

**RESULTS OF SOIL SAMPLING TO
CHARACTERIZE THE SOIL ADJACENT
TO THE SEWER PIPE BENEATH
OPERABLE UNIT 1**

**Sunnyside Yard
Queens, New York**

April 14, 1998

Prepared for:

**National Railroad Passenger Corporation
30th Street Station
4th Floor South
Philadelphia, Pennsylvania 19104**

Prepared by:

**ROUX ASSOCIATES, INC.
1377 Motor Parkway
Islandia, New York 11788**



CONTENTS

1.0 INTRODUCTION	1
1.1 Project Description and Objectives	2
2.0 PREVIOUS INVESTIGATIONS	4
3.0 METHODS OF INVESTIGATION	5
3.1 Soil Boring and Sampling Program.....	5
4.0 DISCUSSION OF RESULTS	6
4.1 Soil Quality.....	6
5.0 SUMMARY AND CONCLUSIONS	7

TABLES

1. Summary of Polychlorinated Biphenyl, Carcinogenic Polychlorinated Biphenyl and Lead Concentrations Detected in Sewer Sediment, Sunnyside Yard, Queens, New York
2. Summary of Polychlorinated Biphenyl Compound Concentrations Detected in Soil Samples Collected for Sewer Line Replacement, Sunnyside Yard, Queens, New York
3. Summary of Carcinogenic Polycyclic Aromatic Hydrocarbon Concentrations Detected in Soil Samples Collected for Sewer Line Replacement, Sunnyside Yard, Queens, New York
4. Summary of Lead Concentrations Detected in Soil Samples for Sewer Line Replacement, Sunnyside Yard, Queens, New York

FIGURES

1. Yard Location Map
2. Soil Sample Location Map

APPENDICES

- A. NYSDEC March 17, 1998 Letter to Roux Associates
- B. Roux Associates March 19, 1998 Letter to NYSDEC
- C. Data Quality and Usability Report

1.0 INTRODUCTION

The National Railroad Passenger Corporation (Amtrak) owns a property known as Sunnyside Yard (Yard), located at 39-29 Honeywell Street in Queens County, a borough of New York City, New York (Figure 1). Portions of the Yard have been designated by Amtrak for construction of a new High Speed Trainset Facility (HSTF) Service and Inspection (S&I) Building and its ancillary structures (i.e., the access road and utilities route, the parking area, the construction easement area which surrounds the building, and the construction laydown area). Changes are necessary in other areas of the Yard to accommodate the HSTF program, including the abandonment of a damaged portion of the sewer system which passes beneath the proposed S&I building and replacement of that pipe with a new section. That abandonment and replacement is the subject of this report.

The Sunnyside Yard is listed as a Class II Site in the New York State Department of Environmental Conservation's (NYSDEC) Registry of Inactive Hazardous Waste Disposal Sites. As a result of the listing, Amtrak, New Jersey Transit Corporation (NJTC), and the NYSDEC entered into an Order on Consent (OOC) Index #W2-0081-87-06 effective October 1989.

In accordance with the OOC, several investigations have been performed throughout the Yard, including, but not limited to, remedial investigations, feasibility studies and a risk assessment. Each of these investigations was performed by Roux Associates, Inc. (Roux Associates). As a result of these investigations, areas of the Yard were identified where levels of contamination require remedial efforts. With the NYSDEC's concurrence, to accommodate the HSTF S&I Building construction schedule and still address remedial efforts sitewide in a timely and orderly manner, the Yard has been subdivided into six operable units. The operable units are described as follows:

- Operable Unit 1 (OU-1) designated as the soil above the water table within the footprint of the proposed HSTF S&I Building;
- Operable Unit 2 (OU-2) designated as the 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 laydown area);

- Operable Unit 3 (OU-3) designated as the soil and separate-phase petroleum accumulation above the water table in Area 1 of the Yard, as defined in the Phase I Remedial Investigation (RI) report;
- Operable Unit 4 (OU-4) designated as the soil above the water table in the remainder of the Yard;
- Operable Unit 5 (OU-5) designated as the sewer system beneath the Yard; and
- Operable Unit 6 (OU-6) designated as the ground water including the saturated soil beneath the Yard.

