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OPERABLE UNIT 4
FEASIBILITY STUDY

Sunnyside Yard
Queens, New York

Prepared for:

NATIONAL RAILROAD PASSENGER CORPORATION
Washington, D.C. 20002

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TABLE OF CONTENTS

TABLE OF CONTENTS

(Continued)

TABLES

FIGURES

TABLE OF CONTENTS

(Continued)

APPENDIX

PLATES

ACRONYM AND UNIT DEFINITIONS

AMTRAK	National Railroad Passenger Corporation
Area	Area of Concern
bls	Below land surface
CAMP	Community Air Monitoring Plan
C&D	Construction and Demolition
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COCs	Compounds of Concern
Conrail	Consolidated Rail Corporation
cPAH	Seven specific PAHs that the NYSDEC considers carcinogenic
CY	Cubic Yards
DER	Division of Environmental Remediation
EA	Exposure Assessment
ESA	East Side Access
FS	Feasibility Study
FT.....	Feet
GRA	General Response Action
HSTF.....	High Speed Trainset Facility
IHWDS	Inactive Hazardous Waste Disposal Site
IRM	Interim remedial measures
LIRR	Long Island Rail Road
mg/kg	Milligrams per kilogram, equal to 1,000 µg/kg
MTA.....	Metropolitan Transit Authority
NCP	National Contingency Plan
NJTC	New Jersey Transit Corporation
NYCRR	New York Code of Rules and Regulations
NYCDOT.....	New York City Department of Transportation
NYSDEC	New York State Department of Environmental Conservation
NYSDOH.....	New York State Department of Health
OOC	Order On Consent

ACRONYM AND UNIT DEFINITIONS

OM&M	Operation, Maintenance and Monitoring
OU	Operable Unit
PAHs	Polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
PPE.....	Personal protective equipment
ppm	Parts per million, equivalent to mg/kg
RAOs	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RSCOs	Recommended Soil Cleanup Objectives
S&I.....	Service and Inspection
SCC.....	Soil Cleanup Criteria
SCGs	Standards, Criteria and Guidance
SPH	Separate-Phase Petroleum Hydrocarbon
SVOCs	Semivolatile Organic Compounds
TAGM	Technical and Administrative Guidance Memorandum
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substance Control Act
USEPA	United States Environmental Protection Agency
USTs	Underground Storage Tanks
VOCs	Volatile Organic Compounds
Yard	Sunnyside Yard, Queens, New York

1.0 INTRODUCTION

On behalf of the National Railroad Passenger Corporation (Amtrak) and the New Jersey Transit Corporation (NJTC), Roux Associates, Inc. (Roux Associates) and Remedial Engineering, P.C. (Remedial Engineering) have prepared this Feasibility Study (FS) for Operable Unit 4 (OU-4) of the Amtrak Sunnyside Yard (Yard) located at 39-29 Honeywell Street, Sunnyside, New York. The purpose of performing this FS was to identify, evaluate, and select an appropriate remedial action alternative for addressing contamination in OU-4. The location of the Yard is shown on Figure 1. The location of OU-4 within the Yard and previously identified Areas of Concern are shown on Figure 2.

1.1 Enforcement Status

The Yard is listed as a Class II Site in NYSDEC's registry of Inactive Hazardous Waste Sites. This FS report was prepared in accordance with the provisions of the Order on Consent (OOC), Index #W2-0081-87-06, as modified between the New York State Department of Environmental Conservation (NYSDEC), Amtrak, and the NJTC. In accordance with the OOC, the Phase I Remedial Investigation (RI) and Phase II RI were performed at the Yard. Consequently, 17 Areas of Concern (Areas) were identified at the Yard based on the results of inspections, discussions with Amtrak personnel, and previous investigations. As will be discussed later, the Yard was divided into Operable Units (OUs) in 1997. The corresponding OUs are included in the table below. With the exception of Areas 1, 6, and 7, which are located within OU-3, the remaining Areas listed below are located within OU-4 and are often referenced by Area designation within this report. The Areas are described below and are shown on Figure 2.

OU	Area		Description
3	Area 1:	Underground Storage Tank and Fueling Area	Nine abandoned underground storage tanks (USTs), former locomotive fueling station, former Engine House, former Metro Shop
4	Area 2:	Material Control Area (Yard receiving area)	Central receiving, temporary storage, and distribution point for materials and supplies received at the Yard
4	Area 3:	Gas Tank Area	Formerly three 750-gallon USTs and pump used for storing and dispensing gasoline

OU	Area	Description
4	Area 4: Fuel Oil Tank Area	20,000-gallon UST used to store fuel oil for the Boiler House
4	Area 5: Transformer Area	Former polychlorinated biphenyl (PCB) transformer area. Two transformers containing PCBs were located in this area.
3	Area 6: Drum Storage Area (Oil House)	Drum and equipment storage area; formerly the Yard receiving area
3	Area 7: Storage Area	Reported to be a former empty drum storage area; currently no drums stored there.
4	Area 8: Transformer Area	Former PCB transformer area. This area is comprised of three distinct areas referred to as Area 8A, 8B, and 8C.
4	Area 9: Former Compressor Area (Substation 1-A)	Former two-story brick structure that housed air compressors and transformers. Currently vacant land.
4	Area 10: Transformer Area (Substation 44)	Non-PCB transformers
4	Area 11: Empty Drum Area	Former empty drum storage area
4	Area 12: Car Washer Area	Area is used to wash railroad cars.
4	Area 13: Former Storage Area	Former storage area for materials including non-PCB transformers; currently contains a Consolidated Edison transformer substation.
4	Area 14: Empty Drum Area	Former empty drum storage area; currently no drums stored there.
4	Area 15: Empty Drum Area	Former empty drum storage area; currently no drums stored there.
4	Area 16: Underground Storage Tank Area	Fourteen abandoned USTs are located in this area. These USTs were emptied in 1989.
4	Area 17: 68 Spur	Area is used to store maintenance equipment and to stage materials.

The NYSDEC requested that Area 16 be removed from the RI/FS program following the cleaning and abandonment activities associated with the fourteen USTs. Details and results of the work completed in Area 16 were summarized in a report prepared by OHM Remediation Services Corporation, dated September 21, 1992 (OHM, 1992). Therefore, Area 16 is not discussed further in this report.

In 1997, to accommodate a rigid construction schedule for Amtrak's High Speed Trainset Facility (HSTF) program and still address sitewide remedial efforts in a timely and orderly manner, the Yard was subdivided into six operable units with the NYSDEC's concurrence, as shown on Figure 2. The operable units (OUs) are described as follows:

- OU-1: Soil above the water table within the footprint of the proposed HSTF Service and Inspection (S&I) Building.
- OU-2: Soil above the water table within the footprint of the HSTF S&I Building ancillary structures (i.e., the access road and utilities route, the parking area, the construction easement area which surrounds the building and the construction lay down area).
- OU-3: Originally, the soil and separate-phase petroleum hydrocarbon (SPH) accumulation (herein referred to as SPH plume) above the water table in the area previously referred to as Area 1 of the Yard; however, it has expanded to include Areas 6 and 7 of the Yard and saturated soil within these three Areas.
- OU-4: Soil above the water table in the remainder of the Yard.
- OU-5: Sewer system (water and sediment) beneath the Yard.
- OU-6: Saturated soil and the groundwater beneath the Yard (delineation of soil to be conducted as appropriate). OU–6 was modified to include soil vapor.

In February 1997, the NYSDEC and the New York State Department of Health (NYSDOH) issued cleanup levels for the compounds of concern (COCs) at the Yard: total PCBs, total carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and lead. The seven cPAHs that are collectively identified as a COC and considered to be carcinogenic by the NYSDEC are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene. The soil cleanup level for total cPAHs issued by the NYSDEC in February 1997 was originally 10 milligrams per kilogram (mg/kg) and was

subsequently revised in March 1998. The existing soil cleanup levels for the Yard are as follows:

- Total PCBs – 25 mg/kg;
- Total cPAHs – 25 mg/kg; and
- lead – 1,000 mg/kg.

Subsequent to issuing the current Yard soil cleanup levels for COCs, the NYSDEC issued 6 NYCRR Part 375 Environmental Remediation Program Subparts 375-1 to 375-4 & 375-6. The effective date of the regulation is December 14, 2006. The NYSDEC Part 375 regulation indicates that restricted industrial cleanups (e.g., railyard remediation) should utilize a soil cleanup objective of 3,900 mg/kg for lead, which is higher than the existing Yard soil cleanup level. The restricted industrial soil cleanup objective for total PCBs is 25 mg/kg, which is equal to the existing Yard soil cleanup level.

In October 2007, Amtrak and NJTC requested alternate soil cleanups levels in OU-4 that would revise the existing Yard soil cleanup level for lead of 1,000 mg/kg to the Part 375 restricted industrial soil cleanup objective. A request for an alternate Yard soil cleanup level for total cPAHs was also presented. This OU-4 FS will provide further discussion of Amtrak and NJTC's request for alternate soil cleanup levels for lead and total cPAHs.

1.2 Yard Operating History

The Pennsylvania Tunnel and Terminal Company, a subsidiary of the Pennsylvania Railroad (later known as the Penn Central Transportation Company), originally constructed the Yard in the early 1900s. The Yard officially opened on November 27, 1910. On April 1, 1976, the Consolidated Rail Corporation (Conrail) acquired the Yard and the same day conveyed it to Amtrak, which has continued to operate it as a storage and maintenance facility for railroad rolling stock and currently functions primarily as a train maintenance and layover storage facility for electric and diesel locomotives and railroad cars for Amtrak and NJTC.

1.3 General Yard Description

The Yard is located in an urban area in northwestern Queens County (Figure 1). The East River is located approximately one mile to the west while Newtown Creek, which defines the border between Queens and Kings Counties, is located less than 0.5-mile south of the western portion of the Yard. The Yard consists of a railroad maintenance and storage facility that currently encompasses approximately 133 acres. OU-4 encompasses 120 acres of the Yard. The land use surrounding the Yard is a combination of commercial, light industrial, and residential areas. The Long Island Rail Road (LIRR) owns a portion of the Yard along the northern boundary (including a portion of OU-3) and maintains rights of way through the Yard (within OU-4).

1.4 Conceptual Site Model

The presence of the COCs in OU-4 soil is largely attributable to predecessor railroads' operations. As discussed in Section 1.2, the Yard has operated as a railyard since 1910. Amtrak has continued to use the Yard for train maintenance and storage since acquiring the Yard in 1976. Currently, there are no significant onsite continuing sources of the COCs resulting from railroad operations.

Past releases of PCBs is likely attributable to losses from and maintenance of train-mounted transformers over time. Transformers were also mounted on the Honeywell Street Bridge. Specific locations, dates, or quantities of PCB releases are not known. However, usage of PCB-containing equipment was significantly more predominant by predecessor railroads than by Amtrak.

The majority of total cPAH and lead exceedances are related to historic fill practices and offsite sources. In the past, coal fired locomotives, coal fired boilers, and onsite incinerators were widely used for railroad operations. These activities generated significant amounts of cinders and coal ash as a waste byproduct. Prior to Amtrak's ownership of the Yard, these cinders and ash were used from time to time as fill material throughout OU-4 and are still present at the Yard today. Cinders and ash are known to contain high levels of lead and semivolatile organic compounds (SVOCs), primarily cPAHs.

In addition to the fill activities, the presence of lead is attributed to the four New York City Department of Transportation (NYCDOT) owned bridges that span the Yard, as shown on Figure 2. These structures have been in place for many decades and at one time were coated with lead based paint. Peeling and chipping paint on the bridges has fallen onto soil underneath the bridges, as well as paint chips from sandblasting operations during bridge repainting and repair operations conducted by the NYCDOT. As demonstrated in the OU-4 RI, the majority of lead exceedances are located under the bridges.

1.5 Objective and Organization of the Feasibility Study

The media of concern in OU-4 consists of soil and historic fill existing above the water table at the Yard, excluding the areas within the areal boundaries of OU-1, OU-2, and OU-3. Groundwater and saturated soil within the areal boundary of OU-4, as shown on Figure 2, will be addressed in the OU-6 RI/FS. The primary objective of this FS will be to determine the most appropriate remedial alternative to address the media of concern. The FS will achieve this objective through the identification, development, and evaluation of alternatives to remediate the unsaturated soil in OU-4.

The identification and analyses of remedial alternatives in the FS will be performed in accordance with the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4030, "Selection of Remedial Actions at Inactive Hazardous Waste Sites, September 13, 1989 (revised May 15, 1990)" (NYSDEC, 1990), the NYSDEC Division of Environmental Remediation (DER) guidance document titled, "Draft DER-10, Technical Guidance for Site Investigation and Remediation" (NYSDEC, 2002), and the Inactive Hazardous Waste Disposal Site Program regulation (6 NYCRR Section 375-1.10).

2.0 SUMMARY OF REMEDIAL INVESTIGATION

To identify applicable remedial alternatives and a remediation strategy, a thorough evaluation of the OU-4 background information is required. The OU-4 RI Report, submitted to the NYSDEC on October 2, 2008, provided a detailed discussion of the previous investigations and Interim Remedial Measures (IRMs) performed in OU-4, a presentation of analytical data for the COCs, and an exposure assessment. The following sections provide summaries of the information presented in the OU-4 RI Report (Roux Associates, 2008).

2.1 Previous Investigations

Investigations in OU-4 have been ongoing since 1983 and include the Phase I RI (Roux Associates, Inc., 1992), Phase II RI (Roux Associates, Inc., 1995), and numerous track maintenance, utility installation, and construction related sampling activities.

The Phase I RI was a comprehensive, facility-wide investigation to identify and determine the nature and extent of contamination primarily associated with the separate phase petroleum identified in Area 1 (OU-3), but also to provide an overall assessment of any other areas of contamination at the Yard. As discussed in Section 1.1, 16 other areas of concern had been identified at that time as possible sources of contamination. The prime objectives of the Phase II RI in relation to OU-4 were to provide further delineation of contaminated areas and confirm analytical results of samples collected during the Phase I RI.

Subsequent to the Phase I and Phase II RIs, numerous soil sampling investigations associated with track maintenance, utility installation, and construction were performed on behalf of Amtrak and NJTC. Investigations conducted for the Metropolitan Transportation Authority (MTA) East Side Access Project (ESA) by AKRF, Inc. and Parsons Brinkerhoff, Quade & Douglas/STV Incorporated have also been performed in OU-4.

2.2 Interim Remedial Measures

Several of the remedial investigations that were performed for track maintenance, construction, and bridge rehabilitation identified soil samples with concentrations exceeding the Yard soil cleanup levels for the COCs. As part of these Yard maintenance activities, the identified COC exceedances were often excavated so the maintenance/construction activities could be completed

and consequently served as an IRM. In summary, 29 PCB exceedances, 28 cPAH exceedances, and 15 lead exceedances were removed by soil IRMs. Similarly, UST IRMs consisting of the removal or abandonment of several USTs were performed.

2.3 Exposure Assessment

The Exposure Assessment (EA) addressed soil-quality conditions in OU-4. Exposure to soil in OU-4 is possible by workers engaged in routine activities. Therefore, exposure point concentrations in soil were compared to appropriate health-based criteria (NYSDEC Part 375 Industrial Soil Cleanup Objectives) to determine the potential for present and future workers to be exposed to chemicals present in soil. All of the exposure point concentrations for the chemicals of potential concern in soil were below these criteria for soil, except for arsenic at six sampling locations and mercury at only one location. Soil at these locations was either previously removed, will be removed, or remains paved or otherwise covered, precluding direct human contact. Arsenic and mercury do not impact groundwater quality at the Yard. Therefore, additional COCs for OU-4 are not necessary and the existing three COCs (total PCBs, total cPAHs, and lead) are sufficient for evaluating existing soil-quality conditions in OU-4.

2.4 Nature and Extent of Contamination

In summary, 1,467 soil samples were collected from 1,067 sampling locations. As discussed in Section 1.1, the NYSDEC and NYSDOH established the COCs and issued the associated Yard soil cleanup levels in 1997. Therefore, subsequent investigations focused on the analysis of the COCs only and interim remedial activities were performed to meet the current Yard soil cleanup levels.

Total PCBs: Of the 1,467 samples collected, 1,241 samples were submitted for PCB analysis and 73 samples exceeded the Yard soil cleanup level for total PCBs (25 mg/kg). Approximately 40 percent of the total PCB exceedances (29 of 73 samples) have been removed by soil IRMs. A total of 44 samples exceeding the Yard soil cleanup level for total PCBs remain in OU-4 (Plate 1). The sample concentrations for remaining total PCB exceedances range from 26 mg/kg in sample PC-10 (1-2) to 25,000 mg/kg in sample SB-68 (0-1).

Total cPAHs: Of the 1,467 samples collected, 812 samples were submitted for cPAH analysis. The Yard soil cleanup level for total cPAHs (25 mg/kg) was exceeded in 49 samples. Approximately 57 percent of the total cPAH exceedances (28 of 49 samples) have been removed by soil IRMs. A total of 21 samples exceeding the Yard soil cleanup level for total cPAHs remain in OU-4 (Plate 1). The sample concentrations for remaining total cPAH exceedances range from 25.54 mg/kg in sample TS36-14 (0-1) to 80.2 mg/kg in sample TU-3 (1-2).

Lead: Of the 1,467 samples collected, 825 samples were submitted for lead analysis. The Yard soil cleanup level for lead (1,000 mg/kg) was exceeded in 69 samples. Approximately 22 percent of the lead exceedances (15 of 69 samples) have been removed by soil IRMs. A total of 54 samples exceeding the current Yard soil cleanup level for lead remain in OU-4 (Plate 1). The sample concentrations for remaining lead exceedances range from 1,010 mg/kg in sample HB-11 (0-1) to 7,020 mg/kg in sample LLS-15 (0-1). Only one sample (LLS-15 [0-1]) of the 54 remaining exceedances for the current Yard soil cleanup level for lead would exceed the NYSDEC Part 375 cleanup level of 3,900 mg/kg.

3.0 REMEDIAL GOALS AND REMEDIAL ACTION OBJECTIVES

This section presents the remedial goals, standards, criteria, and guidance (SCGs), and remedial action objectives (RAOs) that apply to soil in OU-4. The identification of the remedial goals, SCGs, and RAOs for OU-4 was performed in accordance with 40 CFR 300 - National Contingency Plan (NCP) (USEPA, 1994), 6 NYCRR Part 375 - Environmental Remediation Programs (NYSDEC, 2006), and NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) #4030 - Selection of Remedial Actions at Inactive Hazardous Waste Sites (NYSDEC, 1990).

The remedial goals, which are common for all registered inactive hazardous waste sites, as provided in 6 NYCRR Part 375 and the NYSDEC Draft DER-10 guidance document (NYSDEC, 2002), are:

- Restoration to pre-disposal/pre-release conditions, to the extent feasible and authorized by law; and
- Elimination or mitigation of all significant threats to public health and the environment presented by the contaminants caused by site-related activities through the proper application of scientific and engineering principles.

The remedial goals serve to establish the foundation for developing RAOs specific to OU-4 soil. RAOs are operable unit-specific objectives for the protection of public health and the environment and are expressed with regard to the concentration of COCs and comparison to chemical specific SCGs. The chemical specific SCGs used for comparison purposes in the OU-4 RI were the current Yard soil cleanup levels for the COCs. As discussed in Section 1.1, a request for alternate soil cleanup levels for total cPAHs and lead was presented to the NYSDEC in October 2007 and will be further discussed in this report.

3.1 Identification of SCGs

SCGs are promulgated requirements and non-promulgated guidance that govern activities that may affect the environment. Specifically, the standards and criteria are cleanup standards, standards of control and other substantive environmental protection requirements, criteria, or limitations that are generally applicable, consistently applied, and officially promulgated under federal or state law. Guidance includes non-promulgated criteria that are not legal requirements

however should be considered based on professional judgment when applicable (NYSDEC, 2002).

The three general SCG categories specified in TAGM #4030 and United States Environmental Protection Agency (USEPA) guidance documents are: location-specific SCGs; action-specific SCGs; and chemical-specific SCGs. Location-specific SCGs are restrictions placed on the concentration of COCs or performance of remedial activities solely because they are in specific locations such as floodplains, wetlands, historic places, or sensitive ecosystems. The areas to be addressed in OU-4 are not located in the aforementioned locations. Therefore, no applicable location-specific SCGs were identified.

Table 1 presents a comprehensive listing of potential action and chemical specific SCGs that may govern remedial actions in OU-4. The following sections provide a discussion of the current chemical specific SCGs and present a proposal for alternate soil cleanup levels for total SVOCs and lead.

3.1.1 Current Chemical Specific SCGs

The current applicable chemical specific SCGs are the Yard soil cleanup levels for the COCs and Toxic Substance Control Act (TSCA) standards for PCBs (40 CFR 761). Recognizing that restoration to predisposal conditions is not always feasible, the NYSDEC provided recommended soil cleanup levels for the COCs in February 1997. The current Yard soil cleanup levels are:

- Total PCBs – 25 mg/kg;
- Total cPAHs – 25 mg/kg; and
- Lead – 1,000 mg/kg.

TSCA defines PCB remediation waste as environmental media "containing PCBs as a result of a spill, release, or other unauthorized disposal, at the following concentrations:

- Materials disposed prior to April 18, 1978, that are currently at concentrations greater than or equal to 50 ppm PCBs, regardless of the concentration of the original spill;

- Materials which are currently at any volume or concentration where the original source was greater than or equal to 500 ppm PCBs beginning on April 18, 1978, or greater than or equal to 50 ppm PCBs beginning on July 2, 1979; and
- Materials which are currently at any concentration if the PCBs are spilled or released from a source not authorized for use under 40 CFR 761."

