008

URS

BUILDING 2612 - SITE SS-041
OCT. 2003 TEST TRENCH AND CONFIRMATORY
SAMPLING LOCATIONS IN WETLAND AREA

FIGURE 6



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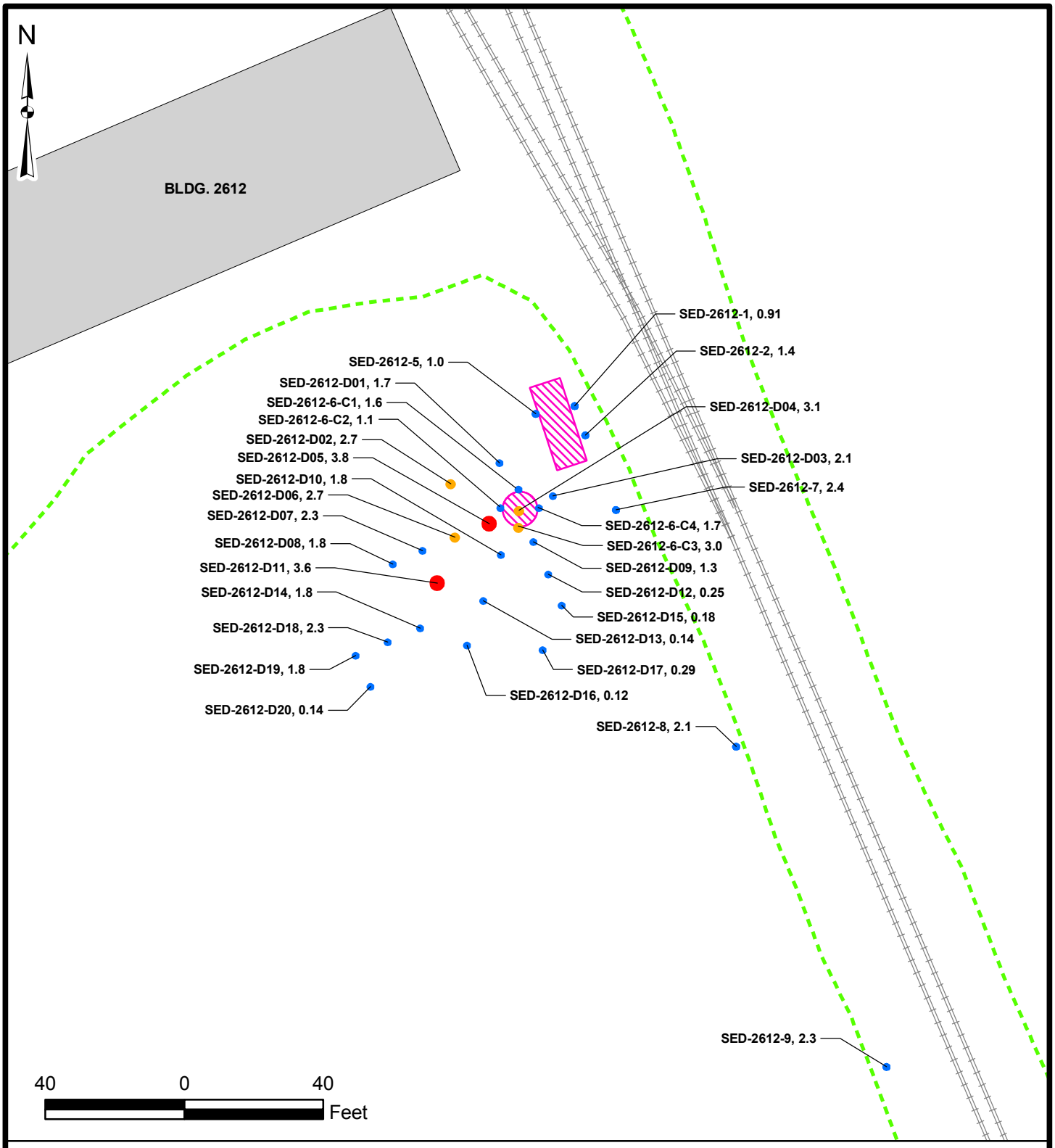
URS

BUILDING 2612 - SITE SS-041
ADDITIONAL SEDIMENT SAMPLING LOCATIONS

FIGURE 7



Legend

Cadmium Concentration (MG/KG) :

- 0 - 2.5
- 2.5 - 3.5
- > 3.5

SED-2612-D20, 0.137

Location ID: Concentration

- Potential Area of Excavation
- Railroad Tracks
- Treeline
- Area Of Excavation (October 2003)