Based on an evaluation of the Yard conditions, the NYSDEC and New York State Department of Health (NYSDOH) issued the following NYSDEC-recommended soil cleanup levels for the contaminants of concern at the Yard:

- Semivolatile organic compounds (SVOCs) - 25 parts per million (ppm) for both surface and subsurface soil for total carcinogenic polycyclic aromatic hydrocarbons (cPAHs);
- Lead - 1,000 ppm for both surface and subsurface soil; and
- Polychlorinated biphenyls (PCBs) - 25 ppm for both surface and subsurface soil.

The NYSDEC further acknowledged that, while certain metals were found in soil throughout the Yard above the NYSDEC's Recommended Soil Cleanup Objectives (RSCOs), none (with the exception of lead) were present at levels high enough to require any remediation. Additionally, the NYSDEC did not address specific soil cleanup levels for volatile organic compounds (VOCs), since none were detected at the Yard above the RSCOs.

1.1 Project Description and Objectives

In order to accommodate discharge of wastewater to the sewer system from the proposed S&I Building, a new section of sewer pipe has been proposed to replace the damaged section which passes beneath OU-1 (Figure 2).

Because the sewer system beneath the Yard (including this portion) has previously been designated as a separate operable unit (OU-5), during a March 13, 1998 meeting, Amtrak informed the NYSDEC of its intention to abandon the existing damaged section of pipe beneath OU-1 in place and replace it with a new section in an adjacent excavation.

In a March 17, 1998 letter to Roux Associates (included as Appendix A), the NYSDEC stated that before it made a determination regarding in place abandonment of the damaged sewer section, the following would be required:

- discrete two-foot soil samples centered at the sewer invert elevation should be collected from three locations along the length of the section proposed to be abandoned;
- the samples should be analyzed for PCBs, cPAHs, and lead; and
- the analytical results must be consistent with the cleanup criteria (i.e., below the respective NYSDEC recommended soil cleanup levels).

In a March 19, 1998 letter to the NYSDEC (included as Appendix B), Roux Associates, on behalf of Amtrak, agreed to the sampling as specified in the NYSDEC's March 17, 1998 letter.

Although the sewer section is part of OU-5, the saturated soil sampled during this investigation is part of OU-6.

The remainder of this report is organized as follows:

- 2.0 - Previous Investigations;
- 3.0 - Methods of Investigation;
- 4.0 - Discussion of Results; and
- 5.0 - Summary and Conclusions.

2.0 PREVIOUS INVESTIGATIONS

In early 1993, during field work for the Phase II RI conducted at the Yard, sewer water and sediment samples were collected from manhole MH-8 (Figure 2) and analyzed for PCBs. PCBs were detected at estimated concentrations of 20.6 micrograms per liter ($\mu\text{g/L}$) or parts per billion (ppb) in the sewer water and 4,200 $\mu\text{g/kg}$ or 4.2 parts per million (ppm) in the sewer sediment, which is below the NYSDEC-recommended soil cleanup level for the Yard.

On March 6, 1998, National Water Main Cleaning Co. of Newark, New Jersey was contracted on behalf of Amtrak to jet-clean and remove sediment between manhole locations MH-8 and MH-73 (Figure 2) and provide a video camera survey of this portion of the sewer system. The sediment removed from this portion of the sewer system (approximately five cubic yards) was sampled for PCBs, cPAHs, and lead. The analytical results are presented in Table 1 and are summarized as follows:

- PCBs were detected at a concentration of 2.1 ppm;
- cPAHs were detected at a concentration of 3.63 ppm; and
- lead was detected at a concentration of 125 ppm.

As shown in Table 1, all of the above detections in the sediment are at concentrations well below their respective NYSDEC-recommended soil cleanup levels for the Yard.

3.0 METHODS OF INVESTIGATION

To achieve the objectives of the investigation, three soil borings were completed and sampled. To ensure that the soil borings would not disrupt any unmapped utilities, Amtrak requested that, at a minimum, the first three feet of all soil borings be advanced by hand. For this investigation, the first three feet of all soil borings were completed using hand tools (i.e., shovel and posthole digger) and the remaining depth completed with a Geoprobe™ unit. Sewer invert depths were determined from measurements taken at manhole locations MH-X, MH-9, and MH-8 (Figure 2).