The cleanup requirements for PCB remediation waste are provided in 40 CFR 761.61(a)(4) and are dependent on PCB concentrations and potential exposure relevant to occupancy usage (i.e., high and low occupancy). The Yard soil cleanup level for PCBs (25 mg/kg) is consistent with the cleanup level for PCB remediation waste in low occupancy areas. Low occupancy use is defined as exposure for less than 335 hours annually, or an average of 6.75 hours per week for any one person. For low occupancy uses, the TSCA regulation is the following:

- PCB remediation waste may remain at a cleanup site at concentrations greater than 25 mg/kg and less than 50 mg/kg if the site is secured by a fence and marked with a sign;
- PCB remediation waste may remain at a cleanup site at concentrations greater than 25 mg/kg and less than 100 mg/kg if the site is covered with a cap meeting the requirements of 40 CFR 761.61 (a)(7) and 40 CFR 761.61(a)(8).
- PCB remediation waste at concentrations greater than 100 mg/kg requires removal.

The NYS regulations for identification and handling of hazardous waste, 6 NYCRR Part 370 through 373, pertain to the waste classification of soil. 6 NYCRR Section 371.4(e) states solid wastes containing 50 mg/kg or greater of PCBs are listed hazardous wastes. Soil containing 50 mg/kg or greater of PCBs would be classified for disposal as a New York State B007 listed PCB hazardous waste.

6 NYCRR Section 371.3(e) states that soil with leachable lead concentrations greater than the toxicity characteristic regulatory level of 5 mg/L using the Toxicity Characteristic Leaching Procedure (TCLP) would be classified as D008 hazardous waste. The NYS regulations for lead are consistent with federal regulations 40 CFR 261.24(b).

3.1.2 Proposed Alternate Chemical Specific SCGs

The proposed chemical specific SCGs revise the Yard soil cleanup levels for the COCs as follows:

- Total PCBs – 25 mg/kg (unchanged)
- Total SVOCs – 500 mg/kg, in accordance with TAGM 4046
- Lead – 3,900 mg/kg, in accordance with 6 NYCRR Part 375

PCBs

Amtrak and NJT are not proposing to modify the current Yard soil cleanup level for PCBs of 25 mg/kg. The current Yard soil cleanup level for PCBs is consistent with the 6 NYCRR Part 375 soil cleanup criteria (SCC) for PCBs for restricted industrial sites and TSCA cleanup level for PCB remediation waste in low occupancy areas.

Total SVOCs

As preliminarily discussed with the NYSDEC, revision of the Yard COC from total cPAHs to total SVOCs would provide a more appropriate criterion. As demonstrated on Table 2, cPAHs represent an average of only 37.85% of the total SVOCs detected. Whereas cPAHs are representative of historic fill type activities throughout the last century, a total SVOC criterion would be more relevant and applicable to current operations as a railroad maintenance facility. As outlined in the Yard's Integrated Spill Prevention Control and Countermeasure Plan and Hazardous Waste Contingency Plan dated May 11, 2007 (Roux Associates, 2007), current operations at the Yard require the storage and handling of oils including fuel oil, motor oils, hydraulic oil, non-PCB transformer oil, and waste oils.

The proposed soil cleanup level for total SVOCs will promote the completion of the OU-4 remedy in a cost-effective manner while maintaining the ultimate objective of protecting human health and the environment. The primary route of human exposure to cPAHs would be through inhalation. Inhalation of fugitive dust is not considered a viable exposure pathway because over 96 percent of the 120 acres that comprise OU-4 is covered with railroad tracks, asphalt/concrete pavement, buildings, or vegetation, as shown on Figure 3.

The proposed value of 500 mg/kg is consistent with the total SVOC cleanup objective provided in NYSDEC's TAGM 4046 – Determination of Soil Cleanup Objectives and Cleanup Levels, which was developed by the NYSDEC based on the Water-Soil Equilibrium Partition Theory to develop soil cleanup objectives for the protection of groundwater quality. Therefore, the proposed total SVOC criterion is protective of groundwater and the environment. Further, historical groundwater data indicates that there have been very few detections of cPAHs and SVOCs in groundwater.

Lead

The NYSDEC issued the revised 6 NYCRR Part 375 regulation in December 2006. Subpart 375-6 of this regulation provides Soil Cleanup Criteria (SCCs) that are protective of public health for restricted industrial sites. The proposed alternate soil cleanup level for lead is supported by the fact that Sunnyside Yard will remain an active railyard for the foreseeable future thereby establishing the 6 NYCRR Part 375 SCCs for restricted industrial sites as an applicable and appropriate criterion.

Although exceedances of the current and proposed soil cleanup levels for lead exist in OU-4, historical groundwater data indicates that there have been very few detections of lead in groundwater. Additionally, to further support that lead impacted soil is not likely to impact groundwater, no soil samples collected for waste characterization purposes have failed TCLP analysis.

3.2 Remedial Action Objectives for OU-4

The RAOs were developed based on the SCGs discussed above and the exposure assessment (Section 7.0 of the OU-4 RI). The following are the RAOs for unsaturated soil in OU-4:

- Remove PCBs above 100 mg/kg in accordance with the TSCA low occupancy regulation;
- Prevent ingestion, direct contact, and/or inhalation of soil that exceeds the applicable chemical specific SCGs;
- Prevent the migration of COCs to groundwater.

3.3 Extent of Remaining Contamination

The following sections discuss the areas exhibiting exceedances of the Yard soil cleanup levels that remain in OU-4 for which the RAOs would apply. Locations of the COC exceedances and analytical data are shown on Plate 1.

PCBs

The current Yard soil cleanup level for PCBs and the TSCA PCB remediation waste cleanup level are 25 mg/kg (PCB SCGs). As noted above, 44 samples exceeding the PCB SCGs remain in OU-4, as shown on Plate 1. These exceedances are located within 12 distinct areas of OU-4. For ease of reference and assembly of remedial alternatives, these areas have been designated remedial zones PCB-1 through PCB-12. Soil with PCB concentrations above 50 mg/kg is classified as New York State B007 listed PCB hazardous waste. With the exception of two areas located under the Honeywell Street Bridge, the PCB impacted soil is typically within 3 feet below land surface (bls). The volume of soil with concentrations exceeding the PCB SCGs and classified as listed PCB hazardous waste is:

		Non-Hazardous	**Hazardous**	**Hazardous – Requires Removal**
Remedial Zone	**Depth**	**Soil Volume PCBs > 25 mg/kg but < 50 mg/kg (cubic yards)**	**Soil Volume PCBs > 50 mg/kg but < 100 mg/kg (cubic yards)**	**Soil Volume PCBs > 100 mg/kg (cubic yards)**
PCB-1	4 ft bls	70		
PCB-2	3.67 ft bls		30	
PCB-3	5.5 ft bls			480
PCB-4	8 ft bls			560
PCB-5	2 ft bls		30	
PCB-6	3 ft bls	30		
PCB-7	2 ft bls	20		
PCB-8	1 ft bls			20
PCB-9	2 ft bls		20	
PCB-10	3 ft bls			130
PCB-11	2 ft bls		20	
PCB-12	1 ft bls		20	
Total Volume		**120**	**120**	**1,190**
% of Total		**8.5%**	**8.5%**	**83%**

The inspection pit at Track 4 (Track 4 Pit) is Remedial Zone PCB-2. Sample PIT-4, shown on Plate 1, is a sediment sample that was collected from within the Track 4 Pit. This sample exceeded the total PCB soil cleanup level with a concentration of 470 mg/kg. The Track 4 Maintenance Pit is constructed of concrete and measures approximately 50 feet long, 6 feet wide, and 2 feet deep. This subsurface structure and surrounding soil requires additional investigation and is a common task to each of the alternatives to be evaluated.

Total cPAHs/SVOCs

Soil with cPAH and lead concentrations above the SCGs originating from historic fill was deposited throughout much of the Yard. A total of 21 samples exceeding the current Yard soil cleanup levels for total cPAHs remain in OU-4 as shown on Plate 1. One cPAH exceedance is located within Remedial Zone PCB-12. The remaining 20 cPAH exceedances are located within 9 distinct areas of OU-4. For ease of reference and assembly of remedial alternatives, these areas have been designated remedial zones CPAH-1 through CPAH-9. The cPAH impacted soil/historic fill is typically located within 3 ft bls. The volume of soil with concentrations exceeding the cPAH SCG is:

Remedial Zone	Depth	Soil Volume Total cPAHs > 25 mg/kg (cubic yards)	Soil Volume Total SVOCs > 500 ppm (cubic yards)
CPAH-1	3 ft bls	50	
CPAH-2	1 ft bls	110	
CPAH-3	1 ft bls	20	
CPAH-4	2 ft bls	40	
CPAH-5	1 ft bls	20	
CPAH-6	3 ft bls	280	
CPAH-7	1 ft bls	30	
CPAH-8	3 ft bls	220	
CPAH-9	1 ft bls	140	
Total Volume		**910**	**0**

As shown in the table above, none of the cPAH Remedial Zones exceeds the total SVOC guidance value of 500 ppm.

Lead

A total of 54 samples exceeding the current Yard soil cleanup level for lead remain in OU-4, as shown on Plate 1. Eleven lead exceedances are located within the PCB remedial zones discussed above. The remaining 43 lead exceedances are located in 20 distinct areas of OU-4, and typically within 3 ft bls. For ease of reference and assembly of remedial alternatives, these areas have been designated remedial zones LEAD-1 through LEAD-20. The volume of soil with lead concentrations exceeding the current Yard soil cleanup level for lead is:

Remedial Zone	Depth	Soil Volume Lead > 1,000 mg/kg (cubic yards)	Soil Volume Lead > 3,900 mg/kg (cubic yards)
LEAD-1	1 ft bls	20	
LEAD-2	1 ft bls	20	
LEAD-3	1 ft bls	70	
LEAD-4	1 ft bls	40	
LEAD-5	1 ft bls	100	
LEAD-6	1 ft bls	20	
LEAD-7	1 ft bls	80	
LEAD-8	1 ft bls	20	
LEAD-9	2 ft bls	70	
LEAD-10	2 ft bls	80	
LEAD-11	2 ft bls	40	
LEAD-12	3 ft bls	180	
LEAD-13	4 ft bls	260	
LEAD-14	1 ft bls	40	
LEAD-15	3 ft bls	100	
LEAD-16	1 ft bls	20	
LEAD-17	1 ft bls	20	
LEAD-18	2 ft bls	100	
LEAD-19	2 ft bls	20	
LEAD-20	1 ft bls		60
Total Volume		**1300**	**60**

3.4 General Response Actions

General response actions (GRAs) are operable unit specific measures that can be performed to achieve the RAOs. GRAs include treatment, containment, extraction, excavation and disposal, institutional controls or a combination of these actions.

The applicable GRAs for soil with concentrations exceeding the current Yard soil cleanup levels include:

- Institutional Control/Containment
- Excavation/Disposal

Based on the discussion of the extent of remaining contamination in Section 3.5, the final remedy must most importantly address the volume of soil containing hazardous concentrations of PCBs. An estimated 1,190 cubic yards of the total 1,430 cubic yards of PCB impacted soil contains PCB concentrations greater than the TSCA low occupancy threshold value of 100 mg/kg for which removal is required. Given that 83 percent of the total estimated volume of PCB impacted soil requires removal, excavation and offsite disposal is considered the Presumptive Remedy for addressing this soil. Furthermore, excavation and offsite disposal is listed as a Presumptive/Proven Remedial Technology for both metals and PCBs in NYSDEC's DER-15: Presumptive/Proven Remedial Technologies technical guidance document (NYSDEC, 2007). Institutional and engineering containment controls are typically used with excavation based remedies performed to restricted use cleanup standards.

In situ treatment would not be appropriate for addressing COC impacted soil for reasons including the following:

- *In situ* treatments are not commonly used for treatment of soil at or near the surface, where the majority of the COC impacts are present in OU-4 (i.e., within 3 ft bls);
- Effective *in situ* treatment of hazardous concentrations of PCBs, which constitute the large percentage of soil to be addressed, has not been widely demonstrated; and
- Installation of treatment systems is not feasible in remedial zones located within track areas due to active train movement operations.

4.0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES

This section develops the GRAs discussed in the previous section into potential remedial technologies by identifying, evaluating, and screening applicable remedial technologies that may be employed in OU-4 to achieve the RAOs. The remedial technologies to be evaluated in this section have been chosen based on evidence of their success in addressing the COCs in soil.

The technology screening process will consider whether technologies and process options can by themselves or in combination address the impacted soil in OU-4 and meet the RAOs. During the screening of the technologies, the demonstrated ability of the technology to prevent potential impacts to human health and the environment and proven reliability of the technology under similar site conditions is evaluated.

The technology types and associated process options in this section have been identified through a review of NYSDEC and USEPA information and guidance, relevant literature, experience with similar types of environmental conditions, and engineering judgment. The selected remedial technologies will be evaluated on the basis of:

- Effectiveness – The effectiveness criterion evaluates the extent to which the technology meets the established RAOs and considers the short-term effectiveness, long-term effectiveness, and potential impacts to human health and the environment. Short-term effectiveness refers to the effects during construction and/or implementation of the technology. Long-term effectiveness refers to the period after the remedial action is in place.

- Implementability – The implementability criterion focuses on both technical and administrative feasibility of constructing and operating a remedial action. Institutional aspects of the remedial technologies with factors such as institutional constraints, time schedules, and the availability of services, equipment, and trained personnel, compliance with applicable rules and regulations being considered as part of the evaluation. Due to the widespread presence of continuously operated railroad tracks and utilities in OU-4, consideration of this constraint will be evaluated for any remedial technology.

The evaluation of technology effectiveness and implementability for technology screening purposes incorporates elements from TAGM 4030 (NYSDEC, 1990), the draft DER-10 (NYSDEC, 2002), and the USEPA document, “Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA” (USEPA, 1988b).

After screening, the remaining technologies will be evaluated as remedial alternatives to ultimately develop a recommended remedial alternative for OU-4.

4.1 Technology Screening

As discussed in Section 3.5, the presumptive remedy for addressing PCBs and lead impacted unsaturated soil is excavation and offsite disposal. Based on continuous railroad operation at the Yard, institutional controls/containment technologies will be required to augment the presumptive excavation technology. Therefore, the three technologies that have been identified to be potentially applicable for addressing the COCs in unsaturated soil and selected for screening include:

Institutional Control/Containment

- Access/Use Restrictions
- Capping/Surface Covers

Ex Situ Treatment

- Excavation/Offsite Disposal

The following sections provide a brief description of the above technologies and present an evaluation of the technology's effectiveness and implementability.

4.1.1 Access/Use Restrictions

Access/use restrictions would prevent workers from contacting COC impacted soil by preventing access and limiting work activities in the Remedial Zones. Institutional controls implemented to enforce the use restrictions include restriction of work within the boundaries of the Remedial Zones and filing a deed restriction to notify all parties that the COCs are present. Engineering controls implemented to enforce the access/use restrictions include maintenance of fencing around the impacted areas and any existing concrete/asphalt covers to prevent direct exposure to workers. As discussed in Section 3.1.1, TSCA regulations for low occupancy use requires fencing and signage for areas with PCB concentrations between 25 mg/kg and 50 mg/kg.

Evaluation

Effectiveness	Implementability
• Few short terms effects are associated with this technology. Minimal direct exposure to impacted soil in open areas could be experienced during fencing installation. Direct exposure to impacted soil in track areas is minimized by the presence of overlying track and ballast. • The long term effects to workers are dependent upon maintenance and adherence to the access/use restrictions. Given the active railyard status, it is not certain that access/use restrictions will have lasting long term effectiveness.	• Fencing of Remedial Zones located in track areas is not implementable. Similarly, use restrictions on track areas are not implementable. Workers will need access to tracks for routine maintenance. • Fencing of Remedial Zones located in open areas is more implementable. Many of these areas are already covered by concrete or asphalt pavement. • Deed restriction of distinct Remedial Zones would entail a higher than average administrative effort.

The access/use restriction technology is typically teamed with additional remedial technologies. Theoretically, access/use restrictions would achieve the RAO associated with the prevention of direct contact and other exposure pathways. This technology alone would not satisfy the RAO of preventing the potential for migration of contaminants into the groundwater. Given the requirement to access areas of the Yard to maintain daily operations, restrictions on the access and use of Remedial Zones is not a viable long term remedy but can be effectively used in conjunction with the excavation and offsite disposal technology. Access/use restrictions would be used as interim measures until soil excavation could be performed.

4.1.2 Capping/Surface Cover

Capping consists of the application of a concrete, asphalt, or compacted soil cover over the areas with soil containing COC concentrations greater than the SCGs. Based on the TSCA low occupancy cleanup levels, PCB remediation waste with concentrations greater than 25 mg/kg and less than 100 mg/kg may remain at a site and covered with a cap. TSCA cap construction requirements for PCB remediation waste are provided in 40 CFR Subpart 761.61(a)(7). Concrete or asphalt caps are to have a required minimum thickness of 6 inches. Compacted soil caps are to have a required minimum thickness of 10 inches. Maintenance of the cap would be required for the life of the cap.

In addition to the construction of the cap, a deed restriction must be filed notifying that the site has been used for disposal purposes, is restricted to low occupancy uses, is required to maintain the cap indefinitely, and must note the cleanup levels used for soil under the cap. The cap and deed restriction can only be removed if additional remediation is performed.

Different requirements would pertain to the non-hazardous COC impacted soil. For instance, a soil cap consisting of a venting layer, low permeability or geomembrane layer, barrier protection layer, and topsoil/vegetative layer per requirements outlined in 6 NYCRR 360 would be acceptable for these areas. However, based on continued operation as an active railyard, a concrete or asphalt cap would likely be more appropriate in areas amenable to capping.

Evaluation

Effectiveness	Implementability
• Given that the contaminants are typically within the upper 3 feet of soil below land surface, there is a potential for short term direct contact to remediation workers during cap construction. • Capping would minimize Amtrak workers' long term direct exposure to COC impacted soil. • A concrete or asphalt cap would prevent infiltration of stormwater, in turn minimizing the potential for contaminant migration.	• Easily implementable in Remedial Zones located in open areas. Capping would not be implementable in Remedial Zones located in track areas. • Asphalt/concrete caps are easily constructed using standard mechanical equipment. • Operation, maintenance, and monitoring (OM&M) of the cap would be required, in perpetuity. Annual inspections of the integrity of the cap would be required. Any cracks would require immediate repair. • Deed restriction requirements entail average administrative effort.

Of the total 1,430 cubic yards of PCB contaminated soil to be addressed in the final remedy, 240 cubic yards of soil contain PCB concentrations less than 100 mg/kg and are eligible for capping (8 of 12 PCB Remedial Zones). Only 5 of the 8 potential PCB Remedial Zones are located in open areas potentially amenable to capping. This technology would not be suitable for remedial zones with PCB concentrations greater than 100 mg/kg.

For select Remedial Zones, this technology would fulfill the RAOs associated with the prevention of direct contact and other exposure pathways and prevention of migration into the groundwater. For other Remedial Zones, this technology would serve as an interim measure until soil excavation could be performed. As shown on Figure 3, approximately 79 percent of the Yard is already covered with asphalt/concrete pavement, compacted roadway gravel, and track (consisting of rails, ties, ballast trackbed, and paved walkways).

An on-going OM&M plan would be needed to outline the routine monitoring of the concrete or asphalt cap and incorporated into the Yard Site Management Plan. Routine monitoring would occur annually to comply with NYSDEC certification requirements. Monitoring would be required for the life of the cap or until additional remediation was performed.

4.1.3 Excavation/Offsite Disposal

This technology consists of the excavation of impacted soil using readily available mechanical excavation equipment. The soil would be temporarily stockpiled onsite or directly loaded into trucks to be transported to an offsite disposal facility. The soil in each of the Remedial Zones is within the unsaturated portion of the subsurface and free liquids are not expected.

Waste characterization sampling would be collected from soil stockpiles to confirm the waste classification for disposal. The analysis would be determined by the disposal facility and may include PCBs, SVOCs, lead, Toxicity Characteristic Leaching Procedure (TCLP) for volatile organic compounds (VOCs), SVOCs, and metals and Resource Conservation and Recovery Act (RCRA) characteristics analysis.

New York State Regulation 6 NYCRR Subpart 371.4(e) requires that soil with PCB concentrations of 50 mg/kg or greater be classified as New York State B007 listed PCB hazardous waste for disposal. Soil with PCB concentrations greater than 50 mg/kg is also classified as TSCA PCB remediation waste. It is estimated that 1,190 cubic yards of soil would be classified as New York State B007 listed PCB hazardous waste and TSCA PCB Remediation Waste. Excavated soil with PCB concentrations less than 50 mg/kg and less than TCLP standards would be disposed as non-hazardous soil.

TCLP analysis would determine the classification of the lead impacted soil in Remedial Zone 11. In the event this soil is considered hazardous based on TCLP metals analysis, this soil would be classified as D008 hazardous waste.

Evaluation

Effectiveness	Implementability
• Short-term effects include significant health and safety concerns with respect to remediation worker exposure to excavated material and increased truck traffic in the surrounding neighborhood. Proper engineering controls and health and safety monitoring can reduce this risk. • COC impacted soil is permanently removed from OU-4. Long-term potential for exposure is permanently eliminated from OU-4.	• Excavation is a proven remedial technology. Experienced contractors, transportation and excavation equipment, and disposal facilities are readily available. • Excavation in track areas would be performed during scheduled track maintenance. Close coordination with the track operations personnel would be required. • Reasonable level of effort and time required for acquiring the appropriate permits, preparation of work plans, and NYSDEC approval. • No long term OM&M requirements.

