INTERIM REMEDIAL MEASURE WORK PLAN

YAPHANK SITE
TOWN OF BROOKHAVEN
SUFFOLK COUNTY, NEW YORK
SITE INDEX NO. W1-0907-02-02
SITE I.D. V00384-1

Prepared for:

METROPOLITAN TRANSPORTATION AUTHORITY
LONG ISLAND RAIL ROAD
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SEPTEMBER 2005

INTERIM REMEDIAL MEASURE WORK PLAN
FOR THE
LONG ISLAND RAIL ROAD
YAPHANK SITE

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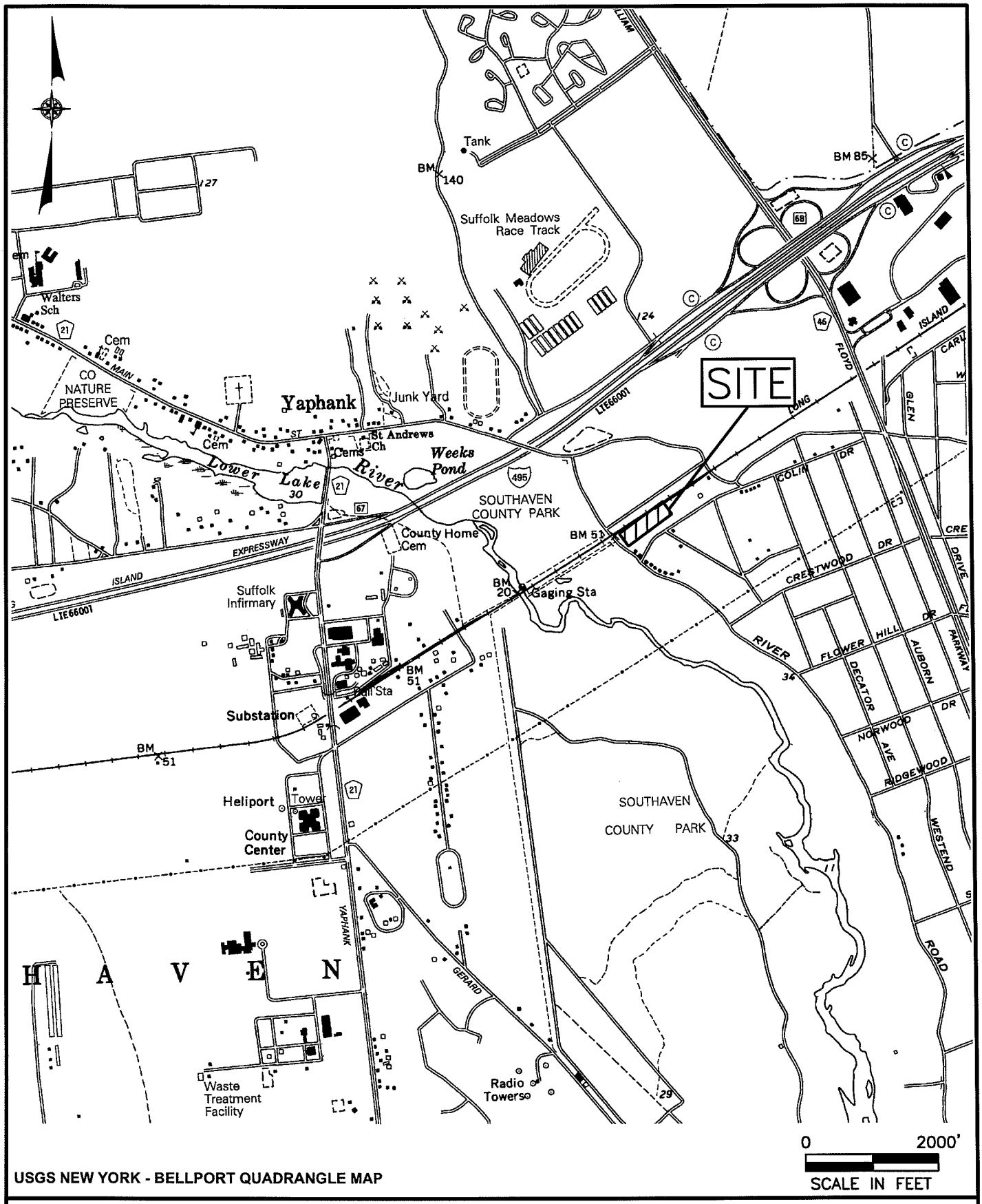
1.0 INTRODUCTION

The Long Island Rail Road (LIRR) has entered into a Voluntary Cleanup Agreement (Index Number W1-0907-02-02) with the New York State Department of Environmental Conservation (NYSDEC) to investigate and remediate the LIRR Yaphank site (Site Number V-00384-1). This Interim Remedial Measure Work Plan describes the interim remedial measures (IRMs) to be undertaken pursuant to the recommendations presented in the final Site Investigation Report, dated January 2005. Based on the findings of the completed site investigation, the LIRR recommended a number of IRMs to be completed on-site as well as at several adjacent off-site locations. The IRMs were recommended to be completed prior to the implementation of a site-wide remedy since they could be completed without extensive data collection or evaluation of remedial technologies and would reduce the potential exposure of human and wildlife receptors to site-related chemical constituents. Consistent with the NYSDEC Voluntary Cleanup Program Guide, dated May 2002, this Work Plan details the methods and procedures to be utilized to perform the IRMs.

1.1 Site Description

The site is located in Yaphank, Town of Brookhaven, Suffolk County, New York (see Figure 1-1). The parcel of property under evaluation is approximately 4 acres in size and is located immediately east of River Road and south of the LIRR Main Line track. The site (Suffolk County tax identification number: Section 640, Block 1, portion of Lot 2) is owned by the LIRR. The majority of the site is fenced and the primary access route is via River Road (see Figure 1-2). The site may also be accessed from Colin Drive via the entrance to the adjacent concrete plant.

The site is bounded to the north by the LIRR Main Line track. An 8-foot high chain link fence is located along the southern, eastern and western boundaries. The site was used by the LIRR for fill operations and contains fill material up to 20 feet in thickness. The site is currently undeveloped and is primarily open space with sparse vegetation. A small segment of the site was utilized by the neighboring concrete plant (Nicolia Ready-Mix, Inc.) to receive loads of



USGS NEW YORK - BELLPORT QUADRANGLE MAP

LONG ISLAND RAIL ROAD - YAPHANK SITE
INTERIM REMEDIAL MEASURE WORK PLAN

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SITE LOCATION MAP

FIGURE 1-1

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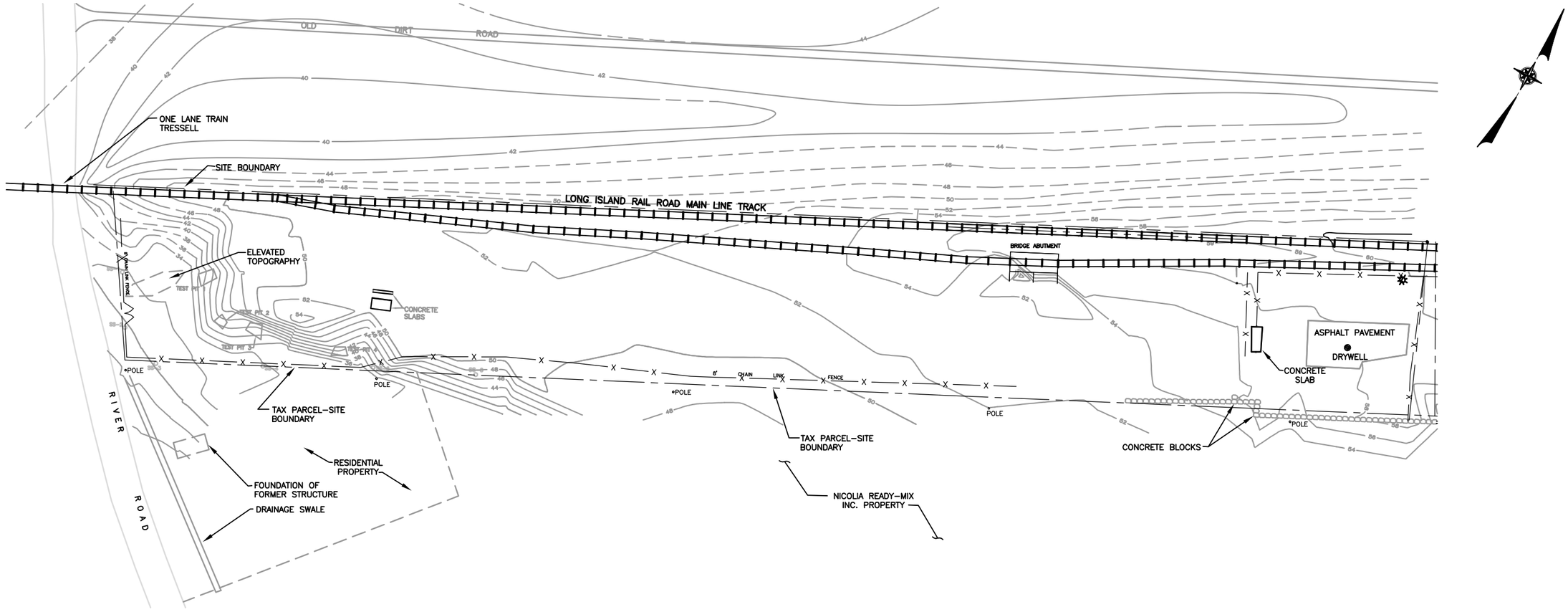

NOTES:

1. DATUMS:
VERTICAL – 1988 NAVD
HORIZONTAL – 1983 NAD

2. PROPERTY LINES SHOWN ARE TAKEN FROM A PLAN PROVIDED BY THE LONG ISLAND RAILROAD, DATED JUNE 30, 1916, LAST REVISED DECEMBER 31, 1958, TITLED RIGHT OF WAY AND TRACK MAP, STATION 3121+00 TO 3175+00.

3. BASE MAP PREPARED BY COTILLA ASSOCIATES, NORTHPORT, NEW YORK SURVEY DATA OBTAINED IN THE FIELD NOVEMBER 1997.

4. THE BASE MAP WAS UPDATED IN AUGUST 1999 BY YEC, INC. BASED ON 1999 SURVEYED LOCATIONS OF MW–9 AND MW–10. THE BASE MAP WAS REDUCED BY A FACTOR 0.7467 FROM THE BASE MAP 0,0 LOCATION.

LEGEND

SITE BOUNDARY

FENCE

ELEVATED TOPOGRAPHY

0 100'
SCALE IN FEET

SOURCE: 1997 SURVEY, COTILLA ASSOCIATES; 1999 SURVEY, YEC INC.; 2004 SURVEY, NELSON AND POPE; TAX MAPS; 1969 AERIAL PHOTOGRAPH, LKB

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LONG ISLAND RAIL ROAD-YAPHANK SITE
INTERIM REMEDIAL MEASURES WORK PLAN

SITE PLAN

FIGURE 1-2

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stone via train along a rail siding, which runs along the northern boundary of the Yaphank site; however, Nicolia is no longer utilizing the rail siding.

There is little topographic relief across the site, with the exception of a steep embankment on the southwestern portion of the property, and a sloped area adjacent to an unloading platform along the rail siding.

To the north of the site, north of the Main Line track, exists undeveloped woodland, which is also owned by the LIRR property. Residential properties are located immediately south of the site. A drainage swale runs along the east side of River Road on a residential property located immediately southwest of the site. The property is currently undeveloped; however, a large concrete foundation remains on the property.

An asbestos transfer facility (occupied by Asbestos Transfer Company, Inc. [ATC]) occupies the property immediately to the east of the site. Brookhaven National Laboratory, a National Priority List (NPL) site, is located approximately one mile to the north of the Yaphank Site.

There are no known records regarding the prior disposal operations conducted at the Yaphank Site, but anecdotal information indicates that this site was used as a general disposal area for railroad-related waste from the 1950s to the early 1970s. It is believed that the site was used as a disposal area for waste generated from railroad track maintenance activities, as well as possibly from electric and diesel train repair shops. However, records of the actual waste type and/or quantities that were landfilled at the site do not exist. Based on information compiled by the LIRR, disposed materials could have included batteries, spent drums, scrap metal, railroad ties, coal clinkers, waste liquids and miscellaneous construction debris.

1.2 Site Investigation Summary of Findings

This section presents a summary of the findings of the site investigation completed by the LIRR in 2003. Note that a detailed discussion of these findings, along with a discussion of site hydrogeology is presented in the final Site Investigation Report, dated January 2005.