3.1 Soil Boring and Sampling Program

The soil boring and sampling program was conducted on March 20, 1998, and the sampling was performed by Roux Associates. The analytical program (PCBs, cPAHs and lead) was completed by Industrial Corrosion Management, Inc. (ICM) laboratory, Randolph, New Jersey following 1995 NYSDEC Analytical Services Protocols with Category B deliverables. All downhole equipment was decontaminated prior to beginning each soil boring and all sampling equipment was decontaminated prior to collecting each sample interval.

Soil samples were collected from the two-foot interval centered at the sewer pipe invert elevation, and were approximately two feet east from the center line of the pipe at each of the three locations (Sewer-1, Sewer-2, and Sewer-3) shown in Figure 2. Groundwater was encountered between 4 and 4.5 feet below land surface (bls) at each location. Sample depths were 6 to 8 feet bls, 6 to 8 feet bls, and 7 to 9 feet bls, respectively. All samples were labeled and placed on ice immediately following collection and during transport to the laboratory.

4.0 DISCUSSION OF RESULTS

The results of the soil boring and sampling program are discussed below. All soil samples were collected below the water table and, as a result, were saturated.

4.1 Soil Quality

The lithology encountered in the two-foot sample interval from each boring consisted of tan fine to coarse sand with a trace of gravel (continuous geologic logs were not completed during this investigation as the direct push Geoprobe™ method was utilized to collect only the discrete sample interval).

The analytical data are presented in Tables 2 through 4 and are summarized below. An evaluation of the analytical data was performed to determine the overall quality and usability of the sample results generated by ICM Laboratory. A data quality and usability report is included in Appendix C.

Polychlorinated Biphenyls - Results of the PCB analyses are presented in Table 2. As shown in the table, PCBs were not detected in any sample.

Carcinogenic Polycyclic Aromatic Hydrocarbons - Results of the cPAH analyses are presented in Table 3. As shown in the table, cPAHs were not detected in any sample.

Lead - Results of the lead analyses are presented in Table 4. As shown in the table, lead concentrations range from a low of 2.2 milligrams per kilogram (mg/kg) or 2.2 ppm in sample Sewer-1 to a high of 64.8 mg/kg or 64.8 ppm in sample Sewer-2, all well below the NYSDEC-recommended soil cleanup level for lead.

5.0 SUMMARY AND CONCLUSIONS

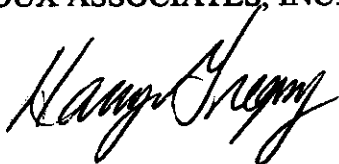
In summary, the analytical results for characterization of the saturated soil immediately adjacent to the existing sewer pipe indicate the following:

- PCBs and cPAHs were not detected; and
- lead was detected but well below the NYSDEC-recommended soil cleanup level.

In conclusion, the results of the investigation indicate that no NYSDEC-recommended soil cleanup levels for the contaminants of concern at the Yard were exceeded in any sample collected from the saturated soil adjacent to the existing damaged sewer section. Therefore, Amtrak proposes to proceed with the plan described in its March 19, 1998 letter to the NYSDEC to abandon the existing damaged sewer pipe in place and install a new section of sewer pipe in an adjacent excavation.

Respectfully Submitted,

ROUX ASSOCIATES, INC.



Harry Gregory
Project Hydrogeologist/
Project Manager



Joseph D. Duminuco
Principal Hydrogeologist

Table 1. Summary of Polychlorinated Biphenyls, Carcinogenic Polycyclic Aromatic Hydrocarbons, and Lead Concentrations Detected in Sewer Sediment, Sunnyside Yard, Queens, New York.

Sample Designation:		SEWER
Sample Date:		3/20/98
NYSDEC Recommended Cleanup Level		
Polychlorinated Biphenyls (Concentrations in $\mu\text{g}/\text{kg}$)		
Aroclor-1016	--	39 U
Aroclor-1221	--	78 U
Aroclor-1232	--	39 U
Aroclor-1242	--	39 U
Aroclor-1248	--	39 U
Aroclor-1254	--	1,000
Aroclor-1260	--	1,100
Total Aroclors	25,000	2,100
Carcinogenic Polycyclic Aromatic Hydrocarbons (Concentrations in $\mu\text{g}/\text{kg}$)		
Benzo(a)anthracene	--	690
Benzo(a)pyrene	--	570
Benzo(b)fluoranthene	--	1,100
Benzo(k)fluoranthene	--	390 U
Chrysene	--	830
Dibenzo(a,h)anthracene	--	98 J
Indeno(1,2,3-cd)pyrene	--	340 J
Total cPAHs	25,000	3,628 J
Lead (Concentrations in mg/kg)		
Lead	1,000	125

mg/kg - Milligrams per kilogram
 $\mu\text{g}/\text{kg}$ - Micrograms per kilogram
 U - Compound was analyzed for
 but not detected