URS

BUILDING 2612 - SITE SS-041
POST EXCAVATION CADMIUM CONCENTRATIONS
IN SEDIMENT SAMPLES

FIGURE 8

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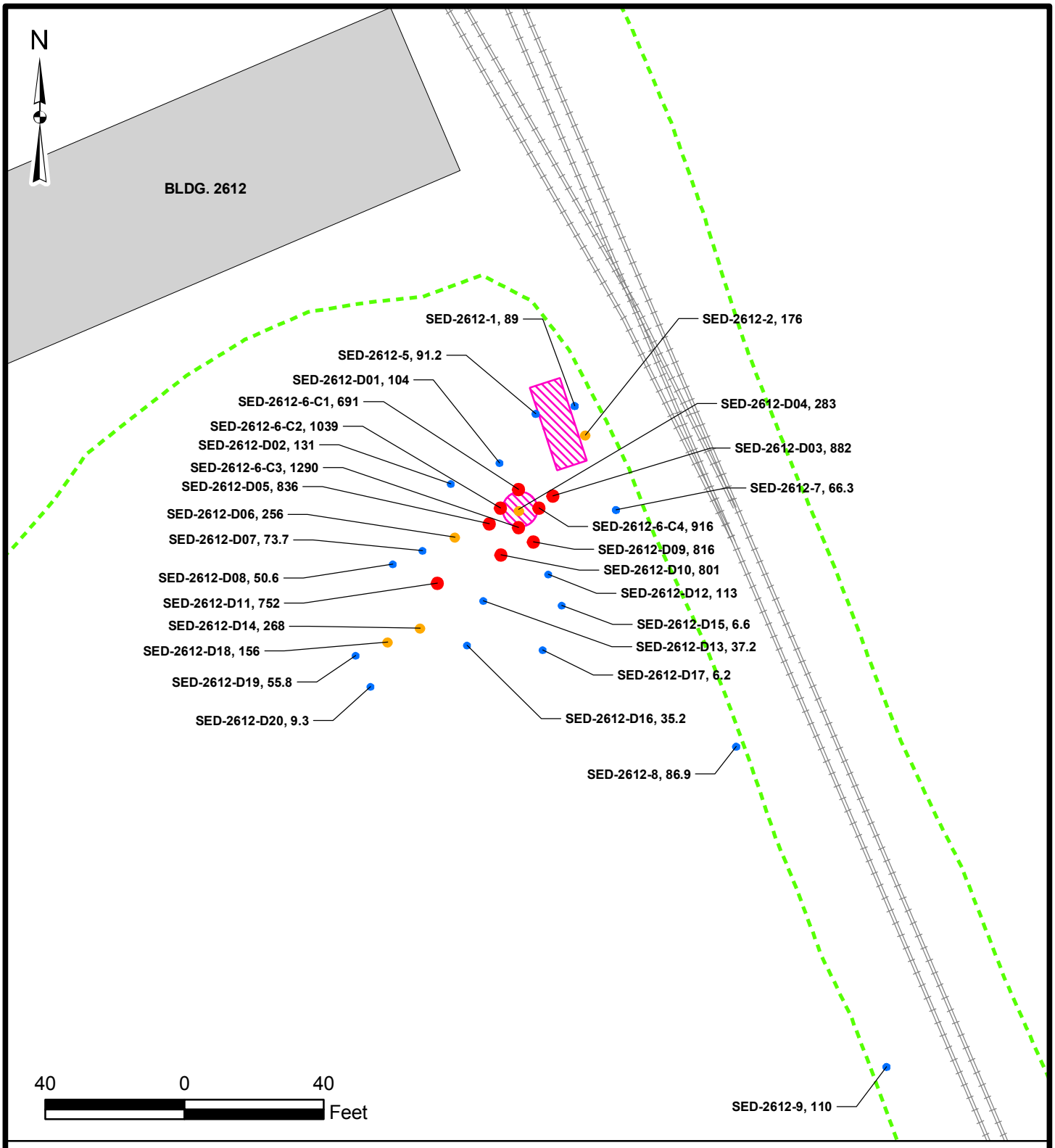

Legend

Chromium Concentration (MG/KG) :

- 0 - 150
- 150 - 500
- > 500

SED-2612-D20, 0.137

Location ID: | Concentration

- Potential Area of Excavation
- Railroad Tracks
- Treeline
- Area Of Excavation (October 2003)

URS

BUILDING 2612 - SITE SS-041
POST EXCAVATION CHROMIUM CONCENTRATIONS
IN SEDIMENT SAMPLES

FIGURE 9

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3.0 SUMMARY OF SITE RISKS

A human health risk assessment (HRA) was performed for the RI Report (URS 2003) and it was revised in the RI Addendum (URS 2007a) in response to regulator comments. The HRA in both reports evaluated potential human exposure to soil and groundwater contamination under future construction and residential development scenarios. As indicated in Section 2.3.4, significant and/or widespread residual soil contamination is not considered to be an issue therefore, the conclusions reached were that soils in the vicinity of Building 2612 do not pose a significant risk to human health under either scenario. The HRA does conclude however, that groundwater contaminants do pose an unacceptable risk to the long-term resident, but not to the construction worker. Risk due to groundwater is being addressed separately as part of the FT-002/IA Groundwater OU and will not be discussed further in this Proposed Plan. ICs required for the FT-002/IA Groundwater OU also apply to Site SS-041 and they are discussed in Section 8.0.

A screening level ecological risk assessment (ERA) also was performed for the RI Report (URS 2003) and revised in the RI Addendum (URS 2007a). The ERA concluded that site contamination in sediments resulted in an unacceptable risk to the short-tailed shrew and the American woodcock.

3.1 Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: Step 1 – *Hazard Identification* – identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence, and concentration. Step 2 – *Exposure Assessment* – estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well water) by which humans are potentially exposed. Step 3 – *Toxicity Assessment* – determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). Step 4 – *Risk Characterization* – summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks.

The HRA for the SS-041 site evaluated potential human health risks associated with contaminated soil under future construction and residential development scenarios. Exposure pathways assessed include the following:

- Ingestion of contaminated soil by a construction worker or a resident;
- Dermal contact with and adsorption of contamination from soil by a construction worker or resident;
- Inhalation by a resident of contaminants volatilizing from soil migrating into indoor air;
- Inhalation of fugitive dust from soils by a construction worker.