This technology has been identified as the presumptive remedy for addressing COC impacted soil. Implementability of this technology in each Remedial Zone is estimated to take only 2-5 days, depending on the size of the excavation. This estimated duration includes mobilization, site preparation, excavation, backfill of the excavation, and demobilization.

During excavation activities, this technology may present dermal contact, inhalation, and ingestion exposure risks to workers associated with the physical removal of the impacted soil. However, with the proper engineering controls and health and safety monitoring, this risk could be reduced. This technology would fulfill each of the RAOs for OU-4.

5.0 DESCRIPTION AND EVALUATION OF REMEDIAL ALTERNATIVES

Excavation and offsite disposal has been identified as the presumptive remedy for addressing COC impacted soil in OU-4. As discussed in Section 4.0, access/use restrictions and use of existing asphalt, concrete and soil covers will be used as interim measures until excavation of the remedial zones can be performed.

In October 2007, Amtrak and NJTC requested alternate soil cleanup levels in OU-4 that would revise the current Yard soil cleanup level for lead of 1,000 mg/kg to the Part 375 restricted industrial soil cleanup objective (3,900 mg/kg). A request for an alternate Yard soil cleanup level for total cPAHs was also presented and has been discussed with the NYSDEC. Therefore, rather than evaluating various technology based alternatives, this section will evaluate the use of excavation and offsite disposal for various COC cleanup level scenarios.

The remedial action alternatives for OU-4 COC-impacted soil include:

Remedial Alternative 1:	No Action
Remedial Alternative 2:	Soil Excavation/Offsite Disposal to Predisposal Unrestricted Use SCOs (6 NYCRR Part 375)
Remedial Alternative 3	Soil Excavation/Offsite Disposal to Existing Yard Soil Cleanup Levels
Remedial Alternative 4	Soil Excavation/Offsite Disposal to Proposed Alternate Yard Soil Cleanup Levels

Each of the above alternatives will be evaluated based on seven specific criteria. The results of this assessment will be used to comparatively evaluate the alternatives to determine which is most appropriate for implementation. The seven criteria are provided in NYSDEC TAGM 4030 (NYSDEC, 1990), the NCP (40 CFR Part 300.430), Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (USEPA, 1988b), and Draft DER-10, Technical Guidance for Site Investigation and Remediation (NYSDEC, 2002). The seven evaluation criteria are the following:

- Overall protection of public health and the environment
- Compliance with SCGs

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

Overall protection of public health and the environment and compliance with SCGs are termed threshold criteria, whereas the remedial alternative must meet these requirements in order to be eligible for selection. The remaining five criteria are termed primary balancing criteria and are used as the primary basis of comparison in selecting the recommended remedial alternative.

The following sections provide a description of the four remedial alternatives that were developed to address soil in the remedial zones and evaluate the alternatives based on the above seven evaluation criteria.

5.1 Remedial Alternative 1: No Further Action

In accordance with the NCP and the draft DER-10, a no action alternative is evaluated to provide a baseline for comparison of potential risks posed if no remedial action were performed. For this remedial alternative, all soil with concentrations of COCs exceeding the prevailing Yard soil cleanup levels located within the remedial zones would remain in place. Additionally, the engineering controls currently in place at a portion of the remedial zones would not be maintained.

5.1.1 Overall Protection of Human Health and the Environment

Remedial Alternative 1 would not be protective to human health and the environment. The presence of soil with concentrations exceeding the Yard soil cleanup levels would continue to pose an exposure risk to onsite workers. Approximately 83 percent of the soil to be addressed contains PCB concentrations greater than 50 mg/kg, which classifies this soil as a New York State B007 hazardous waste and TSCA PCB Remediation Waste. Further, this soil is located within 3 feet bls and poses an increased risk to workers during track maintenance activities.

Although no impact to groundwater has been identified to date, stormwater infiltration in track areas poses the potential for COCs in the soil to migrate deeper and impact groundwater. Concrete/asphalt pavement covering soil in some of the remedial zones currently provides protection to humans and the environment. However, under this alternative, maintenance of pavement in these areas is not required resulting in a long term potential for exposure.

5.1.2 Compliance with SCGs

A summary of the applicable SCGs is presented on Table 1. Since no remedial actions would be conducted under this alternative, many of the action-specific SCGs would not be relevant to this alternative. This alternative would not comply with the applicable chemical and action specific SCGs. Specifically, this remedial alternative would not comply with:

- The chemical-specific SCGs for soil: the current Yard soil cleanup level for the COCs and TSCA low occupancy cleanup levels.
- The 6 NYCRR 375 goals to restore the site to pre-disposal conditions to the extent feasible and authorized by law and to eliminate or mitigate all significant threats to public health and the environment.

5.1.3 Long-Term Effectiveness and Permanence

This evaluation criterion is based on the amount of residual risk of contamination that remains after the remedial action alternative is implemented. Alternative 1 provides neither long-term effectiveness nor permanence since the quality of soil exceeding the Yard soil cleanup levels would remain the same. If Alternative 1 were to be implemented, the current level of risk to workers would remain the same.

5.1.4 Reduction of Toxicity, Mobility, or Volume

This alternative would not be effective in reducing the toxicity, mobility, or volume of impacted soil. The toxicity and volume of the NYS B007 listed PCB hazardous waste would not be reduced. This alternative would not provide a means to ensure the mobility of the COCs in soil would be prevented. PCBs and lead have very little to no potential for biodegradation by indigenous microbes. Therefore, natural attenuation of these compounds would not be a reliable means of reducing the toxicity, mobility, or volume of PCBs and lead in the subsurface.

5.1.5 Short-Term Effectiveness

Since there are no actions proposed for this alternative, there is no associated construction and implementation period and, therefore, no associated short-term impacts to human health and the environment.

5.1.6 Implementability

Implementability concerns posed by this alternative do not exist since there would not be any actions performed. Therefore, this alternative would be readily implementable.

5.1.7 Cost

Since there are no remedial actions for this alternative, there is no capital cost associated with Remedial Alternative 1.

5.2 Remedial Alternative 2: Soil Excavation/Offsite Disposal - Predisposal Unrestricted Use SCOs

Remedial Alternative 2 consists of the excavation of soil impacted with PCBs, lead, and cPAHs at concentrations above the 6 NYCRR Part 375 Unrestricted Use SCOs and removal of the Track 4 Pit. Development of this alternative satisfies the remediation goal of evaluating the technical feasibility of remediation to predisposal conditions. Remediation to predisposal conditions would entail excavation of all soil containing PCB concentrations and historic fill containing cPAH and lead concentrations greater than the Unrestricted Use SCOs.

The approximate areal extent of OU-4 is 120 acres. As shown on Plate 2, comparison of the analytical dataset to the Unrestricted Use SCOs indicates that the majority of OU-4 would need to be addressed under this alternative. However, there are buildings that have been present at the Yard since the early 1900s which would not have cause for underlying historic fill or PCB-impacted soil. Similarly, there are areas of the Yard that have been remediated by soil IRMs, as discussed in the OU-4 RI. The buildings and remediated areas comprise approximately 5 acres. To compensate for the basin like topography of the Yard (sideslopes totaling up to 4 to 5 acres would potentially need to be addressed by a remedy using Unrestricted Use SCOs), the estimated areal extent of 120 acres will be used for evaluation purposes. The extent of COC impacted soil and historic fill is typically limited to 3 ft bls. Based on these assumptions, this alternative

would result in the removal of approximately 508,800 cubic yards of soil. The Track 4 pit would also be removed in its entirety.

5.2.1 Overall Protection of Human Health and the Environment

This alternative would meet each of the RAOs for providing protection to human health and the environment and prevent migration of contaminants to groundwater. Protection is afforded by removing all soil with COC concentrations exceeding the Unrestricted Use SCOs. Site restoration would be accomplished using backfill from approved offsite sources. Institutional controls would not be required to provide future protection to humans and the environment.

Future risk of exposure for railroad workers to both hazardous and non-hazardous levels of PCB-impacted soil and cPAH and lead impacted soil is removed entirely by implementing this remedial action alternative. Protection of the environment is provided through removal of COC impacted soil that could potentially impact groundwater.

5.2.2 Compliance with SCGs

A summary of the applicable SCGs is presented in Table 1. This remedial action alternative would comply with the applicable chemical and action-specific SCGs for the media of concern.

Specifically, Remedial Alternative 2 would:

- Satisfy the 6 NYCRR Part 375 goal to eliminate or mitigate all significant threats to public health and the environment;
- Satisfy the 6 NYCRR Part 375 goal to restore OU-4 to pre-disposal/pre-release conditions;
- Effectively remove "consequential" amounts of NYS listed hazardous waste in accordance with 6 NYCRR Part 375;
- Comply with all TSCA low occupancy PCB Remediation cleanup requirements; and
- Address all COC exceedances of the Unrestricted Use SCOs.

Although Remedial Alternative 2 would comply with the remedial goal to restore OU-4 to pre-disposal/pre-release conditions, OU-4 comprises the majority of the Yard which has operated as a railyard for 95 years and its intended future use is for continued operations as a railyard, as

demonstrated by the current ongoing construction of the MTA's East Side Access connection that traverses OU-4. Remediation to such a stringent SCO is neither applicable nor appropriate for OU-4.

5.2.3 Long Term Effectiveness and Permanence

Remedial Alternative 2 provides long-term effectiveness through the permanent removal of COC impacted soil from OU-4. All excavated soil would be transferred to an offsite disposal facility equipped to properly manage this material.

5.2.4 Reduction of Toxicity, Mobility, or Volume

Soil excavation would effectively reduce the toxicity, mobility, and volume of soil with concentrations exceeding the Unrestricted Use SCOs. All soil exhibiting hazardous PCB concentrations would be removed from OU-4. Likewise, the removal of Track 4 Pit and surrounding impacted soil would remove any potential pathway of contaminants to the subsurface through this inspection pit, thereby reducing mobility, toxicity and volume of contamination.

5.2.5 Short-Term Effectiveness

This alternative requires the greatest amount of excavation and, therefore, poses the greatest short-term impacts for remedial workers, railroad workers, and the community. Remedial workers would be in direct contact with soil during excavation activities. Railroad workers may be in contact with impacted soil during the extensive site preparation and track removal efforts to facilitate the excavation. Exposure would be reduced through the use of mechanical equipment for soil excavation and site preparation, to the extent practicable. Engineering controls including proper PPE requirements can reduce the short-term impacts to workers while conducting this work.

The community would be exposed to a greater potential for dust generated during excavation. Additional potential short-term risks to the community would be posed from transportation of approximately 35,500 truckloads of soil and concrete waste to offsite disposal facilities. Potential exposure would result from releases from haul vehicles along the transportation route. Haul vehicles would need to be secured prior to exiting the Yard to prevent release of waste.

5.2.6 Implementability

Implementation of soil excavation of this magnitude in an active railyard is impracticable and unfeasible to perform in a reasonable timeframe. Daily operations require that all facilities and tracks remain fully operational and functional. Approximately 78 percent of the 120 acres of OU-4 consists of tracks, buildings, and temporary facilities needed to operate the Yard. In order to implement this alternative, areas would need to be excavated whenever new construction or replacement of track is scheduled in that area.

5.2.7 Cost

The estimated capital cost to implement Remedial Alternative 2 is $178,963,051. This capital cost consists solely of soil excavation, disposal, and replacement of 508,800 cubic yards of soil Although an estimated cost has been included for coordination between Amtrak's Track and ET Departments to account for logistical planning, the Remedial Alternative cost does **not** include Amtrak's expense for the removal and replacement of railroad tracks, temporary facilities, utilities, pavement, roadways, and other work areas, expenses associated with additional track out of service time, and overtime costs for Amtrak personnel. The cost for this remedial alternative would be prohibitively expensive.

5.3 Remedial Alternative 3: Soil Excavation/Offsite Disposal – Existing Yard Soil Cleanup Levels

For Remedial Alternative 3, soil with COC concentrations exceeding the existing Yard soil cleanup levels would be excavated. As discussed in Section 3.1.1, the existing Yard soil cleanup levels are:

- Total PCBs – 25 mg/kg;
- Total cPAHs – 25 mg/kg; and
- Lead – 1,000 mg/kg.

An estimated 1,430 cubic yards of PCB impacted soil (Remedial Zones PCB-1 through PCB-12), 910 cubic yards of cPAH impacted soil (Remedial Zones CPAH-1 through CPAH-9), and 1,360 cubic yards of lead impacted soil (Remedial Zones L-1 through L-20) would require removal. Common to each remedial alternative, the Track 4 Pit and surrounding soil would be investigated and removed in its entirety.

Soil Excavation

The samples that exceed the existing Yard soil cleanup levels for the COCs have been fully or partially delineated by soil samples submitted for analysis during previous investigations. For the purposes of this FS, the horizontal and vertical extent of each exceedance that was not confirmed through analysis was approximated to estimate the volume of soil requiring remediation. The approximated areal extent of contamination is shown on Plate 3. The approximation was based on previously collected delineation samples combined with a review of the full dataset for each remedial zone and experience with Yard operations at each remedial zone.

Pre-characterization samples would be collected prior to excavation in areas not horizontally and vertically delineated. The soil within these delineated areas would be excavated and transported offsite for disposal. In total, an estimated 3,700 cubic yards of soil would be excavated. Each excavation would be backfilled with clean fill from offsite sources.

Several of the Remedial Zones are located within active tracks that cannot be addressed without extensive disturbance to the Yard's daily operations. Detailed planning and coordination would be required for scheduling track outages, rerouting trains to maintain operations, and the removal and reconstruction of track. There are Remedial Zones, however, that are located in open areas that are more easily accessible and could be addressed on a quicker timetable. For those remedial zones that would not be addressed in the short term, the existing pavement would serve as an asphalt/concrete cap until soil excavation is performed. Similarly, the trackbed ballast would serve as an interim engineering control that prevents direct contact with underlying PCB and lead impacted soil.

Track 4 Pit Removal

Remedial Zone PCB-2 consists of the concrete inspection pit within Track 4. This pit would be removed in its entirety. Assuming the concrete thickness of the inspection pit is 8 inches, it is estimated that 27 cubic yards of concrete would be removed and disposed offsite.

Characterization soil samples would be collected from soil at each end and below the bottom of Track 4 Pit to identify any impacts to soil from historical usage of this inspection pit. Two soil

borings would be completed on each end of the inspection pit (to the west and east) and three soil borings would be performed within the inspection pit footprint to collect samples of soil underlying the inspection pit. Three soil samples would be collected in 1 foot sampling intervals from each soil boring and submitted for PCB analysis based on the PCB concentrations identified in sediment sample PIT-4.

In the event the soil sampling results indicate that PCB concentrations exist above the Yard soil cleanup level in the surrounding and underlying soil, excavation would be performed. It is estimated that 30 cubic yards of soil may require excavation. This estimate is based on the anticipated location of characterization soil borings. Post-excavation samples would be collected only if the characterization soil sample results do not provide horizontal and vertical delineation of the extent of contamination.

Ambient Air Monitoring

A Community Air Monitoring Plan (CAMP) that specifies the components of this program would be developed in accordance with the NYSDOH Generic Community Air Monitoring Plan contained in Appendix 1A of the draft DER-10 (NYSDEC, 2002). The air monitoring program would include real-time continuous particulate monitoring using particulate monitoring devices. VOCs and odors are not expected to be a concern due to the nature of impacts present in OU-4.

Dust would be controlled by spraying a water mist over the work area if perimeter action levels established in the CAMP are exceeded. This would be generated by connecting a misting device to a hose, which would be connected to any potable water source. The degree to which these measures would be used would depend on particulate levels in ambient air at the perimeter of the Yard as determined through implementation of the CAMP.

Transportation and Offsite Disposal

Remediation-derived waste to be transported offsite for disposal would include:

- PCB-impacted non-hazardous soil – 120 cubic yards (estimated)
- NYS B007 hazardous waste/TSCA PCB Remediation Waste – 1,310 cubic yards (estimated)
- Non-hazardous soil (cPAH and lead impacted) – 2,270 cubic yards (estimated)

- Bulk concrete from the Track 4 Pit removal – 27 cubic yards (estimated)

Segregation of each of the remediation-derived wastes would be performed based on media and classifications (e.g., concrete, PCB hazardous soil, non-hazardous soil). Waste characterization samples would be submitted for analysis for the disposal facility requirements, which may include PCBs, total lead, TCLP VOCs, TCLP SVOCs, TCLP metals, and RCRA characteristics.

An average density of 1.5 tons per cubic yard was assumed for concrete removed from Track 4 Pit. Based on this density assumption, it is estimated that approximately 40 tons of concrete would be generated. The Track 4 Pit concrete would be sampled for waste characterization purposes. It is likely the concrete will be classified as non-hazardous petroleum impacted concrete.

Site Management Plan

Implementation of this alternative would remediate OU-4 to restricted use standards. For this reason, a Site Management Plan that outlines the long term institutional and engineering control plan would be developed. The institutional and engineering controls will be contained in an environmental easement, an enforcement mechanism to ensure required institutional and engineering controls remain in place (NYSDEC, 2004). An annual certification will be performed that certifies the institutional and engineering controls are unchanged and nothing has occurred to impair the ability of the controls to protect human health and the environment. Operations personnel at the Yard would retain a copy of the Site Management Plan for reference by onsite workers.

The Site Management Plan will include a long term Soil Management Plan. The long term objectives of the Soil Management Plan would be to minimize potential exposure of workers to low-level COCs in soil after the remediation is completed. Further, the Soil Management Plan would establish applicable management practices for the future disturbance/reuse of Yard soils, particularly in remediated portions of the Yard that are under a use restriction. Specifically, the Soil Management Plan would describe proper procedures for the disturbance of soil in a manner that would protect workers from exposure and identify proper soil management protocols. Routine maintenance activities (e.g., utility and track installation, repair, and maintenance)

would involve worker contact with COCs at concentrations below the Yard soil cleanup levels. The Soil Management Plan would outline the procedures that would provide worker safety and proper handling of any waste that is generated.

The Soil Management Plan would provide requirements for the analytical testing of soil in areas requiring excavation work as part of routine maintenance activities at the Yard. In the event that analytical testing of the soil is not performed prior to maintenance activities, the soil would be stockpiled and sampled for analytical testing. The Soil Management Plan would also provide guidelines for workers in the event soil requires offsite disposal. Soil requiring offsite disposal would be sampled for waste characterization analysis to be determined by the waste disposal facility.

5.3.1 Overall Protection of Human Health and the Environment

This alternative would meet the RAOs for providing protection to human health and the environment and prevent migration of contaminants to groundwater. Protection is afforded by: removing soil with COC concentrations exceeding the existing Yard soil cleanup levels, maintaining existing concrete/asphalt pavement and track areas that currently cover remedial zones until soil excavation is performed, and removal of the Track 4 Pit. Site restoration would be accomplished using backfill from approved offsite sources. Institutional controls would be required for implementing a remedy to restricted use standards.

Future risk of exposure for railroad workers to hazardous levels of PCBs and non-hazardous levels of COC impacted soil and historic fill is reduced by implementing this remedial action alternative. Protection of the environment is provided through removal of COC impacted soil that could potentially impact groundwater.

5.3.2 Compliance with SCGs

A summary of the applicable SCGs is presented in Table 1. This remedial action alternative would comply with the applicable chemical and action-specific SCGs for the media of concern.

Specifically, Remedial Alternative 3 would:

- Comply with the chemical specific SCGs for soil (i.e., Yard soil cleanup levels, TSCA);

- Comply with TSCA low occupancy PCB Remediation cleanup requirements;
- Address the 6 NYCRR Part 375 goal to eliminate or mitigate all significant threats to public health and the environment; and
- Effectively remove "consequential" amounts of NYS listed hazardous waste in accordance with 6 NYCRR Part 375.

Remedial Alternative 3 would not comply with the remedial goal to restore OU-4 to pre-disposal/pre-release conditions. However, OU-3 has operated as a railyard for 95 years and its intended future use is for continued operations as a railyard, as demonstrated by the ongoing construction of the MTA's East Side Access project which traverses OU-4. Therefore, remediation to restricted use SCGs is reasonable and appropriate for OU-4.

5.3.3 Long Term Effectiveness and Permanence

Remedial Alternative 3 provides long-term effectiveness through the permanent removal of hazardous levels of PCBs and non-hazardous COC-impacted soil and historic fill from OU-4. All excavated soil would be transferred to an offsite disposal facility equipped to properly manage this material. The Track 4 Pit will be investigated for pathways of contaminants to the surrounding soil and the concrete pit will be removed, as well as any surrounding soil found to exceed the existing Yard soil cleanup levels. Maintenance of engineering controls (i.e., surface covers) provides long term effectiveness of worker protection from exposure to COCs that remain in the soil at concentrations less than the Yard soil cleanup levels.

5.3.4 Reduction of Toxicity, Mobility, or Volume

Soil excavation would effectively reduce the toxicity, mobility, and volume of soil with concentrations exceeding the existing Yard soil cleanup levels. All soil exhibiting hazardous PCB concentrations would be removed. The removal of Track 4 Pit and surrounding impacted soil, if necessary, would remove any potential pathway of contaminants to the subsurface through this inspection pit, thereby reducing mobility, toxicity, and volume of contamination.