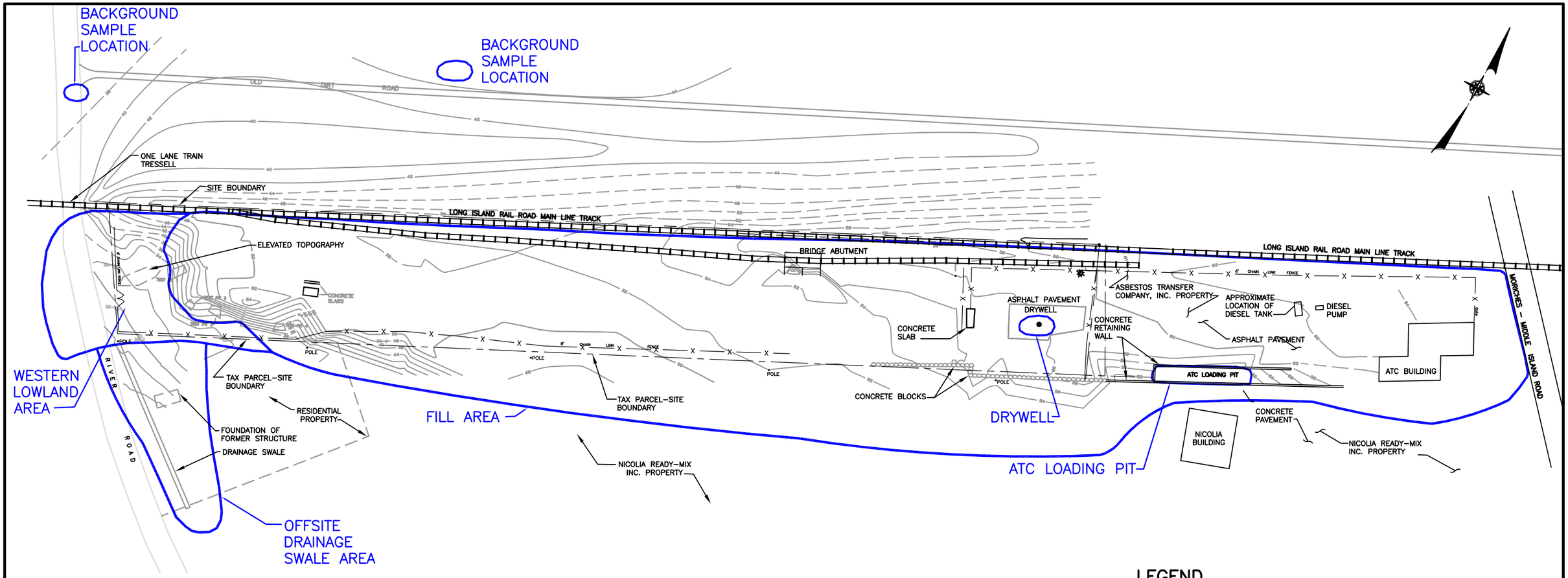
The findings of the site investigation have been organized into specific on-site and off-site areas (see Figure 1-3). These areas include:

- Background Sample Locations
- Fill Area
- Western Lowland Area
- Off-site Drainage Swale

Fill Area

The Fill Area includes that portion of the LIRR Yaphank site and adjacent properties to the east and south where filling has occurred based on a review of the completed soil boring program and historical aerial photographs. This includes the majority of the LIRR property, the majority of the ATC property and a portion of the Nicolia property along the LIRR southern property boundary.

The fill material encountered throughout the site and adjoining properties consists of a brown to black poorly sorted sand and gravel with varying amounts of anthropogenic materials such as glass, brick, concrete, coal, ash, clinker and wood. The fill material also contains a "slag-like" material that is most prevalent within the western portion of the LIRR property. In general, the fill thickness ranges from 15 to 25 feet throughout the majority of the Fill Area. Immediately beneath this fill material exists glacial outwash sand.



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LEGEND

- APPROXIMATE BOUNDARIES OF INVESTIGATION AREAS
- SITE BOUNDARY
- FENCE
- ELEVATED TOPOGRAPHY

0 120'
SCALE IN FEET

SOURCE: 1997 SURVEY, COTILLA ASSOCIATES; 1999 SURVEY, YEC INC.; 2004 SURVEY, NELSON AND POPE; TAX MAPS; 1969 AERIAL PHOTOGRAPH, LKB

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LONG ISLAND RAIL ROAD-YAPHANK SITE
INTERIM REMEDIAL MEASURES

INVESTIGATION AREAS

FIGURE 1-3

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The analysis of several samples of the slag-like material present in the fill indicates that it is comprised of a number of metals at "percent level" concentrations (by weight of sample) including: arsenic (3.3 percent), copper (0.62 percent), iron (33 percent), lead (6.3 percent) and antimony at 2.4 percent.

The metals which most frequently exceeded the NYSDEC soil cleanup objectives in surface soil include arsenic, copper, lead and zinc, while to a lesser extent, mercury and nickel were also found to exceed the soil cleanup objectives at a number of locations. The highest concentrations of the above-listed metals were detected within surface soil within the western half of the LIRR property due to the fact that the fill material is present at ground surface (including the slag-like material) with little to no soil cover. Surface soil samples collected from the eastern half of the LIRR property are generally found to exhibit lower concentrations of TAL metals within the Fill Area due to the fact that this portion of the site is covered with 6 to 12 inches of sand and gravel with little evidence of the fill material being exposed at the ground surface.

The TAL-listed metals found to most frequently exceed the respective NYSDEC cleanup objectives in subsurface soil within the Fill Area include arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc. The review of the subsurface soil chemical data for the Fill Area clearly demonstrates that the highest concentrations of metals are present in the fill material. In contrast, analysis of the glacial outwash sand collected immediately below the fill material exhibited relatively low metal concentrations that, in most cases, were found to be consistent with the background subsurface soil data.

Based on the samples collected from the fill material, total PAH concentrations range from 0.17 mg/kg to a maximum of 152.2 mg/kg detected in SB-67 (13 to 15 feet), well below the NYSDEC soil cleanup objective for total PAHs of 500 mg/kg. Several PAHs were detected above their respective individual NYSDEC soil cleanup objectives in the fill material, including benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene and dibenzo(a,h)anthracene. All PAHs, as well as phenol and pentachlorophenol, were found to be nondetectable within the underlying glacial sand.

Therefore, similar to the distribution of metals, PAHs, phenol and pentachlorophenol are restricted to the fill material and are not impacting the underlying glacial outwash sand.

The metal concentrations detected in the surface soil samples collected from the Nicolia property were found to be relatively low. However, arsenic and copper were detected at concentrations that exceed the NYSDEC soil cleanup objectives in several samples collected in the westernmost portion of the Nicolia property. It is important to note that this portion of the property is not actively used by Nicolia and, therefore, the presence of these contaminants do not represent a significant potential exposure pathway.

Surface soil samples collected from unpaved areas of the ATC property exhibited several metals above the NYSDEC soil cleanup objectives. Surficial soil within these areas also appeared to contain a small portion of the site-related fill material. The presence of these metals within unpaved areas represents a remote potential exposure pathway to on-site workers through ingestion, dermal contact and inhalation of windblown dust.

Western Lowland Area

The Western Lowland Area is the westernmost portion of the LIRR Yaphank site. Due to the fact that this area is approximately 15 feet lower in elevation from the remainder of the site, it is believed that historic filling activities have not been conducted in this area. Soil borings in this area have confirmed that filling has not taken place in this portion of the LIRR Yaphank site. However, there exists a thin "veneer" of surficial soil that does contain a portion of the site-related fill material, including the slag-like material. It is believed that the presence of the fill material in this area is associated with the erosion and transportation of material from the steep slope located directly to the east of the Western Lowland Area.

As a result of the presence of the site-related fill material, elevated concentrations of metals, including arsenic, copper and lead, have been identified in surface soil throughout this portion of the Yaphank site. In general, the highest concentrations of the above-listed metals were observed in samples collected at the foot of the slope adjacent to the Fill Area.

Concentrations of these metals tend to decrease significantly toward River Road and toward the wooded north end of this area.

Off-site Drainage Swale

The Off-site Drainage Swale encompasses the wooded area to the south of the Western Lowland Area, along the east side of River Road. It is believed that years of surface water run-off from the Western Lowland Area and Fill Area has resulted in the erosion and deposition of fill material within this off-site area.

The metals that exceeded the NYSDEC soil cleanup objectives in surface soil and shallow subsurface soil within the Off-site Drainage Swale include arsenic, copper and zinc. To a lesser extent, mercury, cadmium and lead were also found to exceed the soil cleanup objectives at a number of locations. The highest concentrations of the above-listed metals were generally found within and in the vicinity of the Drainage Swale.

Groundwater

Groundwater at the site is approximately 30 feet below grade throughout the Fill Area, including the ATC property, and the northernmost portion of the Nicolia property located to the south of the LIRR property. Based on the depth of groundwater and the thickness of the site-related fill material, the fill is not in contact with groundwater and, in most locations, there exists between 10 and 15 feet of glacial outwash sand separating the fill and the water table. Within the western lowland portion of the site, depth to groundwater ranges from 7 to 15 feet below grade.

In general, the majority of metals detected in on-site and downgradient groundwater were at concentrations comparable to upgradient groundwater quality. In addition, the metals detected most frequently in the site-related fill material, including arsenic, cadmium, chromium, copper, lead and zinc were generally found below NYSDEC Class GA groundwater standards in on-site groundwater. One exception was the presence of lead that was detected marginally above the

NYSDEC Class GA groundwater standard of 25 ug/l at monitoring wells MW-07, MW-09 and MW-10.

Off-site groundwater samples downgradient of the site show concentrations of metals above NYSDEC Class GA groundwater standards. However, these exceedances are less extensive than impacts to on-site groundwater. This is likely due to the relatively insoluble nature of these metals and the fact that there exists a 10 to 15-foot buffer of unimpacted sand separating the fill material from the local water table. In addition, the Public and Private Water Supply Survey completed in 1999 did not identify any public or private supply wells within a 1/2-mile radius downgradient of the LIRR site. Based on these findings, groundwater is not considered a potential exposure pathway for site-related contaminants.

1.3 Summary of the Interim Remedial Measures

The following is a summary of the IRMs recommended in the Site Investigation Report based on the findings:

- Excavate metal-impacted soil from the off-site drainage swale and portion of the western lowland area and replace it with clean soil.
- Design and install erosion controls on the western lowland area of LIRR Yaphank site to prevent sediment containing site-related contaminants from migrating into the swale area after this area has been remediated.
- Install a windscreen on the existing site perimeter separating the LIRR Yaphank site and the off-site drainage swale to minimize the potential for windblown dust from the LIRR property entering the remediated swale area.
- Upgrade and repair the existing site perimeter fence and extend the fence along the northern, southern and eastern property boundaries in order to secure the entire property boundary and reduce the potential for trespassing. In areas where fencing has to be offset from the rail line on the northern property boundary, 6 inches of crushed stone will be placed between the fence and track ballast in areas where fill material may be exposed at the ground surface.

- Selected unpaved areas within the ATC property where fill material is suspected of being at ground surface, including along its northern property boundary and adjacent to the ATC loading pit, will be covered with 6 inches of crushed stone or recycled concrete aggregate.

The following sections provide a description of the IRMs and the methods for implementation.

2.0 OFF-SITE DRAINAGE SWALE PRE-INTERIM REMEDIAL MEASURE INVESTIGATION

This section presents a discussion of the analytical results of the Pre-interim Remedial Measure Investigation (Pre-IRM Investigation) of the Off-site Drainage Swale Area completed on March 18, 2005, in accordance with the Pre-IRM Sampling Plan dated January 24, 2005. As part of this investigation, a total of 17 surface soil and 14 subsurface soil samples were collected for metals analysis, including arsenic, copper, lead and zinc.

The objective of the pre-IRM sampling program was to collect sufficient surface and subsurface soil data in the Off-site Drainage Swale Area to fully delineate the area requiring remediation as part of an IRM. Therefore, the results of the sampling program, along with data previously collected from this area, are used to define the area to be excavated within this off-site property.

2.1 Surface Soil

Tables 2-1 and 2-2 present all surface soil metal data collected from the Off-site Drainage Swale Area during the Pre-IRM sampling and previous investigations, respectively. Tables 2-1 and 2-2 include comparisons to the NYSDEC Soil Cleanup Objectives for each metal. Figure 2-1 provides the location of each surface soil sample.

Based on a review of Tables 2-1 and 2-2, the metals found to most frequently exceed their NYSDEC soil cleanup objectives in surface soil within the Off-site Drainage Swale Area include arsenic, copper, zinc and, to a lesser extent, mercury, cadmium and lead. The highest concentrations of the above-listed metals were generally found within and in the vicinity of the Off-site Drainage Swale, as well as along the fence line of the Yaphank site to the north and east of the Off-site Drainage Swale.

