Long Island Rail Road

Contract No. 6052A-9-5

Resource Conservation and Recovery Act Investigation Report Former Paint Stripping Building Morris Park Yard

USEPA ID No. NYD980641625

December 2013

Dvirka and Bartilucci Consulting Engineers

A Division of D&B Engineers and Architects, P.C.

RESOURCE CONSERVATION AND RECOVERY ACT
INVESTIGATION REPORT
LONG ISLAND RAIL ROAD
FORMER PAINT STRIPPING BUILDING
MORRIS PARK YARD
RICHMOND HILL, NEW YORK

USEPA ID NO. NYD980641625

Prepared for:

METROPOLITAN TRANSPORTATION AUTHORITY
LONG ISLAND RAIL ROAD

Prepared by:

D&B ENGINEERS AND ARCHITECTS, P.C.
WOODBURY, NEW YORK

DECEMBER 2013

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CERTIFICATION

I certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Resource Conservation and Recovery Act Investigation Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Thomas P. Fox

Printed Name of Qualified Environmental Professional

Signature of Qualified Environmental Professional

Date 12/30/13

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1.0 INTRODUCTION

1.1 Project Background

As part of the existing Long Island Rail Road (LIRR) On-Call Environmental Consulting Services contract (Contract No. 6052A-9-5), the LIRR authorized Dvirka and Bartilucci Consulting Engineers (D&B) to prepare a Resource Conservation and Recovery Act (RCRA) Investigation Report for the Former Paint Stripping Building (the Site) located at the LIRR Morris Park Yard (the Yard) in Richmond Hill, Queens, New York utilizing existing environmental data collected by others. A site location map is provided as Figure A-1, provided in Appendix A. This RCRA Investigation Report presents the data collected by others and D&B's conclusions based on a review of this data with regard to subsurface contamination at the Former Paint Stripping Building located at the Yard along with recommendations, where appropriate.

The groundwater investigation phase was completed by LIRR between December 2012 and June 2013 in accordance with the New York State Department of Environmental Conservation (NYSDEC) approved groundwater investigation scope of work dated October 31, 2012. The soil investigation phase was completed in May 2013 in accordance with the NYSDEC-approved Work Plan prepared by LIRR, dated March 22, 2013. The objective of these investigations was to determine the nature and extent of any residual contamination associated with the Former Paint Stripping Building and if additional investigation or environmental remediation is necessary for the Site.

1.2 Site Description

As shown on Figure A-1, provided in Appendix A, the Morris Park Yard is located in a primarily residential and manufacturing district of Richmond Hill, New York and is situated just north of Atlantic Avenue and east of 121st Street. The Yard is approximately 23-acres in size and consists of a track area, two LIRR-employee platforms located in the southern portion of the Yard, a round-house facility equipped with a rail car turntable, an employee facility located in

the central portion of the Yard, a wheel-truing facility in the eastern portion of the Yard and a former fueling area located in the southern portion of the Yard. In addition, a yard office building, Bridges and Buildings facility and several temporary office and equipment storage buildings are located in the western portion of the Yard. The Former Paint Stripping Building, demolished in the early 2000's, was located in the northwestern portion of the Yard. The concrete slab of the Former Paint Stripping Building still exists at the Yard and is currently utilized for the storage of equipment. The areas in the immediate vicinity of the Former Paint Stripping Building are utilized for parking and storage of equipment by the LIRR and are not accessible by the public.

The Site is generally flat with a surface elevation approximately 40 to 50 feet above mean sea level. Groundwater flow is to the southwest. Jamaica Bay is located approximately 3.5 miles south of the Site and Willow Lake and Meadow Lake are located approximately 2 miles north of the Site.

1.3 Site History

Historically, the Paint Stripping Building was located at the northern end of the Motor Shop located between the Western and Eastern Transfer Pits in the northwestern portion of the Yard. Operations in the Paint Stripping Building involved the stripping of paint and decals from the exterior shell of train cars to prepare metal surfaces for the application of new paint and decals. A storage room for paint and primer and a paint mixing room were located at the northernmost end of the building. Paint and decal stripping operations occurred in bays 21 through 24, south of the paint mixing room. A solvent based stripper solution was applied to the areas to be stripped and the paint and decals were manually scraped from the train cars. Residual material was removed by spraying with water and was collected in concrete troughs located on the bay floor. The concrete troughs conveyed the spent solvent to floor drains, which discharged to an underground settling/storage tank located in the East Transfer Pit. The rinsate from the underground settling/storage tank was then discharged to the sewer system. After stripping operations were completed, any required painting or decal application was completed in the same work bay.

In 1990, a RCRA violation associated with metals contamination was identified on the concrete floor of the Former Paint Stripping Building. Subsequently, paint stripping operations ceased in December 1990. To rectify the RCRA violation and in consultation with NYSDEC, the concrete floor was washed and scarified in March 1996. In a letter dated March 30, 2001, the NYSDEC indicated no further action was required with respect to the inside of the Paint Stripping Building, however the soil beneath the Paint Stripping Building would need to be addressed when the soil becomes accessible.

The Former Paint Stripping Building was demolished in the early 2000s, in anticipation of the construction of a new locomotive repair shop at the Morris Park Yard. The LIRR intended to remove the remaining concrete slab beneath the Former Paint Stripping Building and, if necessary, any contaminated soil as part of this construction. However, due to budgetary constraints the new repair shop was not constructed.

In a September 19, 2012 letter, NYSDEC requested the status of the soil underlying the Former Paint Stripping Building. The LIRR responded in a letter dated October 16, 2012, indicating that groundwater samples would be collected from existing groundwater monitoring wells located in the vicinity of the Former Paint Stripping Building and analyzed for metals to determine if groundwater resources have been impacted. The NYSDEC approved this request in a letter dated October 19, 2012 but also required the collection of soil samples beneath the concrete slab of the Former Paint Stripping Building. On March 22, 2013 the LIRR submitted a work plan for the collection of soil samples beneath the concrete slab of the Former Paint Stripping Building. Groundwater samples were collected in December 2012, March 2013 and June 2013 and the soil investigation was completed in May 2013.

1.4 Project Objectives

The primary objectives of the LIRR RCRA groundwater and soil investigation included:

- Investigate and assess the presence of metals contamination in soil and groundwater associated with the Former Paint Stripping Building;
- Determine the need for supplemental data that may be necessary to adequately delineate the extent of contamination; and
- Identify and select appropriate remedial actions (if necessary) to clean up impacted soil and/or groundwater and obtain closure of the RCRA violation.