5.3.5 Short-Term Effectiveness

This alternative poses moderate short-term effects for remedial workers and railroad workers. Remedial workers would be in direct contact with soil during excavation activities. Railroad

workers may be in contact with impacted soil during site preparation and track removal efforts to facilitate the excavation. Exposure would be reduced through the use of mechanical equipment for soil excavation and site preparation, to the extent practicable. Engineering controls including proper personal protective equipment (PPE) requirements can reduce the short-term impacts to workers while conducting this work.

Potential short-term risks to the community would be posed from transportation of approximately 250 truckloads of soil and concrete waste to offsite disposal facilities. Potential exposure could result from releases from haul vehicles along the transportation route. Based on the accessibility of the remedial zones, the excavations would not be performed continuously but rather spread over time. Therefore, the implementation schedule would reduce the number of trucks traveling through the community at one time. Haul vehicles would also be secured prior to exiting the Yard to prevent release of waste and exposure to the community.

5.3.6 Implementability

The soil excavation technology to be used for this remedial alternative is readily available. Experienced remedial contractors are readily available to implement the remedial activities associated with this alternative. Mechanical equipment and contractors are readily available for soil excavation and subsurface structure removal. Disposal tracking and waste characterization sampling would require moderate effort due to the anticipated various waste classifications.

Implementability concerns that do exist for this remedial alternative arise due to the location of the remedial zones and subsequent disturbance of Yard operations to access these areas. Remedial zones located in open areas could be accessed for remediation shortly after remedy selection by the NYSDEC. From a logistics and cost perspective, the remaining remedial zones would be addressed during scheduled demolition and maintenance of these areas. Specifically, PCB 1 is located immediately adjacent to a building, under pavement, and above an UST. Excavating soil in PCB 1 during the building demolition would allow better access to the area and reduce the costs associated with the remediation being that the pavement and UST will be removed as part of the demolition. Likewise, the logistics and track material costs associated with the removal and reconstruction of sections of railroad tracks significantly decreases the

implementability of this technology. However, if soil excavation were performed during scheduled railroad track maintenance, the logistics and costs concerns would be greatly reduced.

5.3.7 Cost

The estimated capital cost to implement Remedial Alternative 3 is $2,183,667. This capital cost consists solely of soil excavation, disposal, and replacement of 3,700 cubic yards of soil. Although an estimated cost has been included for coordination between Amtrak's Track and ET Departments to account for logistical planning, the Remedial Alternative cost does **not** include Amtrak's expense for the removal and replacement of railroad tracks, temporary facilities, utilities, pavement, roadways, and other work areas, expenses associated with additional track out of service time, and overtime costs for Amtrak personnel. Provided the soil excavation can be planned to occur during new construction or planned track maintenance, no added site preparation and replacement costs would need to be added to the cost estimate for this remedial alternative.

5.4. Remedial Alternative 4: Soil Excavation/Offsite Disposal – Proposed Alternate Yard Soil Cleanup Levels

For Remedial Alternative 4, soil with COC concentrations exceeding the proposed Yard soil cleanup levels would be excavated and transported offsite for disposal. The proposed Yard soil cleanup levels are as follows:

- Total PCBs – 25 mg/kg (**unchanged**)
- Total SVOCs – 500 mg/kg, in accordance with TAGM 4046
- Lead – 3,900 mg/kg, in accordance with 6 NYCRR Part 375

An estimated 1,430 cubic yards of PCB impacted soil (Remedial Zones PCB-1 through PCB-12) and 60 cubic yards of lead impacted soil (Remedial Zone 20) would require removal. There are no exceedances of the proposed total SVOC soil cleanup level. Areas of soil containing PCB and lead concentrations above the proposed Yard soil cleanup levels are shown on Plate 4.

Common to each remedial alternative, the Track 4 Pit and surrounding soil would be investigated and removed in its entirety.

Soil Excavation

The samples that exceed the proposed Yard soil cleanup levels for PCBs and lead have been fully or partially delineated by soil samples submitted for analysis during previous investigations. For the purposes of this FS, the horizontal and vertical extent of each exceedance that was not confirmed through analysis has been approximated to estimate the volume of soil requiring remediation. The approximation was based on previously collected delineation samples combined with a review of the full dataset for each Remedial Zone and experience with Yard operations at each Remedial Zone. The soil within these delineated areas would be excavated and transported offsite for disposal. Pre-characterization samples would be collected prior to excavation in areas not horizontally and vertically delineated. The soil within these delineated areas would be excavated and transported offsite for disposal. In total, an estimated 1,490 cubic yards of soil would be excavated. Each excavation would be backfilled with clean fill from offsite sources.

Several of the Remedial Zones are located within active tracks that cannot be addressed without extensive disturbance to the Yard's daily operations. Detailed planning and coordination would be required for scheduling track outages, rerouting trains to maintain operations, and the removal and reconstruction of track. There are Remedial Zones, however, that are located in open areas that are more easily accessible and could be addressed on a quicker timetable. For those remedial zones that would not be addressed in the short term, the existing pavement would serve as an asphalt/concrete cap until soil excavation is performed. Similarly, the trackbed ballast would serve as an interim engineering control that prevents direct contact with underlying PCB and lead impacted soil.

Track 4 Pit Removal

Remedial Zone PCB-2, the concrete inspection pit within Track 4, would be investigated and removed as described for Remedial Alterative 3 in Section 5.3. This pit would be removed in its entirety. Assuming the concrete thickness of the inspection pit is 8 inches, it is estimated that 27 cubic yards of concrete would be removed and disposed offsite.

Characterization soil samples would be collected from soil to the west, east and below the bottom of Track 4 Pit to identify any impacts to soil from historical usage of this inspection pit.

Two soil borings would be completed on each side of the inspection pit (to the west and east) and three soil borings would be performed within the inspection pit footprint to collect samples of soil underlying the inspection pit. Three soil samples would be collected in 1 foot sampling intervals from each soil boring and submitted for PCB analysis based on the PCB concentrations identified in sediment sample PIT-4.

In the event the soil sampling results indicate that PCB concentrations exist above the Yard soil cleanup level in the surrounding and underlying soil, excavation would be performed. It is estimated that 30 cubic yards of soil may require excavation. This estimate is based on the anticipated location of characterization soil borings. Post-excavation samples would be collected only if the characterization soil sample results do not provide horizontal and vertical delineation of the extent of contamination.

Ambient Air Monitoring

A CAMP that specifies the components of this program would be developed in accordance with the NYSDOH Generic Community Air Monitoring Plan contained in Appendix 1A of the draft DER-10 (NYSDEC, 2002). The air monitoring program would include real-time continuous particulate monitoring using particulate monitoring devices. VOCs and odors are not expected to be a concern due to the nature of impacts present in OU-4.

Dust would be controlled by spraying a water mist over the work area if perimeter action levels established in the CAMP are exceeded. This would be generated by connecting a misting device to a hose, which would be connected to any potable water source. The degree to which these measures would be used would depend on particulate levels in ambient air at the perimeter of the Yard as determined through implementation of the CAMP.

Transportation and Offsite Disposal

Remediation-derived waste to be transported offsite for disposal would include:

- PCB-impacted non-hazardous soil – 120 cubic yards (estimated)
- NYS B007 hazardous waste/TSCA PCB Remediation Waste – 1,310 cubic yards (estimated)
- Non-hazardous soil lead impacted soil – 60 cubic yards (estimated)

- Bulk concrete from the Track 4 Pit removal – 27 cubic yards (estimated)

Segregation of each of the remediation-derived wastes would be performed based on media and classifications (e.g., concrete, PCB hazardous soil, non-hazardous soil). Waste characterization samples would be submitted for analysis for the disposal facility requirements, which may include PCBs, total lead, TCLP VOCs, TCLP SVOCs, TCLP metals, and RCRA characteristics.

An average density of 1.5 tons per cubic yard was assumed for concrete removed from Track 4 Pit. Based on this density assumption, it is estimated that approximately 40 tons of concrete would be generated. The Track 4 Pit concrete would be sampled for waste characterization purposes. It is likely the concrete will be classified as non-hazardous petroleum impacted concrete.

Site Management Plan

Implementation of this alternative would remediate OU-4 to restricted use standards. For this reason, a Site Management Plan that outlines the long term institutional and engineering control plan would be developed. The institutional and engineering controls will be contained in an environmental easement, an enforcement mechanism to ensure required institutional and engineering controls remain in place (NYSDEC, 2004). An annual certification will be performed that certifies the institutional and engineering controls are unchanged and nothing has occurred to impair the ability of the controls to protect human health and the environment. Operations personnel at the Yard would retain a copy of the Site Management Plan for reference by onsite workers.

The Site Management Plan will include a long term Soil Management Plan. The long term objectives of the Soil Management Plan would be to minimize potential exposure of workers to low-level COCs in soil after the remediation is completed. Further, the Soil Management Plan would establish applicable management practices for the future disturbance/reuse of Yard soils, particularly in remediated portions of the Yard that are under a use restriction. Specifically, the Soil Management Plan would describe proper procedures for the disturbance of soil in a manner that would protect workers from exposure and identify proper soil management protocols. Routine maintenance activities (e.g., utility and track installation, repair, and maintenance)

would involve worker contact with COCs at concentrations below the Yard soil cleanup levels. The Soil Management Plan would outline the procedures that would provide worker safety and proper handling of any waste that is generated.

The Soil Management Plan would provide requirements for the analytical testing of soil in areas requiring excavation work as part of routine maintenance activities at the Yard. In the event that analytical testing of the soil is not performed prior to maintenance activities, the soil would be stockpiled and sampled for analytical testing. The Soil Management Plan would also provide guidelines for workers in the event soil requires offsite disposal. Soil requiring offsite disposal would be sampled for waste characterization analysis to be determined by the waste disposal facility.

5.4.1 Overall Protection of Human Health and the Environment

This alternative would meet the RAOs for providing protection to human health and the environment and prevent migration of contaminants to groundwater. Protection is afforded by: removing all soil with hazardous levels of PCBs, removing soil with PCB and lead concentrations exceeding the proposed Yard soil cleanup levels, maintaining existing concrete/asphalt pavement and track areas that currently cover remedial zones until soil excavation is performed; and removal of the Track 4 Pit.

Future risk of exposure for railroad workers to hazardous levels of PCB-impacted soil is removed by implementing this remedial action alternative. Surface covers including existing pavement, railroad tracks, and ballast covered areas will be maintained throughout OU-4, which will limit direct exposure for workers to soil meeting industrial restricted cleanup levels. Greater than 96 percent of OU-4 is currently covered with tracks, pavement, buildings, or vegetation. Institutional controls to manage the surface cover engineering controls will be required for remediation to restricted use standards.

Protection of the environment is provided through removal of hazardous levels of PCBs and lead impacted soil and historic fill that could potentially migrate and impact groundwater.

5.4.2 Compliance with SCGs

A summary of the applicable SCGs is presented in Table 1. This remedial action alternative would comply with the applicable chemical and action-specific SCGs for the media of concern.

Specifically, Remedial Alternative 4 would:

- Comply with the chemical specific SCGs for soil (i.e., Yard soil cleanup levels, TSCA);
- Comply with TSCA low occupancy PCB Remediation cleanup requirements;
- Address the 6 NYCRR Part 375 goal to eliminate or mitigate all significant threats to public health and the environment; and
- Effectively remove "consequential" amounts of NYS listed hazardous waste in accordance with 6 NYCRR Part 375.

Remedial Alternative 4 would not comply with the remedial goal to restore OU-4 to pre-disposal/pre-release conditions. However, OU-3 has operated as a railyard for 95 years and its intended future use is for continued operations as a railyard, as demonstrated by the ongoing construction of the MTA's East Side Access project which traverses OU-4. Therefore, remediation to restricted use SCGs is reasonable and appropriate for OU-4.

5.4.3 Long Term Effectiveness and Permanence

Remedial Alternative 4 provides long-term effectiveness through the permanent removal of hazardous levels of PCBs and non-hazardous lead impacted soil from OU-4. All excavated soil will be transported offsite to a disposal facility equipped to properly manage this material. The Track 4 Pit will be investigated for past pathways of contaminants to the surrounding soil, the concrete pit will be removed, as well as any surrounding soil found to exceed the revised Yard soil cleanup levels. Maintenance of engineering controls (i.e., surface covers) provides long term effectiveness of worker protection from exposure to COCs that remain in the soil at concentrations less than the proposed Yard soil cleanup levels.

5.4.4 Reduction of Toxicity, Mobility, or Volume

Soil excavation would effectively reduce the overall toxicity, mobility, and volume of soil with concentrations exceeding the proposed Yard soil cleanup levels. All hazardous levels of PCBs would be removed, reducing the overall volume of PCBs and potential for mobility to

groundwater. Likewise, the removal the Track 4 Pit and surrounding impacted soil, if necessary, would remove any potential pathway of contaminants to the subsurface through this inspection pit, thereby reducing mobility, toxicity, and volume of contamination.

5.4.5 Short-Term Effectiveness

This alternative poses moderate short-term effects for remedial workers and railroad workers. Remedial workers would be in direct contact with soil during excavation activities. Railroad workers may be in contact with impacted soil during site preparation and track removal efforts to facilitate the excavation. Exposure would be reduced through the use of mechanical equipment for soil excavation and site preparation, to the extent practicable. Engineering controls including proper PPE requirements can reduce the short-term effects to workers while conducting this work.

Potential short-term risks to the community would be posed from transportation of approximately 82 truckloads of soil and concrete waste to offsite disposal facilities. Potential exposure could result from releases from haul vehicles along the transportation route. Based on the accessibility of the remedial zones, the excavations would not be performed continuously but rather spread over time. Therefore, the implementation schedule would reduce the number of trucks traveling through the community at one time. Haul vehicles would also be secured prior to exiting the Yard to guard against release of waste and exposure to the community.

5.4.6 Implementability

The soil excavation technology to be used for this remedial alternative is readily available. Experienced remedial contractors are readily available to implement the remedial activities associated with this alternative. Mechanical equipment and contractors are readily available for soil excavation and subsurface structure removal. Disposal tracking and waste characterization sampling would require moderate effort due to the anticipated various waste classifications.

Similar to Remedial Alternative 3, implementability concerns that do exist for this remedial alternative arise due to the location of the remedial zones and subsequent disturbance of Yard operations to access these areas. Remedial zones located in open areas could be accessed for remediation shortly after remedy selection by the NYSDEC. From a logistics and cost

perspective, the remaining four remedial zones would be addressed during scheduled demolition and maintenance of these areas.

5.4.7 Cost

The estimated capital cost to implement Remedial Alternative 4 is $1,132,647. This capital cost consists solely of soil excavation, disposal, and replacement of 1,490 cubic yards of soil. Although an estimated cost has been included for coordination between Amtrak's Track and ET Departments to account for logistical planning, the Remedial Alternative cost does **not** include Amtrak's expense for the removal and replacement of railroad tracks, temporary facilities, utilities, pavement, roadways, and other work areas, expenses associated with additional track out of service time, and overtime costs for Amtrak personnel. Provided the soil excavation can be planned to occur during new construction or planned track maintenance, no added site preparation and replacement costs would need to be added to the cost estimate for this remedial alternative.

5.5 Comparison of Remedial Alternatives

The NCP and the NYSDEC regulation and guidance on the selection of remedial alternatives for inactive hazardous waste disposal sites require that the seven evaluation criteria be used to individually evaluate the remedial action alternatives and also evaluate comparatively to identify advantages and disadvantages of each alternative relative one another (NYSDEC, 1990 and NYSDEC, 2002).

The NCP and the NYSDEC guidance also require that alternatives be evaluated based on community acceptance. In accordance with NYSDEC guidance, alternatives are evaluated for community acceptance after the public comment period.

5.5.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment and compliance with SCGs are threshold criteria. Therefore, the remedial action alternatives must adequately protect the human health and the environment and successfully comply with SCGs to be considered for selection as a recommended alternative. The protection of human health and the environment can be measured by the alternative's ability to satisfy the RAOs.

Remedial Alternative 1 – No Action would not reduce or control the potential for exposure to impacted soil and would not satisfy the RAOs. The presence of soil exceeding Yard soil cleanup levels would continue to pose an exposure risk to onsite railroad workers. Further, the presence of hazardous PCB waste would persist in the subsurface and this alternative would provide no protection from further impacts to the subsurface from these contaminants. Therefore, this alternative would not offer a sufficient level of protection to human health and the environment.

Remedial Alternatives 3 and 4 would provide adequate protection to human health and the environment by reducing and controlling risks through: interim engineering and institutional controls; soil excavation; maintenance of long term soil covers throughout OU-4; and removal of the Track 4 Pit. All PCB hazardous waste would be removed. Although Remedial Alternative 3 would remove a larger volume of soil due to the current cPAH cleanup level, the level of protection to human health and the environment provided by Remedial Alternative 4 for an industrial setting is maintained because the proposed total SVOC cleanup level is an established NYSDEC guidance value, deemed to be protective to human health and/or the environment. Similarly, an increased volume of lead-impacted soil would be removed by Remedial Alternative 3, but the level of protection to human health and the environment provided by Remedial Alternative 4 for an industrial setting is maintained because the proposed lead cleanup level is a promulgated NYSDEC standard for industrial use, derived by human health risk evaluations.

Remedial Alternative 2 would provide the most protection of human health and the environment by removing all soil with COC concentrations exceeding the Unrestricted Use SCOs. Future risk of exposure to railroad workers and COC migration to groundwater would be removed entirely.

5.5.2 Compliance with SCGs

Compliance with SCGs, also a threshold criterion, determines whether an alternative satisfies regulatory requirements. The action and chemical specific SCGs are provided on Table 1.

Remedial Alternative 1 would not satisfy the applicable chemical and action specific SCGs. In addition, Remedial Alternative 1 would not address the remedial goals provided in 6 NYCRR Part 375 to: eliminate or mitigate all significant risk to public health and the environment; restore

the site to pre-disposal/pre-release conditions, to the extent feasible and authorized by law; and remove "consequential" amounts of listed hazardous waste.

Through employing the same remedial technology, Remedial Alternatives 3 and 4 would equally meet the applicable action-specific SCGs. The extent of excavation performed for each Remedial Alternative would be driven by either the current or proposed Yard soil cleanup levels, thereby satisfying the chemical specific SCGs. Both Alternatives would satisfy the TSCA chemical and action specific SCGs associated with hazardous levels of PCBs and NYSDEC regulation requiring the removal of "consequential amounts" NYS listed hazardous waste. Both alternatives satisfy the goal of eliminating or mitigating significant threats to human health and the environment. The proposed chemical specific SCGs (Remedial Alternative 4) are NYSDEC guidance values and promulgated criteria and would thereby satisfy regulatory requirements.

Remedial Alternative 2 is the only alternative to meet the goal to restore OU-4 to pre-disposal/pre-release conditions. However, as discussed earlier, remediation to predisposal, unrestricted use standards is neither applicable nor appropriate for OU-4 given the current and future intended use as a railyard.

5.5.3 Long-Term Effectiveness and Permanence

Long-term effectiveness examines the effectiveness of the alternative to provide protection to human health and the environment and is measured by the magnitude of residual risk remaining after the remedial action and by the adequacy and reliability of controls.

Remedial Alternative 1 provides neither long-term effectiveness nor permanence since the volume of soil exceeding the Yard soil cleanup levels would remain the same. Existing concrete/asphalt pavement acting as engineering controls would not be maintained. Further, no institutional controls would be maintained to prevent onsite workers from accessing remedial zones with soil exceeding the revised Yard soil cleanup levels.

Remedial Alternative 2 provides the highest level of long term effectiveness and permanence through the removal of COC impacted soil to unrestricted use standards. By employing the same technology, Remedial Alternatives 3 and 4 provide fairly equal levels of long term effectiveness

and permanence of the remedy. Soil containing hazardous levels of PCBs would be permanently removed from OU-4 under both alternatives. Excavation to the selected set of restricted use Yard soil cleanup levels (i.e., either current or proposed levels) would satisfy requirements for addressing COC impacted soil through permanent removal from OU-4. Although the COC concentrations in the excavated soil would persist, the soil would be transported to an offsite disposal facility that will properly manage this soil. Both alternatives include maintenance of engineering controls consisting of existing pavement, railroad track, and paved areas throughout OU-4, which provide long term effectiveness of the worker protection from exposure to COCs that meet the selected set of restricted use cleanup levels, yet remain in the soil.

5.5.4 Reduction of Toxicity, Mobility, or Volume

This criterion evaluates the anticipated performance of the remedial action alternative in terms of the treatment used to reduce the toxicity, mobility, or volume, the type and quantity of residuals remaining after treatment, and the degree to which the treatment is irreversible. Specifically, this criterion evaluates the remedial alternative's ability to reduce the toxicity, mobility, or volume of the COCs in OU-4 soil.

Remedial Alternative 1 would not reduce the toxicity, mobility, or volume of COC-impacted soil. The toxicity and volume of the NYS B007 PCB hazardous soil would not be reduced and Remedial Alternative 1 does not provide any controls to ensure the mobility of this waste continues to be prevented.

Alternative 2, 3, and 4 each include removal of all soil characterized as NYS B007 listed PCB hazardous waste. Remedial Alternative 2 provides the highest level of reduction of toxicity, mobility, and volume of COCs from OU-4. Based on the varying cleanup levels for SVOCs/cPAHs and lead associated with Remedial Alternatives 2, 3, and 4, varying volumes of non-hazardous levels of COCs remain following soil excavation. Remedial Alternative 2 removes the largest volume of non-hazardous soil (508,800 cubic yards), followed by 3,700 cubic yards of soil removed under Remedial Alternative 3, and 1,490 cubic yards of soil removed under Remedial Alternative 4. Similarly, the residual toxicity and potential for mobility is more greatly reduced by Remedial Alternative 2, followed by Remedial Alternatives 3 and 4.