During the RI, contaminant concentrations in sediment samples collected from the wetland south of Building 2612 were compared to New York State sediment screening criteria (NYSDEC 1999a). There were a number of compounds that exceeded the criteria for human health bioaccumulation; however, it was concluded that there were no wildlife resources in the wetland that could or would be utilized by humans as a food source (URS 2008). Direct contact with sediments was not evaluated, however.

One of the compounds being remediated in the wetland south of Building 2612 is chromium. Due to new human health toxicological information on hexavalent chromium, it is anticipated that USEPA will soon revise its Integrated Risk Information System (IRIS) assessment for this compound to establish its carcinogenicity through the oral route of exposure. Although the source of the chromium contamination at Building 2612 is unknown, it is unlikely that 100 percent of the chromium in the sediment would be hexavalent considering 1) the length of time that has passed since contamination occurred (between 1963 and 1965); and, 2) the fact that wetlands are biologically active and have a high organic matter content, which promotes the transformation of hexavalent chromium to trivalent chromium, an essential nutrient.

Although human exposure to sediments through direct contact was not quantified in the HRA, based on the lines of evidence presented above, it is believed that the ecological sediment remediation goal selected for hexavalent chromium would also be protective of human exposure

given the anticipated commercial/industrial future land use of SS-041. The remediation goal for chromium, 150 mg/kg, is also considerably lower than the human health commercial/industrial restricted use soil cleanup objectives for hexavalent chromium listed in 6 NYCRR Part 375, which are 400 mg/kg and 800 mg/kg respectively. The remediation goal for cadmium, the other contaminant of concern for ecological receptors, is 2.5 mg/kg, also less than the 6 NYCRR Part 375 human health commercial/industrial restricted use soil cleanup objectives for cadmium of 9.3 mg/kg and 60 mg/kg respectively.

The HRA results presented in this Proposed Plan used data from soil samples collected adjacent to and beneath Building 2612; data from sediment samples collected in the wetland were not used. Soil samples collected from the area adjacent to Building 2616 with the high PAH concentrations due to asphalt pieces in the samples also were not used in the HRA presented herein. Risks were quantified and compared to USEPA evaluation criteria. Under USEPA regulations, for known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 1×10^{-4} and 1×10^{-6} (USEPA 1990). A potential non-cancer risk is indicated if the hazard index exceeds 1 (USEPA 1991). The HRA results for potential human cancer risks and non-cancer risks are given in Tables 3 and 4, respectively.

The total exposure excess cancer risk posed by chemicals detected in soil via the four soil exposure pathways is 4×10^{-8} for a construction worker and 5×10^{-6} for a lifetime resident. The overall non-cancer hazard index for the soil pathways for both construction workers and lifetime resident is less than 1.

TABLE 3

SUMMARY OF HUMAN HEALTH CANCER RISKS

EXPOSURE PATHWAY	CANCER RISK	
	LIFETIME RESIDENT (1)	CONSTRUCTION WORKER
Soil (2)		
Ingestion of soil	$2x10^{-6}$	$2x10^{-8}$
Dermal Contact with Soil	$3x10^{-6}$	$2x10^{-8}$
Inhalation of Soil Vapors in Indoor Air	$5x10^{-8}$	---
Inhalation of Fugitive Dust	---	$2x10^{-9}$
TOTAL EXPOSURE CANCER RISK	$5x10^{-6}$	$4x10^{-8}$

NOTES:

1. The 30-year residential exposure is the sum of a six year exposure duration evaluated for young children (1 through 6 years old) and a 24-year exposure duration evaluated for older children and adults).

2. Soil consists of surface and subsurface soil combined.

TABLE 4

SUMMARY OF HUMAN HEALTH NON-CANCER RISKS

EXPOSURE PATHWAY	HAZARD INDEX		
	RESIDENT		CONSTRUCTION WORKER
	ADULT	CHILD	
Soil			
Ingestion of soil	$9x10^{-3}$	$8x10^{-2}$	$3x10^{-2}$
Dermal Contact with Soil	$9x10^{-3}$	$2x10^{-2}$	$7x10^{-3}$
Inhalation of Soil Vapors in Indoor Air	$9x10^{-6}$	$8x10^{-6}$	---
Inhalation of Fugitive Dust	---	---	$2x10^{-1}$
TOTAL EXPOSURE HAZARD INDEX	$2x10^{-2}$	$10x10^{-2}$	$3x10^{-1}$

3.2 Ecological Risk Assessment

As discussed previously in Section 2.3.5, contaminant concentrations in the sediment samples from the wetland south of building 2612 were initially compared to NYSDEC's *Technical Guidance for Screening Contaminated Sediments* (NYSDEC 1999a). This initial screening identified the PCB Aroclor 1260 and eight metals (antimony, cadmium, chromium, copper, iron, lead, mercury, and zinc) at concentrations that exceeded NYSDEC's sediment guidance values; however, the guidance values for metals are for benthic organisms that are not viable in the intermittent surface water environment of this wetland. Therefore, to further evaluate the impact of these contaminants of concern, a screening level ecological risk assessment was performed for terrestrial species that could be exposed to the sediments.

Four indicator species were identified that could potentially be found in the wetlands: the short-tailed shrew, the American woodcock, the red-tailed hawk, and the red-winged blackbird. The short-tailed shrew was selected because it is a burrowing mammal placing it in constant contact with the sediment and it has a diet consisting primarily of sediment dwelling invertebrates. The red-wing blackbird, American woodcock and the red-tailed hawk, a predator species, are all likely to be found in this wetland. Each species could be impacted by exposure to contaminated sediments, by ingesting contaminated terrestrial invertebrates, and, in the case of the red-tailed hawk, by ingesting the short-tailed shrew.