2.0 FIELD INVESTIGATION PROGRAM

This section provides an overview of the field activities associated with the RCRA soil and groundwater investigation of the Former Paint Stripping Building located at the Morris Park Yard performed by the LIRR. The soil site investigation was completed by the LIRR in May 2013 in accordance the NYSDEC-approved Work Plan prepared by LIRR, dated March 22, 2013. The groundwater site investigation was completed by the LIRR in December 2012, March 2013 and June 2013 in accordance with the NYSDEC-approved groundwater investigation scope of work letter dated October 31, 2012.

2.1 Subsurface Soil Sampling

A total of eight soil sample locations (SS-01 through SS-08) were completed in order to determine the presence and extent of residual soil contamination. The soil sample locations are provided on Figure A-2 provided in Appendix A. Note that sample location SS-06 was completed to a depth of 3 feet below the concrete due to the presence of creosote odors**.**

At all soil sample locations, a core drill was utilized to remove the overlying concrete. After removing the concrete, all soil probes were advanced using a hand auger. Each recovered soil sample was inspected and characterized. Any evidence of contamination, such as staining or odors was recorded. A summary of field observations is included on Table C-1, provided in Appendix C.

As summarized on Table C-1, provided in Appendix C, a total of 16 soil samples were collected for laboratory analysis. Two subsurface soil samples were selected from each soil sample location for laboratory analysis, with the exception of soil location SS-03 in which one sample was collected and soil location SS-06 in which three samples were collected. One soil sample was collected from each sample location from 0 to 6 inches below the concrete slab. A second soil sample was collected from the majority of the sample locations due to cracks in the concrete and a surficial layer of anthropogenic material located immediately beneath the concrete slab. At soil location SS-06, a creosote odor was observed. As such, a sample was collected from

the most impacted interval and one from the first clean interval below the impacted soil. All soil samples were analyzed for Target Analyte List (TAL) metals by United States Environmental Protection Agency (USEPA) Methods 6010/7471. Soil samples from SS-06 were also analyzed for volatile organic compounds (VOCs) by USEPA Method 8260. Subsurface soil analytical results are summarized in Appendix B on Tables B-1 and B-2, and are discussed in Section 3.2.

The soil remaining after the completion of each soil sample location was placed back into the borehole and the borehole was patched with the appropriate material at grade. All soil sample locations were documented utilizing a Magellan Professional Mobile Mapper CX global positioning system unit. All sample equipment was decontaminated between sampling locations in accordance with the work plan.

2.2 Monitoring Well Sampling

As indicated in the NYSDEC-approved groundwater investigation scope of work dated October 31, 2012, six existing down-gradient monitoring wells (MW-8-60, MW-11-60, MW-20-50, MW-21S, MW-GF-20 and MW-GF-26) and one existing up-gradient monitoring well (MW-28S) were sampled for chemical analysis. Sampling was completed on December 12, 2012, March 27, 2013 and June 27, 2013. Monitoring well MW-8-60 was not accessible during the December 12, 2012 sampling event and monitoring well MW-GF-20 was not accessible during the March 27, 2013 sampling event. A total of 19 groundwater samples were collected for laboratory analysis during the three sample events. The groundwater samples were analyzed for total and dissolved TAL metals by USEPA Methods 6010/7470. Groundwater analytical results are summarized in Appendix B in Table B-3, and are discussed in Section 3.3.

2.3 Analytical and QA/QC Procedures

All sample analyses were performed by Analytical Chemists, a certified NYSDOH Environmental Laboratory Approval Program (ELAP) laboratory. All analyses were conducted utilizing NYSDEC 6/05 Analytical Services Protocol (ASP) methods, or latest version, that are at least as stringent as USEPA CLP protocols. NYSDEC ASP Category B data packages were

provided for all analyses. In accordance with USEPA guidance, samples were received at the laboratory no later than 48 hours after collection.

2.4 Data Usability Summary Report

A total of 16 subsurface soil samples and 19 groundwater samples were selected for analysis as part of the RCRA soil and groundwater investigation of the Former Paint Stripping Building at the LIRR Morris Park Yard. All soil samples were analyzed for TAL metals and select soil samples were analyzed for VOCs. All groundwater samples were analyzed for total and dissolved TAL metals.

The analytical laboratory, Analytical Chemists, provided four NYSDEC ASP Category B deliverable data packages for review, including 1212088, 1303218, 1305047 and 1306242. These data packages were reviewed by Ms. Donna Brown, D&B's QA/QC Officer. Ms. Brown meets the NYSDEC requirements of a data validator as listed in the DER-10 Technical Guidance for Site Investigation and Remediation, dated June 2010. The review of the data was conducted in accordance with NYSDEC 6/05 ASP QA/QC requirements, as well as DER-10. The findings of the validation process are presented below.

Data package 1212088:

- Potassium (dissolved) in sample MW-GF-26 was analyzed at secondary dilutions due to initial analysis exceeding calibration range. However, this metal was not detected above the reporting limit in the samples at the secondary dilution. The original analysis was reported and was qualified as estimated (J) based on exceeding calibration range.

- Aluminum (total and dissolved) was detected in the initial calibration blank associated with all samples. Aluminum was qualified as non-detect (UB) for total samples MW-20-50, MW-GF-26, MW-11-60 and MW-21S; and dissolved samples MW-GF-20 and MW-28S.

- The percent recovery for vanadium was above quality control limits in the initial calibration. Only vanadium (total) was detected and qualified as estimated high (J+) in samples MW-GF-20 and MW-28S.

- The percent recovery was below quality control limits in the spike for sodium (total). Sodium (total) was qualified as estimated (J/UJ) based on spike percent recovery in all samples.

Data package 1303218:

- Aluminum (total and dissolved) was detected in the continuing calibration associated with all samples. Aluminum was qualified as non-detect (UB) for total sample MW-11-60; and dissolved sample MW-21S.

- Sodium was detected in the dissolved result and not in the total sample for MW-GF-26. Sodium was qualified as estimated (J/UJ) in the total and dissolved sample for MW-GF-26.

Data package 1305047:

- Chloroethane percent difference was above quality control limits in the continuing calibration associated with all samples. Chloroethane was qualified as an estimated detection limit (UJ) in all samples.

- Potassium in samples SS-07(0-6") and SS-08(6-12") and magnesium in sample SS-06(6-12") were analyzed at secondary dilutions due to initial analysis exceeding calibration range. However, these metals were not detected above the reporting limit in the samples at the secondary dilution. The original analysis was reported and was qualified as estimated (J) based on exceeding calibration range.

- The percent recovery for mercury was below quality control limits in the continuing calibration associated with samples SS-01(0-6"), SS-01(6-12"), SS-03(0-6"), SS-04(0-6"), SS-04(6-12"), SS-05(0-6"), SS-05(6-12"), SS-06(2.5-3'), SS-08(0-6") and SS-08(6-12"). Mercury was qualified as estimated low (J-) based on calibration results in all samples.