Table 2. Summary of Polychlorinated Biphenyl Compound Concentrations Detected in Soil Samples Collected for Sewer Replacement, Sunnyside Yard, Queens, New York.

Parameter (Concentrations in µg/kg)	Sample Designation:		
	SEWER-1 6-8 3/20/98	SEWER-2 6-8 3/20/98	SEWER-3 7-9 3/20/98
	NYSDEC - Recommended Cleanup Level		
Aroclor-1016	--	38 U	39 U
Aroclor-1221	--	76 U	78 U
Aroclor-1232	--	38 U	39 U
Aroclor-1242	--	38 U	39 U
Aroclor-1248	--	38 U	39 U
Aroclor-1254	--	38 U	39 U
Aroclor-1260	--	38 U	39 U
Total Aroclors	25,000	--	--

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

U - Compound was analyzed for
but not detected

Table 3. Summary of Carcinogenic Polycyclic Aromatic Hydrocarbon (cPAH) Concentrations Detected in Soil Samples Collected for Sewer Line Replacement, Sunnyside Yard, Queens, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: SEWER-1		SEWER-2		SEWER-3	
	Sample Depth (ft bls):	6-8	6-8	7-9	6-8	7-9
	Sample Date:	3/20/98	3/20/98	3/20/98	3/20/98	3/20/98
	NYSDEC - Recommended Cleanup Level					
Benzo(a)anthracene	--	410 U	380 U	390 U	390 U	390 U
Benzo(a)pyrene	--	410 U	380 U	390 U	390 U	390 U
Benzo(b)fluoranthene	--	410 U	380 U	390 U	390 U	390 U
Benzo(k)fluoranthene	--	410 U	380 U	390 U	390 U	390 U
Chrysene	--	410 U	380 U	390 U	390 U	390 U
Dibenzo(a,h)anthracene	--	410 U	380 U	390 U	390 U	390 U
Indeno(1,2,3-cd)pyrene	--	410 U	380 U	390 U	390 U	390 U
Total cPAHs	25,000	--	--	--	--	--

µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
U - Compound was analyzed for
but not detected

Table 4. Summary of Lead Concentrations Detected in Soil Samples Collected for Sewer Line Replacement, Sunnyside Yard, Queens, New York.

Parameter (Concentrations in mg/kg)	SEWER-1 6-8 3/20/98	SEWER-2 6-8 3/20/98	SEWER-3 7-9 3/20/98
Lead	2.2	64.8	4.1

mg/kg - Milligrams per kilogram
 ft bls - Feet below land surface

NYSDEC -
 Recommended
 Cleanup Level

APPENDIX A

NYSDEC March 17, 1998 Letter to Roux Associates

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21st Street
Long Island City, New York 11101
(718) 482-4895 Fax: (718) 482-6358



John P. Cahill
Commissioner

March 17, 1998

Mr. Joseph Duminuco
Principal Hydrogeologist
Roux Associates
1377 Motor Parkway
Islandia, New York 11788

Re: Amtrak, Sunnyside Yard, Queens, New York Work Plan
Characterization of Soil under the Sewer Pipe in OU 1 Area

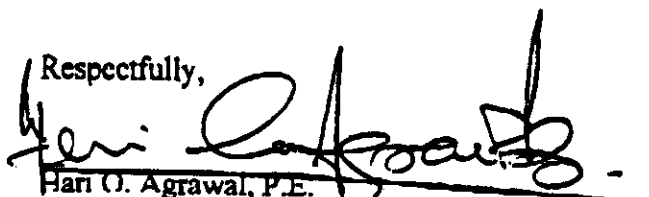
Dear Mr. Duminuco:

At our March 13 meeting, Amtrak stated that it now plans to abandon the existing sewer pipe that traverses the footprint of the proposed HSTF building, and replace it with a new pipe that would also run beneath the HSTF building, but possibly in a slightly different location. We understand that this replacement has been necessitated because Amtrak believes the pipe to be damaged. Since this pipe was known to convey PCB contaminated water and sediments, and because its integrity may be damaged to an extent such that the pipe act as an underdrain, either allowing contaminants to enter or leave dependent upon the groundwater elevation, and the fact that the pipe may be left in place, the Department is requesting that the soil near the invert of the pipe be tested to determine the presence of contaminants.

The timing of this testing depends upon the option of pipe replacement selected by Amtrak. If you wish to leave the pipe in place, then soil samples shall be taken at three locations (each a separate sample) at a depth of the pipe invert. The two foot split spoon should be centered at the elevation of the invert of the pipe. The samples should be analyzed for PCBs, Base Neutral extractables, and lead. Dependent upon these results, consistent with the cleanup criteria approved in the Record of Decision for OU-1, a determination will be made regarding whether the pipe should be closed in-place or removed. If you decide to remove the pipe and replace it in the same trench, then the soil should be sampled and tested at the time of the pipe replacement. The same number of samples and analysis should be undertaken.

If you have any questions, please contact me at 718 - 482-4909 or Mr. Richard Gardineer at 718 - 482- 4895 immediately.

Respectfully,


Hari O. Agrawal, P.E.
Environmental Engineer

APPENDIX B

Roux Associates March 19, 1998 Letter to NYSDEC

ENVIRONMENTAL CONSULTING & MANAGEMENT
ROUX ASSOCIATES INC



1377 MOTOR PARKWAY
ISLANDIA, NEW YORK 11788
TEL 516 232-2600 FAX 516 232-9898

March 19, 1998

Hari O. Agrawal, P.E.
Environmental Engineer
New York State Department of Environmental Conservation
Hazardous Waste Remediation - Region 2
27-20 21st Street
Long Island City, New York 11101

**Re: Characterization of Soil Under Sewer Pipe Located in Operable Unit 1,
Sunnyside Yard, Queens, New York**

Dear Mr. Agrawal:

Roux Associates, Inc. (Roux Associates), on behalf of Amtrak, has reviewed the New York State Department of Environmental Conservation's (NYSDEC) March 17, 1998 letter regarding the above referenced sewer pipe. Amtrak has agreed to the soil sampling in your letter on the basis that it is Amtrak's intention to abandon the existing sewer pipe between a nondesignated manhole (MH-X) located south of Operable Unit 1 (OU-1) in the access road and MH-8, located north of OU-1 (Figure 1, attached). The existing pipe between these manholes will be abandoned (i.e., filled with concrete) and a new section installed by Amtrak's contractor.

As we discussed, soil sampling is scheduled to be completed on March 20, 1998 in accordance with the specifications contained in your March 17, 1998 letter to Roux Associates. Analytical results will be submitted to the NYSDEC for review.

We appreciate the NYSDEC's cooperation regarding this high profile project. If you have any questions, please do not hesitate to call.