During the PSAs and Site Investigation, the highest concentrations of the above-listed metals were detected in surface soil sample locations SS-49 and SS-55, located approximately 20

TABLE 2-1

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PRE-IRM SAMPLING
SURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SS-101	SS-102	SS-103	SS-104	SS-104	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	0-6"	0-6"	0-6"	0-6"	12-18"	--	
DATE OF COLLECTION	3/18/05	3/18/05	3/18/05	3/18/05	3/18/05		
PERCENT SOLIDS	92.0	83.0	89.0	88.0	87.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L	mg/kg
Arsenic	**9.7**	6.5	6.2	**15.0**	0.79 B	3.0	7.5 or SB
Copper	**27.7**	19.3	20.0	**31.4**	2.1	4.0	25 or SB
Lead	256	211	214	302	6.1	4.0	500
Zinc	**24.8**	15.1	**40.2**	18.5	9.0	7.0	20 or SB

SAMPLE ID	SS-105	SS-106	SS-107	SS-108	SS-109	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	0-6"	0-6"	0-6"	0-6"	0-6"	--	
DATE OF COLLECTION	3/18/05	3/18/05	3/18/05	3/18/05	3/18/05		
PERCENT SOLIDS	90.0	85.0	87.0	91.0	89.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L	mg/kg
Arsenic	2.4	4.7	1.3	2.4	1.9	3.0	7.5 or SB
Copper	4.8	9.7	3.2	4.4	4.3	4.0	25 or SB
Lead	39.3	87.4	27.1	27.9	45.0	4.0	500
Zinc	4.7	7.1	5.6	4.4	7.4	7.0	20 or SB

SAMPLE ID	SS-110	SS-111	SS-112	SS-113	SS-114	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	0-6"	0-6"	0-6"	0-6"	0-6"	--	
DATE OF COLLECTION	3/18/05	3/18/05	3/18/05	3/18/05	3/18/05		
PERCENT SOLIDS	87.0	85.0	47.0	93.0	91.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L	mg/kg
Arsenic	1.1	2.4	**8.3**	1.0	3.3	3.0	7.5 or SB
Copper	2.4	4.3	**36.1**	2.1	6.2	4.0	25 or SB
Lead	10.4	56.1	347	14.5	78.3	4.0	500
Zinc	3.5	3.8	**74.3**	2.0 B	10.1	7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

TABLE 2-1 (continued)

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PRE-IRM SAMPLING
SURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SS-115	SS-116				Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	0-6"	0-6"				--	
DATE OF COLLECTION	3/18/05	3/18/05					
PERCENT SOLIDS	87.0	81.0					
UNITS	mg/kg	mg/kg				ug/L	mg/kg
Arsenic	1.3	**14.3**				3.0	7.5 or SB
Copper	3.4	**31.1**				4.0	25 or SB
Lead	34.4	**574**				4.0	500
Zinc	3.3	**38.4**				7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

TABLE 2-2

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PREVIOUS INVESTIGATION RESULTS
SURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SS-48	SS-49	SS-50	SS-53	SS-54	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DATE OF COLLECTION	5/17/99	5/17/99	5/17/99	10/30/03	10/30/03		
PERCENT SOLIDS	94.5	91.0	93.0	84.0	81.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L	mg/kg
Aluminum	2,700	4,180	3,470	4,220	4,140	17.0	SB
Antimony	7.1 B	288	2.0 B	1.1	1.9	3.0	SB
Arsenic	6.1	**181**	2.7	3	4.3	3.0	7.5 or SB
Barium	8.3 B	80.4	9.4 N	25.4	28.5	4.0	300 or SB
Beryllium	U	**0.17 B**	U	U	0.026 B	0.5	0.16 or SB
Cadmium	U	**1.5**	U	0.33	0.6	0.7	1 or SB*
Calcium	231 B	2,310	160 B	3,440	588	240.0	SB
Chromium	4.3	**13.1**	4.2	5.8	6.8	0.6	10 or SB*
Cobalt	1.0 B	3.2 B	0.88 B	1.1 B	1.6 B	0.9	30 or SB
Copper	16.9	**222**	15.1	17.7	**33.8**	4.0	25 or SB
Iron	**4830**	**18500**	**5270**	**4910**	**8220**	26.0	2,000 or SB
Lead	141	**4290**	38.4	58.3	227	4.0	500
Magnesium	339 B	551 B	317 B	888	456	8.0	SB
Manganese	35.3	172	28.9	105	107	0.8	SB
Mercury	U	0.092	U	0.028 B	**0.24**	0.1	0.1
Nickel	2.8 B	**21.4**	1.9 B	2.9	4.3	0.8	13 or SB
Potassium	U	57.5 B	U	217	188	78.0	SB
Selenium	U	**5.4**	U	U	0.67 B	9.0	2 or SB
Silver	U	U	U	1.4 B	1.7	2.0	SB
Sodium	U	135 B	U	34.2 B	28.2 B	83.0	SB
Thallium	U	0.7 B	U	0.33 B	0.2 B	3.0	SB
Vanadium	9.3 B	15	9.5 B	10	11.5	0.7	150 or SB
Zinc	**26.2**	**206**	11.5	**47.3**	**97.4**	7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
*: Proposed revised criteria for cadmium and chromium in TAGM 4046 Appendix A.
Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

TABLE 2-2 (continued)

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PREVIOUS INVESTIGATION RESULTS
SURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SS-55	SS-56	SS-57	SS-58	SS-59	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DATE OF COLLECTION	10/30/03	12/12/03	10/30/03	10/30/03	10/30/03		
PERCENT SOLIDS	82.0	80.0	93.0	87.0	85.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L	mg/kg
Aluminum	4760	2800	2730	8520	5300	17.0	SB
Antimony	146	3.8	1.8	3.1	4.4	3.0	SB
Arsenic	**36.2**	5.4	2.1	**8.6**	6.4	3.0	7.5 or SB
Barium	27.9	6.6 B	17.3	55.9	14.3	4.0	300 or SB
Beryllium	0.038 B	0.14 B	U	0.068 B	U	0.5	0.16 or SB
Cadmium	**1.1**	0.064 B	0.21 B	0.87	0.39	0.7	1 or SB*
Calcium	2990	342	762	1990	269	240.0	SB
Chromium	7.9	3.3	3.7	**13.7**	8.5	0.6	10 or SB*
Cobalt	1.9 B	0.65 B	0.72 B	3 B	1.2 B	0.9	30 or SB
Copper	**91.3**	14.9	13.1	**88**	**26.9**	4.0	25 or SB
Iron	**7570**	**4860**	**3460**	**12700**	**7650**	26.0	2,000 or SB
Lead	**4770**	120	85	224	187	4.0	500
Magnesium	618	356	373	1020	510	8.0	SB
Manganese	99.6	38.2	39.5	157	33.4	0.8	SB
Mercury	0.077	0.051	0.027 B	**0.17**	0.094	0.1	0.1
Nickel	10.1	1.8 B	2.3 B	10.9	4.3	0.8	13 or SB
Potassium	212	135	272	334	202	78.0	SB
Selenium	0.99 B	U	U	1.2 B	0.86 B	9.0	2 or SB
Silver	1.3 B	0.24 B	0.49 B	1.7 B	1.1 B	2.0	SB
Sodium	36.7 B	14.0 B	24.4 B	47.3 B	38.4 B	83.0	SB
Thallium	1 B	U	0.17 B	0.41 B	0.41 B	3.0	SB
Vanadium	15.5	12.1	7.9	25.5	21.1	0.7	150 or SB
Zinc	**83.2**	12.4	**34.1**	**129**	**49.2**	7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
*: Proposed revised criteria for cadmium and chromium in TAGM 4046 Appendix A.
Bold Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

TABLE 2-2 (continued)

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PREVIOUS INVESTIGATION RESULTS
SURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SS-60	SS-61	SS-62	SS-63	SS-64	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DATE OF COLLECTION	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03		
PERCENT SOLIDS	77.0	78.0	78.0	77.0	89.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L	mg/kg
Aluminum	2430	3620	3560	4460	471	17.0	SB
Antimony	9.8	23.7	11.5	2.3	1.2	3.0	SB
Arsenic	5.6	**31.5**	**11.3**	3.8	0.57 B	3.0	7.5 or SB
Barium	26.2	70.5	15.3	21.2	9.9 B	4.0	300 or SB
Beryllium	U	0.029 B	U	U	U	0.5	0.16 or SB
Cadmium	0.31	**1.2**	0.32	0.37	0.14 B	0.7	1 or SB*
Calcium	1500	2020	250	567	1140	240.0	SB
Chromium	5.2	4.6	7.4	7.3	1.1	0.6	10 or SB*
Cobalt	0.88 B	1.6 B	1.2 B	1.2 B	0.25 B	0.9	30 or SB
Copper	20.1	**77**	**37.9**	23.5	4.7	4.0	25 or SB
Iron	**4250**	**8350**	**7040**	**6210**	659	26.0	2,000 or SB
Lead	255	**1580**	371	105	33.5	4.0	500
Magnesium	461	1060	321	500	232	8.0	SB
Manganese	24.5	122	27.1	64.7	30.7	0.8	SB
Mercury	**0.18**	0.049	0.1	**0.13**	0.054	0.1	0.1
Nickel	5.5	**14.2**	5.5	4.3	3	0.8	13 or SB
Potassium	258	192	191	204	221	78.0	SB
Selenium	0.71 B	0.74 B	1.2 B	0.77 B	U	9.0	2 or SB
Silver	0.62 B	1.1 B	0.93 B	0.8 B	U	2.0	SB
Sodium	54.1 B	273	49.9 B	37 B	33.5 B	83.0	SB
Thallium	U	0.44 B	0.26 B	0.2 B	U	3.0	SB
Vanadium	19.5	15.4	31.7	15.7	4.8	0.7	150 or SB
Zinc	**53.8**	**175**	**33.3**	**37.2**	15.6	7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
*: Proposed revised criteria for cadmium and chromium in TAGM 4046 Appendix A.
Bold Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

TAX PARCEL–SITE BOUNDARY

8' CHAIN LINK FENCE

ELEVATED TOPOGRAPHY

FILL AREA

TEST PIT 1

TEST PIT 2

TEST PIT 3

SLAG-1

SLAG-2

POLE

RIVER ROAD

APPROXIMATE LOCATION OF CONCRETE SLAB/FOUNDATION OF FORMER STRUCTURE

DRAINAGE SWALE

SS-72 SB-35 SS-76 SS-17 SS-77 SB-38 SB-1 SB-40 SS-27 SS-79 SS-80 SB-23 MW-08 SB-22 SS-16 SS-4 SS-66 SS-67 SB-17 SS-69 SB-18 SS-68 SB-24 SS-1 SS-8 SS-9 SS-7 SS-70 SB-7 SB-19 SS-10 SS-11 SS-12 SB-20 SS-46 SS-71 MW-07 SS-13 SB-21 SS-14 SS-15 SB-8 SS-3 SB-6 SS-2 SS-53 SS-48 SB-25 RR2 SS-49 SS-47 SS-101 SB-79 SB-27 SS-55 SS-50 SS-103 RR3 SS-104 SB-28 SS-56 SB-76 SB-77 SS-102 SB-80 SB-26 SS-54 SS-105 SS-106 SB-78 SB-30 SS-58 SS-57 SB-29 SS-107 SS-108 SS-109 SB-32 SB-31 SS-59 RR1 SS-60 SS-110 SS-111 MW-15 SB-81 SS-62 SS-112 SS-61 SS-113 SS-115 SS-114 SS-63 SS-116 SB-33 SB-34 SS-64 MW-16

LEGEND

- SITE BOUNDARY
- FENCE
- ELEVATED TOPOGRAPHY
- SS-101 — PRE-IRM SAMPLING PROGRAM SURFACE SOIL SAMPLE LOCATION
- SB-76 — PRE-IRM SAMPLING PROGRAM SOIL BORING LOCATION
- SS-01 — EXISTING SURFACE SOIL SAMPLE LOCATION
- SB-17 — EXISTING SOIL BORING LOCATION
- TEST PIT 1 — EXISTING TEST PIT LOCATION FROM 1998 PSA
- SLAG-1 — EXISTING SLAG SAMPLE LOCATION FROM 2003 SITE INVESTIGATION
- MW-05 — EXISTING GROUNDWATER MONITORING WELL
- RR1 — APPROXIMATE LOCATION OF EXISTING SCDHS GROUNDWATER MONITORING WELL
- APPROXIMATE EXTENT OF FILL

0 30
SCALE IN FEET

\\Nt4\CADwork\1916\dwg\1916-ots-prop.dwg, 09/22/05 09:36:46 AM, MDeVinney

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

LONG ISLAND RAIL ROAD
YAPHANK SITE

PRE-IRM PROGRAM SAMPLE LOCATION MAP

FIGURE 2-1

feet south of the LIRR Yaphank site property boundary and approximately 50 feet east of the Drainage Swale. Analytical results from the Pre-IRM sampling indicate concentrations of metals above the NYSDEC Soil Cleanup Objectives approximately 100 feet east of these samples at surface soil sample location SS-104, with arsenic and copper detected at concentrations of 15.0 mg/kg and 31.4 mg/kg, respectively. SS-104 was collected from 0 to 6 inches below grade. Note that a sample collected from 12 to 18 inches did not exhibit exceedances of NYSDEC soil cleanup objectives. A number of metal exceedances were detected approximately 180 feet south of the Yaphank site adjacent to the Drainage Swale and River Road at surface soil sample location SS-116. However, exceedances of NYSDEC soil cleanup objectives were not detected in the wooded area south of the LIRR Yaphank site and east of the Drainage Swale as indicated by surface soil samples SS-105 to SS-111, SS-113 and SS-115.