- The percent recovery was below quality control limits in the spike for the following metals: antimony, arsenic, barium, chromium, copper, lead, selenium and zinc associated with all samples. The percent recovery was above quality control limits in the spike for potassium associated with all samples. The above metals were qualified as estimated (J/UJ) based on spike percent recovery in all samples.

- The duplicate relative percent difference was above quality control limits for arsenic, barium, chromium, copper and zinc associated with all samples. The above metals were qualified as estimated (J/UJ) based on duplicate relative percent difference in all samples.

Data package 1306242:

- Iron, thallium and arsenic (total and dissolved) were detected in the continuing calibration blank associated with all samples. Dissolved iron was qualified as non-detected (UB) sample MW-8-60.

- The percent recoveries for potassium and sodium were above quality control limits in the continuing calibration. Potassium and sodium were detected and qualified as estimated high (J+) in all samples.

- The percent recovery was below quality control limits in the spike for and total and dissolved mercury associated with all samples. Total and dissolved mercury was qualified as an estimated detection limit (UJ) based on spike percent recovery in all samples.

- The duplicate relative percent difference was above quality control limits for dissolved aluminum and iron associated with all samples. The above metals were qualified as estimated (UJ) based on duplicate relative percent difference in all samples.

- Sodium was detected in the dissolved result at a much higher concentration than the total sample for MW-20-50 and MW-GF-26. Sodium was qualified as estimated (J/UJ) in the total and dissolved sample for MW-20-50 and MW-GF-26.

Based on the findings of the data validation process, the results have been deemed valid and usable for environmental assessment purposes as qualified above. Data validation checklists are provided in Appendix D.

3.0 INVESTIGATION FINDINGS

This section presents a detailed discussion of the geology and results of the RCRA s investigation specific to the presence or absence of metals contamination in soil and groundwater. Figures A-2 and A-3, provided in Appendix A, depict the location of all soil and groundwater sample locations, respectively, referenced in this section. A summary of field observations for the soil investigation is provided in Appendix C.

3.1 Geology

Based on the field observations recorded as part of the soil investigation, a layer of fill material was observed immediately below the concrete slab of the Former Paint Stripping Building. The fill material is generally described as a brown to black cinder and ash fill. Below the fill material was a layer of brown clay.

The majority of the soil sample locations completed below the concrete slab of the Former Paint Stripping Building exhibited no evidence of metals contamination or odors. Soil sample location SS-06 exhibited creosote odors from 0 to 2.5 feet below the concrete slab.

Based on a September 2009 Site Investigation Report prepared by Parsons Brinckerhoff and YU & Associates Engineers, P.C., the depth to groundwater at the Morris Park Yard ranges from 38 to 42 feet below ground surface. Groundwater flow at the Yard is to the southwest and regional groundwater flow is southerly.

3.2 Soil Samples

A total of 16 soil samples were collected for chemical analysis from 8 locations beneath the concrete slab of the Former Paint Stripping Building (SS-01 through SS-08). A sample location map is provided as Figure A-2 in Appendix A. All subsurface soil samples were analyzed for TAL Metals and select soil samples were analyzed for VOCs. The subsurface soil data has been compared to the Unrestricted Use Soil Cleanup Objectives (SCOs) and Industrial

Use SCOs as defined in NYSDEC 6 NYCRR Part 375. The Morris Park Yard as well as the area of the Former Paint Stripping Building will remain as a rail yard for the foreseeable future and therefore is considered industrial use. Therefore the Industrial Use SCOs are the most appropriate SCOs to be utilized in determining the need for additional investigation or remediation at the Site.

As shown on Tables B-1 and B-2, provided in Appendix B, TAL metals and VOCs were either not detected or were detected at concentrations below their respective Unrestricted and Industrial Use SCOs in all of the collected soil samples, with the exception of the following metals discussed below.

Fourteen of the 16 soil samples collected for analysis exhibited detectable levels of cadmium at concentrations slightly above its respective Unrestricted Use SCO of 2.5 mg/kg. Cadmium concentrations ranged from non-detect to a maximum of 3.66 mg/kg detected in subsurface soil sample SS-06 (2.5-3').

One of the 16 soil samples collected for analysis exhibited detectable levels of chromium at a concentration above its respective Unrestricted Use SCO of 30 mg/kg. Chromium concentrations ranged from 3.1 mg/kg to a maximum of 46.5 mg/kg in subsurface soil sample SS-07 (0-6").

One of the 16 soil samples collected for analysis exhibited detectable levels of copper at a concentration above its respective Unrestricted Use SCO of 50 mg/kg. Copper concentrations ranged from 6.84 mg/kg to a maximum of 78.7 mg/kg in subsurface soil sample SS-06 (2.5-3').

Five of the 16 soil samples collected for analysis exhibited detectable levels of lead at concentrations above its respective Unrestricted Use SCO of 63 mg/kg. Lead concentrations ranged from 8.74 mg/kg to a maximum of 265 mg/kg in subsurface soil sample SS-06 (2.5-3').

One of the 16 soil samples collected for analysis exhibited detectable levels of mercury at a concentration above its respective Unrestricted Use SCO of 0.18 mg/kg. Mercury

concentrations ranged from 0.02 mg/kg to a maximum of 0.25 mg/kg in subsurface soil sample SS-05 (0-6”).

Two of the 16 soil samples collected for analysis exhibited detectable levels of zinc at concentrations above its respective Unrestricted Use SCO of 109 mg/kg. Zinc concentrations ranged from 10.3 mg/kg to a maximum of 209 mg/kg in subsurface soil sample SS-06 (0-6”).

Again, while several metals were found to exceed their respective Unrestricted Use SCO, all metals were found to be well below the established Industrial Use SCO.

3.3 Groundwater

A total of 16 groundwater samples were collected for chemical analysis from six existing downgradient groundwater monitoring wells (MW-8-60, MW-11-60, MW-20-50, MW-21S, MW-GF-20 and MW-GF-26) and three groundwater samples were collected from one existing upgradient groundwater monitoring well (MW-28S) throughout the Yard. A sample location map is provided as Figure A-3 in Appendix A. All groundwater samples were analyzed for total and dissolved TAL metals. The groundwater sample data was compared to the NYSDEC Part 703 Groundwater Quality Standards (GQS) (class GA) and Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS). Class GA waters are fresh groundwaters and are defined as a source of potable water supply. However, it should be noted that groundwater in the vicinity of the Site is not used as a source of potable water.

As shown on Table B-3, provided in Appendix B, TAL metals were either not detected or were detected at concentrations below their respective NYSDEC Part 703 GQS (class GA) and Division of Water TOGS 1.1.1 AWQS in all of the collected groundwater samples, with the exception of the following metals discussed below. In addition to the metals discussed below, total and dissolved iron, manganese and sodium were detected above their respective AWQS, however these metals are not considered contaminants of concern.