The ecological risk assessment was based on sediment data from samples shown on Figures 6 and 7, except that data from samples SED-2612-3, -4, and –6 were not used because the area associated with these samples was excavated in October 2003 (see Figure 6).

A two-step approach was used to evaluate the potential impact to terrestrial species from exposure to wetland sediments. The first step was to compare the maximum concentrations of the contaminants of concern noted above to risk-based screening concentrations (RBSCs). The RBSC is a concentration above which the terrestrial receptor is adversely impacted by exposure to a given contaminant. Concentrations of cadmium, chromium, lead, mercury, and Aroclor 1260 exceeded the RBSCs so exposure to these compounds was further

evaluated following USEPA's hazard quotient (HQ) approach (USEPA 1996). Antimony, copper, iron, and zinc were eliminated from further consideration during the first step.

The results of the ecological risk assessment are summarized in Table 5. HQs were determined separately for each compound and a value greater than one is considered as evidence of a potential significant threat to the species by that compound.

TABLE 5

SEDIMENT EXPOSURE ECOLOGICAL RISK HAZARD QUOTIENTS

Chemical Parameter	Short-tailed Shrew	American Woodcock	Red-tailed Hawk	Red-winged Blackbird
Cadmium	1.4	0.2	0.05	0.2
Chromium	28	0.3	0.0003	0.1
Lead	96	0.1	0.005	0.02
Mercury	4.4	1.5	0.3	0.5
Aroclor 1260	0.4	0.001	0.004	0.001

The ecological risk assessment results indicate that there is a potential significant risk to the short-tailed shrew and the American woodcock. For the short-tailed shrew, the risk is attributable to cadmium, chromium, lead, and mercury. Only mercury poses a risk to the American woodcock, and only slightly above an HQ of 1. The highest HQ for the short-tailed shrew was 96, due to lead at a maximum concentration of 79 mg/kg, which is less than the PAFB basewide background surface soil level for lead of 79.4 mg/kg (URS 1996). All other lead concentrations found in the sediment samples were less than the background level. Mercury also poses a risk to the short-tailed shrew, but it is likely that any additional mercury-contaminated sediment is co-located within the areas of elevated cadmium and chromium concentrations.

4.0 SCOPE AND ROLE OF OPERABLE UNIT

Site SS-041 is one of a number of sites administered under the Plattsburgh AFB IRP. Records of Decision (RODs) have been signed for 17 OUs at the base and additional RODs are

planned for other IRP sites. This Proposed Plan addresses soil and sediment contamination that has been detected at Site SS-041. Groundwater contamination is being addressed by remedial actions that are part of the FT-002/IA Groundwater OU.

Surface water is not considered a media of concern for Site SS-041 because there is no consistent, long-term standing surface water at the site. No significant threat to human health is posed by contaminants remaining in soil and sediment at the site. There are, however, significant threats to ecological receptors, specifically the short-tailed shrew and American woodcock, from exposure to sediments at the site and, therefore, further action is required for sediments at SS-041.

5.0 REMEDIAL ACTION OBJECTIVES

The remedial action objective for the SS-041 site is to reduce sediment contaminant concentrations to the remediation goals listed in Table 6. The remediation goals are contaminant-specific cleanup criteria that do not pose a significant potential threat to ecological receptors. Figure 10 shows the area of sediment contamination requiring cleanup based on the remediation goals, which were developed during the RI based on a screening level ecological risk assessment. They represent a HQ for the short-tailed shrew of 1 for cadmium and 3 for chromium (URS 2008). As discussed in section 3.1, the selected remediation goals are also considered protective of human health. The remediation goals have been accepted by USEPA and NYSDEC.

TABLE 6

SEDIMENT REMEDIATION GOALS

COMPOUND	MAXIMUM ALLOWABLE CONCENTRATION (mg/kg)
Cadmium	2.5
Chromium	150

6.0 SUMMARY OF ALTERNATIVES

Based on discussions among the Air Force, NYSDEC, and USEPA, two alternatives were evaluated for Site SS-041 as described in this section.

Alternative 1

NO ACTION

Capital Cost:	$0
Present Worth O&M:	$0
Total Present Worth:	$0
Time to Reach Sediment RGs:	Not applicable

The Superfund program requires that the "No Action" alternative be evaluated at every site to establish a baseline for comparison. Under this alternative, the Air Force would take no further action to prevent exposure to metals-contaminated sediments at Site SS-041.

Alternative 2

EXCAVATION WITH OFF-SITE DISPOSAL

Capital Cost:	$200,000
Present Worth O&M:	$0
Total Present Worth:	$200,000
Time to Reach Sediment RGs:	6 months

In Alternative 2, contaminated sediment at concentrations greater than the remediation goals would be removed from the wetland to a depth of two feet in an area of about 3,400 square feet. The approximate area to be excavated is shown on Figure 10. The excavated sediment, about 250 cubic yards, would then be disposed of at a landfill permitted to receive this material. The portion of the wetland disturbed by the excavation will be backfilled with clean material, seeded, and then the wetland will be allowed to naturally restore itself. When completed, the remedial action will be a permanent solution. The estimated time to complete the remediation of this site is about 6 months.