2.2 Subsurface Soil

Tables 2-3 and 2-4 present all subsurface soil metal data collected from the Off-site Drainage Swale Area during the Pre-IRM sampling and previous investigations, respectively. Tables 2-3 and 2-4 include comparisons to the NYSDEC Soil Cleanup Objectives for each metal. Figure 2-1 provides the location of each subsurface soil sample.

Based on a review of Tables 2-3 and 2-4, the metals found to most frequently exceed their NYSDEC soil cleanup objectives in shallow subsurface soil within the Off-site Drainage Swale Area include copper and zinc and, to a lesser extent, mercury and beryllium. The highest concentrations of the above-listed metals were generally found within and in the vicinity of the Off-site Drainage Swale.

During the Site Investigation, metals-impacted soil was observed to at least 6 feet below grade at soil probe SB-26, located within the Off-site Drainage Swale. Analytical results from the Pre-IRM sampling at soil probes SB-76 through SB-78, completed within the Off-site Drainage Swale confirmed the elevated concentrations of metals detected at SB-26. At soil probe SB-77, completed adjacent to soil probe SB-26, zinc was detected at a concentration of 23.3 mg/kg at 4 to 6 feet, slightly above the NYSDEC soil cleanup objective of 20 mg/kg.

TABLE 2-3

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PRE-IRM SAMPLING
SUBSURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SB-76 (2-4)	SB-76 (4-6)	SB-76 (6-8)	SB-77 (2-4)	SB-77 (4-6)	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	2-4'	4-6'	6-8'	2-4'	4-6'	--	mg/kg
DATE OF COLLECTION	3/18/05	3/18/05	3/18/05	3/18/05	3/18/05	ug/L	
PERCENT SOLIDS	91.0	90.0	84.0	70.0	83.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
Arsenic	1.0 B	0.25 B	U	2.7	0.40 B	3.0	7.5 or SB
Copper	5.6	13.1	4.2	**111**	10.3	4.0	25 or SB
Lead	10.3	1.3	1.2	244	1.3	4.0	500
Zinc	**94.6**	13.2	11.5	**349**	**23.3**	7.0	20 or SB

SAMPLE ID	SB-77 (6-8)	SB-78 (2-4)	SB-78 (4-6)	SB-78 (6-8)	SB-79 (2-4)	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	6-8'	2-4'	4-6'	6-8'	2-4'	--	mg/kg
DATE OF COLLECTION	3/18/05	3/18/05	3/18/05	3/18/05	3/18/05	ug/L	
PERCENT SOLIDS	82.0	65.0	76.0	87.0	95.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
Arsenic	0.52 B	2.4	0.98 B	1.5	1.2	3.0	7.5 or SB
Copper	17.5	**41.5**	20.3	22.9	6.5	4.0	25 or SB
Lead	0.72	263	85.4	161	4.2	4.0	500
Zinc	13.6	**208**	**104**	**105**	11.2	7.0	20 or SB

SAMPLE ID	SB-79 (4-6)	SB-80 (2-4)	SB-80 (4-6)	SB-81 (2-4)		Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	4-6'	2-4'	4-6'	2-4'		--	mg/kg
DATE OF COLLECTION	3/18/05	3/18/05	3/18/05	3/18/05		ug/L	
PERCENT SOLIDS	96.0	98.0	93.0	85.0			
UNITS	mg/kg	mg/kg	mg/kg	mg/kg			
Arsenic	0.68 B	0.86 B	0.64 B	0.36 B		3.0	7.5 or SB
Copper	3.3	4.9	3.3	4.0		4.0	25 or SB
Lead	1.7	2.3	1.3	0.95		4.0	500
Zinc	5.9	6.8	4.6	12.6		7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

TABLE 2-4

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PREVIOUS INVESTIGATION RESULTS
SUBSURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SB-25 (0-2)	SB-25 (2-4)	SB-25 (4-6)	SB-26 (0-2)	SB-26 (2-4)	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	0-2'	2-4'	4-6'	0-2'	2-4'	--	mg/kg
DATE OF COLLECTION	10/14/03	10/14/03	10/14/03	10/14/03	10/14/03	ug/L	
PERCENT SOLIDS	94.0	93.0		87.0	94.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
Aluminum	2380	4230	1630	8680	4650	17.0	SB
Antimony	0.2 U		0.16 B	2.4	0.64	3.0	SB
Arsenic	1 B	1.2	0.45 B	6.2	2.9	3.0	7.5 or SB
Barium	4.8 B	10.5	4.1 B	110	28.9	4.0	300 or SB
Beryllium	0.058 B	0.08 B	0.039 B	**0.28**	0.13 B	0.5	0.16 or SB
Cadmium	U	U	U	0.88	0.16 B	0.7	1 or SB*
Calcium	77.3	96.2	28.3 B	1270	434	240.0	SB
Chromium	3.1	3.7	2.2	**12**	5.9	0.6	10 or SB*
Cobalt	0.58 B	0.51 B	1.5 B	3.8	1.6 B	0.9	30 or SB
Copper	6.1	5.4	4.5	**176**	**25.8**	4.0	25 or SB
Iron	**3290**	**4390**	**2440**	**10600**	**5820**	26.0	2,000 or SB
Lead	7.8	7.2	5.2	**985**	168	4.0	500
Magnesium	240	287	311	863	435	8.0	SB
Manganese	28.2	23.9	94.0	136	81.3	0.8	SB
Mercury	0.024 B	**0.48**	U	**0.23**	**0.13**	0.1	0.1
Nickel	0.97 B	1.4 B	1.8 B	10.5	4	0.8	13 or SB
Potassium	54.2	72.2	48.4	268	124	78.0	SB
Selenium	1.2 B	1.5	U	**3.5**	**2.1**	9.0	2 or SB
Silver	0.31 B	0.39 B	0.31 B	1.1 B	0.6 B	2.0	SB
Sodium	16.1 B	30.5 B	8.9 B	66.6	20 B	83.0	SB
Thallium	0.71 B	0.78 B	U	1.9	1	3.0	SB
Vanadium	5.4	7.3	3.2	21.2	10.3	0.7	150 or SB
Zinc	9.7	16.1	6.6	**154**	**69.4**	7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
*: Proposed revised criteria for cadmium and chromium in TAGM 4046 Appendix A.
Bold: Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

TABLE 2-4 (continued)

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PREVIOUS INVESTIGATION RESULTS
SUBSURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SB-26 (4-6)	SB-27 (0-2)	SB-27 (2-4)	SB-27 (4-6)	SB-28 (0-2)	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	4-6'	0-2'	2-4'	4-6'	0-2'	--	
DATE OF COLLECTION	10/14/03	10/15/03	10/15/03	10/15/03	10/15/03		
PERCENT SOLIDS	79.0	77.0	23.0	83.0	83.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L	mg/kg
Aluminum	2160	4370	12900	1270	2840	17.0	SB
Antimony	2.9	15.4	8.8	0.25 B	4.4	3.0	SB
Arsenic	1.2	**15.4**	**8.1**	0.64 B	4.3	3.0	7.5 or SB
Barium	59.6	24.8	45.1	7.4 B	6.8 B	4.0	300 or SB
Beryllium	0.041 B	**0.23 B**	**0.69 B**	0.033 B	0.13 B	0.5	0.16 or SB
Cadmium	0.29 B	0.38	U	U	U	0.7	1 or SB*
Calcium	514	988	1240	73	108	240.0	SB
Chromium	4.4	7.6	**18.8**	1.9	3.7	0.6	10 or SB*
Cobalt	1.6 B	1.2 B	3.2 B	1.1 B	0.17 B	0.9	30 or SB
Copper	**135**	**56.8**	**60.7**	3.1	10.5	4.0	25 or SB
Iron	**3500**	**6980**	**16700**	**2510**	**4660**	26.0	2,000 or SB
Lead	**700**	418	111	2.6	72.7	4.0	500
Magnesium	268	472	1130	263	226	8.0	SB
Manganese	22.0	72.2	186	87.9	25.7	0.8	SB
Mercury	**0.78**	0.091	**0.11 B**	U	0.035 B	0.1	0.1
Nickel	**146**	7.2	12.1	1.2 B	1.9 B	0.8	13 or SB
Potassium	52.3 B	157	353	67.2	91.6	78.0	SB
Selenium	0.65 B	1.1 B	**2.4 B**	U	0.73 B	9.0	2 or SB
Silver	0.71 B	U	U	0.31 B	U	2.0	SB
Sodium	16.3 B	38.6 B	86.7 B	6.5 B	20.1 B	83.0	SB
Thallium	0.43 B	0.75 B	1.4 B	0.15 B	0.5 B	3.0	SB
Vanadium	4.6	11.3	27.7	4.5	8.7	0.7	150 or SB
Zinc	**177**	**51.6**	**78.7**	13.5	13.9	7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
*: Proposed revised criteria for cadmium and chromium in TAGM 4046 Appendix A.
Bold: Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

TABLE 2-4 (continued)

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PREVIOUS INVESTIGATION RESULTS
SUBSURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SB-28 (2-4)	SB-29 (0-2)	SB-29 (2-4)	SB-30 (0-2)	SB-30 (2-4)	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	2-4'	0-2'	2-4'	0-2'	2-4'	--	mg/kg
DATE OF COLLECTION	10/15/03	10/14/03	10/14/03	10/14/03	10/14/03	ug/L	
PERCENT SOLIDS	74.0	94.0	85.0	88.0	94.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
Aluminum	3760	3340	6430	4610	3720	17.0	SB
Antimony	1.8	0.59	U	1	U	3.0	SB
Arsenic	2	1.6	0.6 B	3	0.67 B	3.0	7.5 or SB
Barium	5.3 B	10.5 B	12.7	**515**	11.5	4.0	300 or SB
Beryllium	**0.18 B**	0.072 B	0.041 B	0.15 B	0.1 B	0.5	0.16 or SB
Cadmium	U	0.071 B	0.13 B	0.34	U	0.7	1 or SB*
Calcium	96.6	202	270	643	166	240.0	SB
Chromium	5.3	3.5	5.4	5	3.6	0.6	10 or SB*
Cobalt	0.91 B	0.71 B	0.84 B	1.4 B	0.56 B	0.9	30 or SB
Copper	4.1	5.7	2.7	**55.7**	1.9	4.0	25 or SB
Iron	**5670**	**3720**	**3860**	**5990**	**3160**	26.0	2,000 or SB
Lead	4.1	30.6	3.9	127	4.7	4.0	500
Magnesium	284	307	281	376	279	8.0	SB
Manganese	47.7	37.5	14.1	103	15.1	0.8	SB
Mercury	U	U	U	U	U	0.1	0.1
Nickel	2.8 B	1.8 B	2.6 B	4.4	1.6 B	0.8	13 or SB
Potassium	74.2	98.8	109	141	82.4	78.0	SB
Selenium	0.65 B	1.3 B	1.3 B	**2.3**	1.1 B	9.0	2 or SB
Silver	U	0.34 B	U	0.52 B	0.27 B	2.0	SB
Sodium	14.7 B	13.3 B	36.4 B	19 B	13.1 B	83.0	SB
Thallium	0.44 B	0.71 B	0.57 B	1.1	0.66 B	3.0	SB
Vanadium	7.1	7.2	8.6	8.9	5.7	0.7	150 or SB
Zinc	8.8	17.9	7.7	**104**	6.2	7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
*: Proposed revised criteria for cadmium and chromium in TAGM 4046 Appendix A.
Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

TABLE 2-4 (continued)