One of the 16 groundwater samples collected for analysis downgradient of the Site exhibited a concentration of total chromium above its respective AWQS of 0.05 mg/l. Total chromium concentrations ranged from non-detect to a maximum of 0.073 mg/l detected in groundwater monitoring well MW-GF-26.

One of the 16 groundwater samples collected for analysis downgradient of the Site exhibited a concentration of total mercury above its respective AWQS of 0.0007 mg/l. Total mercury concentrations ranged from non-detect to a maximum of 0.00083 mg/l detected in groundwater monitoring well MW-21S.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This section of the report presents the conclusions and recommendations with respect to the nature and extent of metals contamination observed in the vicinity of the Former Paint Stripping Building. The conclusions and recommendations are based on the comparison of chemical constituents detected in soil and groundwater during the site assessment to the Unrestricted and Industrial Use SCOs and Class GA Standards, respectively. The Morris Park Yard as well as the area of the Former Paint Stripping Building will remain as a rail yard for the foreseeable future and therefore is considered industrial use.

4.1 Conclusions

Subsurface Soil

Based on the findings of the soil investigation presented herein, the presence and extent of residual subsurface contamination associated with the Former Paint Stripping Building has been characterized. As part of this soil investigation, 16 subsurface soil samples were selected for chemical analysis beneath the concrete slab of the Former Paint Stripping Building. In general, no visual evidence of metals contamination was observed within the fill material and the clay-rich unit, immediately below the concrete slab of the Former Paint Stripping Building. Additional evidence of potential impacts to Site soil such as creosote odors were observed at soil sample location SS-06. However, this is likely due to much of the Yard being underlain by historic fill and not necessarily indicative of a release from the Former Paint Stripping Building.

The analytical results for the subsurface soil samples support these conclusions. All individual metals and VOCs were detected at concentrations well below their respective Unrestricted and Industrial Use SCOs with the exception of cadmium, chromium, copper, lead, mercury and zinc. Cadmium was detected slightly above its respective Unrestricted Use SCO in 15 of the 16 soil samples collected at sample locations SS-01 through SS-08. Chromium was detected slightly above its respective Unrestricted Use SCO in one of the 16 soil samples collected at sample location SS-07. Copper was detected slightly above its respective

Unrestricted Use SCO in one of the 16 soil samples collected at sample location SS-06. Lead was detected above its respective Unrestricted Use SCO in five of the 16 soil samples collected at sample location SS-05 through SS-07. Mercury was detected slightly above its respective Unrestricted Use SCO in one of the 16 soil samples collected at sample location SS-05. Zinc was detected slightly above its respective Unrestricted Use SCO in two of the 16 soil samples collected at sample location SS-06.

However, the soil samples with the highest metals concentrations were detected at concentrations well below their respective Industrial Use SCOs.

Groundwater

Based on the findings of this groundwater investigation presented herein, the presence and extent of groundwater contamination associated with the Former Paint Stripping Bay has been characterized. As part of this groundwater investigation, a total of 19 groundwater samples were selected for chemical analysis: 16 samples from downgradient monitoring wells MW-8-60, MW-11-60, MW-20-50, MW-21S, MW-GF-20 and MW-GF-26 located south and southwest of the Former Paint Stripping Building; and three samples from upgradient monitoring well MW-28S located northeast of the Former Paint Stripping Building. All seven of the groundwater monitoring wells exhibited concentrations of metals above Class GA Standards. In general, evidence of metals contamination was not observed in groundwater downgradient of the Former Paint Stripping Building.

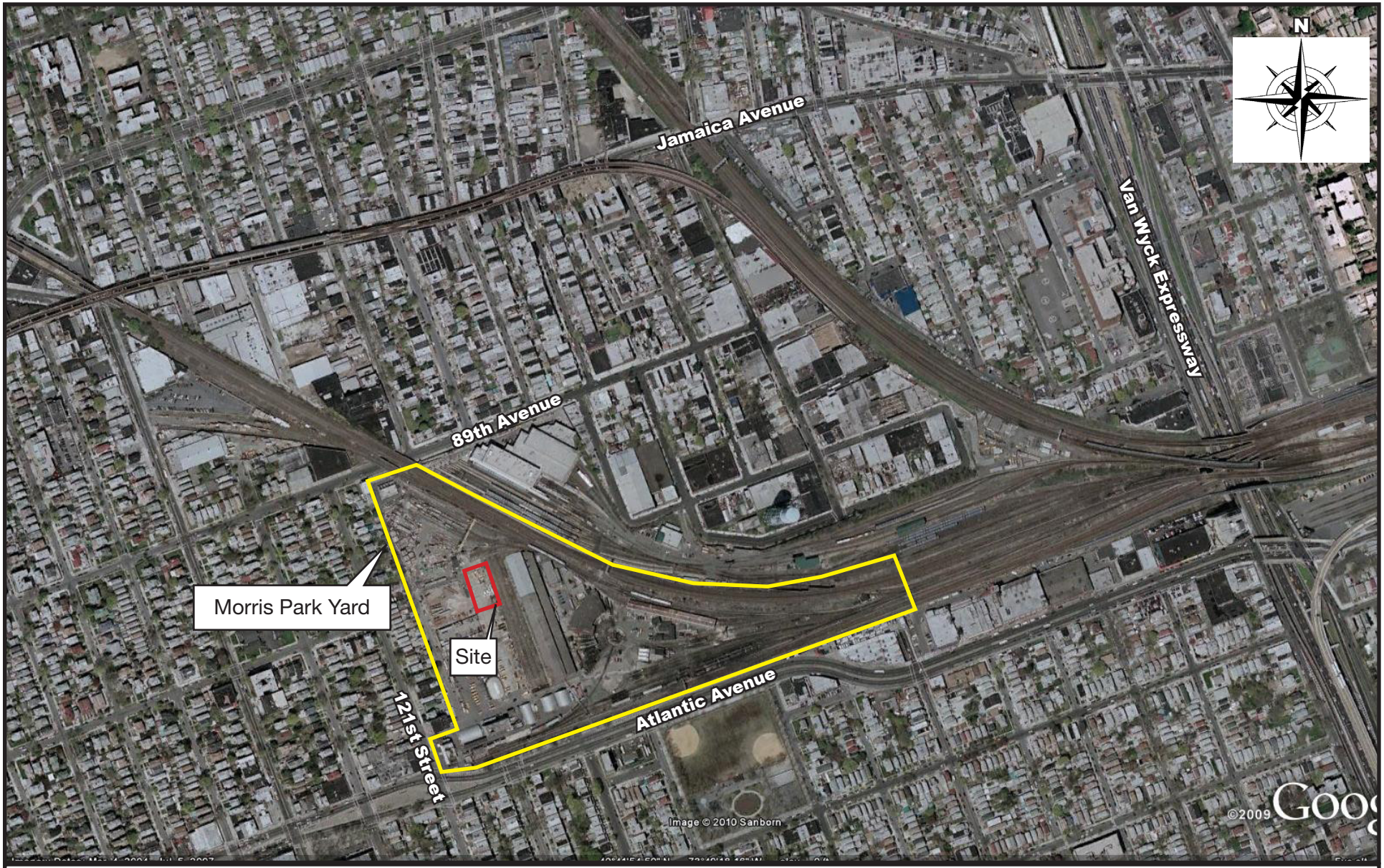
Detectable concentrations of metals above Class GA Standards downgradient of the Former Paint Stripping Building included chromium and mercury, only marginally above their respective Class GA Standard. Iron, manganese and sodium were also detected above Class GA Standards; however, these metals are not contaminants of concern. Although concentrations of metals were compared to Class GA Standards, groundwater at the Site and in the vicinity of the Morris Park Yard is not used as a source of potable water.