Common to each remedial alternative, soil excavation does not reduce the toxicity of the PCBs, SVOCs/cPAHs, and lead in soil. However, the risk associated with the toxicity of this remediation waste would be transferred to the disposal facility equipped to properly manage this material.

5.5.5 Short-Term Effectiveness

Short-term effectiveness refers to the potential effects and related risks associated with the implementation of the remedial action alternative. Potential short-term effects would occur during construction and operation of the remedy. Since Remedial Alternative 1 does not include any remedial actions, it would not have any short-term impacts.

Potential short-term impacts from the implementation of Remedial Alternative 2, 3, and 4 include:

- Direct contact with hazardous and non-hazardous soil;
- Air emissions during excavation;
- Transportation risks; and
- Remedial contractor and onsite worker safety.

Remedial Alternative 2 poses the highest level of short term impacts due to the extensive volume of soil to be excavated throughout OU-4. The time to complete this remedial alternative could span 25 years due to implementability concerns, thus providing extensive opportunities to remedial and Amtrak workers for COC exposure.

The quantities of excavated soil associated with Remedial Alternatives 3 and 4 represent manageable, medium scale excavations and would pose comparable short term impacts to remedial and Amtrak workers. The short term impacts are increased for Remedial Alternative 3 based on the increased volume of soil to be removed, requiring more truck traffic.

The above short term concerns can be reduced through the use of engineering controls (e.g., dust suppression, tarp on soil stockpiles), use of mechanical equipment to directly handle soil, and use of appropriate personal protective equipment. Added engineering controls would be required to

prevent exposure to PCB hazardous soil. As with all work performed in active track areas, railroad personnel would be present to add protection from passing trains.

5.5.6 Implementability

The implementability criterion evaluates the feasibility of an alternative based on the ability to construct and operate the technology, reliability of the technology, ease of undertaking additional remedial actions, if necessary, ability to monitor effectiveness, the administrative feasibility, and the availability of services and materials.

Remedial Alternative 1 can be implemented with relative ease. No active construction or remedial actions would be performed. This alternative would not provide any reliability in reducing exposure risks. Alternatively, implementation of Remedial Alternative 2 in an active railyard is not feasible. Daily operations require that all facilities and tracks remain fully operational and functional.

Remedial Alternatives 3 and 4 would be technically feasible to implement. The equipment required to perform the work would consist of standard demolition and excavation equipment. Remedial contractors are readily available to perform this work. Although technically feasible, Remedial Alternative 3 and 4 would pose implementability difficulties due to the location of some of the remedial zones in active track areas. Remedial zones in open areas are accessible with little administrative effort and could be addressed shortly after remedy selection. The remaining remedial zones in railroad track areas would be excavated on a scheduled program consistent with track maintenance and new construction activities with existing surface covers being maintained in the interim. Based on the increased number of remedial zones to be addressed for Remedial Alternative 3 and their locations within track areas, this alternative is anticipated to require a greater impact on Yard operations and a longer timeframe to complete than Remedial Alternative 4.

5.5.7 Cost

The following is a summary of the estimated costs for each of the remedial action alternatives. The detailed cost estimates are provided in Appendix A.

	Direct Costs	Indirect Costs	Total Cost
Alternative 1	$0	$0	$0
Alternative 2	$168,833,067	$10,129,984	$178,963,051
Alternative 3	$1,527,040	$656,627	$2,183,667
Alternative 4	$792,061	$340,586	$1,132,647

The cost for Alternative 2 is extremely high and would be prohibitively expensive to implement. The direct costs for Alternative 3 are significantly greater than Alternative 4 primarily associated with soil disposal to address cPAHs and lead at current Yard cleanup levels. Alternative 4 provides a more cost effective alternative to Alternative 3 while achieving an equivalent level of protection of human health and the environment.

6.0 RECOMMENDED REMEDIAL ACTION ALTERNATIVE

The recommended remedial action alternative for OU-4 is Remedial Alternative 4. Remedial Alternative 4 would comply with the majority of the applicable chemical and action-specific SCGs. Each of the remedial tasks associated with Remedial Alternative 4 would provide long-term effectiveness and permanence. Soil with concentrations in excess of the proposed Yard soil cleanup levels for the COCs would be excavated. PCB-hazardous waste would be permanently removed from OU-4. Furthermore, excavation and offsite disposal is a NYSDEC DER-15 Presumptive Remedy for PCB-impacted soil.

Remedial Alternative 4 poses few short-term impacts to onsite workers and remedial contractors, is administratively feasible, with a reasonable level of effort in obtaining permits and for disposal tracking. Lastly, Remedial Alternative 4 is protective to human health and the environment and is a cost effective alternative.

Respectfully submitted,

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USEPA, 2000. A Guide to Developing and Documenting Cost Estimates During Feasibility Study, EPA 540-R-00-002, July 2000.

Table 1. Action and Chemical-Specific SCGs, OU-4 Feasibility Study, Amtrak, Sunnyside Yard, Queens, New York

Citation	Title	Description	SCG Type
NEW YORK STATE SCGs			
6 NYCRR Section 371.3 (e)	Identification and Listing of Hazardous Wastes - Characteristics of Hazardous Waste, Toxicity Characteristic	Soil with leachable lead concentrations greater than the toxicity characteristic regulatory level of 5 mg/l using the TCLP test method is classified as D008 hazardous waste.	Chemical
6 NYCRR Section 371.4 (e)	Identification and Listing of Hazardous Wastes - Lists of Hazardous Waste, Wastes containing PCBs	Soil containing 50 ppm or greater of PCBs are B007 as a listed PCB hazardous waste.	Chemical
6 NYCRR Section 372.2	Standards Applicable to Generators of Hazardous Waste	Provides requirements for the management and handling of hazardous waste	Action
6 NYCRR Subparts 375-1 and 375-2	Environmental Remediation Programs - Inactive Hazardous Waste Sites	Provides general requirements and IHWDS remedial program requirements and procedures for developing RAOs and remedy selection.	Action
6 NYCRR Subpart 375-6	Remedial Program Soil Cleanup Objectives	Establishes the soil cleanup objectives for restricted industrial sites.	Chemical
6 NYCRR Part 376	Land Disposal Restrictions	This standard provides hazardous waste disposal requirements and lists wastes that are restricted from land disposal.	Action
Letters from NYSDEC dated 2/25/97 and 3/27/98	Letter containing NYSDEC recommended soil cleanup levels for COCs	Current Yard soil cleanup levels for the COCs.	Chemical
FEDERAL SCGs			
39 CFR 261.24	Identification and Listing of Hazardous Wastes - Toxicity Characteristic	Soil with leachable lead concentrations greater than the toxicity characteristic regulatory level of 5 mg/l using the TCLP test method is classified as D008 hazardous waste.	Chemical
40 CFR 262	Standards Applicable to Generators of Hazardous Waste	Standard provides requirements for hazardous waste management	Action
40 CFR 268	Standards Applicable to Transporters of Hazardous Waste	Standard provides requirements for manifests and the transportation of hazardous waste	Action
41 CFR 263	Land Disposal Restrictions	This standard provides hazardous waste disposal requirements and lists wastes that are restricted from land disposal.	Action
NCP, 40 CFR 300.430	Remedial Investigation/Feasibility Study and Selection of Remedy	Establishes procedures and requirements in developing the RAOs and remedy selection.	Action
TSCA, 40 CFR 761.61	PCB Remediation Waste	This standard sets the cleanup levels and the treatment, storage and disposal requirements of PCB-impacted material.	Action, Chemical
29 CFR 1910	Occupational Safety and Health Standards	This regulation will be applicable and relevant to any selected remedy.	Action
29 CFR 1926	Occupational Safety and Health	This regulation will be applicable and relevant to any selected remedy.	Action

Table 1. Action and Chemical-Specific SCGs, OU-4 Feasibility Study, Amtrak, Sunnyside Yard, Queens, New York

Citation	Title	Description	SCG Type
LOCAL SCGs			
RCNY Titles 1,15,16	Rules of the City of New York		Action
GUIDANCE			
TAGM 4030	Selection of Remedial Actions at Inactive Hazardous Waste Sites	Provides procedures for development of RAOs and remedial alterative evaluation.	Action
TAGM 4041	Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites	May relate to required activities during remedy implementation	Action
NYSDOH Generic CAMP for Ground Intrusive Activities	Generic Community Air Monitoring Protocol	Would relate to intrusive remedial actions	Action
NYSDEC Draft DER-10	Technical Guidance for Site Investigation and Remediation	Guidance provides procedures for developing RAOs, remedial alternative screening and selection	Action

Glossary of Acronyms

CFR	Code of Federal Regulations
NYSDEC	New York State Department of Environmental Conservation
NYCRR	New York Code of Rules and Regulations
SCG	Standards, Criteria, and Guidance
DER	Department of Environmental Remediation
NCP	National Contingency Plan
TSCA	Toxic Substance Control Act
RCNY	Rules of the City of New York
NYSDOH	New York State Department of Health
TAGM	Technical and Administrative Guidance Memorandum
CAMP	Community Air Monitoring Protocol
PCB	Polychorinated Biphenyls
COC	Compounds of Concern
TCLP	Toxicity Characteristic Leaching Procedure
IHWDS	Inactive Hazardous Waste Disposal Site
RAO	Remedial Action Objective
PPM	parts per million
mg/l	milligrams per liter

Table 2. Comparison of Total SVOC Concentrations to Total cPAH Concentrations, OU-4 Feasibility Study Amtrak Sunnyside Yard, Queens, New York

Designation	Date	Depth (feet)	Location	Total SVOCs (mg/kg)	Total cPAHs (mg/kg)	% cPAHs
S-43	11/05/1990	0-2	OU-4	98.456	42.59	43.26%
S-101 RE	01/18/1993	0-2	OU-4	51.64	23.6	45.70%
SS-0027A	11/10/2006	--	OU-4 Stockpile	27.624	11.14	40.33%
SS-0025D	10/27/2006	--	OU-4 Stockpile	23.695	12.98	54.78%
SS-0025A	10/27/2006	--	OU-4 Stockpile	22.01	12.4	56.34%
SS-0025B	10/27/2006	--	OU-4 Stockpile	20.518	11.01	53.66%
SS-0027E	11/10/2006	--	OU-4 Stockpile	19.18	5.14	26.80%
PC-13	07/19/2007	1-2	OU-4	18.663	9.88	52.94%
SS-0025E	10/27/2006	--	OU-4 Stockpile	18.075	9.67	53.50%
TP-10	03/24/1997	0-2	OU-2	16.89	7.78	46.06%
SS-0025C	10/27/2006	--	OU-4 Stockpile	16.632	8.83	53.09%
PC-13	07/19/2007	0-1	OU-4	16.303	7.83	48.03%
PC-13	07/19/2007	2-3	OU-4	16.08	8.27	51.43%
SS-0026C	11/3/2006	--	OU-4 Stockpile	15.716	8.15	51.86%
SS-0027F	11/10/2006	--	OU-4 Stockpile	14.578	7.05	48.36%
SS-0026D	11/3/2006	--	OU-4 Stockpile	14.294	6.42	44.91%
SS-0007C	8/7/2006	--	OU-4 Stockpile	13.632	7.32	53.70%
SS-0027D	11/10/2006	--	OU-4 Stockpile	13.142	7.03	53.49%
S-168	07/20/2007	0-1	OU-4	13.03	5.62	43.13%
SS-0026E	11/3/2006	--	OU-4 Stockpile	12.991	42.59	327.84%
SH-9	12/10/2007	0-1	OU-4	12.69	5.01	39.48%
SS-0007A	8/7/2006	--	OU-4 Stockpile	11.853	6.05	51.04%
SS-0026B	11/3/2006	--	OU-4 Stockpile	11.817	5.85	49.50%
SS-0007B	8/7/2006	--	OU-4 Stockpile	11.024	5.67	51.43%
S-22 RE	10/17/1990	0-2	OU-4	10.972	5.617	51.19%
SS-0026A	11/3/2006	--	OU-4 Stockpile	10.733	5.5	51.24%
SS-0026F	11/3/2006	--	OU-4 Stockpile	10.202	5.67	55.58%
SS-0027B	11/10/2006	--	OU-4 Stockpile	10.09	5.16	51.14%
S-102 RE	01/18/1993	0-2	OU-4	9.833	6.21	63.15%
R-UST/N	11/18/1997	--	OU-4	9.419	4.71	50.01%
R-UST/S	11/18/1997	--	OU-4	9.227	4.79	51.91%
S-100	01/18/1993	0-2	OU-4	8.681	4.571	52.66%
SS-0007D	8/7/2006	--	OU-4 Stockpile	8.606	4.5	52.29%
FC-5	09/14/1994	0-2	OU-4	8.228	4.463	54.24%
HST-10	03/25/1997	0-2	OU-2	7.965	3.8	47.71%
SS-0027C	11/10/2006	--	OU-4 Stockpile	6.399	2.914	45.54%
FC-11	09/14/1994	0-2	OU-4	6.238	4.006	64.22%
SH-11	12/10/2007	0-1	OU-4	6.039	3.01	49.84%
S-165	07/19/2007	0-1	OU-4	5.638	3.1	54.98%
S-167	07/20/2007	0-1	OU-4	5.53	2.59	46.84%
HST-7	04/18/1996	0-2	OU-1	5.094	3.229	63.39%
MW-34	11/29/1990	0-2	OU-4	4.845	2.498	51.56%
HST-7	04/18/1996	6-8	OU-1	4.823	2.657	55.09%
HST-8	04/19/1996	0-2	OU-1	4.384	3.069	70.00%
FC-4	09/14/1994	0-2	OU-4	4.149	2.176	52.45%
S-169	07/20/2007	7-9	OU-4	4.081	2.21	54.15%
SH-1	12/10/2007	0-1	OU-4	4.055	1.821	44.91%
FC-33	04/04/1994	1-3	OU-4	4.014	1.387	34.55%
HST-5	04/17/1996	0-2	OU-1	3.85	1.83	47.53%
TP-8	03/25/1997	0-2	OU-2	3.593	1.667	46.40%

Table 2. Comparison of Total SVOC Concentrations to Total cPAH Concentrations, OU-4 Feasibility Study Amtrak Sunnyside Yard, Queens, New York

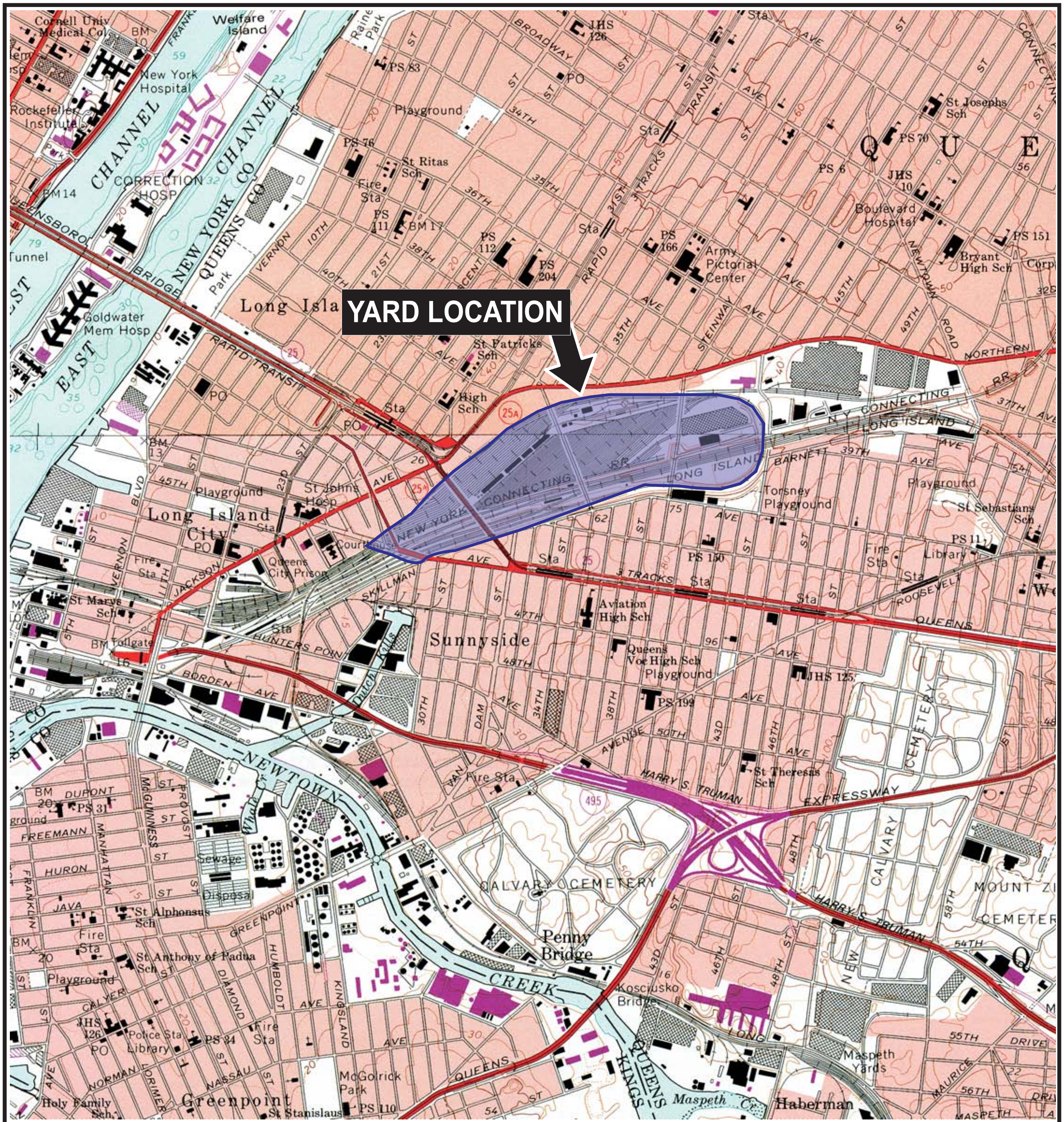
Designation	Date	Depth (feet)	Location	Total SVOCs (mg/kg)	Total cPAHs (mg/kg)	% cPAHs
TP-6	04/17/1996	0-2	OU-2	2.883	1.543	53.52%
FC-8	09/14/1994	0-2	OU-4	2.877	1.3	45.19%
HST-14	03/25/1997	0-2	OU-2	2.766	1.252	45.26%
SH-6	12/10/2007	0-1	OU-4	2.621	0.886	33.80%
SH-12	12/10/2007	0-1	OU-4	2.478	1.376	55.53%
R-UST/W DUP	11/18/1997	--	OU-4	2.38	1.18	49.58%
HST-11	03/25/1997	0-2	OU-2	2.105	0.74	35.15%
PC-14	07/19/2007	0-1	OU-4	1.879	1.2	63.86%
HST-9	03/25/1997	0-2	OU-2	1.757	0.634	36.08%
HST-13	03/25/1997	0-2	OU-2	1.541	0.636	41.27%
SH-4	12/10/2007	0-1	OU-4	1.509	0.673	44.60%
FC-24	04/05/1994	1-3	OU-4	1.498	0.53	35.38%
HST-12	03/25/1997	0-2	OU-2	1.34	0.418	31.19%
S-17 RE	10/19/1990	0-2	OU-4	1.34	0	0.00%
HST-6	04/19/1996	0-2	OU-1	1.322	0.441	33.36%
S-82	10/16/1990	0-2	OU-4	1.233	1.233	100.00%
TP-9	03/24/1997	0-2	OU-2	1.042	0.389	37.33%
PC-14	07/19/2007	1-2	OU-4	1.034	0.657	63.54%
S-30	10/16/1990	0-2	OU-4	0.962	0	0.00%
S-80	10/03/1990	2-4	OU-4	0.875	0	0.00%
FC-31	04/05/1994	1-3	OU-4	0.858	0.353	41.14%
S-165	07/19/2007	2-3	OU-4	0.849	0.536	63.13%
MW-26R	12/05/1990	9-11	OU-4	0.829	0	0.00%
SH-8	12/10/2007	0-1	OU-4	0.815	0.343	42.09%
SH-10	12/10/2007	0-1	OU-4	0.812	0.297	36.58%
S-169	07/20/2007	0-1	OU-4	0.808	0.463	57.30%
FC-27	04/04/1994	1-3	OU-4	0.688	0.418	60.76%
HST-13	03/25/1997	4-6	OU-2	0.672	0.174	25.89%
FC-40	04/05/1994	1-3	OU-4	0.67	0.287	42.84%
TP-7	04/17/1996	0-2	OU-1	0.649	0.327	50.39%
S-165	07/19/2007	1-2	OU-4	0.611	0.377	61.70%
S-166	07/20/2007	0-1	OU-4	0.596	0.361	60.57%
S-167	07/20/2007	1-2	OU-4	0.564	0.302	53.55%
S-53	11/18/1990	5-7	OU-4	0.461	0	0.00%
HST-12	03/25/1997	4-6	OU-2	0.454	0.052	11.45%
TP-7	04/17/1996	5-7	OU-1	0.428	0.147	34.35%
HST-9	03/25/1997	2-4	OU-2	0.369	0.052	14.09%
S-168	07/20/2007	1-2	OU-4	0.334	0.175	52.40%
HST-4	04/19/1996	0-2	OU-4	0.221	0.097	43.89%
TP-6	04/17/1996	3-5	OU-1	0.219	0.035	15.98%
S-37	12/01/1990	4-6	OU-4	0.217	0	0.00%
S-35	11/30/1990	8-10	OU-4	0.203	0	0.00%
S-39	11/29/1990	2-4	OU-4	0.197	0	0.00%
S-169	07/20/2007	1-2	OU-4	0.191	0.097	50.79%
O/W-UST/E	11/19/1997	--	OU-4	0.184	0.113	61.41%
HST-5	04/17/1996	5-7	OU-1	0.16	0.019	11.88%
HST-4	04/19/1996	4-6	OU-1	0.144	0	0.00%
O/W-UST/W	11/19/1997	--	OU-4	0.13	0	0.00%
FC-18	04/06/1994	1-3	OU-4	0.105	0.038	36.19%
S-168	07/20/2007	2-3	OU-4	0.082	0	0.00%