Sincerely,

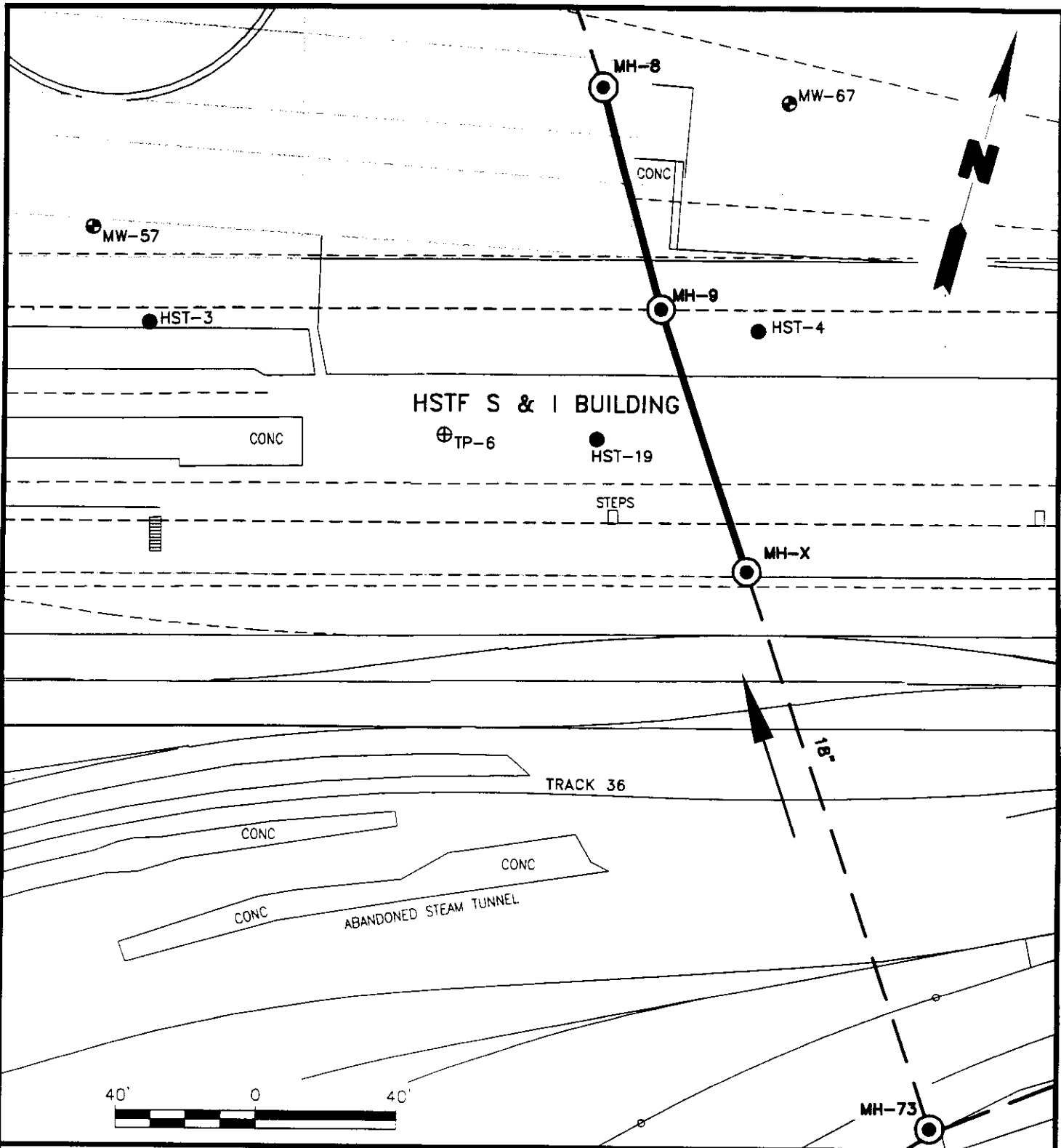
ROUX ASSOCIATES, INC.

A handwritten signature in black ink, appearing to read "Joseph D. Duminuco".



Joseph D. Duminuco
Principal Hydrogeologist

Attachment

cc: J. Matthews, Amtrak
R. Mohlenhoff, P.E., Amtrak
C. Warren, Esq., Robinson, Silverman, et al.
C. Rosenthal, Esq., Kalkines, Arky, et al.



LEGEND

-  SEWER LINE
-  SECTION OF SEWER LINE TO BE ABANDONED AND REPLACED

Title:

OU-1 SEWER SECTION

SUNNYSIDE YARD, QUEENS, NEW YORK

Prepared For:

AMTRAK

ROUX
 ROUX ASSOCIATES INC
 Environmental Consulting
 & Management

Compiled by: H.G.	Date: 3/98	FIGURE 1
Prepared by: R.K.	Scale: As Shown	
Project Mgr: H.G.	Status: FINAL	
File No: A5216901	Project: 05552Y05	

APPENDIX C

Data Quality and Usability Report

CONTENTS

1.0 DATA REVIEW.....	1
1.1 Polycyclic Aromatic Hydrocarbons.....	2
1.2 Polychlorinated biphenyls.....	2
1.3 Lead.....	3
2.0 OVERALL DATA QUALITY/USABILITY ASSESSMENT.....	4
2.1 Precision.....	4
2.2 Accuracy.....	4
2.3 Completeness.....	4