4.2 Recommendations

The recommendations provided are based on the findings of this RCRA investigation. Based on the results of this site assessment, further investigation and/or remediation of site soil and groundwater in regards to metals contamination is not warranted at this time. It is recommended that the RCRA violation associated with the Former Paint Stripping Building is closed with a status of “no further action required.”

APPENDIX A

FIGURES



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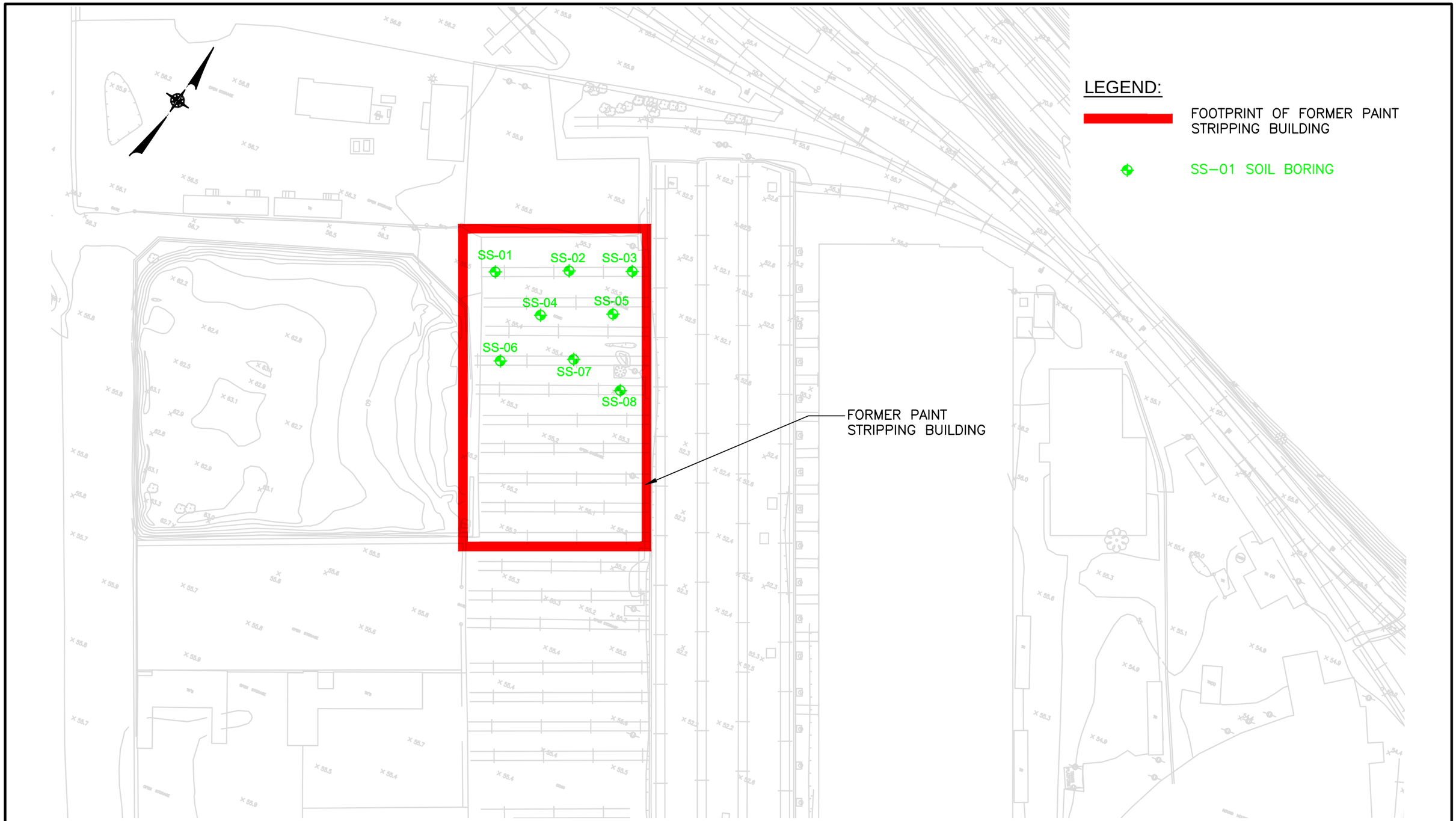
Long Island Rail Road
Morris Park Yard - Former Paint Stripping Building
RCRA Investigation

SITE LOCATION MAP

FIGURE A-1

3455-1A - Morris Park_Site Location Map2.indd (12/16/13 - 10:37 AM)



SOURCE: BASE MAP PETRACCA & SONS, INC., WHITESTONE, NEW YORK (OCTOBER 2, 2000)