Table 2. Comparison of Total SVOC Concentrations to Total cPAH Concentrations, OU-4 Feasibility Study Amtrak Sunnyside Yard, Queens, New York

Designation	Date	Depth (feet)	Location	Total SVOCs (mg/kg)	Total cPAHs (mg/kg)	% cPAHs
HST-11	03/25/1997	4-6	OU-2	0.077	0	0.00%
R-UST/BOT	11/18/1997	--	OU-4	0.071	0	0.00%
TP-10	03/24/1997	9-11	OU-2	0.067	0.019	28.36%
HST-15	03/24/1997	0-2	OU-2	0.061	0.025	40.98%
HST-8	04/19/1996	6-8	OU-1	0.051	0	0.00%
HST-15	03/24/1997	6-8	OU-2	0.049	0	0.00%
SH-7	12/10/2007	0-1	OU-4	0.049	0	0.00%
FC-36	04/06/1994	7-9	OU-4	0.048	0	0.00%
HST-6	04/19/1996	7-9	OU-1	0.045	0	0.00%
S-166	07/20/2007	2-3	OU-4	0.044	0	0.00%
SH-5	12/10/2007	0-1	OU-4	0.043	0	0.00%
TP-9	03/24/1997	4-6	OU-2	0.038	0	0.00%
S-164	07/19/2007	2-3	OU-4	0.035	0	0.00%
O/W-UST/S	11/19/1997	--	OU-4	0.027	0.027	100.00%
TP-8	03/25/1997	4-6	OU-2	0.023	0	0.00%
HST-10	03/25/1997	2-4	OU-2	0.019	0	0.00%
HST-14	03/25/1997	6-8	OU-2	0.015	0	0.00%
O/W-UST/B	11/19/1997	--	OU-4	0	0	0.00%
O/W-UST/N	11/19/1997	--	OU-4	0	0	0.00%
PC-14	07/19/2007	2-3	OU-4	0	0	0.00%
R-UST/E	11/18/1997	--	OU-4	0	0	0.00%
R-UST/W	11/18/1997	--	OU-4	0	0	0.00%
S-164	07/19/2007	0-1	OU-4	0	0	0.00%
S-164	07/19/2007	1-2	OU-4	0	0	0.00%
S-166	07/20/2007	1-2	OU-4	0	0	0.00%
S-167	07/20/2007	2-3	OU-4	0	0	0.00%
S-169	07/20/2007	2-3	OU-4	0	0	0.00%
S-33	12/13/1990	4-6	OU-4	0	0	0.00%
S-38	11/29/1990	2-4	OU-4	0	0	0.00%
S-41A	11/07/1990	3.5-5.5	OU-4	0	0	0.00%
S-47 RE	10/19/1990	2-4	OU-4	0	0	0.00%
S-49 RE	10/19/1990	2-4	OU-4	0	0	0.00%
S-60	12/12/1990	4-6	OU-4	0	0	0.00%
S-90	10/01/1990	1-3	OU-4	0	0	0.00%
SH-2	12/10/2007	0-1	OU-4	0	0	0.00%
SH-3	12/10/2007	0-1	OU-4	0	0	0.00%
					Average:	**34.60%**

Notes:

1. mg/kg - milligram per kilogram
2. cPAH - carcinogenic polycyclic aromatic hydrocarbon; SVOC - Semivolatile organic compound
3. -- indicates surface sample collected from 0-6" or less



SOURCE:
CENTRAL PARK AND BROOKLYN, NEW YORK
QUADRANGLE 7.5 MINUTE SERIES (TOPOGRAPHIC)

QUADRANGLE
LOCATION

N

0 2000'

Title:

LOCATION OF SITE

OU-4 FEASIBILITY STUDY
SUNNYSIDE YARD, QUEENS, NEW YORK

Prepared for:

AMTRAK

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: H.G.	Date: 15JAN09	FIGURE
Prepared by: J.A.D.	Scale: 1"=2000'	1
Project Mgr.: H.G.	Office: NY	
File No.: AM7114501.CDR	Project No.: 05571Y08	

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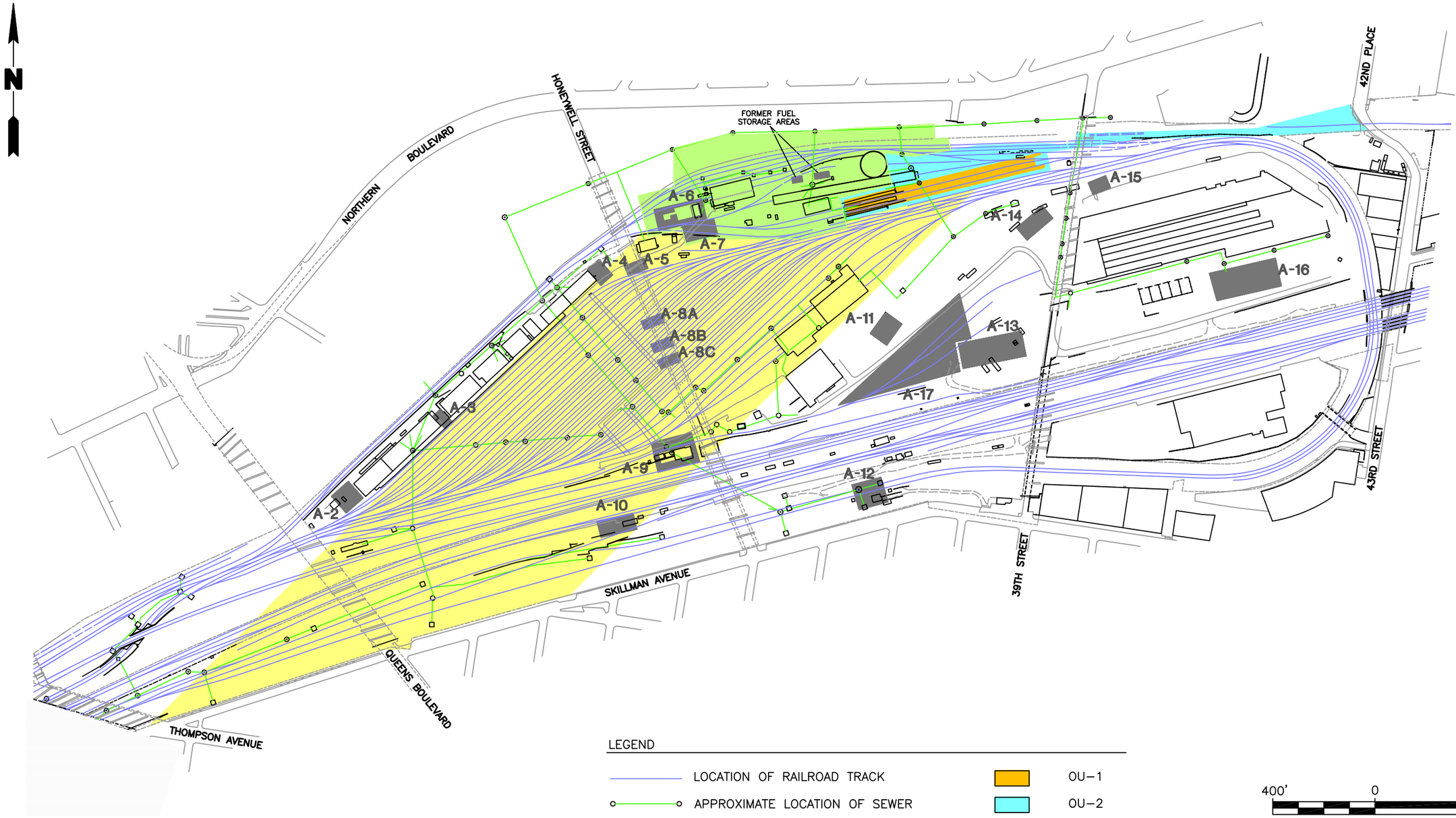

LEGEND

- LOCATION OF RAILROAD TRACK
- APPROXIMATE LOCATION OF SEWER
- GRATE COVER CATCH BASIN LOCATION
- SOLID COVER MANHOLE LOCATION
- GRATE COVER MANHOLE LOCATION
- A-2 LOCATION AND DESIGNATION OF PREVIOUSLY DETERMINED AREA OF CONCERN
- APPROXIMATE PROPERTY BOUNDARY

- OU–1
- OU–2
- OU–3
- OU–4
- OU–5

400' 0 400'

NOTES

1. LOCATIONS OF SEWER COMPONENTS BASED UPON A REVIEW OF AMTRAK–SUPPLIED ENGINEERING DIAGRAMS AND LIMITED FIELD SURVEY.
2. OU–6, GROUND WATER BENEATH THE YARD, IS NOT SHOWN.
3. RI – REMEDIAL INVESTIGATION
4. LIRR – LONG ISLAND RAIL ROAD

Title:

AMTRAK YARD LAYOUT

OU–4 FEASIBILITY STUDY
SUNNYSIDE YARD, QUEENS, NEW YORK

Prepared For:
AMTRAK

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: H.G.	Date: 15JAN09	FIGURE
Prepared by: J.A.D.	Scale: AS SHOWN	2
Project Mgr: H.G.	Office: NY	
File No: AM7114502	Project: 05571Y08	

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DESCRIPTION OF LAND SURFACE COVER

TRACK (INCLUDES TRACKS, BALLAST, CONCRETE AND PAVED WALKWAYS)
(65.13 ACRES - 54.27%)

ASPHALT / CONCRETE PAVEMENT AND BUILDINGS
(29.6 ACRES - 24.66%)

BRUSH/VEGETATION
(20.66 ACRES - 17.21%)

EXPOSED GROUND
(4.59 ACRES - 3.82%)

APPROXIMATE EXTENT OF OU-4 BOUNDARY

NOTE:
APPROXIMATE TOTAL AREA OF OPERABLE UNIT 4 IS 120 ACRES.

N

Title:

OU-4 - LAND SURFACE COVER

OU-4 FEASIBILITY STUDY

Prepared For: AMTRAK

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: RSK	Date: 1/16/2009	FIGURE
Prepared by: RSK	Scale: 1 INCH = 400 FEET	3
Project Mgr: HG	Office: NY	
File No: AM7114504.WOR	Project: 0055.0071Y008	

APPENDIX A

Remedial Alternative Cost Estimation Tables

Table A1. Remedial Alternative 2 - Soil Excavation to Predisposal Unrestricted Use Soil Criteria, OU-4 Feasibility Study
Amtrak Sunnyside Yard, Queens, New York

Description	Quantity	Unit	Unit Cost	Total Cost
Track Pit 4				
Removal of concrete inspection pit (Track 4 Pit), investigation of surrounding soil, excavation of PCB-containing soil.				
Removal of sediment	1	LS	$1,000.00	$1,000.00
Inspection Pit Removal	1	LS	$10,000.00	$10,000.00
Soil Investigation	1	LS	$7,000.00	$7,000.00
Excavate and Stockpile Soil	30	CY	$30.00	$900.00
Backfill and Compaction	75	CY	$35.00	$2,625.00
Stabilization of Sediment	1.25	CY	$15.00	$18.75
T&D PCB Hazardous Sediment	1.22	Tons	$177.00	$215.94
T&D Hazardous PCB Containing Soil	45	Tons	$177.00	$7,965.00
T&D Non-Hazardous PCB Containing Concrete	40	Tons	$100.00	$4,000.00
Waste Characterization Sampling	2	Each	$750.00	$1,500.00
H&S Dust Control	1	LS	$2,500.00	$2,500.00
Subtotal				**$37,724.69**
Pre-Disposal Excavation				
Soil Excavation - Excludes soil surrounding Track 4 Pit				
Excavate and Stockpile Soil	580,802	CY	$30.00	$17,424,060.00
Backfill and Compaction	638,882	CY	$35.00	$22,360,870.00
T&D Non-Hazardous Containing Soil	869,466	Tons	$100.00	$86,946,600.00
T&D Hazardous Containing Soil	1,737	Tons	$177.00	$307,449.00
Post-Excavation Soil Samples	500	samples	$177.00	$88,500.00
Waste Characterization Sampling	580	samples	$750.00	$435,000.00
H&S Dust Control	1	LS	$1,280,000.00	$1,280,000.00
Subtotal				**$128,842,479.00**

Subtotal Direct Costs	$128,880,204
Mobilization/Demobilization (1%)	$1,288,802
Contingency (30%)	$38,664,061
TOTAL DIRECT COSTS	**$168,833,067**
Project Management (1%)	$1,688,331
Remedial Design (1%)	$1,688,331
Construction Management (1%)	$1,688,331
Track and ET Dept. Coordination (2%)	$3,376,661
Community Air Monitoring (1%)	$1,688,331
TOTAL INDIRECT COSTS	**$10,129,984**
TOTAL CAPITAL COSTS	**$178,963,051**

Table A2. Remedial Alternative 3 - Soil Excavation to Existing Yard Soil Cleanup Levels, OU-4 Feasibility Study
Amtrak Sunnyside Yard, Queens, New York

Description	Quantity	Unit	Unit Cost	Total Cost
Track Pit 4				
Removal of concrete inspection pit (Track 4 Pit), investigation of surrounding soil, excavation of PCB-containing soil.				
Removal of sediment	1	LS	$1,000.00	$1,000.00
Inspection Pit Removal	1	LS	$10,000.00	$10,000.00
Soil Investigation	1	LS	$7,000.00	$7,000.00
Excavate and Stockpile Soil	30	CY	$30.00	$900.00
Backfill and Compaction	75	CY	$35.00	$2,625.00
Stabilization of Sediment	1.25	CY	$15.00	$18.75
T&D PCB Hazardous Sediment	1.22	Tons	$177.00	$215.94
T&D Hazardous PCB Containing Soil	45	Tons	$177.00	$7,965.00
T&D Non-Hazardous PCB Containing Concrete	40	Tons	$100.00	$4,000.00
Waste Characterization Sampling	2	Each	$750.00	$1,500.00
H&S Dust Control	1	LS	$2,500.00	$2,500.00
Subtotal				**$37,724.69**
PCB Exceedance Excavations - PCBs > 25 ppm (12 remedial zones)				
Pavement Removal	10	CY	$24.00	$240
Predelineation Soil Samples (PCBs only)	32	Each	$60.00	$1,920
Excavate and Stockpile Soil	1,400	CY	$30.00	$42,000
Backfill and Compaction	1,540	CY	$35.00	$53,900
T&D Non-Hazardous PCB Containing Soil	180	Tons	$100.00	$18,000
T&D Hazardous PCB Containing Soil	1,965	Tons	$177.00	$347,805
T&D asphalt/concrete pavement material	10	CY	$60.00	$600.00
Waste Characterization Sampling	12	Each	$750.00	$9,000
Replace pavement	1000	SF	$6.00	$6,000.00
H&S Dust Control	1	LS	$33,600.00	$33,600.00
Subtotal				**$513,065.00**
Lead Exceedance Excavation - Lead > 3900 ppm (1 remedial zone)				
Excavation of non-hazardous Lead-containing soil (Excavation depth 1 ft bls)				
Predelineation Soil Samples (lead only)	9	Each	$12.00	$108.00
Excavate and Stockpile Soil	60	CY	$30.00	$1,800.00
Backfill and Compaction	66	CY	$35.00	$2,310.00
T&D Non-Hazardous Lead Containing Soil	90	Tons	$100.00	$9,000.00
Waste Characterization Sampling	1	Each	$750.00	$750.00
H&S Dust Control	1	LS	$1,000.00	$1,000.00
Subtotal				**$14,968.00**
Lead Exceedance Excavations - Lead > 1000 ppm (19 remedial zones)				
Excludes Lead impacted soil removed in PCB excavations (11 Exceedances)				
Predelineation Soil Samples (lead only)	50	Each	$12.00	$600.00
Excavate and Stockpile Soil	1,300	CY	$30.00	$39,000.00
Backfill and Compaction	1,430	CY	$35.00	$50,050.00
T&D Non-Hazardous Lead Containing Soil	1,950	Tons	$100.00	$195,000.00
Waste Characterization Sampling	2	Each	$750.00	$1,500.00
H&S Dust Control	1	LS	$20,000.00	$20,000.00
Subtotal				**$306,150.00**

Table A2. Remedial Alternative 3 - Soil Excavation to Existing Yard Soil Cleanup Levels, OU-4 Feasibility Study
Amtrak Sunnyside Yard, Queens, New York

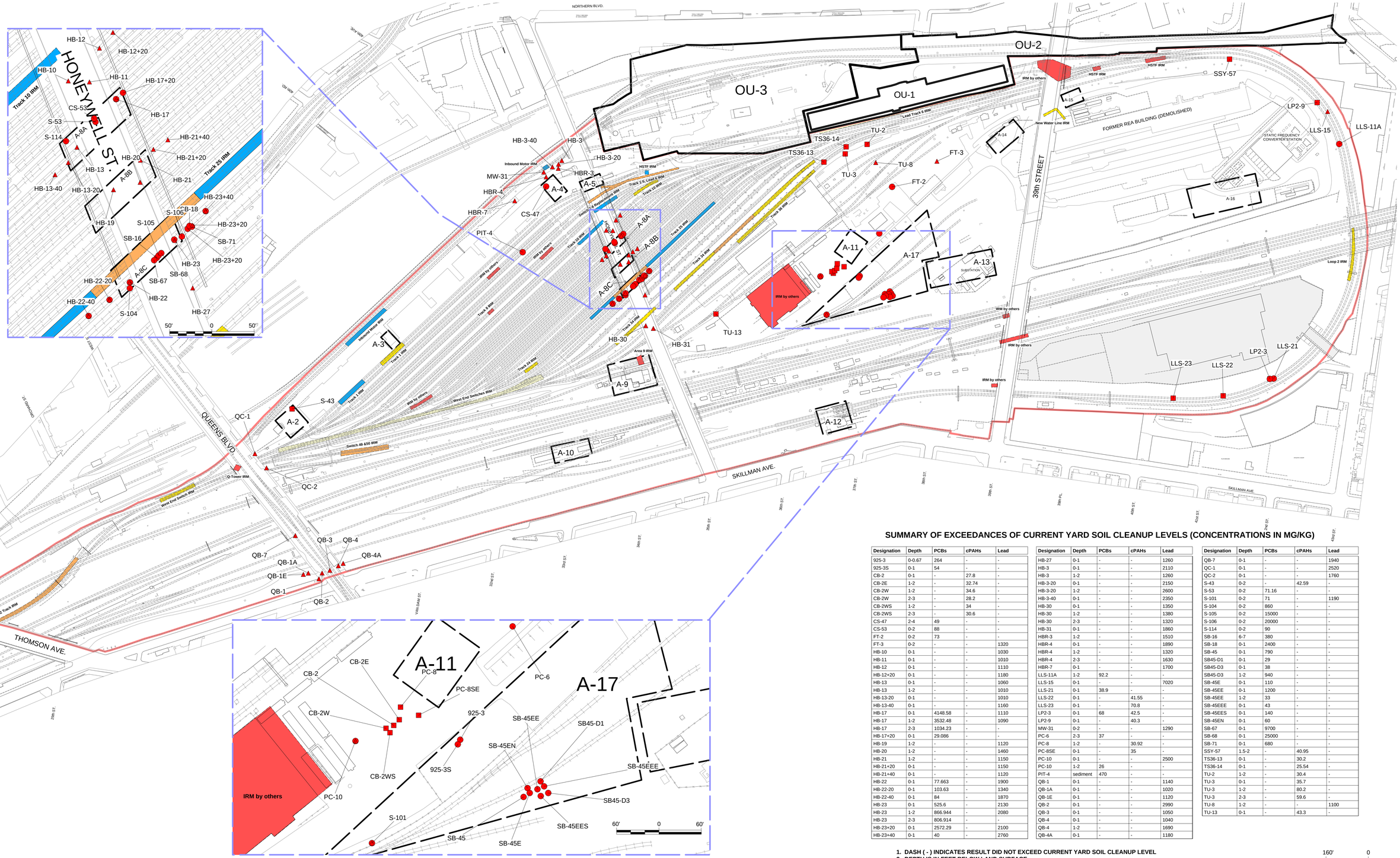
CPAH Exceedance Excavations - CPAH > 25 ppm (9 remedial zones)				
Excludes cPAH impacted soil removed in PCB excavations (1 Exceedance)				
Predelineation Soil Samples (cPAHs only)	50	Each	$105.00	$5,250.00
Excavate and Stockpile Soil	910	CY	$30.00	$27,300.00
Backfill and Compaction	1,001	CY	$35.00	$35,035.00
T&D Non-Hazardous cPAH Containing Soil	1,365	Tons	$100.00	$136,500.00
Waste Characterization Sampling	1	Each	$750.00	$750.00
H&S Dust Control	1	Day	$14,000.00	$14,000.00
Subtotal				**$218,835.00**