Data Quality and Usability

An evaluation of the overall quality and usability of the data generated by Industrial Corrosion Management, Inc. (ICM) of Randolph, New Jersey for the soil sampling to support the abandonment and replacement of the sewer line beneath Operable Unit 1 at Sunnyside Yard, Queens, New York was completed. Three soil samples were collected and analyzed for polycyclic aromatic hydrocarbons (PAHs) (New York State Department of Environmental Conservation [NYSDEC] Analytical Services Protocol [ASP] 95-2), polychlorinated biphenyls (PCBs) (NYSDEC ASP 95-3), and lead (USEPA Contract Laboratory Statement of Work).

1.0 DATA REVIEW

The data review is presented by sampling parameter and evaluates the following criteria based on the laboratory documentation provided.

- Holding Times
- GC/MS Instrument Performance Check
- Initial Calibration
- Continuing Calibration
- Blanks
- Surrogate spikes
- Matrix Spikes/Matrix Spike Duplicates/Matrix Spike Blanks
- Sample Duplicates (inorganics)
- Laboratory Control Samples
- Internal Standards

Data were reviewed for laboratory precision, accuracy, and completeness in accordance with the National Functional Guidelines for Organic Data Review, and the National Functional Guidelines for Inorganic Data Review, as well as the NYSDEC Standard Operating Procedures.

1.1 Polycyclic Aromatic Hydrocarbons

Holding times were met for all sample processing. Initial and continuing calibration standards were within the required limits. The matrix spike blanks were also within the recommended limits. Method blanks and instrument performance checks were compliant with the protocol requirements.

Sample matrix spikes and duplicates were performed on sample Sewer-1. All recoveries and duplicate correlation values were within recommended limits. Internal standards for this sample were all within the protocol requirements.

Surrogate recoveries were within the recommended limits with the exceptions noted below.

Sample Number	Compound (Surrogate)	% Recovery	Control Limits
Sewer-2	2-fluorophenol	128	25-121
Sewer 3	2-fluorophenol	130	25-121
Blank spike	2-fluorophenol	148	25-121
	1,2-dichlorobenzene d-4	132	20-136
Sewer-1MS	1,2-dichlorobenzene d4	8	25-121
Sewer-1MSD	2-fluorophenol	133	20-130

Data are not qualified with respect to surrogate recovery unless two or more semivolatile surrogates within the same fraction are out of specification. Only one acid extractable and/or one base neutral extractable surrogate were out of specification; therefore, no qualification is required.

1.2 Polychlorinated biphenyls

Holding times were met for all sample processing. Method blank, initial and continuing calibration standards were compliant with protocol requirements. Sample matrix spikes and duplicates were performed on sample Sewer 1. All recoveries and duplicate correlation values were within recommended limits with the exception of endrin which had no matrix spike or duplicate recoveries due to the complete breakdown of endrin into endrin aldehyde and endrin ketone. No qualification of data is based on the matrix spike alone. Matrix spike blank and QC check standard recoveries were within the required range. Surrogate standard recoveries met protocol requirements

1.3 Lead

All protocol requirements for sample processing and quality control were evaluated and were found to be compliant and acceptable with the exception of the duplicate sample analysis. The relative percent difference (RPD) between the sample and its duplicate was outside protocol requirements; therefore, in accordance with the protocol, all data are flagged with an asterisk. However, no qualification of the data is necessary.

2.0 OVERALL DATA QUALITY/USABILITY ASSESSMENT

Based upon the evaluation of the data, and a review of laboratory and field QA/QC, the chemical data generated have generally met the data quality objectives established for the sampling.

2.1 Precision

The overall precision review was based upon laboratory samples. A review of laboratory duplicate samples, MS/MSD results for the organics, demonstrates adequate reproduction of all sample results when detectable concentrations of analytes were present. The RPD for lead was outside the protocol requirement.

2.2 Accuracy

The accuracy of the chemical data generated was reviewed based on the results for holding times, laboratory control samples, calibration criteria, spiked samples, and surrogate standards. Based upon this review, the accuracy of the chemical analyses is acceptable.

2.3 Completeness

The data completeness as measured by the percentage of overall usable data is considered acceptable based on the data review.