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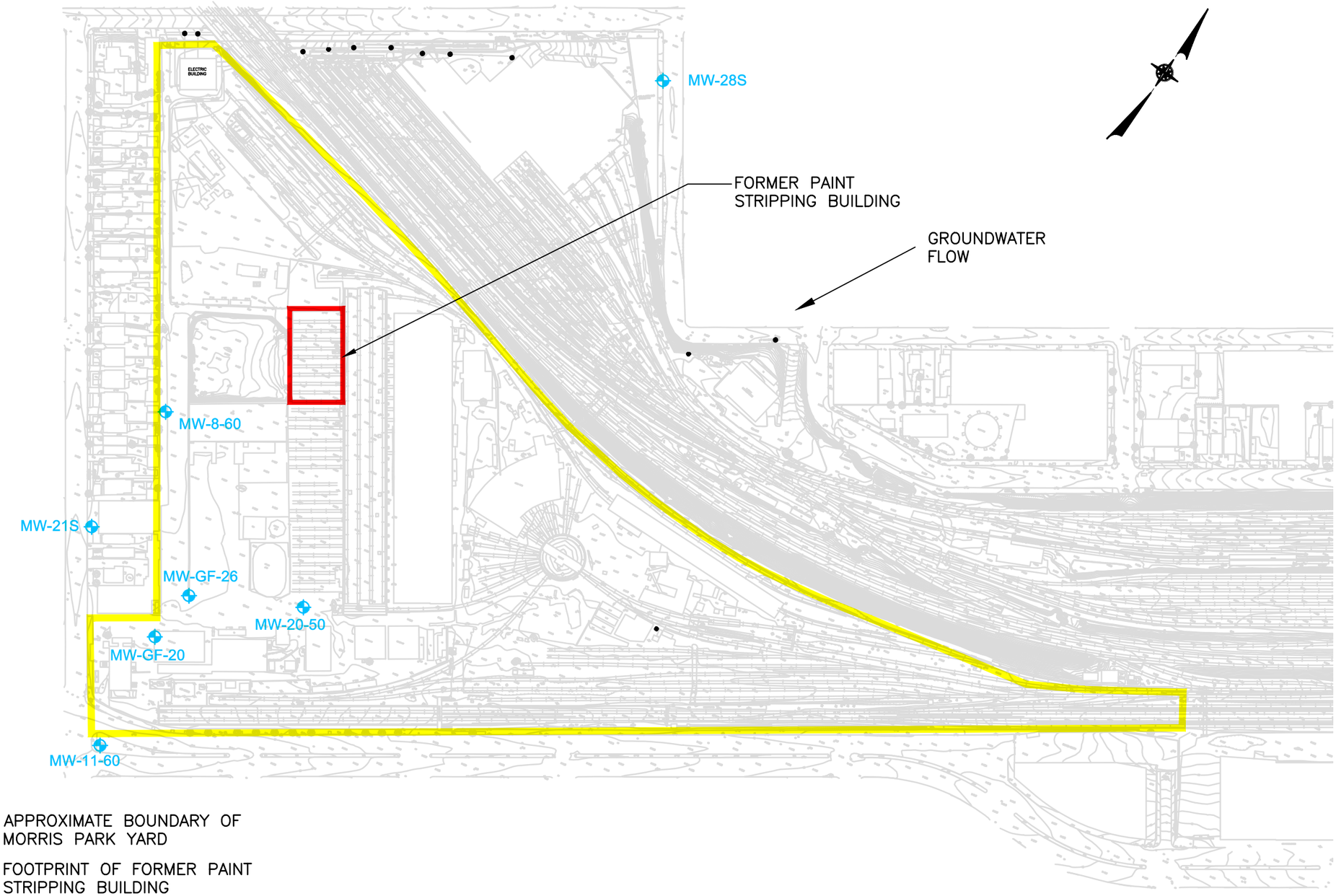
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION

SOIL BORING LOCATION MAP

SCALE: 1" = 50'

FIGURE A-2

F:\3455\Dwg\3455-FIG2.dwg, 12/16/2013 4:15:31 PM, DWG to PDF.pc3



LEGEND:

- APPROXIMATE BOUNDARY OF MORRIS PARK YARD
- FOOTPRINT OF FORMER PAINT STRIPPING BUILDING
- MW–28S GROUNDWATER MONITORING WELL

SOURCE: BASE MAP PETRACCA & SONS, INC., WHITESTONE, NEW YORK (OCTOBER 2, 2000)

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LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION

GROUNDWATER SAMPLE LOCATION MAP

SCALE: 1" = 200'

FIGURE A-3

APPENDIX B

CHEMICAL DATA TABLES

TABLE B-1
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
SOIL SAMPLES
TAL METALS

Sample ID	SS-01(0-6")	SS-01(6-12")	SS-02(0-6")	SS-02(1-1.5')	SS-03(0-6")	SS-04(0-6")	SS-04(6-12")	NYCRR 6 Part 375 Unrestricted Use Soil Cleanup Objectives (SCO)	NYCRR 6 Part 375 Industrial Use Soil Cleanup Objectives (SCO)
Sampling Date	5/2/2013	5/2/2013	5/2/2013	5/2/2013	5/2/2013	5/2/2013	5/2/2013		
Start Depth (in Feet)	0	0.5	0	1	0	0	0.5		
End Depth (in Feet)	0.5	1	0.5	1.5	0.5	0.5	1		
Dilution Factor	1	1	1	1	1	1	1		
Units	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
METALS									
Aluminum	20,900	20,700	11,400	22,300	22,500	20,300	21,700	--	--
Antimony	UJ	UJ	UJ	UJ	UJ	UJ	UJ	--	--
Arsenic	UJ	UJ	UJ	UJ	UJ	UJ	UJ	13	16
Barium	58.8 J	54.4 J	47.9 J	33.6 J	72.4 J	50.7 J	59.6 J	350	10,000
Beryllium	0.498	0.566	0.335	0.529	0.575	0.493	0.491	7.2	2,700
Cadmium	***3.01***	***3.19***	1.83	***3.04***	***3.43***	***2.94***	***2.82***	2.5	60
Calcium	1,530	961	1,890	319	1,300	1,590	1,420	--	--
Chromium	6.16 J	6.50 J	3.45 J	4.45 J	7.09 J	8.30 J	6.52 J	30	6,800
Cobalt	19.8	11.2	6.93	7.22	6.60	10.0	5.37	--	--
Copper	14.3 J	11.0 J	11.3 J	9.56 J	9.35 J	11.4 J	6.84 J	50	10,000
Iron	23,900	22,200	18,100	28,400	25,700	24,200	21,200	--	--
Lead	12.8 J	11.5 J	30.7 J	9.02 J	15.9 J	38.6 J	9.19 J	63	3,900
Magnesium	2,920	2,450	1,730	2,980	2,540	2,960	2,250	--	--
Manganese	355	224	358	137	375	273	120	1,600	10,000
Mercury	0.05 J-	0.03 J-	0.03	0.03	0.04 J-	0.05 J-	0.05 J-	0.18	5.7
Nickel	13.3	14.1	11.1	14.0	13.3	14.7	11.0	30	10,000
Potassium	1,120 J	997 J	819 J	904 J	1,140 J	1,080 J	1,000 J	--	--
Selenium	UJ	UJ	UJ	UJ	UJ	UJ	UJ	3.9	6,800
Silver	U	U	U	U	U	U	U	2	6,800
Sodium	90.9	141	64.5	51.1	111	82.8	60.6	--	--
Thallium	U	U	U	U	U	U	U	--	--
Vanadium	39.0	40.2	24.0	42.4	45.5	36.3	37.3	--	--
Zinc	34.8 J	33.9 J	40.7 J	31.7 J	32.5 J	35.4 J	26.0 J	109	10,000