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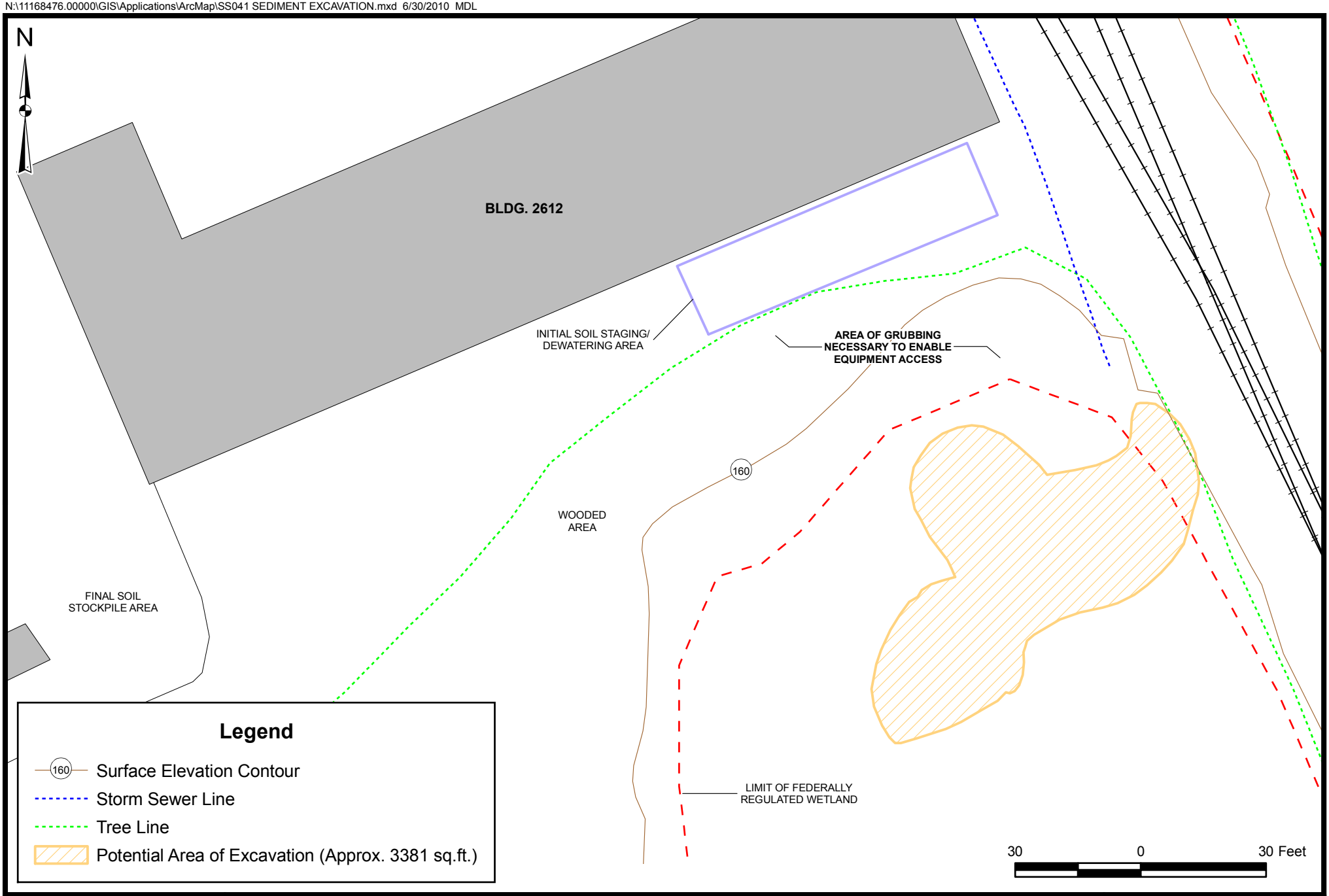

URS

BUILDING 2612 - SITE SS-041
AREA OF CADMIUM AND CHROMIUM IMPACTED
SEDIMENT POTENTIALLY REQUIRING EXCAVATION

FIGURE 10

7.0 EVALUATION OF ALTERNATIVES

The two alternatives for the SS-041 site were analyzed with respect to the nine criteria specified in the National Contingency Plan (NCP), which directs remediation of inactive hazardous waste sites. A brief description of each criterion and the evaluation of alternatives based on these criteria are presented below. The USEPA has categorized the evaluation criteria into three principal groups:

Threshold Criteria - The recommended alternative must meet these requirements.

- Overall protection of human health and the environment.
- Compliance with ARARs.

Primary Balancing Criteria - The most favorable and cost-effective alternative is determined using these criteria (a remedy is cost effective if its costs are proportional to its overall effectiveness).

- Long-term effectiveness and permanence.
- Reduction of toxicity, mobility, or volume.
- Short-term effectiveness.
- Implementability.
- Cost.

Modifying Criteria - The recommended alternative may be modified by public input before it is finalized and presented in the ROD.

- State Acceptance.
- Community Acceptance.

Alternative 1

NO ACTION

The No Action alternative does not meet the requirement of the first threshold criteria for the overall protection of human health and the environment because the ecological risks posed by site sediments to the short-tailed shrew and the American woodcock would remain and the exposure of these receptors to potential hazards associated with these sediments would not be mitigated. Therefore, the no action alternative is rejected.

Alternative 2

EXCAVATION WITH OFF-SITE DISPOSAL

A comparison of Alternative 2 to the USEPA criteria is provided below and summarized in Table 7.

- **Overall Protection of Human Health and the Environment** addresses whether a remedy provides adequate protection to potential human and ecological receptors.

  Alternative 2 is protective of human health and the environment, and includes mitigating the potential risks to the short-tailed shrew and American woodcock as indicated in the ERA.