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PREVIOUS INVESTIGATION RESULTS
SUBSURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SB-31 (0-2)	SB-31 (2-4)	SB-32 (0-2)	SB-32 (2-4)	SB-33 (0-2)	Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	0-2'	2-4'	0-2'	2-4'	0-2'	--	
DATE OF COLLECTION	10/14/03	10/14/03	10/14/03	10/14/03	10/14/03		
PERCENT SOLIDS	87.0	93.0	90.0	93.0	94.0		
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L	mg/kg
Aluminum	4610	3890	5160	3450	3790	17.0	SB
Antimony	0.18 U	0.54 U				3.0	SB
Arsenic	0.94 B	0.88 B	3.3	0.55 B	0.67 B	3.0	7.5 or SB
Barium	16.8	13.3	53.1	13.8	6.5 B	4.0	300 or SB
Beryllium	0.13 B	0.1 B	0.14 B	0.074 B	0.069 B	0.5	0.16 or SB
Cadmium	0.048 B	0.23 B	0.23 B	0.23 U	0.23 U	0.7	1 or SB*
Calcium	188	155	542	205	53.5	240.0	SB
Chromium	4.1	4.2	5.9	3.8	3.1	0.6	10 or SB*
Cobalt	0.72 B	0.86 B	1.6 B	0.8 B	0.48 B	0.9	30 or SB
Copper	6.9	2.9	**95**	3.1	1 B	4.0	25 or SB
Iron	**3650**	**3090**	**6250**	**2310**	**3340**	26.0	2,000 or SB
Lead	36.5	6.1	127	5.2	4.7	4.0	500
Magnesium	278	334	506	451	180	8.0	SB
Manganese	30	34.2	73.2	18.1	16.2	0.8	SB
Mercury	0.028 B	0.1 U	0.1 U	0.1 U	0.018 B	0.1	0.1
Nickel	2.3 B	1.8 B	4.5	2.1 B	1.4 B	0.8	13 or SB
Potassium	88.4	92	142	101	59	78.0	SB
Selenium	1.2 B	1 B	**2.2**	0.69 B	1.2 B	9.0	2 or SB
Silver	0.31 B	0.26 B	0.56 B	0.19 B	0.29 B	2.0	SB
Sodium	13.8 B	11.5 B	23.1 B	19.3 B	9.5 B	83.0	SB
Thallium	0.75 B	0.62 B	1.1	0.59 B	0.55 B	3.0	SB
Vanadium	6.9	5.9	10.3	4.8	5.9	0.7	150 or SB
Zinc	**61**	**21.5**	**136**	13.2	8.7	7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
*: Proposed revised criteria for cadmium and chromium in TAGM 4046 Appendix A.
Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

TABLE 2-4 (continued)

LONG ISLAND RAILROAD YAPHANK SITE - DRAINAGE SWALE AREA
PREVIOUS INVESTIGATION RESULTS
SUBSURFACE SOIL SAMPLING RESULTS
TAL METALS

SAMPLE ID	SB-33 (2-4)	SB-34 (0-2)	SB-34 (2-4)			Instrument Detection Limits	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives
DEPTH	2-4'	0-2'	2-4'			--	
DATE OF COLLECTION	10/14/03	10/14/03	10/14/03				
PERCENT SOLIDS	91.0	94.0	93.0				
UNITS	mg/kg	mg/kg	mg/kg			ug/L	mg/kg
Aluminum	3940	3520	3370			17.0	SB
Antimony	U	0.22				3.0	SB
Arsenic	0.99	1	1.4			3.0	7.5 or SB
Barium	6.1 B	7 B	5.9 B			4.0	300 or SB
Beryllium	0.097 B	0.071 B	0.15 B			0.5	0.16 or SB
Cadmium	U	U	U			0.7	1 or SB*
Calcium	54.3	148	104			240.0	SB
Chromium	5.1	2.9	3.4			0.6	10 or SB*
Cobalt	0.94 B	0.78 B	0.86 B			0.9	30 or SB
Copper	2.1	1.7	3			4.0	25 or SB
Iron	4390	4540	5030			26.0	2,000 or SB
Lead	9.5	17.5	26.1			4.0	500
Magnesium	460	413	282			8.0	SB
Manganese	29.7	95.9	34.4			0.8	SB
Mercury	U	0.022 B	U			0.1	0.1
Nickel	3.4	1.7 B	1.9 B			0.8	13 or SB
Potassium	100	68.6	81.5			78.0	SB
Selenium	1.5	1.6	1.8			9.0	2 or SB
Silver	0.36 B	0.39 B	0.43 B			2.0	SB
Sodium	8.7 B	12.4 B	11.1 B			83.0	SB
Thallium	0.79 B	0.59 B	0.82 B			3.0	SB
Vanadium	7.5	7.7	7.2			0.7	150 or SB
Zinc	8.7	10.3	11.1			7.0	20 or SB

QUALIFIERS:
U: Constituent analyzed for but not detected.
B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:
*: Proposed revised criteria for cadmium and chromium in TAGM 4046 Appendix A.
Value exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
SB: Site Background

Copper and zinc were detected at concentrations of 111 mg/kg and 349 mg/kg, respectively, in the shallower soil sample SB-77 (2 to 4 feet). Exceedances of NYSDEC soil cleanup objectives were not detected in the 6 to 8 foot sample. At soil probe SB-76, completed approximately 10 feet north of SB-26, zinc was detected at a concentration of 94.6 mg/kg at a depth of 2 to 4 feet below grade.

During the Pre-IRM sampling program, soil probe SB-81 was completed approximately 80 feet south of SB-26 to a depth of 4 feet below grade within the Off-site Drainage Swale for further delineation. No exceedances of NYSDEC soil cleanup objectives were detected.

During the Site Investigation, soil samples collected at SB-27 exhibited metals in excess of the NYSDEC soil cleanup objectives to 4 feet below grade. SB-27 was located approximately 50 feet east of the Off-site Drainage Swale and in the vicinity of surface soil samples SS-49 and SS-55. However, soil probes SB-79 and SB-80, completed during the Pre-IRM sampling in the vicinity of SB-27, did not exhibit any exceedances of NYSDEC soil cleanup objectives to a completed depth of 6 feet below grade.

2.3 Limits of Soil Removal

Based on the results of the Pre-IRM sampling program and the data previously collected from the Off-site Drainage Swale Area, as described above, the LIRR proposes to remove the contaminated soil from this area as depicted on Figure 2-2.

Surface soil found to exceed the NYSDEC soil cleanup objectives will be removed to a depth of 1 foot below grade, as shown on Figure 2-2. Note that in areas where the concrete slab exists as shown on Figure 2-2, surface soil will be removed to the top of the slab, but the slab will not be removed. Generally, this includes the area within and in the vicinity of the Off-site Drainage Swale, as well as along the fence line of the Yaphank site to the north and east of the Off-site Drainage Swale. This area to be excavated is estimated to be approximately 15,000 square feet and will involve the removal of approximately 556 cubic yards of soil.

TAX PARCEL–SITE BOUNDARY

ELEVATED TOPOGRAPHY

APPROX. LOCATION EP–02A

ADDITIONAL AREA TO BE EXCAVATED TO 2' BGS

ADDITIONAL AREA TO BE EXCAVATED TO 6' BGS

APPROX. LOCATION EP–19A

APPROX. LOCATION EP–13

8' CHAIN LINK FENCE

POLE

FILL AREA

TEST PIT 1

TEST PIT 2

TEST PIT 3

SLAG–1

SLAG–2

RIVER ROAD

ADDITIONAL AREA TO BE EXCAVATED TO 2' BGS

APPROX. LOCATION EP–07A

ADDITIONAL AREA TO BE EXCAVATED TO 2' BGS

APPROXIMATE LOCATION OF CONCRETE SLAB/FOUNDATION OF FORMER STRUCTURE

DRAINAGE SWALE

SS–72 SB–35 SS–76 SS–17 SS–66 SS–77 SB–38 SB–1 SB–40 SS–27 SS–67 SB–17 SS–69 SB–18 SS–68 SB–24 SS–1 SS–8 SS–9 SS–7 SS–70 SS–79 SB–7 SB–19 SS–10 SB–6 SS–2 SS–11 SS–12 SS–80 SS–46 SS–71 MW–07 SB–20 SB–23 MW–08 SS–13 SB–21 SS–14 SS–15 SB–22 SS–16 SB–8 SS–3 SS–4 SS–48 SS–53 SB–25 SS–47 SS–50 SS–103 SS–104 RR2 SB–79 SS–101 SS–49 SB–27 SS–55 RR3 SB–28 SS–56 SB–76 SB–77 SS–54 SB–26 SB–80 SS–102 SS–105 SS–106 SB–78 SB–30 SS–58 SS–57 SB–29 SS–107 SS–108 SB–32 SB–31 SS–59 SS–109 RR1 SS–60 SS–110 SS–111 MW–15 SB–81 SS–62 SS–112 SS–113 SS–61 SS–114 SS–115 SS–63 SS–116 SB–33 SB–34 SS–64 MW–16

LEGEND

- SITE BOUNDARY
- FENCE
- ELEVATED TOPOGRAPHY
- SS–101 — PRE–IRM SAMPLING PROGRAM SURFACE SOIL SAMPLE LOCATION
- SB–76 — PRE–IRM SAMPLING PROGRAM SOIL BORING LOCATION
- SS–01 — EXISTING SURFACE SOIL SAMPLE LOCATION
- SB–17 — EXISTING SOIL BORING LOCATION
- TEST PIT 1 — EXISTING TEST PIT LOCATION FROM 1998 PSA
- SLAG–1 — EXISTING SLAG SAMPLE LOCATION FROM 2003 SITE INVESTIGATION
- MW–05 — EXISTING GROUNDWATER MONITORING WELL
- RR1 — APPROXIMATE LOCATION OF EXISTING SCDHS GROUNDWATER MONITORING WELL
- APPROXIMATE EXTENT OF FILL
- AREA TO BE EXCAVATED TO A DEPTH OF 1 FOOT
- AREA TO BE EXCAVATED TO A DEPTH OF 2 FEET
- AREA TO BE EXCAVATED TO A DEPTH OF 4 FEET
- AREA TO BE EXCAVATED TO A DEPTH OF 6 FEET
- AREA TO BE EXCAVATED TO A DEPTH OF 8 FEET

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SCALE IN FEET

LONG ISLAND RAIL ROAD
YAPHANK SITE

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AREA TO BE EXCAVATED IN VICINITY OF THE DRAINAGE SWALE

FIGURE 2-2

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The area of soil to be excavated to a depth of 2 feet below grade is based on where exceedances of the NYSDEC soil cleanup objectives were detected to a maximum depth of 2 feet below grade. Generally, this includes the area within and in the vicinity of the northern half of the Off-site Drainage Swale. The area to be excavated is estimated to be approximately 2,151 square feet and will involve the removal of approximately 160 cubic yards of soil. As shown on Figure 2-2, this area includes a portion of a concrete slab and therefore will require the partial removal of this slab in order to complete the excavation of the soil.

The area of soil to be excavated to a depth of 4 feet below grade is based on where soil was observed to exceed the NYSDEC soil cleanup objectives to a maximum depth of 4 feet below grade. Generally, this includes the area within and in the vicinity of the Off-site Drainage Swale surrounding completed soil probe SB-27. The area to be excavated is estimated to be approximately 100 square feet and will involve the removal of approximately 15 cubic yards of soil.

The area of soil to be excavated to a depth of 6 feet below grade is based on where soil was observed to exceed the NYSDEC soil cleanup objectives to a maximum depth of 6 feet below grade. Generally, this includes the area within and in the vicinity of the Off-site Drainage Swale, adjacent to completed soil probes SB-26, SB-76 and SB-77. This area to be excavated is estimated to be approximately 300 square feet and will involve the removal of approximately 67 cubic yards of soil. As shown on Figure 2-2, this area includes a portion of a concrete slab and therefore will require the partial removal of this slab in order to complete the excavation of the soil.

The area of soil to be excavated to a depth of 8 feet below grade is based on where soil was observed to exceed the NYSDEC soil cleanup objectives to a maximum depth of 8 feet below grade. Generally, this includes the area within and in the vicinity of the Off-site Drainage Swale surrounding completed soil probe SB-78. The area to be excavated is estimated to be approximately 90 square feet and will involve the removal of approximately 27 cubic yards of soil. As shown on Figure 2-2, this area includes a portion of a concrete slab and therefore will require the partial removal of this slab in order to complete the excavation of the soil.

3.0 OFF-SITE DRAINAGE SWALE AREA

As detailed in Section 2.0, the LIRR has identified an area within the off-site drainage swale area and the adjoining western lowland area that will require soil excavation based on the concentrations of metals detected in surface and shallow subsurface soil. The area requiring excavation is approximately 17,100 square feet and would include approximately 755 cubic yards of soil to be removed. This section describes the activities to be undertaken to complete this IRM. These activities will be completed by a remediation contractor under the supervision of the LIRR and/or the LIRR's Engineer.

3.1 Mobilization

Site mobilization activities will be performed by the contractor prior to initiation of IRM activities. Staging areas for construction equipment and excavated material storage and handling, decontamination areas and temporary facilities will be established in the western lowland area of the LIRR Yaphank site. This area is fenced with a gate for access and security.

Equipment and personnel decontamination facilities will be described in detail in a Construction Health and Safety Plan (CHASP) to be provided by the contractor. All equipment exposed to contaminated soil will be decontaminated on-site in accordance with the CHASP and removed at the conclusion of IRM activities.