Footnotes/Qualifiers:

mg/kg: Milligrams per kilogram
U: Analyzed for but not detected
J: Estimated value
J-: Estimated value bias low
--: No standard
Exceeds Unrestricted Use SCO

TABLE B-1
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
SOIL SAMPLES
TAL METALS

Sample ID	SS-05(0-6")	SS-05(6-12")	SS-06(0-6")	SS-06(6-12")	SS-06(2.5-3")	SS-07(0-6")	SS-07(6-12")	NYCRR 6 Part 375 Unrestricted Use Soil Cleanup Objectives (SCO)	NYCRR 6 Part 375 Industrial Use Soil Cleanup Objectives (SCO)
Sampling Date	5/2/2013	5/2/2013	5/2/2013	5/2/2013	5/2/2013	5/2/2013	5/2/2013		
Start Depth (in Feet)	0	0.5	0	0.5	2.5	0	0.5		
End Depth (in Feet)	0.5	1	0.5	1	3	0.5	1		
Dilution Factor	1	1	1	1	1	1	1		
Units	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
METALS									
Aluminum	20,900	23,600	19,900	24,800	23,700	15,700	17,200	--	--
Antimony	UJ	UJ	UJ	UJ	UJ	UJ	UJ	--	--
Arsenic	UJ	UJ	UJ	UJ	UJ	UJ	UJ	13	16
Barium	117 J	65.8 J	148 J	79.0 J	138 J	125 J	39.9 J	350	10,000
Beryllium	0.543	0.569	0.338	0.630	0.914	0.415	0.446	7.2	2,700
Cadmium	***3.46***	***3.56***	***3.40***	***3.36***	***3.66***	***3.43***	***2.83***	2.5	60
Calcium	1,780	1,740	1,300	933	358	2,170	898	--	--
Chromium	3.29 J	3.10 J	18.9 J	14.3 J	24.3 J	***46.5 J***	6.91 J	30	6,800
Cobalt	9.22	9.27	7.52	6.73	5.08	14.9	10.9	--	--
Copper	23.9 J	13.0 J	40.3 J	39.9 J	***78.7 J***	45.5 J	12.4 J	50	10,000
Iron	35,500	35,800	23,800	21,200	27,600	32,400	28,900	--	--
Lead	***141 J***	16.0 J	***163 J***	***106 J***	***265 J***	***192 J***	10.7 J	63	3,900
Magnesium	2,840	3,160	3,040	2,770 J	2,390	2,230	2,700	--	--
Manganese	232	411	116	104	193	448	411	1,600	10,000
Mercury	***0.25 J-***	0.04 J-	0.16	0.05	0.17 J-	0.09	0.04	0.18	5.7
Nickel	14.9	17.1	15.2	14.8	14.6	16.8	15.9	30	10,000
Potassium	1,050 J	1,200 J	1,280 J	1,260 J	1,270 J	1,090 J	884 J	--	--
Selenium	UJ	UJ	UJ	UJ	UJ	UJ	UJ	3.9	6,800
Silver	U	U	U	U	U	U	U	2	6,800
Sodium	71.3	73.2	95.9	85.1	60.2	105	53.9	--	--
Thallium	U	7 U	U	U	U	U	U	--	--
Vanadium	38.6	40.6	42.2	42.8	49.2	35.2	40.1	--	--
Zinc	73.3 J	33.2 J	***209 J***	71.9 J	***140 J***	98.1 J	33.2 J	109	10,000

Footnotes/Qualifiers:

mg/kg: Milligrams per kilogram
U: Analyzed for but not detected
J: Estimated value
J-: Estimated value bias low
--: No standard
Exceeds Unrestricted Use SCO

TABLE B-1
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
SOIL SAMPLES
TAL METALS

Sample ID	SS-08(0-6")	SS-08(6-12")	NYCRR 6 Part 375	NYCRR 6 Part 375
Sampling Date	5/2/2013	5/2/2013	Unrestricted	Industrial
Start Depth (in Feet)	0	0.5	Use Soil	Use Soil
End Depth (in Feet)	0.5	1	Cleanup	Cleanup
Dilution Factor	1	1	Objectives (SCO)	Objectives (SCO)
Units	mg/Kg	mg/Kg	mg/Kg	mg/Kg
METALS				
Aluminum	1,500	19,100	--	--
Antimony	UJ	UJ	--	--
Arsenic	UJ	UJ	13	16
Barium	30.1 J	47.9 J	350	10,000
Beryllium	U	0.569	7.2	2,700
Cadmium	U	***3.11***	2.5	60
Calcium	1,170	828	--	--
Chromium	16.6 J	27.0 J	30	6,800
Cobalt	3.44	12.7	--	--
Copper	22.1 J	12.2 J	50	10,000
Iron	10,500	27,700	--	--
Lead	23.8 J	8.74 J	63	3,900
Magnesium	166	2,990	--	--
Manganese	22.5	210	1,600	10,000
Mercury	0.02 J-	0.04 J-	0.18	5.7
Nickel	6.14	19.5	30	10,000
Potassium	236 J	932 J	--	--
Selenium	UJ	UJ	3.9	6,800
Silver	U	U	2	6,800
Sodium	46.1	63.9	--	--
Thallium	U	U	--	--
Vanadium	11.7	40.9	--	--
Zinc	10.3 J	76.2 J	109	10,000

Footnotes/Qualifiers:
mg/kg: Milligrams per kilogram
U: Analyzed for but not detected
J: Estimated value
J-: Estimated value bias low
--: No standard
Exceeds Unrestricted Use SCO

TABLE B-2
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
SOIL SAMPLES
VOLATILE ORGANICS

Sample ID	SS-06(0-6")	SS-06(6-12")	SS-06(2.5-3")	NYCRR 6 Part 375	NYCRR 6 Part 375
Sampling Date	5/2/2013	5/2/2013	5/2/2013	Unrestricted	Industrial
Start Depth (in Feet)	0	0.5	2.5	Use Soil	Use Soil
End Depth (in Feet)	0.5	1	3	Cleanup	Cleanup
Dilution Factor	1	1	1	Objectives (SCO)	Objectives (SCO)
Units	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
VOLATILE COMPOUNDS					
Benzene	U	U	U	60	70,000
Bromobenzene	U	U	U	--	--
Bromochloromethane	U	U	U	--	--
Bromodichloromethane	U	U	U	--	--
Bromoform	U	U	U	--	--
Bromomethane	U	U	U	--	--
sec-Butylbenzene	U	U	U	11,000	1,000,000
n-Butylbenzene	U	U	U	12,000	--
tert-Butylbenzene	U	U	U	5,900	1,000,000
Carbon Tetrachloride	U	U	U	760	44,000
Chlorobenzene	U	U	U	1,100	1,000,000
Chloroethane	UJ	UJ	UJ	--	--
Chloroform	U	U	U	370	700,000
Chloromethane	U	U	U	--	--
2-Chlorotoluene	U	U	U	--	--
4-Chlorotoluene	U	U	U	--	--
1,2 Dibromo-3-chloropropane	U	U	U	--	--
Dibromochloromethane	U	U	U	--	--
1,2-Dibromoethane	U	U	U	--	--
Dibromomethane	U	U	U	--	--
1,2-Dichlorobenzene	U	U	U	1,100	1,000,000
1,3-Dichlorobenzene	U	U	U	2,400	560,000
1,4-Dichlorobenzene	U	U	U	1,800	250,000
Dichlorodifluoromethane	U	U	U	--	--
1,1-Dichloroethane	U	U	U	270	480,000
1,2-Dichloroethane	U	U	U	20	60,000
1,1-Dichloroethene	U	U	U	330	1,000,000
cis-1,2-Dichloroethene	U	U	U	250	1,000,000