Subtotal Direct Costs	$1,090,743
Mobilization/Demobilization (10%)	$109,074
Contingency (30%)	$327,223
TOTAL DIRECT COSTS	***$1,527,040***
Project Management (6%)	$91,622
Remedial Design (12%)	$183,245
Construction Management (8%)	$122,163
Track and ET Dept. Coordination (10%)	$152,704
Community Air Monitoring (7%)	$106,893
TOTAL INDIRECT COSTS	***$656,627***
TOTAL CAPITAL COSTS	**$2,183,667**

Table A3. Remedial Alternative 4 - Soil Excavation to Proposed Yard Soil Cleanup Levels, OU-4 Feasibility Study
Amtrak Sunnyside Yard, Queens, New York

Description	Quantity	Unit	Unit Cost	Total Cost
Track Pit 4				
Removal of concrete inspection pit (Track 4 Pit), investigation of surrounding soil, excavation of PCB-containing soil.				
Removal of sediment	1	LS	$1,000.00	$1,000.00
Inspection Pit Removal	1	LS	$10,000.00	$10,000.00
Soil Investigation	1	LS	$7,000.00	$7,000.00
Excavate and Stockpile Soil	30	CY	$30.00	$900.00
Backfill and Compaction	75	CY	$35.00	$2,625.00
Stabilization of Sediment	1.25	CY	$15.00	$18.75
T&D PCB Hazardous Sediment	1.22	Tons	$177.00	$215.94
T&D Hazardous PCB Containing Soil	45	Tons	$177.00	$7,965.00
T&D Non-Hazardous PCB Containing Concrete	40	Tons	$100.00	$4,000.00
Waste Characterization Sampling	2	Each	$750.00	$1,500.00
H&S Dust Control	1	LS	$2,500.00	$2,500.00
Subtotal				**$37,724.69**
PCB Exceedance Excavations - PCBs > 25 ppm (12 remedial zones)				
Pavement Removal	10	CY	$24.00	$240
Predelineation Soil Samples (PCBs only)	32	Each	$60.00	$1,920
Excavate and Stockpile Soil	1,400	CY	$30.00	$42,000
Backfill and Compaction	1,540	CY	$35.00	$53,900
T&D Non-Hazardous PCB Containing Soil	180	Tons	$100.00	$18,000
T&D Hazardous PCB Containing Soil	1,965	Tons	$177.00	$347,805
T&D asphalt/concrete pavement material	10	CY	$60.00	$600.00
Waste Characterization Sampling	12	Each	$750.00	$9,000
Replace pavement	1000	SF	$6.00	$6,000.00
H&S Dust Control	1	LS	$33,600.00	$33,600.00
Subtotal				**$513,065.00**
Lead Exceedance Excavation - Lead > 3900 ppm (1 remedial zone)				
Excavation of non-hazardous Lead-containing soil (Excavation depth 1 ft bls)				
Predelineation Soil Samples (lead only)	9	Each	$12.00	$108.00
Excavate and Stockpile Soil	60	CY	$30.00	$1,800.00
Backfill and Compaction	66	CY	$35.00	$2,310.00
T&D Non-Hazardous Lead Containing Soil	90	Tons	$100.00	$9,000.00
Waste Characterization Sampling	1	Each	$750.00	$750.00
H&S Dust Control	1	LS	$1,000.00	$1,000.00
Subtotal				**$14,968.00**

Subtotal Direct Costs	$565,758
Mobilization/Demobilization (10%)	$56,576
Contingency (30%)	$169,727
TOTAL DIRECT COSTS	**$792,061**
Project Management (6%)	$47,524
Remedial Design (12%)	$95,047
Construction Management (8%)	$63,365
Track and ET Dept. Coordination (10%)	$79,206
Community Air Monitoring (7%)	$55,444
TOTAL INDIRECT COSTS	**$340,586**
TOTAL CAPITAL COSTS	**$1,132,647**



SUMMARY OF EXCEEDANCES OF CURRENT YARD SOIL CLEANUP LEVELS (CONCENTRATIONS IN MG/KG)

Designation	Depth	PCBs	cPAHs	Lead
925-3	0-0.67	264	-	-
925-3S	0-1	54	-	-
CB-2	0-1	-	27.8	-
CB-2E	1-2	-	32.74	-
CB-2W	1-2	-	34.6	-
CB-2W	2-3	-	28.2	-
CB-2WS	1-2	-	34	-
CB-2WS	2-3	-	30.6	-
CS-47	2-4	49	-	-
CS-53	0-2	88	-	-
FT-2	0-2	73	-	-
FT-3	0-2	-	-	1320
HB-10	0-1	-	-	1030
HB-11	0-1	-	-	1010
HB-12	0-1	-	-	1110
HB-12+20	0-1	-	-	1180
HB-13	0-1	-	-	1060
HB-13	1-2	-	-	1010
HB-13-20	0-1	-	-	1010
HB-13-40	0-1	-	-	1160
HB-17	0-1	4148.58	-	1110
HB-17	1-2	3532.48	-	1090
HB-17	2-3	1034.23	-	-
HB-17+20	0-1	29.086	-	-
HB-19	1-2	-	-	1120
HB-20	1-2	-	-	1460
HB-21	1-2	-	-	1150
HB-21+20	0-1	-	-	1150
HB-21+40	0-1	-	-	1120
HB-22	0-1	77.663	-	1900
HB-22-20	0-1	103.63	-	1340
HB-22-40	0-1	84	-	1870
HB-23	0-1	525.6	-	2130
HB-23	1-2	866.944	-	2080
HB-23	2-3	806.914	-	-
HB-23+20	0-1	2572.29	-	2100
HB-23+40	0-1	40	-	2760

Designation	Depth	PCBs	cPAHs	Lead
HB-27	0-1	-	-	1260
HB-3	0-1	-	-	2110
HB-3	1-2	-	-	1260
HB-3-20	0-1	-	-	2150
HB-3-20	1-2	-	-	2600
HB-3-40	0-1	-	-	2350
HB-30	0-1	-	-	1350
HB-30	1-2	-	-	1380
HB-30	2-3	-	-	1320
HB-31	0-1	-	-	1860
HBR-3	1-2	-	-	1510
HBR-4	0-1	-	-	1890
HBR-4	1-2	-	-	1320
HBR-4	2-3	-	-	1630
HBR-7	0-1	-	-	1700
LLS-11A	1-2	92.2	-	-
LLS-15	0-1	-	-	7020
LLS-21	0-1	38.9	-	-
LLS-22	0-1	-	41.55	-
LLS-23	0-1	-	70.8	-
LP2-3	0-1	68	42.5	-
LP2-9	0-1	-	40.3	-
MW-31	0-2	-	-	1290
PC-6	2-3	37	-	-
PC-8	1-2	-	30.92	-
PC-8SE	0-1	-	35	-
PC-10	0-1	-	-	2500
PC-10	1-2	26	-	-
PIT-4	sediment	470	-	-
QB-1	0-1	-	-	1140
QB-1A	0-1	-	-	1020
QB-1E	0-1	-	-	1120
QB-2	0-1	-	-	2990
QB-3	0-1	-	-	1050
QB-4	0-1	-	-	1040
QB-4	1-2	-	-	1690
QB-4A	0-1	-	-	1180

Designation	Depth	PCBs	cPAHs	Lead
QB-7	0-1	-	-	1940
QC-1	0-1	-	-	2520
QC-2	0-1	-	-	1760
S-43	0-2	-	42.59	-
S-53	0-2	71.16	-	-
S-101	0-2	71	-	1190
S-104	0-2	860	-	-
S-105	0-2	15000	-	-
S-106	0-2	20000	-	-
S-114	0-2	90	-	-
SB-16	6-7	380	-	-
SB-18	0-1	2400	-	-
SB-45	0-1	790	-	-
SB45-D1	0-1	29	-	-
SB45-D3	0-1	38	-	-
SB45-D3	1-2	940	-	-
SB-45E	0-1	110	-	-
SB-45EE	0-1	1200	-	-
SB-45EE	1-2	33	-	-
SB-45EEE	0-1	43	-	-
SB-45EES	0-1	140	-	-
SB-45EN	0-1	60	-	-
SB-67	0-1	9700	-	-
SB-68	0-1	25000	-	-
SB-71	0-1	680	-	-
SSY-57	1.5-2	-	40.95	-
TS36-13	0-1	-	30.2	-
TS36-14	0-1	-	25.54	-
TU-2	1-2	-	30.4	-
TU-3	0-1	-	35.7	-
TU-3	1-2	-	80.2	-
TU-3	2-3	-	59.6	-
TU-8	1-2	-	-	1100
TU-13	0-1	-	43.3	-

1. **DASH (-) INDICATES RESULT DID NOT EXCEED CURRENT YARD SOIL CLEANUP LEVEL**
2. **DEPTH IS IN FEET BELOW LAND SURFACE**

160' 0 160'

LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS FOR PCBs GREATER THAN THE CURRENT YARD SOIL CLEANUP LEVEL (25 MG/KG)

LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS FOR TOTAL cPAHs GREATER THAN THE CURRENT YARD SOIL CLEANUP LEVEL (25 MG/KG)

LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS FOR LEAD GREATER THAN THE CURRENT YARD SOIL CLEANUP LEVEL (1,000 MG/KG)

APPROXIMATE EXTENT OF IRM EXCAVATION COMPLETED TO ADDRESS PCB EXCEEDANCE (25 MG/KG)

APPROXIMATE EXTENT OF IRM EXCAVATION COMPLETED TO ADDRESS TOTAL cPAH EXCEEDANCE (25 MG/KG)

APPROXIMATE EXTENT OF IRM EXCAVATION COMPLETED TO ADDRESS TOTAL cPAH EXCEEDANCE OF FORMER YARD SOIL CLEANUP LEVEL (10 MG/KG)

EXPLANATION

APPROXIMATE EXTENT OF IRM EXCAVATION COMPLETED TO ADDRESS LEAD EXCEEDANCE (1,000 MG/KG)

APPROXIMATE EXTENT OF IRM EXCAVATION COMPLETED TO ADDRESS AN EXCEEDANCE OF MULTIPLE COCs

A-9 LOCATION AND DESIGNATION OF PREVIOUSLY DETERMINED AREA OF CONCERN (AREA)

PRIVATE PROPERTY NOT OWNED BY AMTRAK (NOT PART OF SUNNYSIDE YARD)

APPROXIMATE EXTENT OF OU-4 BOUNDARY

NOTES:

THE SOIL IRMS DESIGNATED AS "IRM BY OTHERS" REFERS TO THE SEVEN PCB-RELATED IRMS PERFORMED BY AMTRAK CONTRACTORS

FS - FEASIBILITY STUDY

IRM - INTERIM REMEDIAL MEASURE

OU-4 - OPERABLE UNIT 4

COCs - COMPOUNDS OF CONCERN FOR THE YARD (PCBs, TOTAL cPAHS, AND LEAD)

MG/KG - MILLIGRAMS PER KILOGRAM

N

Title:

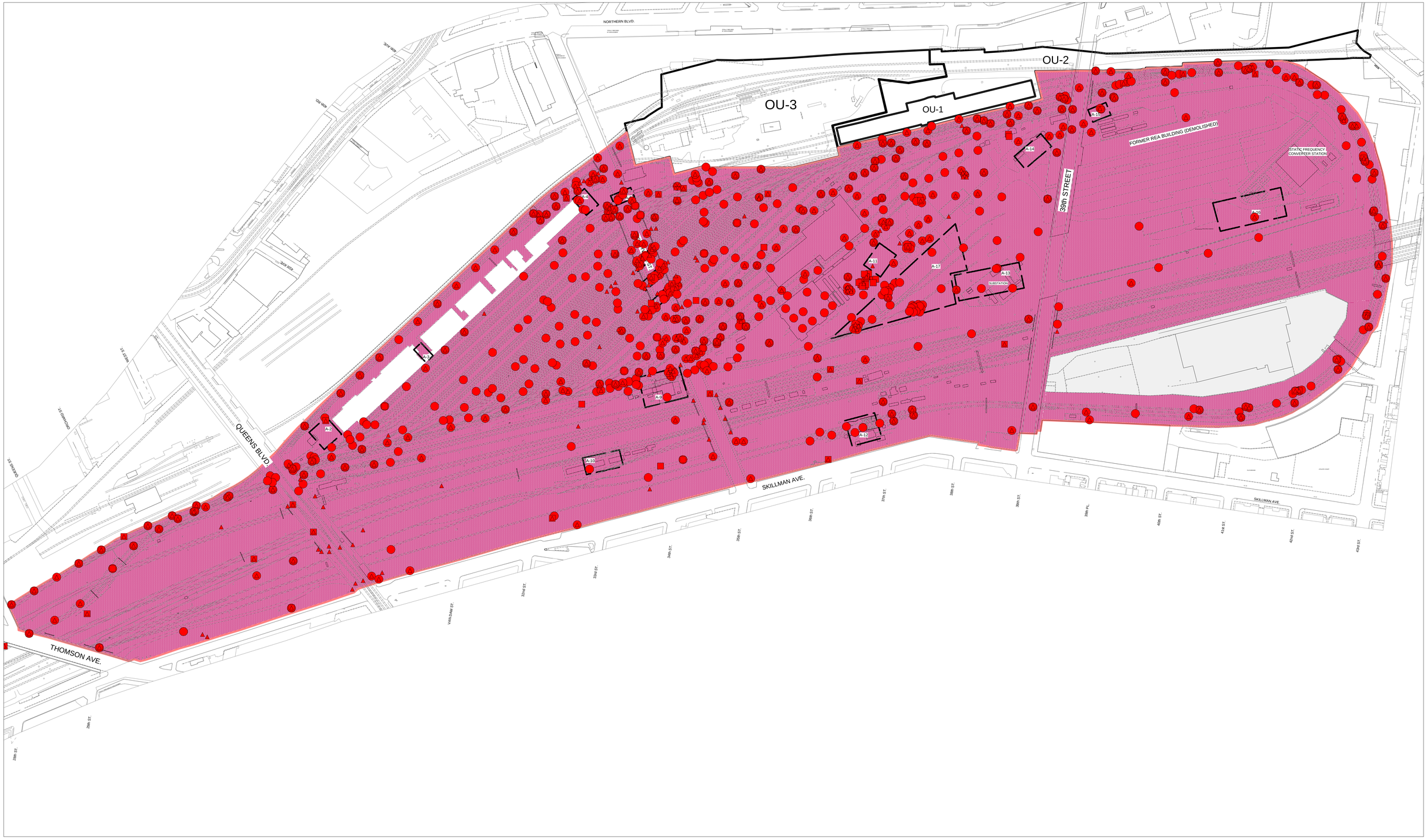
SUMMARY OF SOIL IRM ACTIVITIES AND REMAINING EXCEEDANCES IN OU-4

OU-4 FEASIBILITY STUDY

Prepared For: AMTRAK

ROUX ASSOCIATES INC. Environmental Consulting & Management

Compiled by: RSK	Date: 1/16/2009	PLATE
Prepared by: RSK	Scale: SHOWN	1
Project Mgr: HG	Office: NY	
File No: AM7114504.WOR	Project: 0055.0071Y008	



LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS FOR PCBs GREATER THAN THE NYSDEC 6 NYCRR PART 375 UNRESTRICTED USE CRITERIA

LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS FOR LEAD GREATER THAN THE NYSDEC 6 NYCRR PART 375 UNRESTRICTED USE CRITERIA

LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS GREATER THAN THE NYSDEC 6 NYCRR PART 375 UNRESTRICTED USE CRITERIA FOR ONE OR MORE cPAH COMPOUNDS

APPROXIMATE EXTENT OF PROPOSED REMEDIAL ALTERNATIVE 2 EXCAVATION TO ADDRESS YARD COC EXCEEDANCES OF THE NYSDEC 6 NYCRR PART 375 UNRESTRICTED USE CRITERIA

NYSDEC 6 NYCRR PART 375 UNRESTRICTED USE CRITERIA

COMPOUND	CRITERIA	UNITS
PCBs	100	UG/KG
LEAD	63	MG/KG
BENZO(A)ANTHRACENE	1,000	UG/KG
BENZO(A)PYRENE	1,000	UG/KG
BENZO(B)FLUORANTHENE	1,000	UG/KG
BENZO(K)FLUORANTHENE	800	UG/KG
CHRYSENE	1,000	UG/KG
DIBENZO(A,H)ANTHRACE	330	UG/KG
INDENO(1,2,3-CD)PYRENE	500	UG/KG

A-9 LOCATION AND DESIGNATION OF PREVIOUSLY DETERMINED AREA OF CONCERN (AOC)

PRIVATE PROPERTY NOT OWNED BY AMTRAK (NOT PART OF SUNNYSIDE YARD)

APPROXIMATE EXTENT OF OU-4 BOUNDARY

NOTES:

FS - FEASIBILITY STUDY

OU-4 - OPERABLE UNIT 4

SCOs - SOIL CLEANUP OBJECTIVES

UG/KG - MICROGRAMS PER KILOGRAM

MG/KG - MILLIGRAMS PER KILOGRAM

160' 0 160'

N

Title:

ALTERNATIVE 2 - SOIL EXCAVATION TO UNRESTRICTED USE SCOs

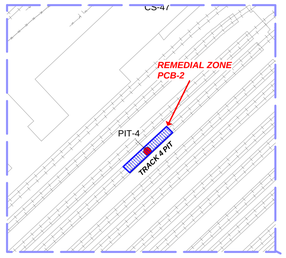
OU-4 FS REPORT

Prepared For: AMTRAK

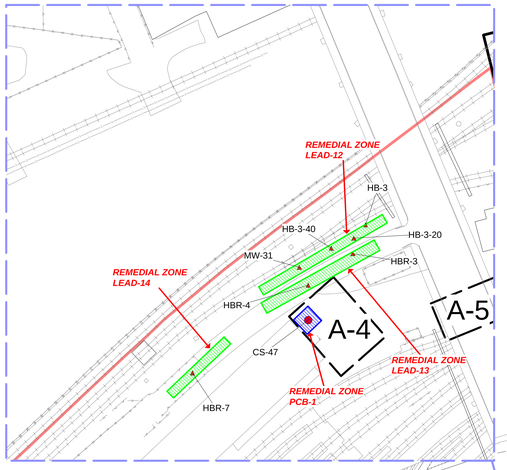
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: RSK	Date: 1/20/2009	PLATE
Prepared by: RSK	Scale: SHOWN	2
Project Mgr: JEP	Office: NY	
File No: AM7114505.WOR	Project: 0055.0071Y008	

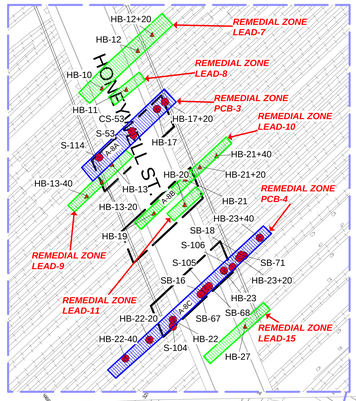
REMEDIAL ZONE: PCB-2



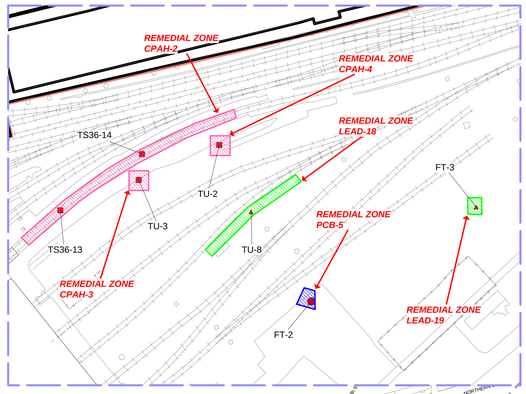
REMEDIAL ZONES: PCB-1, LEAD 12, LEAD-13, AND LEAD-14



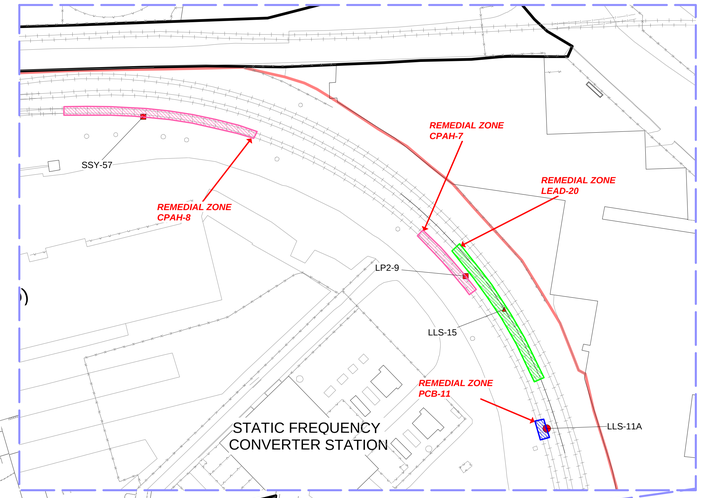
REMEDIAL ZONES: PCB-3, PCB-4, LEAD-7, LEAD-8, LEAD-9, LEAD-10, LEAD-11, AND LEAD-15



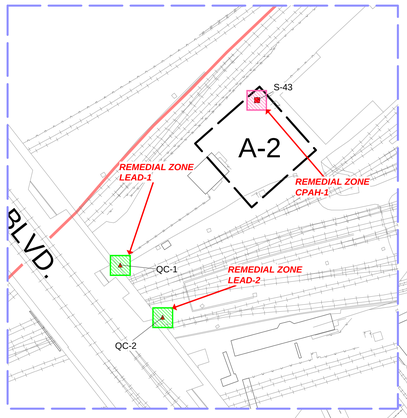
REMEDIAL ZONES: PCB-5, CPAH-2, CPAH-3, CPAH-4, LEAD-18 AND LEAD-19