All personnel and visitors will be required to sign in and sign out upon arrival and departure. Personnel and visitors entering the site will be required to have 40-hour HAZWOPER training and participate in a medical surveillance program.

Prior to the initiation of remedial activities, utilities on public and private properties will be identified and located by the contractor in accordance with local and state requirements. Potable water will be supplied to the site by the contractor from the nearest hydrant.

3.2 Excavation

The area of surface and subsurface soil to be excavated as part of this IRM is presented in Figure 2-2. As shown on the figure, soil from a portion of the western lowland area will also be removed in order to allow for placement of erosion control measures and reduce potential for future impacts to off-site properties. The limits of excavation will be surveyed by the contractor in the field, prior to initiation of interim remedial activities, by a land surveyor licensed to practice in New York State. Since a concrete foundation of a former building remains on a portion of the off-site drainage swale area, soil from this area will be excavated to expose the surface of the concrete foundation. As described in Section 2.3, partial removal of this slab will be required to facilitate excavation. The depth of excavation for the remaining portion of this area is relatively shallow and therefore, excavation can be completed with standard excavation equipment, such as a small backhoe. In some areas, hand tools such as picks and shovels or vactor equipment may be required to excavate around large trees or other areas not accessible by the excavation equipment, such as in the vicinity of the existing site fence and around monitoring wells.

The contractor will take all necessary precautions, as required, to prevent the disturbance of bushes, shrubs, trees, top soil and other property assets outside the limits of the proposed excavation. In addition, only trees of less than 6 inches in diameter will be removed from within the area to be excavated. All other trees greater than 6 inches in diameter will not be disturbed. Soil around the trees will be excavated in a manner to minimize damage to the trees.

Excavation of contaminated soil surrounding existing groundwater monitoring wells will be completed in a manner to maintain the integrity of the wells. Soil will be replaced around the wells to restore the existing grade. If necessary, at the completion of the IRM, damaged wells will be restored.

Air monitoring will be performed throughout the duration of the work and will dictate actions required to control emissions. A detailed air monitoring program, including action levels, will be included in the CHASP. If dust is generated during implementation of the IRM at

levels that exceed minimum action levels, standard dust suppression techniques will be employed. Standard dust suppression techniques that may be employed during excavation activities, as well as any other material handling activities include:

- application of wetting agents to soil, stockpiles, buckets and equipment; and
- covering/tarping of containers, excavations and stockpiles.

If dust suppression techniques do not lower the particulate concentrations to an acceptable level, work will be suspended until acceptable corrective measures are implemented. As part of the CHASP, the contractor will prepare a Community Air Monitoring Plan (CAMP) prior to mobilization. The contractor will be responsible for implementing the CAMP. The plan will comply with the requirements of the New York State Department of Health Generic Community Air Monitoring Plan included in Appendix A.

3.3 Characterization of Soil

In order to minimize the staging of soil on-site during the implementation of the IRM, pre-characterization sampling will be completed by the contractor in place and prior to mobilization of the remedial equipment in accordance with the approved disposal facility requirements. Given the estimated volume to be removed will be less than 1,000 cubic yards, a minimum of four composite soil samples will be collected by the contractor. Each composite soil sample will be composited from six locations located within the excavated area and will be collected from 0 to 1 foot below grade. Each composite soil sample will be analyzed for the parameters required by the approved disposal facility. Further details regarding soil analysis will be provided in the QA/QC Plan to be prepared by the contractor. Once pre-characterized, material can be excavated and directly loaded into off-site transportation vehicles.

3.4 Off-site Transportation and Disposal

As discussed above, prior to transport off-site, sampling of soil will be required to obtain waste characterization data for disposal purposes. Permitted transporters approved by the LIRR

will transport the soil to permitted off-site LIRR-approved disposal facilities. All trucks will have functional intact tarps to cover their loads.

LIRR will be the generator of record. Soil will not be transported for disposal without prior approval from LIRR. The waste transporters will provide manifests for any hazardous waste shipped as part of this project. Documentation of transportation and disposal of all material will be maintained in the project files.

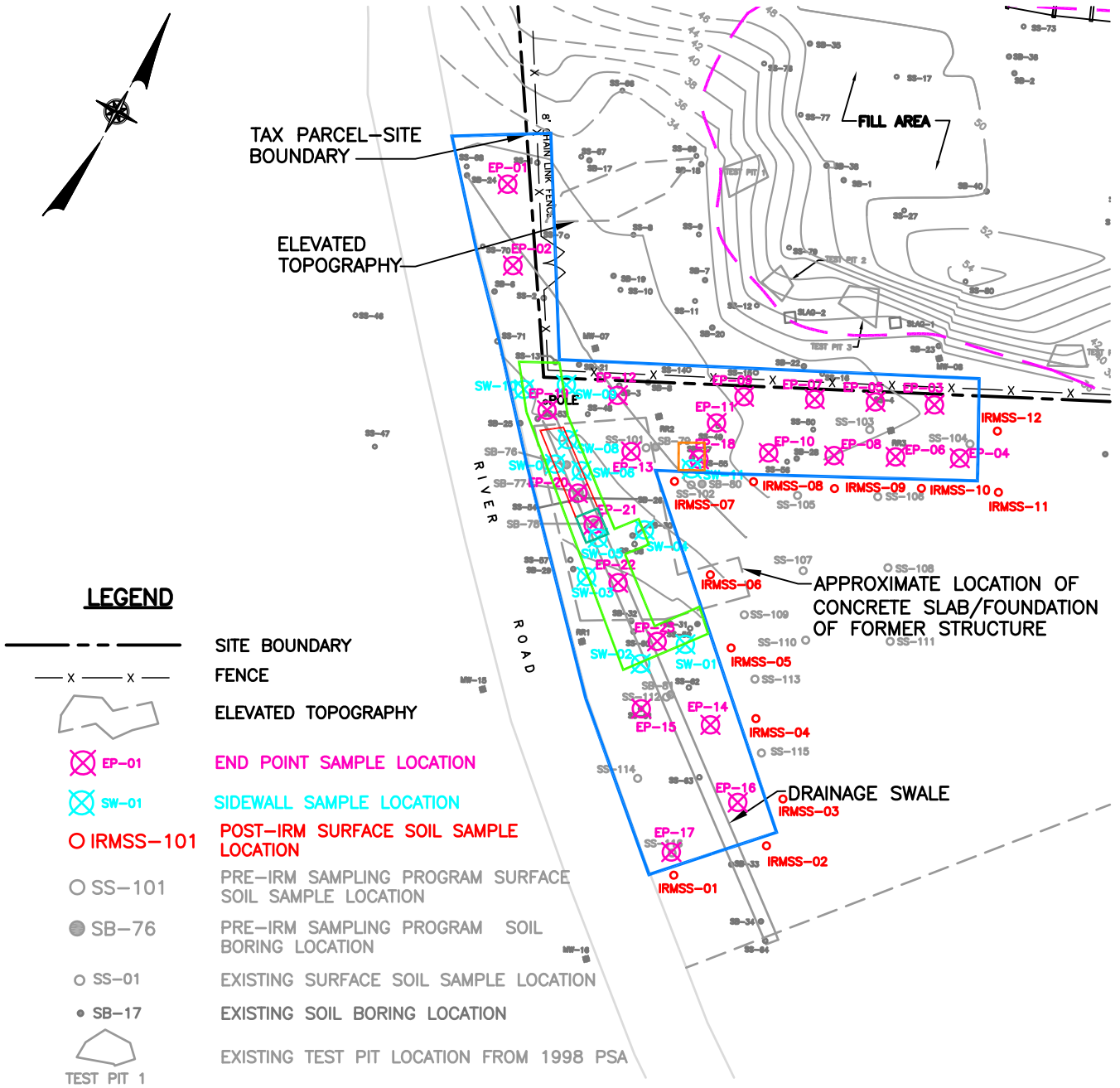
3.5 Endpoint Sampling

After reaching the final remediation depth, samples will be collected by the contractor from the excavation to determine the characteristics of the remaining soil prior to site restoration. Figure 3-1 provides the approximate location of each endpoint sample location. Endpoint sampling will be completed as follows:

- 1-foot excavation: 17-endpoint samples
- 2-foot excavation: 3-endpoint samples and 6-sidewall samples
- 4-foot excavation: 1-endpoint sample and 1-sidewall sample
- 6-foot excavation: 1-endpoint sample and 3-sidewall samples
- 8-foot excavation: 1-endpoint sample and 1-sidewall sample

These endpoint samples will be positioned, as shown on Figure 3-1, in the areas of known contamination, specifically, the location of SB-77, SB-78, SS-49, SS-55, SS-61 and SS-116.

Each sample will be collected and analyzed for target analyte list (TAL) metals. Expedited two-day turn-around analysis will be performed and determinations will be made for further excavation prior to site restoration. The NYSDEC Recommended Soil Cleanup Objectives presented in TAGM 4046 will be used to screen the endpoint samples. The actual need for additional soil remediation will be determined by the LIRR in consultation with the



LEGEND

- SITE BOUNDARY
- FENCE
- ELEVATED TOPOGRAPHY
- EP-01 — END POINT SAMPLE LOCATION
- SW-01 — SIDEWALL SAMPLE LOCATION
- IRMSS-101 — POST-IRM SURFACE SOIL SAMPLE LOCATION
- SS-101 — PRE-IRM SAMPLING PROGRAM SURFACE SOIL SAMPLE LOCATION
- SB-76 — PRE-IRM SAMPLING PROGRAM SOIL BORING LOCATION
- SS-01 — EXISTING SURFACE SOIL SAMPLE LOCATION
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LONG ISLAND RAIL ROAD
YAPHANK SITE

POST EXCAVATION END POINT SAMPLE LOCATIONS

FIGURE 3-1

NYSDEC. When available, the LIRR will transmit the data to the NYSDEC for review along with a sample location map. The NYSDEC will be available for a conference call with the LIRR to discuss the provided data and to determine if additional remediation is necessary within one day of receipt of the endpoint sample analysis data. Field sampling procedures and quality assurance protocols will be conducted in accordance with the QA/QC Plan prepared by the remedial contractor.

3.6 Backfill and Top Soil Placement

Backfill will be placed in excavated areas by the contractor, including the area of existing concrete foundations. Backfill will be placed to within 6 inches of the required grade and will be clean fill from off-site certified sources and approved by the LIRR and NYSDEC prior to use. The fill will consist of mostly coarse sandy material containing no organic material, rubbish or debris capable of being compacted to a relative compaction of 90 percent.

The fill material will be accompanied by a Certificate of Clean Fill certifying that the area from which the fill originated was never used for industrial purposes and that the fill is free of contaminants. This certificate will be signed by an officer of the contractor or its designee. The Certificate of Clean Fill will be submitted with a description of the origin of the fill, including the name of the supplier, the source of the fill and the history of the location where the fill was obtained for approval by the LIRR and NYSDEC prior to use of the fill.

After placing the clean backfill to the required grade, a minimum of 6 inches of topsoil will be placed on top of the backfill. Prior to placement of the topsoil, the contractor will pre-qualify the source of the topsoil layer material. For each source (stockpile) to be pre-qualified, the contractor will furnish the name and location of the source or stockpile, the estimated quantity of material available and a representative sample of each soil under consideration. Sampling will be performed in the presence of the LIRR. The LIRR may test, at its discretion, the submitted soil for the purpose of determining conformance with the IRM Work Plan. The contractor will sample and test each source, as specified below.

- Grain size distribution tests will be performed in accordance with ASTM D422, including sieve and hydrometer analysis.
- The soil will be characterized in accordance with ASTM D2487.
- pH of the soil will be determined in accordance with ASTM D4972.
- Organic content of the soil will be determined in accordance with ASTM D2974.

Upon receipt, the LIRR and NYSDEC will jointly review the data and determine the acceptability of the material and its source.

3.7 Site Restoration

Upon completion of the interim remedial activities, all equipment, any remaining materials and temporary access/tracking pads will be removed from the site.

Areas outside the excavation area disturbed during implementation of the IRM, will be restored to the existing grade. Within the off-site drainage swale area, soil will be replaced on the exposed concrete foundation. As necessary, trees will be planted to replace trees removed during the implementation of the IRM.

3.8 Erosion Controls

Storm water management, soil erosion and sediment control will be performed in accordance with New York State Guidelines for Urban Erosion and Sediment Control. The contractor will be responsible for preventing off-site migration of storm water during implementation of the IRM.

Temporary stockpiles of contaminated soil will be placed on bermed plastic liners and covered with plastic liners to prevent erosion. Stockpiles of clean fill will also be placed on bermed liners. Liners will be secured in place with stakes or concrete blocks.

At the completion of the removal of the contaminated soil, a silt fence will be installed along the fence line in the western lowland area. The location of the silt fence is presented on Drawing 1, provided in the map pocket at the back of the work plan. The silt fence will trap the sediment in runoff water on-site while passing relatively clear water. The silt fence is made up of livestock wire fence fastened onto wooden fence posts. A filter fabric is fastened to the fence. The bottom end of the fabric will be buried in a 6-inch deep trench. This temporary measure will be utilized until full remediation of the LIRR Yaphank site is completed.