- **Compliance with ARARs** addresses whether a remedy will meet all of the ARARs of federal and state environmental statutes, and/or provide grounds for invoking a waiver.

  Excavation of sediments with disposal at an off-site permitted facility meets chemical specific ARARs relevant to sediment disposal and reduces sediment concentrations of cadmium and chromium to acceptable levels.

  Location-specific ARARs associated with wetlands will be satisfied by compliance with substantive requirements under the Federal Water Pollution Control Act and through consultation with the Federal or State agency officials as to any necessary mitigation prior to the start of remedial actions at the site.

Action-specific ARARs associated with excavation, transport, and disposal of contaminated sediments will be satisfied by following the applicable Federal and State laws, ordinances and regulations governing excavation, construction, dewatering, transportation and disposal of water/sediments/soils. On-site remedial actions will meet the substantive standards for excavation and storage prior to transport.

- **Long-Term Effectiveness and Permanence** refers to the magnitude of residual risk, and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

  Removal of the contaminated sediments and placement of clean backfill material will achieve remediation goals.

- **Reduction of Toxicity, Mobility, or Volume** addresses the anticipated performance of treatment technologies employed in the remedy.

  This alternative does not include treatment as a component of the remedy; however, because contaminated sediments are being excavated and disposed of at a secure and engineered landfill, the toxicity, mobility, and volume of contaminants are reduced at the site.

- **Short-Term Effectiveness** refers to the speed with which the alternative achieves protection, as well as the alternative's potential to create adverse impacts on human health or the environment during its implementation.

  This alternative achieves protection immediately with the implementation of excavation and disposal at a permitted offsite facility**.** Additionally, the seeding of the affected wetland during site restoration will enhance the habitat for the short-tailed shrew.

- **Implementability** addresses aspects of implementing the remedial alternatives, such as the ability to construct and operate technologies, reliability, ability to monitor effectiveness, availability of materials and services, permitting, and coordination with other agencies.

This alternative includes common construction techniques and is easily implemented.

- **Cost** includes the initial capital cost as well as annual operating and monitoring (O&M) costs of the alternative.

The estimated capital cost to remove the contaminated sediments from the wetland is $200,000.

- **State acceptance** addresses technical and administrative concerns of the State with regard to remediation.

  The NYSDEC has participated in the RI process and will provide input during the preparation of the Proposed Plan and its concurrence with this alternative is expected.

- **Community acceptance** addresses public comments received on the Administrative Record and the Proposed Plan.

  Community acceptance of the alternative will be evaluated after the public comment period ends and will be described in the ROD for the site.

TABLE 7

COMPARISON OF ALTERNATIVE 2, EXCAVATION WITH OFF-SITE DISPOSAL, TO USEPA EVALUATION CRITERIA

CRITERION	DESCRIPTION OF CRITERION	COMPARISON OF ALTERNATIVE TO CRITERION
Overall Protection of Human Health and the Environment	Addresses whether a remedy provides adequate protection to human and ecological receptors.	The preferred alternative is protective of human health and the environment. It includes measures to restore wetlands for ecological protection.
Compliance with ARARs	Addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of all state and federal environmental statutes.	Remediation goals of cadmium concentration <2.5 mg/kg and chromium <150 mg/kg will be achieved within 6 months when excavation/restoration is anticipated to be complete.
Long-Term Effectiveness and Permanence	Refers to the magnitude of residual risk and the ability of the remedy to maintain reliable protection of human health and the environment once cleanup goals have been met.	The risk to ecological receptors will be reduced to an acceptable level after remediation.
Reduction of Toxicity, Mobility, or Volume	Addresses the anticipated performance of treatment technologies employed in the remedy.	Treatment is not a component of the alternative; however, toxicity, mobility, and volume of contamination at the site are reduced with excavation and disposal off-site at a secure, engineered landfill.

TABLE 7 (continued)

CRITERION	DESCRIPTION OF CRITERION	COMPARISON OF ALTERNATIVE TO CRITERION
Implementability	Addresses aspects of implementing the remedy such as the ability to construct and operate technologies, reliability, ability to monitor effectiveness, availability of materials, permitting, and coordination with other agencies .	The preferred alternative is feasible. Design and construction of all this technology is conventional and standardized.
Cost	Refers to the capital and O&M cost of a remedy and its present worth.	The cost to implement the elements of the preferred alternative (capital cost) is $200,000.
State Acceptance	Addresses the technical and administrative concerns of the State with regard to remediation.	The NYSDEC has provided input during the preparation of the Proposed Plan and its concurrence with the preferred alternative is expected.
Community Acceptance	Addresses public comments received on the Administrative Record and the Proposed Plan.	Community acceptance of the recommended alternative will be evaluated after the public comment period ends and will be described in the Record of Decision for the SD-041 site. A description of how the community can become involved in the selection process is presented in section 9.0.

8.0 DESCRIPTION OF THE PREFERRED ALTERNATIVE

The Air Force has selected Excavation With Off-Site Disposal (Alternative 2) as the preferred alternative for Site SS-041. The development and selection of this alternative is based on a consensus of opinion among the Air Force, NYSDEC, and USEPA. It provides a permanent solution and is protective of human health and the environment.

The preferred alternative for remediating Site SS-041 includes the following elements:

- Clearing and grubbing of the area to be excavated;
- Removing contaminated sediments from an area of about 3,400 square feet to a depth of two feet (250 cubic yards);
- Confirmatory soil sampling;
- Disposing of the excavated sediments at a permitted landfill;
- Backfilling the excavation with clean material;
- Seeding the disturbed area.