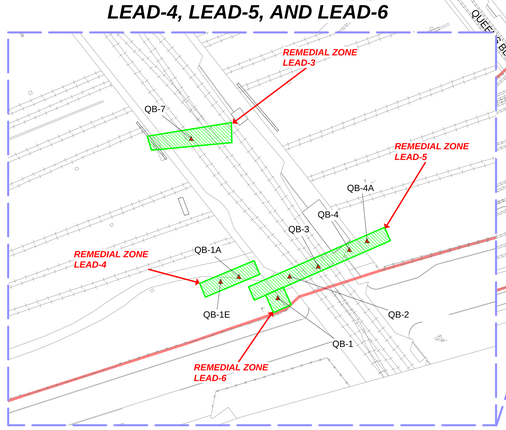
REMEDIAL ZONES: PCB-11, CPAH-7, CPAH-8 AND LEAD-20



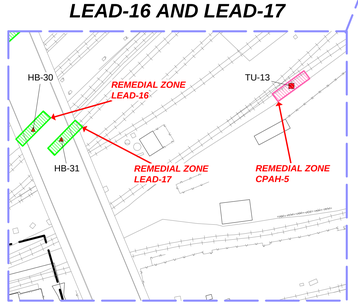
REMEDIAL ZONE: CPAH-1, LEAD-1, AND LEAD-2



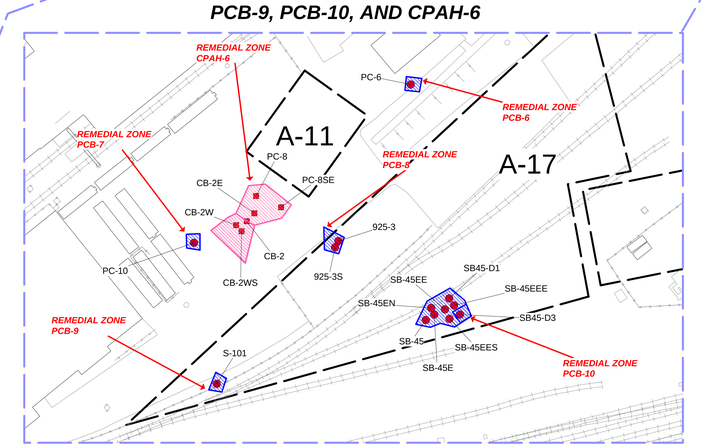
REMEDIAL ZONES: LEAD-3, LEAD-4, LEAD-5, AND LEAD-6



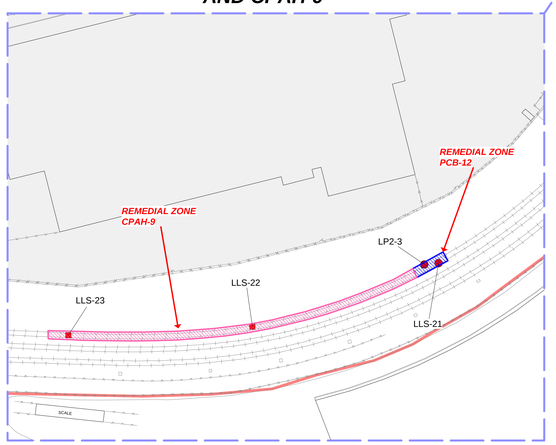
REMEDIAL ZONES: CPAH-5, LEAD-16 AND LEAD-17



REMEDIAL ZONES: PCB-6, PCB-7, PCB-8, PCB-9, PCB-10, AND CPAH-6



REMEDIAL ZONES: PCB-12, AND CPAH-9



SUMMARY OF EXCEEDANCES OF CURRENT YARD SOIL CLEANUP LEVELS (CONCENTRATIONS IN MG/KG)

Remedial_Zone	Designation	Depth	PCBs	cPAHs	Lead
CPAH-1	S-43	0-2	-	42.59	-
CPAH-2	TS36-13	0-1	-	30.2	-
CPAH-2	TS36-14	0-1	-	25.54	-
CPAH-3	TU-3	0-1	-	35.7	-
CPAH-3	TU-3	1-2	-	80.2	-
CPAH-3	TU-3	2-3	-	59.6	-
CPAH-4	TU-2	1-2	-	30.4	-
CPAH-5	TU-13	0-1	-	43.3	-
CPAH-6	CB-2	0-1	-	27.8	-
CPAH-6	CB-2E	1-2	-	32.74	-
CPAH-6	CB-2W	1-2	-	34.6	-
CPAH-6	CB-2W	2-3	-	28.2	-
CPAH-6	CB-2WS	1-2	-	34	-
CPAH-6	CB-2WS	2-3	-	30.6	-
CPAH-6	PC-8	1-2	-	30.92	-
CPAH-6	PC-8SE	0-1	-	35	-
CPAH-7	LP2-9	0-1	-	40.3	-
CPAH-8	SSY-57	1.5-2	-	40.95	-
CPAH-9	LLS-22	0-1	-	41.55	-
CPAH-9	LLS-23	0-1	-	70.8	-
Lead-1	QC-1	0-1	-	-	2520
Lead-2	QC-2	0-1	-	-	1760
Lead-3	QB-7	0-1	-	-	1940
Lead-4	QB-1A	0-1	-	-	1020
Lead-4	QB-1E	0-1	-	-	1120
Lead-5	QB-2	0-1	-	-	2990
Lead-5	QB-3	0-1	-	-	1050
Lead-5	QB-4	0-1	-	-	1040
Lead-5	QB-4	1-2	-	-	1690
Lead-5	QB-4A	0-1	-	-	1180
Lead-6	QB-1	0-1	-	-	1140
Lead-7	HB-10	0-1	-	-	1030
Lead-7	HB-12	0-1	-	-	1110
Lead-7	HB-12+20	0-1	-	-	1180
Lead-8	HB-11	0-1	-	-	1010
Lead-9	HB-13	0-1	-	-	1060
Lead-9	HB-13	1-2	-	-	1010
Lead-9	HB-13-20	0-1	-	-	1010
Lead-9	HB-13-40	0-1	-	-	1160
Lead-10	HB-19	1-2	-	-	1120
Lead-10	HB-21	1-2	-	-	1150
Lead-10	HB-21+20	0-1	-	-	1150
Lead-10	HB-21+40	0-1	-	-	1120
Lead-11	HB-20	1-2	-	-	1460
Lead-12	HB-3	0-1	-	-	2110
Lead-12	HB-3	1-2	-	-	1260
Lead-12	HB-3-20	0-1	-	-	2150
Lead-12	HB-3-20	1-2	-	-	2600
Lead-12	HB-3-40	0-1	-	-	2350
Lead-12	MW-31	0-2	-	-	1290
Lead-13	HBR-3	1-2	-	-	1510
Lead-13	HBR-4	0-1	-	-	1890
Lead-13	HBR-4	1-2	-	-	1320
Lead-13	HBR-4	2-3	-	-	1630
Lead-14	HBR-7	0-1	-	-	1700

Remedial_Zone	Designation	Depth	PCBs	cPAHs	Lead
Lead-14	HBR-7	0-1	-	-	1700
Lead-15	HB-27	0-1	-	-	1260
Lead-16	HB-30	0-1	-	-	1350
Lead-16	HB-30	1-2	-	-	1380
Lead-16	HB-30	2-3	-	-	1320
Lead-17	HB-31	0-1	-	-	1860
Lead-18	TU-8	1-2	-	-	1100
Lead-19	FT-3	0-2	-	-	1320
Lead-20	LLS-15	0-1	-	-	7020
PCB-1	CS-47	2-4	49	-	-
PCB-2	PIT-4	sediment	470	-	-
PCB-3	CS-53	0-2	88	-	-
PCB-3	HB-17	0-1	4148.58	-	1110
PCB-3	HB-17	1-2	3532.48	-	1090
PCB-3	HB-17	2-3	1034.23	-	-
PCB-3	HB-17+20	0-1	29.086	-	-
PCB-3	S-53	0-2	71.16	-	-
PCB-3	S-114	0-2	90	-	-
PCB-4	HB-22	0-1	77.663	-	1900
PCB-4	HB-22-20	0-1	103.63	-	1340
PCB-4	HB-22-40	0-1	84	-	1870
PCB-4	HB-23	0-1	525.6	-	2130
PCB-4	HB-23	1-2	866.944	-	2080
PCB-4	HB-23	2-3	806.914	-	-
PCB-4	HB-23+20	0-1	2572.29	-	2100
PCB-4	HB-23+40	0-1	40	-	2760
PCB-4	S-104	0-2	860	-	-
PCB-4	S-105	0-2	15000	-	-
PCB-4	S-106	0-2	20000	-	-
PCB-4	SB-16	6-7	380	-	-
PCB-4	SB-18	0-1	2400	-	-
PCB-4	SB-67	0-1	9700	-	-
PCB-4	SB-68	0-1	25000	-	-
PCB-4	SB-71	0-1	680	-	-
PCB-5	FT-2	0-2	73	-	-
PCB-6	PC-6	2-3	37	-	-
PCB-7	PC-10	0-1	-	-	2500
PCB-7	PC-10	1-2	26	-	-
PCB-8	925-3	0-0.67	264	-	-
PCB-8	925-3S	0-1	54	-	-
PCB-9	S-101	0-2	71	-	1190
PCB-10	SB-45	0-1	790	-	-
PCB-10	SB-45E	0-1	110	-	-
PCB-10	SB-45EE	0-1	1200	-	-
PCB-10	SB-45EE	1-2	33	-	-
PCB-10	SB-45EEE	0-1	43	-	-
PCB-10	SB-45EES	0-1	140	-	-
PCB-10	SB-45EN	0-1	60	-	-
PCB-10	SB45-D1	0-1	29	-	-
PCB-10	SB45-D3	0-1	38	-	-
PCB-10	SB45-D3	1-2	940	-	-
PCB-11	LLS-11A	1-2	92.2	-	-
PCB-12	LLS-21	0-1	38.9	-	-
PCB-12	LP2-3	0-1	68	42.5	-

1. **DASH (-) INDICATES RESULT DID NOT EXCEED CURRENT YARD SOIL CLEANUP LEVEL**
2. **DEPTH IS IN FEET BELOW LAND SURFACE**

S-114 — LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS FOR PCBs GREATER THAN THE CURRENT YARD SOIL CLEANUP LEVEL (25 MG/KG) AND STILL PRESENT AT YARD

CB-2E — LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS FOR TOTAL cPAHS GREATER THAN THE CURRENT YARD SOIL CLEANUP LEVEL (25 MG/KG) AND STILL PRESENT AT YARD (AMTRAK HAS REQUESTED AN ALTERNATE CLEANUP LEVEL)

HB-27 — LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS FOR LEAD GREATER THAN THE CURRENT YARD SOIL CLEANUP LEVEL (1,000 MG/KG) STILL PRESENT AT YARD (AMTRAK HAS REQUESTED 3,900 MG/KG IN ACCORDANCE WITH 6NYCRR PART 375)

EXPLANATION

APPROXIMATE EXTENT OF PROPOSED REMEDIAL ALTERNATIVE 3 EXCAVATION TO ADDRESS PCB EXCEEDANCE OF 25 MG/KG

APPROXIMATE EXTENT OF PROPOSED REMEDIAL ALTERNATIVE 3 EXCAVATION TO ADDRESS TOTAL CPAH EXCEEDANCE OF 25 MG/KG

APPROXIMATE EXTENT OF PROPOSED REMEDIAL ALTERNATIVE 3 EXCAVATION TO ADDRESS LEAD EXCEEDANCE OF 1,000 MG/KG

A-9 — LOCATION AND DESIGNATION OF PREVIOUSLY DETERMINED AREA OF CONCERN (AREA)

PRIVATE PROPERTY NOT OWNED BY AMTRAK (NOT PART OF SUNNYSIDE YARD)

APPROXIMATE EXTENT OF OU-4 BOUNDARY

NOTES:

1. COCs - COMPOUNDS OF CONCERN FOR THE YARD (PCBs, TOTAL cPAHS, AND LEAD)
2. MG/KG - MILLIGRAMS PER KILOGRAM
3. SCALE ON ALL INSETS: 1 INCH = 60 FEET
4. OU-4 - OPERABLE UNIT 4
5. FS - FEASIBILITY STUDY

N

160' 0 160'

Title: ALTERNATIVE 3 - SOIL EXCAVATION TO CURRENT YARD SOIL CLEANUP LEVELS

OU-4 FS REPORT

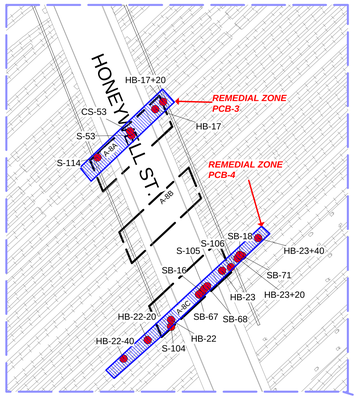
Prepared For: AMTRAK

ROUX ASSOCIATES INC
Environmental Consulting & Management

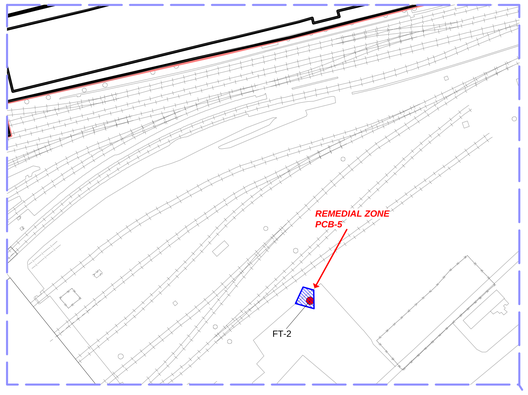
Compiled by: JEP	Date: 1/14/2009
Prepared by: RSK	Scale: SHOWN
Project Mgr: JEP	Office: NY
File No: AM7114506	Project: 0055.0071Y008

PLATE 3

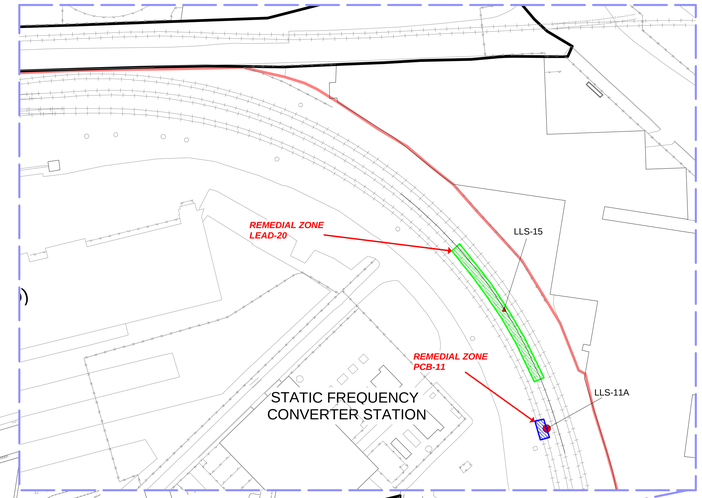
REMEDIAL ZONES: PCB-3, AND PCB-4



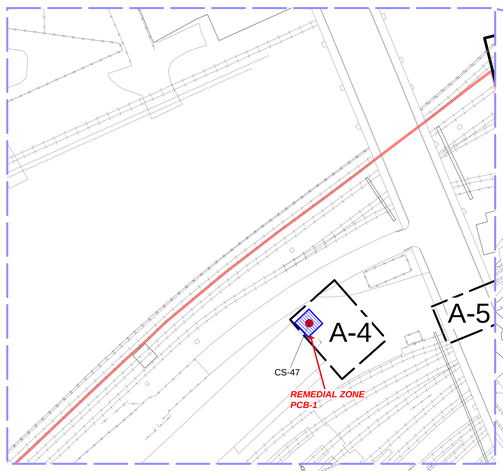
REMEDIAL ZONE: PCB-5



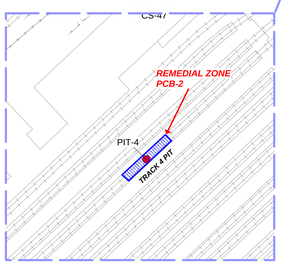
REMEDIAL ZONES: PCB-11, AND LEAD-20



REMEDIAL ZONE: PCB-1



REMEDIAL ZONE: PCB-2



REMEDIAL ZONES: PCB-6, PCB-7, PCB-8, PCB-9, AND PCB-10

REMEDIAL ZONE: PCB-12

SUMMARY OF EXCEEDANCES OF PROPOSED YARD SOIL CLEANUP LEVELS (CONCENTRATIONS IN MG/KG)

Remedial_Zone	Designation	Depth	PCBs	cPAHs	Lead
Lead-20	LLS-15	0-1	-	-	7020
PCB-1	CS-47	2-4	49	-	-
PCB-2	PIT-4	sediment	470	-	-
PCB-3	CS-53	0-2	88	-	-
PCB-3	HB-17	0-1	4148.58	-	1110
PCB-3	HB-17	1-2	3532.48	-	1090
PCB-3	HB-17	2-3	1034.23	-	-
PCB-3	HB-17+20	0-1	29.086	-	-
PCB-3	S-53	0-2	71.16	-	-
PCB-3	S-114	0-2	90	-	-
PCB-4	HB-22	0-1	77.663	-	1900
PCB-4	HB-22-20	0-1	103.63	-	1340
PCB-4	HB-22-40	0-1	84	-	1870
PCB-4	HB-23	0-1	525.6	-	2130
PCB-4	HB-23	1-2	866.944	-	2080
PCB-4	HB-23	2-3	806.914	-	-
PCB-4	HB-23+20	0-1	2572.29	-	2100
PCB-4	HB-23+40	0-1	40	-	2760
PCB-4	S-104	0-2	860	-	-
PCB-4	S-105	0-2	15000	-	-
PCB-4	S-106	0-2	20000	-	-
PCB-4	SB-16	6-7	380	-	-
PCB-4	SB-18	0-1	2400	-	-
PCB-4	SB-67	0-1	9700	-	-
PCB-4	SB-68	0-1	25000	-	-
PCB-4	SB-71	0-1	680	-	-

Remedial_Zone	Designation	Depth	PCBs	cPAHs	Lead
PCB-5	FT-2	0-2	73	-	-
PCB-6	PC-6	2-3	37	-	-
PCB-7	PC-10	0-1	-	-	2500
PCB-7	PC-10	1-2	26	-	-
PCB-8	925-3	0-0.67	264	-	-
PCB-8	925-3S	0-1	54	-	-
PCB-9	S-101	0-2	71	-	1190
PCB-10	SB-45	0-1	790	-	-
PCB-10	SB-45E	0-1	110	-	-
PCB-10	SB-45EE	0-1	1200	-	-
PCB-10	SB-45EE	1-2	33	-	-
PCB-10	SB-45EEE	0-1	43	-	-
PCB-10	SB-45EES	0-1	140	-	-
PCB-10	SB-45EN	0-1	60	-	-
PCB-10	SB45-D1	0-1	29	-	-
PCB-10	SB45-D3	0-1	38	-	-
PCB-10	SB45-D3	1-2	940	-	-
PCB-11	LLS-11A	1-2	92.2	-	-
PCB-12	LLS-21	0-1	38.9	-	-
PCB-12	LP2-3	0-1	68	42.5	-

1. DASH (-) INDICATES RESULT DID NOT EXCEED PROPOSED YARD SOIL CLEANUP LEVEL
2. DEPTH IS IN FEET BELOW LAND SURFACE

EXPLANATION

S-114 — LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS FOR PCBs GREATER THAN THE CURRENT YARD SOIL CLEANUP LEVEL (25 MG/KG) AND STILL PRESENT AT YARD

LLS-15 — LOCATION AND DESIGNATION OF SOIL BORING WITH ONE OR MORE SOIL SAMPLE RESULTS FOR LEAD GREATER THAN THE PROPOSED YARD SOIL CLEANUP LEVEL (3,900 MG/KG, CONSISTENT WITH 6NYCRR PART 375) AND STILL PRESENT AT YARD

APPROXIMATE EXTENT OF PROPOSED REMEDIAL ALTERNATIVE 4 EXCAVATION TO ADDRESS PCB EXCEEDANCE OF 25 MG/KG

APPROXIMATE EXTENT OF PROPOSED REMEDIAL ALTERNATIVE 4 EXCAVATION TO ADDRESS LEAD EXCEEDANCE OF 3,900 MG/KG

A-9 — LOCATION AND DESIGNATION OF PREVIOUSLY DETERMINED AREA OF CONCERN (AREA)

PRIVATE PROPERTY NOT OWNED BY AMTRAK (NOT PART OF SUNNYSIDE YARD)

APPROXIMATE EXTENT OF OU-4 BOUNDARY

NOTES:

1. MG/KG - MILLIGRAMS PER KILOGRAM
2. SCALE ON ALL INSETS: 1 INCH = 60 FEET
3. OU-4 - OPERABLE UNIT 4
4. FS - FEASIBILITY STUDY

N

160' 0 160'

Title: ALTERNATIVE 4 - SOIL EXCAVATION TO PROPOSED YARD SOIL CLEANUP LEVELS

OU-4 FS REPORT

Prepared For: AMTRAK

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: JEP	Date: 1/14/2009
Prepared by: RSK	Scale: SHOWN
Project Mgr: JEP	Office: NY
File No: AM7114507	Project: 0055.0071Y008

PLATE 4