3.9 Windscreen

As discussed in Section 1.0, a windscreen will be installed on the existing site perimeter separating the LIRR Yaphank site and the off-site drainage swale to minimize the potential for windblown dust from the LIRR property to enter the remediated area. The windscreen will be a PVC vinyl coated polyester mesh fabric with reinforced hems and grommets every 12 inches on all edges. The windscreen will be installed on the interior side of the fence using appropriate tie wraps at every grommet. The location of the windscreen is shown on Drawing 1.

4.0 SITE FENCING

Currently, the LIRR Yaphank site is only partially fenced on the western and southern property boundaries and, therefore, access to the site is unrestricted. The existing fence consists of a chain link fence 8 feet in height, which is damaged or in need of maintenance primarily along the southern property boundary. In order to prevent access to the site by unauthorized personnel, the existing fence will be repaired and upgraded as required. In addition, the 8-foot high chain link fence will be extended along the northern, southern and eastern property boundaries, as shown on Drawing 1 provided in the map pocket at the back of the work plan. Finally, a temporary snow fence will be erected through the SS-51, SS-52, SB-9 and SS-81 sample locations, as shown on Drawing 1.

As shown on Drawing 1, the fencing installed on the northern property would be approximately 1,200 feet in length and will be offset from the active rail line and rail spur a minimum of 20 feet from the track centerline to allow for track maintenance. Due to the presence of site-related fill material present at ground surface in several locations adjacent to the tracks, the LIRR will be placing 6 inches of crushed stone between the new fence and the track ballast in the area shown on Drawing 1. As part of the fence installation, a small pile of site-related fill material which is located at ground surface will be sampled for waste characterization analysis and removed from the site for off-site disposal. In addition, a swing gate will be installed on the southern side of the fence as shown on Drawing 1 to allow for equipment access to the site.

It is anticipated that approximately 360 feet of fencing will need to be installed along the southern site boundaries and approximately 120 feet along the eastern property boundary. As part of this effort, an existing chain link fence bisecting the eastern portion of the LIRR property will be removed.

All materials for the 8-foot high chain link fence will be new and will not include reconditioned thin-wall pipe, rerolled or open seam pipe. All materials will be thoroughly galvanized on the inside and outside surface in accordance with specifications for "zinc (hot galvanized) coatings on products fabricated from rolled, pressed and forged steel shapes, plates,

bars and strip," ASTM A123, as currently revised. The hot dip galvanizing process will provide a minimum of 2 ounces per square foot of total coated surface. The chain link fence fabric will consist of galvanized steel wire fabric. The fabric thickness will be 9-gauge (0.148-inch) with a uniform square mesh measuring 2 inches ±1/8-inch between its parallel sides. The wire core will consist of the best open hearth commercial quality steel to which a 7 mil. galvanized coating has been evenly applied free of blisters.

A 0.177-inch diameter tension wire will be placed 6 inches from the top of the fabric and 3 inches from the bottom of the fabric that will be attached to each fence fabric using 11-gauge hog rings.

Fence posts will be 2.5-inch diameter on end and corner sections and will be 2-inch diameter at all other locations.

All posts will be set 3 feet deep in concrete footings. These footings will have a minimum diameter of 12 inches and a minimum depth of 3 feet 6 inches. The top of the footings will be located approximately at the existing grade and will be domed so as to shed water. All posts will be centered in their footings. The footings will be constructed of concrete having a minimum compressive strength of 3,000 psi after 28 days.

Locks and keys will be supplied and master keyed to the LIRR's specifications. The contractor will supply four sets of keys to the LIRR. Locks will be four-pin tumbler brass construction Master Lock Model 2KA, or approved equal.

5.0 ATC PROPERTY

The ATC property located to the east of the LIRR-Yaphank site is underlain by fill material. As described in the Site Investigation Report, analysis of the fill material indicated the presence of metals exceeding the NYSDEC soil cleanup objectives, including arsenic, copper, lead and zinc. The presence of these metals within unpaved areas represents a remote potential exposure pathway to on-site workers through ingestion, dermal contact and inhalation of windblown dust. Therefore, recommendation was made as part of the SIR to cover the unpaved areas within the ATC property with 6 inches of crushed stone or recycled concrete aggregate (RCA).

As shown on Drawing 1, based on a site visit conducted in February 2005, approximately 30,000 square feet of the ATC property is currently unpaved. This area will be covered with a minimum of 6 inches of crushed stone or RCA. Prior to use, proposed material will be approved by LIRR.

The RCA used will be a uniformly graded mixture of crushed concrete conforming to the material requirements of the New York State Department of Transportation (NYSDOT) Standard Specification Item No. 304.03 - Subbase Course, Type 2.

Prior to placement, the areas will be compacted and graded, and all hollows and depressions shall be filled with acceptable general fill and re-rolled. Once placed, the RCA or crushed stone will be compacted as required and directed by LIRR. The contractor will compact the areas using no less than four passes of the roller and will fill and re-roll any depressions as required and as directed by LIRR.

6.0 CITIZEN PARTICIPATION

In accordance with the NYSDEC Voluntary Cleanup Program Guide, dated May 2002, the LIRR will assist the NYSDEC in the citizen participation activities as part of this IRM program. After the NYSDEC has approved the IRM Work Plan, the Department will send a fact sheet to persons on a mailing list before the start of field work. The fact sheet will be sent to adjacent property owners, elected officials, any relevant community groups, and local media. The NYSDEC will be responsible for developing the mailing list. The fact sheet will describe the site, provide a summary of the purpose and goals of the IRM, include the project schedule and milestones, and list sources of additional information.

7.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

A Construction Quality Assurance/Quality Control Plan will be prepared by the contractor for review by the LIRR. The plan will identify procedures to be utilized to ensure the quality of the work performed meets the objectives of this Interim Remedial Measures Work Plan. The QA/QC plan will include, at a minimum, the following:

- A description of the quality control organization including a chart showing the lines of authority.
- The names, qualifications, duties and responsibilities of each person assigned a QC function.
- Procedures for scheduling and managing submittals including those from subcontractors.
- The location, number and type of each sample to be collected and analysis to be performed for all samples to be collected, including waste characterization and endpoint sampling requirements.
- Description of sample collection methods for each sample matrix including sample containers, sample custody, sample packaging, storage and shipping procedures.
- The analytical protocols to be utilized.
- Quality control methods and procedures for each specific test to be used during construction.
- The name, address and qualifications of each proposed testing laboratory and the intended project-specific function.
- A description of all instrumentation and equipment to be used for testing on-site, as well as operating and calibration procedures.
- Reporting procedures for quality assurance activities including proposed reporting formats.
- Method for notification of changes.

The contractor will be responsible for implementing the QA/QC plan.

8.0 HEALTH AND SAFETY

The contractor will prepare a Construction Health and Safety Plan (CHASP). Site personnel performing interim remedial measures work will be required to read and comply with the requirements of the CHASP.

The CHASP will be submitted to LIRR prior to initiation of the project. The CHASP will be required to address all the appropriate federal, state and local regulatory requirements necessary to undertake and successfully complete the Interim Remedial Measures. The CHASP will be prepared in accordance with 29 CFR 1910.129 and will include the following items:

- Health and safety organization, including résumés of personnel responsible for health and safety
- Project site description and hazard assessment
- Training requirements
- Medical surveillance requirements
- Project site control procedures
- Standard operating procedures and engineering controls
- Personnel protective equipment requirements
- Personnel hygiene and decontamination protocols
- Equipment decontamination procedures
- Air monitoring requirements
- Emergency equipment/first aid requirements
- Emergency responses/contingency procedures
- Heat and cold stress procedures
- Record keeping requirements
- Community protection plan

The contractor will be responsible for ensuring that the CHASP and all work associated with the implementation of the IRM is performed in accordance with safe working practices including all Occupational Safety and Health Administration (OSHA) requirements. All site personnel will be trained and certified in the proper use of personal protective equipment and will have knowledge and understanding of construction standards. Certifications regarding training and expertise will be required prior to the start of work.

As part of the CHASP, the construction contractor will prepare a Community Air Monitoring Plan (CAMP) prior to mobilization. The remedial contractor will be responsible for implementing the CAMP. The plan will comply with the requirements of the New York State Department of Health Generic Community Air Monitoring Plan included as Appendix A.

9.0 REPORTING AND DOCUMENTATION

The contractor will be required to prepare progress reports each month during implementation of the interim remedial measure. Each report will include information on the work completed during the month, the anticipated schedule for the following months, and a description of any problems encountered which will impact project progress and their resolution. Progress reports will be available for regulatory agency review.

Throughout implementation of the interim remedial measure, records will be maintained by the contractor and engineer performing construction inspection to document activities completed on-site. Records that will be maintained include the following:

- Daily field activity reports
- Visitor sign-in/sign-out logs
- Construction photographs
- Instrument calibration logs
- Pre-Characterization Sampling Results
- Waste manifests/bills of lading and disposal facility receipts
- Waste characterization sampling results and waste treatment/ disposal facility prequalification forms
- Chain-of-custody forms
- Air monitoring forms
- Contractor submittals
- Measurements of material quantities for progress payments
- Surveys
- Incident/accident reports
- Meeting minutes
- Endpoint sampling results

At the completion of the program, the LIRR will submit to the NYSDEC an Interim Remedial Measures Completion Report that will include a description of the activities that were accomplished, the results of samples that were collected, and a data usability report. Conclusions regarding the completeness of the objectives described in the plan and recommendations on any future actions that need to be taken will be included.

10.0 PROJECT SCHEDULE AND KEY MILESTONES

A preliminary schedule for implementation of the interim remedial measures is provided below. Key milestones are identified in order to monitor work progress.

Schedule Milestone	Estimated Completion Time from Submittal of Draft Interim Remedial Measures Work Plan
• Submittal of Draft Interim Remedial Measures Work Plan for NYSDEC Review	Day 0
• Receive Comments from NYSDEC	Day 30
• Submittal of Final Interim Remedial Measure Work Plan	Day 45
• Preparation of Specifications for Remedial Contractor	Day 60
• NYSDEC to issue IRM Fact Sheet	Day 90
• Solicitation/Selection of Contractor	Day 165
• Mobilization	Day 180
• Completion of Interim Remedial Measures	Day 240
• Submit IRM Completion Report to NYSDEC	Day 280

APPENDIX A

NEW YORK STATE DEPARTMENT OF HEALTH
GENERIC COMMUNITY AIR MONITORING PLAN

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored **continuously** at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 20, 2000

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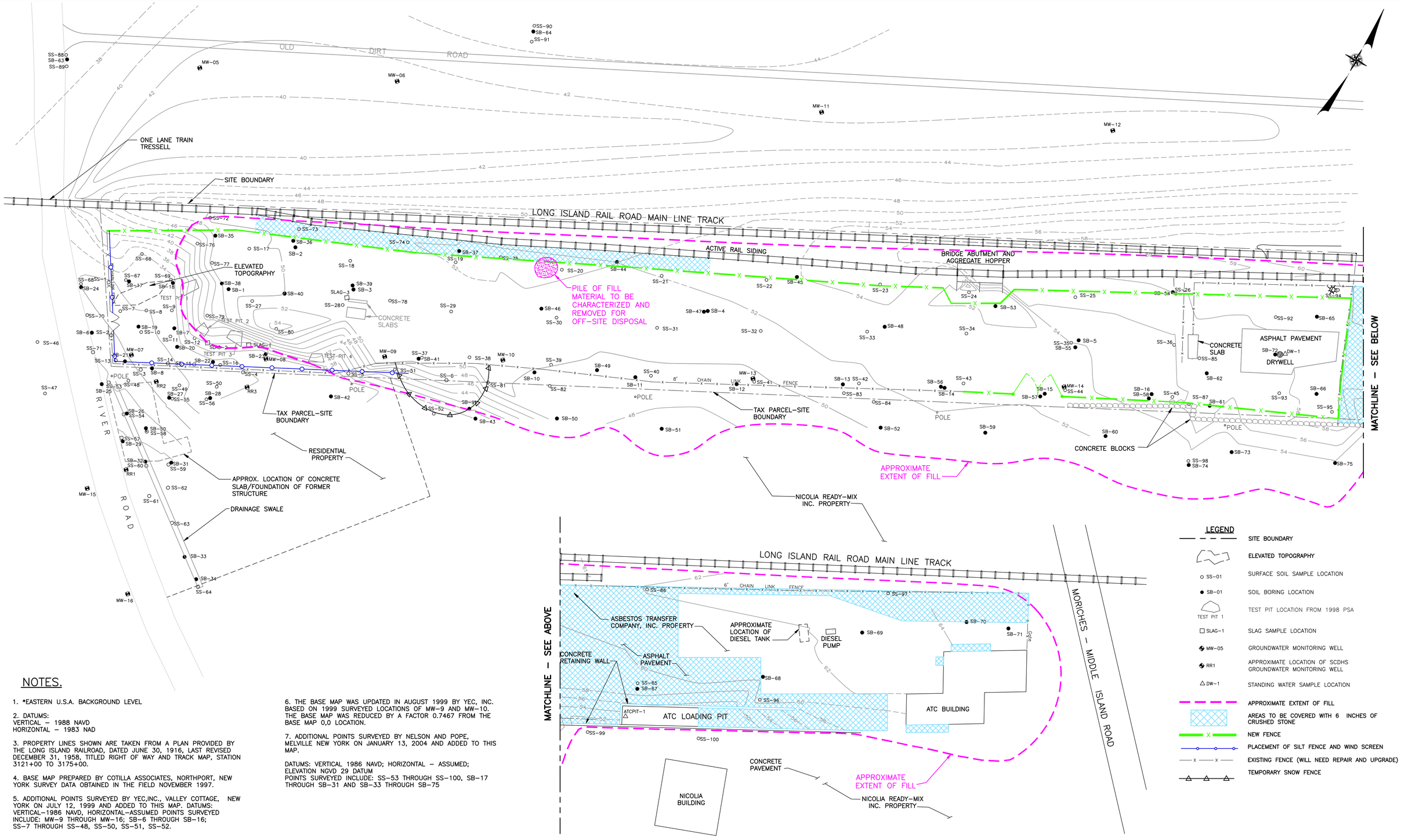

NOTES.