This alternative addresses the principal threats by removing the contaminants from the wetland and placing them in a controlled landfill, thereby removing the threat of exposure for the potentially impacted terrestrial species.

Institutional Controls

A temporary institutional control (IC) is a component of the preferred remedy for Site SS-041 and is referenced in the deed(s) for this property (CCIDA 2009; see Section VII, Item 7 on page 8, and Drawing 3 of Exhibit B). The temporary IC prohibits any property development or land use that would interfere with the planned removal of contaminated sediment. Upon completion of the proposed remedy, the temporary IC will no longer be necessary.

Additional restrictions have been placed in the deed(s) for property encompassed by Site SS-041 in association with the larger FT-002/IA Groundwater OU. These restrictions were also specified in the Finding of Suitability for Early Transfer (FOSET) for the Golf Course, Industrial, and Western Areas Properties (AFRPA 2009), which included the property encompassed by SS-041. These restrictions included: prohibition of groundwater use, restrictions on groundwater discharge, restriction of land use to non-residential uses only, SVI restrictions that require that Building 2612 on the property remain unoccupied, and that SVI evaluations and/or installation of SVI mitigation systems be undertaken in the event of modifications to other buildings or the construction of new buildings, prior to occupancy.

9.0 COMMUNITY PARTICIPATION

The following paragraphs explain how the public can become involved in the selection process after reviewing the Proposed Plan. Note that the preferred alternative can change in response to public comment or as a result of new information.

Public Comment Period

Plattsburgh AFB will hold a 30-day public comment period from _____, 2011 to _____, 2011 to solicit public input. During this period, the public is invited to review the SS-041 Proposed Plan, and other project documents, and to comment on the proposed action. The Administrative Record for this site is available on line at:

htpps//afrpaar.lackland.af.mil/ar/docsearch.aspx.

Public Informational Meeting

Plattsburgh AFB will hold a public meeting on _____, 2011 at the old Court House, Second Floor Meeting Room, 133 Margaret Street. The actual date and time of the meeting will be published in the Plattsburgh *Press Republican*. The meeting will be divided into two segments. In the first segment, data gathered at the site, the preferred alternative, and the decision-making process will be discussed. The public is encouraged to attend this presentation

and to ask questions. Immediately after the informational presentation, the Air Force will accept comments about the remedial action being considered for the SS-041 site. The meeting will provide the opportunity for people to comment officially on the plan. Public comments will be recorded and transcribed, and a copy of the transcript will be added to the Administrative Record.

Written Comments

Written comments about Plattsburgh AFB's preferred alternative or other issues relevant to the site remediation shall be provided to the Plattsburgh AFB's IRP Coordinator at the Public Meeting or mailed, to be received no later than _____, 2011 to:

Mr. David Farnsworth
BRAC Environmental Coordinator
Air Force Center for Engineering and the Environment
8 Colorado Street Room 121
Plattsburgh, NY 12903
(518) 563-2871
david.farnsworth@us.af.mil

Plattsburgh AFB's Review of Public Comment

Public comments are part of the process of reaching a final decision on an appropriate remedial alternative for the SS-041 site. Plattsburgh AFB's final choice of a remedial alternative will be issued in a ROD for the site and will be submitted to the USEPA for review, approval, and signature and to the NYSDEC for review and concurrence. A Responsiveness Summary of public comments and Plattsburgh AFB's responses to them will accompany the ROD. Once the ROD is signed, it becomes part of the Administrative Record.

Additional Public Information

Because the Proposed Plan only summarizes the field investigation and remedial alternative for the SS-041 site, the public is encouraged to consult the Administrative Record which contains supporting reports on line at afrpa.lackland.af.mil/ar/docsearch.aspx.

10.0 REFERENCES

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11.0 GLOSSARY

Administrative Record: A file established and maintained in compliance with section 113(K) of the Comprehensive Environmental Response, Compensation, and Liability Act consisting of information upon which the lead agency bases its final decisions on the selection of remedial method(s) for a Superfund site. The Administrative Record is available to the public.

Applicable Requirements: Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and are more stringent than federal requirements may be applicable. See also Relevant and Appropriate Requirements.

Area Subject to Institutional Controls: This area is subject to the institutional controls associated with the alternative actions and the selected alternative. A deed for property encompassing all or a portion of this area will contain the applicable institutional controls.

Aquifer: A water-bearing formation or group of formations.

Bedrock: Rock that underlies soil or other unconsolidated material.

Chlorinated Hydrocarbons: Organic compounds that contain chloride such as trichloroethene (TCE) and dichloroethene (DCE). Also referred to as chlorinated solvents.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The act requires federal agencies to investigate and remediate abandoned or uncontrolled hazardous waste sites.

Confining Layer: A body of impermeable or distinctly less permeable material adjacent to an aquifer or water-bearing zone.

Contaminant Plume: A volume of contaminated groundwater with measurable horizontal and vertical dimensions. Plume contaminants are dissolved in and move with groundwater.

Drainage Basin: A region or area that gathers water originating as precipitation and contributes it to a particular stream channel, system of channels, lake, reservoir, or other body of water.

Electromagnetic Geophysical Survey: An exploration method based on the measurement of alternating magnetic fields associated with currents artificially or naturally maintained in the subsurface.

Environmental Impact Statement: A study conducted to provide information on potential environmental impacts that could result from a proposed action.

Feasibility Study (FS): An evaluation to identify and evaluate appropriate remedial goals and remedial alternatives for a site based upon United States Environmental Protection Agency criteria.

Groundwater: Water found beneath the earth's surface that fills pores within materials such as sand, soil, gravel, and cracks in bedrocks, and often serves as a source of drinking water if found in an adequate quantity.

Hazard Index: A quantitative measure of non-carcinogenic risk associated with exposure to chemicals. The hazard index is determined for all chemicals of concern affecting a particular organ or acting by a common mechanism. If the sum of all hazard indices is less than 1 for a particular exposure scenario, the risk of adverse health effects is considered acceptable.

Hydrogeologic: Pertaining to subsurface waters and the related geologic aspects of subsurface waters.

Infiltration: The flow of a fluid into a solid substance, such as soil or porous rock, through pores or small openings.

Inorganic Compounds: A class of naturally occurring compounds that includes metals, cyanide, nitrates, sulfates, chlorides, carbonate, bicarbonate, and other oxide complexes.

Installation Restoration Program (IRP): The United States Air Force subcomponent of the Defense Environment Restoration Program (DERP) that specifically deals with investigating and remediating sites associated with suspected releases of toxic and hazardous materials from past activities. The DERP was established to clean up hazardous waste disposal and spill sites at Department of Defense facilities nationwide.

Institutional Controls: Non-engineering measures designed to prevent or limit exposure to hazardous substances left in place at a site, or to verify the effectiveness of the chosen remedy. Institutional controls are usually, but not always, legal controls, such as easements, restrictive covenants, and zoning ordinances.

Monitoring: Ongoing collection of information about the environment that helps gauge the effectiveness of a cleanup action. Information gathering may include groundwater well sampling, surface water sampling, soil sampling, air sampling, and physical inspections.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The NCP provides the organization, structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants, and contaminants. The NCP is required under CERCLA and the Clean Water Act, and USEPA has been delegated the responsibility for preparing and implementing the NCP. The NCP is applicable to response actions taken pursuant to the authorities under CERCLA and the Clean Water Act.

National Priorities List: USEPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program.

Operation and Maintenance (O&M): A step in the remedial program. While a site is being remediated, it is overseen to make sure that the remedy is working as planned and that the construction remains operational.

Operable Unit (OU): A separate and distinct remedial project that is part of a large, complex hazardous waste site. Each OU has its own Record of Decision, remedial investigation, feasibility study, design and construction.

Organic Compounds: Any chemical compounds built on the carbon atom, i.e., methane, propane, phenol, etc.

Overburden: The loose soil, silt, sand and gravel, or other unconsolidated material overlying bedrock.

Pesticide: Chemical compounds used to control insects, rodents, plants, etc. Two classes of organic pesticides include chlorine (chlorinated) or organic phosphorous (organophosphorous).

Polychlorinated Biphenyl (PCB): An organic pollutant that was formerly used in electrical transformers and capacitors, their manufacture was banned in 1979. There are 210 different PCB compounds that typically have 40% to 60% chlorine by weight.

Polycyclic Aromatic Hydrocarbons (PAHs): Compounds often associated with combustion process and distillation tars.

Proposed Plan: A public document that solicits public input on a recommended remedial alternative to be used at a National Priorities List (NPL) site. The Proposed Plan is based on information and technical analysis generated during the RI/FS. The recommended remedial action could be modified or changed based on public comments and community concerns.

Record of Decision (ROD): A public document that explains the remedial alternative to be used at a National Priorities List (NPL) site. The ROD is based on information and technical analysis

generated during the remedial investigation, and on consideration of the public comments and community concerns received on the Proposed Plan. The ROD includes a Responsiveness Summary of public comments.

Remedial Action: An action that stops or substantially reduces a release or threat of a release of hazardous substances that is serious but not an immediate threat to human health or the environment.

Relevant and Appropriate Requirements: These are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified by a state in a timely manner and are more stringent than federal requirements may be relevant and appropriate. See also Applicable Requirements.

Remedial Alternatives: Options evaluated to address the source and/or migration of contaminants to meet health-based or ecology-based remediation goals.

Remedial Investigation (RI): An investigation that determines the nature and extent and composition of contamination at a hazardous waste site. It is used to assess the types of remedial options that are developed in the feasibility study.

Risk Assessment: A systematic scientific process of determining risk estimates based on the presence of contaminants in the environment and who might be exposed to the contaminants.

Semivolatile Organic Compounds (SVOCs): Organic constituents which are generally insoluble in water and are not readily transported in groundwater.

Solvents: Organic liquids used to dissolve grease and other oil-based materials. Many solvents are toxic at high concentrations.

Source: Area at a hazardous waste site from which contamination originates.

Stratigraphic: Pertaining to the arrangement of consolidated or unconsolidated geologic materials as to geographic position and chronologic order of sequence.

Superfund: The trust fund, created by CERCLA out of special taxes, used to investigate and clean up abandoned or uncontrolled hazardous waste sites. Out of this fund USEPA either: (1) pays for site remediation when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work or (2) takes legal action to force parties responsible for site contamination to clean up the site or pay back the federal government for the cost of the remediation. Federal facilities are not eligible for Superfund monies.

Toxicity: The quality or condition of a destructive, deadly, or poisonous substance.

Vadose Zone: The volume located between the ground surface and the water table. Also known as the unsaturated zone.

Volatile Organic Compounds (VOCs): Organic constituents which tend to volatilize or to change from a liquid to a gas form when exposed to the atmosphere. Many VOCs are readily transported in groundwater.

Water Table: The surface of a body of unconfined groundwater at which the water pressure is equal to that of the atmosphere.