1. *EASTERN U.S.A. BACKGROUND LEVEL

2. DATUMS:
VERTICAL – 1988 NAVD
HORIZONTAL – 1983 NAD

3. PROPERTY LINES SHOWN ARE TAKEN FROM A PLAN PROVIDED BY THE LONG ISLAND RAILROAD, DATED JUNE 30, 1916, LAST REVISED DECEMBER 31, 1958, TITLED RIGHT OF WAY AND TRACK MAP, STATION 3121+00 TO 3175+00.

4. BASE MAP PREPARED BY COTILLA ASSOCIATES, NORTHPORT, NEW YORK SURVEY DATA OBTAINED IN THE FIELD NOVEMBER 1997.

5. ADDITIONAL POINTS SURVEYED BY YEC,INC., VALLEY COTTAGE, NEW YORK ON JULY 12, 1999 AND ADDED TO THIS MAP. DATUMS: VERTICAL–1986 NAVD, HORIZONTAL–ASSUMED POINTS SURVEYED INCLUDE: MW-9 THROUGH MW-16; SB-6 THROUGH SB-16; SS-7 THROUGH SS-48, SS-50, SS-51, SS-52.

6. THE BASE MAP WAS UPDATED IN AUGUST 1999 BY YEC, INC. BASED ON 1999 SURVEYED LOCATIONS OF MW-9 AND MW-10. THE BASE MAP WAS REDUCED BY A FACTOR 0.7467 FROM THE BASE MAP 0,0 LOCATION.

7. ADDITIONAL POINTS SURVEYED BY NELSON AND POPE, MELVILLE NEW YORK ON JANUARY 13, 2004 AND ADDED TO THIS MAP.

DATUMS: VERTICAL 1986 NAVD; HORIZONTAL – ASSUMED; ELEVATION NGVD 29 DATUM
POINTS SURVEYED INCLUDE: SS-53 THROUGH SS-100, SB-17 THROUGH SB-31 AND SB-33 THROUGH SB-75

SOURCE: 1997 SURVEY, COTILLA ASSOCIATES; 1999 SURVEY, YEC INC.; 2004 SURVEY, NELSON AND POPE; TAX MAPS; 1969 AERIAL PHOTOGRAPH, LKB

LEGEND

- SITE BOUNDARY
- ELEVATED TOPOGRAPHY
- SS-01 — SURFACE SOIL SAMPLE LOCATION
- SB-01 — SOIL BORING LOCATION
- TEST PIT 1 — TEST PIT LOCATION FROM 1998 PSA
- SLAG-1 — SLAG SAMPLE LOCATION
- MW-05 — GROUNDWATER MONITORING WELL
- RR1 — APPROXIMATE LOCATION OF SCDHS GROUNDWATER MONITORING WELL
- DW-1 — STANDING WATER SAMPLE LOCATION
- APPROXIMATE EXTENT OF FILL
- AREAS TO BE COVERED WITH 6 INCHES OF CRUSHED STONE
- NEW FENCE
- PLACEMENT OF SILT FENCE AND WIND SCREEN
- EXISTING FENCE (WILL NEED REPAIR AND UPGRADE)
- TEMPORARY SNOW FENCE

LONG ISLAND RAILROAD - YAPHANK SITE
INTERIM REMEDIAL MEASURE WORK PLAN

INTERIM REMEDIAL MEASURES PLAN

0 40' 80'
SCALE: 1"=40'

DRAWING 1

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

October 28, 2005

Nathan Putnam, Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A, 11th Floor
625 Broadway
Albany, NY 12233-7015

Re: IRM Work Plan
LIRR Yaphank Site
(Site No. V-00384-1)

Dear Mr. Putnam:

As requested, Figure 3-1 from the Final Interim Remedial Measure Work Plan for the Long Island Rail Road Yaphank site has been revised to include additional surface soil samples. Specifically, and as shown by the attached revised Figure 3-1, surface soil samples will be collected approximately every 30-feet along the southern and eastern boundaries of the excavation.

Please do not hesitate to contact me at (718) 558-3620 if you have any questions or comments.

Very truly yours,

Andrew Wilson, P.E.
Project Manager

AW/MRD/tp
Enclosure
cc/encl.:
D. D'Ambrosio, NYSDEC
J. Deming, NYSDOH
C.Channer, Esq., MTA
L. Wunderlich, LIRR
T. Fox, D&B
cc: G. Bobersky, NYSDEC
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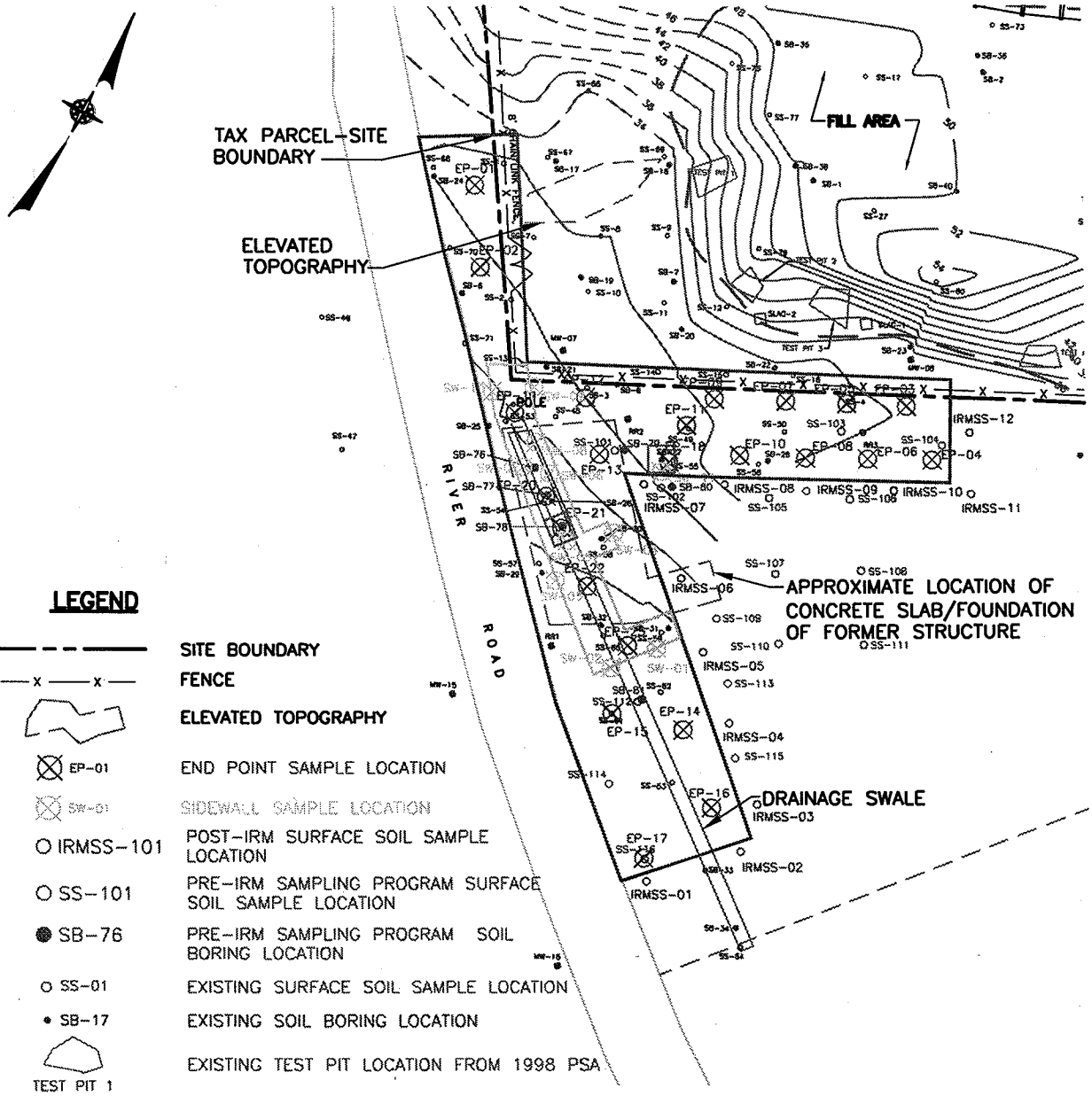

LEGEND

	SITE BOUNDARY
— X — X —	FENCE
	ELEVATED TOPOGRAPHY
EP-01	END POINT SAMPLE LOCATION
SW-01	SIDEWALL SAMPLE LOCATION
IRMSS-101	POST-IRM SURFACE SOIL SAMPLE LOCATION
SS-101	PRE-IRM SAMPLING PROGRAM SURFACE SOIL SAMPLE LOCATION
SB-76	PRE-IRM SAMPLING PROGRAM SOIL BORING LOCATION
SS-01	EXISTING SURFACE SOIL SAMPLE LOCATION
SB-17	EXISTING SOIL BORING LOCATION
TEST PIT 1	EXISTING TEST PIT LOCATION FROM 1998 PSA
SLAG-1	EXISTING SLAG SAMPLE LOCATION FROM 2003 SITE INVESTIGATION
MW-05	EXISTING GROUNDWATER MONITORING WELL
RR1	APPROXIMATE LOCATION OF EXISTING SCDHS GROUNDWATER MONITORING WELL
	APPROXIMATE EXTENT OF FILL
	AREA TO BE EXCAVATED TO A DEPTH OF 1 FOOT
	AREA TO BE EXCAVATED TO A DEPTH OF 2 FEET
	AREA TO BE EXCAVATED TO A DEPTH OF 4 FEET
	AREA TO BE EXCAVATED TO A DEPTH OF 6 FEET
	AREA TO BE EXCAVATED TO A DEPTH OF 8 FEET

0 60

SCALE IN FEET

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

LONG ISLAND RAIL ROAD
YAPHANK SITE

POST EXCAVATION END POINT SAMPLE LOCATIONS

FIGURE 3-1

\\Nt4\CADwork\1916\dwg\1916-END POINT.dwg, 10/28/05 02:09:37 PM, MDeVinney

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A
625 Broadway, 11th Floor
Albany, New York 12233-7015
Phone: (518) 402-9621 • Fax: (518) 402-9022
Website: www.dec.state.ny.us

Denise M. Sheehan
Acting
Commissioner

November 23, 2005

Mr. Andrew Wilson
Long Island Rail Road
Department #0435 4th Floor
90-27 Sutphin Boulevard
Jamaica, New York 11435

RE: Long Island Rail Road Yaphank Site
Site No. V00384
Suffolk County

Dear Mr. Wilson:

The New York State Department of Environmental Conservation, NYSDEC, has approved the September 2005 Interim Remedial Measure Work Plan with the November 9, 2005 addendum for the Yaphank site. The samples identified as IRMSS - 04, 07, 08, and 09 in the addendum are not required as they duplicate areas sampled during the pre-IRM sampling. The NYSDEC must issue a fact sheet to the public prior to the start of the fieldwork activities. Please coordinate the start of field work activities with the NYSDEC to ensure that we are able to provide such notice.

Sincerely,

Nathan E. Putnam

Nathan E. Putnam
Project Manager
Section A

cc: C. Channer, Esq., MTA
L. Wunderlich, LIRR

ec: A. Quartararo, NYSDEC
G. Bobersky, NYSDEC
W. Parish, NYSDEC
B. Mitchell, NYSDOH