See next page for Footnotes/Qualifiers

TABLE B-2
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
SOIL SAMPLES
VOLATILE ORGANICS

Sample ID	SS-06(0-6")	SS-06(6-12")	SS-06(2.5-3")	NYCRR 6 Part 375	NYCRR 6 Part 375
Sampling Date	5/2/2013	5/2/2013	5/2/2013	Unrestricted	Industrial
Start Depth (in Feet)	0	0.5	2.5	Use Soil	Use Soil
End Depth (in Feet)	0.5	1	3	Cleanup	Cleanup
Dilution Factor	1	1	1	Objectives (SCO)	Objectives (SCO)
Units	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
COMPOUNDS CONTINUED					
trans-1,2-Dichloroethene	U	U	U	190	1,000,000
1,3-Dichloroproane	U	U	U	--	--
2,2-Dichloropropane	U	U	U	--	--
1,2-Dichloropropane	U	U	U	--	--
trans-1,3-Dichloropropene	U	U	U	--	--
1,1-Dichloropropene	U	U	U	--	--
cis-1,3-Dichloropropene	U	U	U	--	--
Ethylbenzene	20.4	U	U	1,000	780,000
Hexachlorobutadiene	U	U	U	--	--
Isopropylbenzene	7.84	U	U	--	--
4-Isopropyltoluene	6.34	U	U	--	--
Methyl-tert-Butyl-Ether	U	U	U	930	1,000,000
Methylene Chloride	U	U	U	50	1,000,000
n-propylbenzene	5.95	U	U	3,900	1,000,000
Styrene	U	U	U	--	--
1,1,2,2-Tetrachloroethane	U	U	U	--	--
1,1,1,2-Tetrachloroethane	U	U	U	--	--
Tetrachloroethene	U	U	2.99	1,300	300,000
Toluene	4.79	U	U	700	1,000,000
1,2,3-Trichlorobenzene	U	U	U	--	--
1,1,1-Trichloroethane	U	U	U	680	1,000,000
1,1,2-Trichloroethane	U	U	U	--	--
Trichloroethene	U	U	U	470	400,000
Trichlorofluoromethane	U	U	U	--	--
1,2,3-Trichloropropane	U	U	U	--	--
1,2,4-Trimethylbenzene	94.6	3.96	U	3,600	380,000
1,3,5-Trimethylbenzene	2.67	U	U	8,400	380,000
Vinyl Chloride	U	U	U	20	27,000
o-Xylene	21.3	U	U	260	1,000,000
m,p-Xylene	7.45	U	U	260	1,000,000

Footnotes/Qualifiers:
ug/kg: Micrograms per kilogram
U: Analyzed for but not detected
J: Estimated detection limit
--: No standard

TABLE B-3
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
GROUNDWATER SAMPLES
TAL METALS

Sample ID	MW-8-60 Total	MW-8-60 Dissolved	MW-8-60 Total	MW-8-60 Dissolved	MW-8-60 Total	MW-8-60 Dissolved	NYSDEC Class GA Standard or Guidance Value
Sampling Date	12/12/2012	12/12/2012	3/27/2013	3/27/2013	6/27/2013	6/27/2013	
Dilution Factor	1	1	1	1	1	1	
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
METALS							
Aluminum	NS	NS	U	U	U	UJ	--
Antimony	NS	NS	U	U	U	U	0.003
Arsenic	NS	NS	U	U	U	U	0.025
Barium	NS	NS	0.018	0.016	0.018	0.019	1
Beryllium	NS	NS	U	U	U	U	0.003
Cadmium	NS	NS	U	U	U	U	0.005
Calcium	NS	NS	30.3	30.2	24.6	22.4	--
Chromium	NS	NS	U	U	U	U	0.05
Cobalt	NS	NS	U	U	U	U	--
Copper	NS	NS	U	0.005	0.006	0.011	0.2
Iron	NS	NS	U	U	U	UJB	0.3
Lead	NS	NS	U	U	U	U	0.025
Magnesium	NS	NS	4.90	4.47	4.84	3.95	35
Manganese	NS	NS	0.006	0.012	0.019	U	0.3
Mercury	NS	NS	U	U	UJ	UJ	0.0007
Nickel	NS	NS	U	U	U	U	0.1
Potassium	NS	NS	2.64	2.73	2.79 J+	3.06 J+	--
Selenium	NS	NS	U	U	U	U	0.01
Silver	NS	NS	U	U	U	U	0.05
Sodium	NS	NS	***35.9***	***44.5***	***34.9 J+***	***38.2 J+***	20
Thallium	NS	NS	U	U	U	U	0.0005
Vanadium	NS	NS	U	U	U	U	--
Zinc	NS	NS	U	U	U	U	2

Footnotes/Qualifiers:

mg/l: Milligrams per liter
NS: Not sampled; well not accessible.
--: No standard or guidance value
B: Detected in the calibration
J: Estimated value
J+: Estimated value bias high
U: Analyzed for but not detected

Exceeds Class GA Standard or Guidance Value

TABLE B-3
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
GROUNDWATER SAMPLES
TAL METALS

Sample ID	MW-11-60 Total	MW-11-60 Dissolved	MW-11-60 Total	MW-11-60 Dissolved	MW-11-60 Total	MW-11-60 Dissolved	NYSDEC Class GA Standard or Guidance Value
Sampling Date	12/12/2012	12/12/2012	3/27/2013	3/27/2013	6/27/2013	6/27/2013	
Dilution Factor	1	1	1	1	1	1	
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
METALS							
Aluminum	UB	U	UB	U	U	UJ	--
Antimony	U	U	U	U	U	U	0.003
Arsenic	U	U	U	U	U	U	0.025
Barium	0.048	0.046	0.014	0.013	0.033	0.031	1
Beryllium	U	U	U	U	U	U	0.003
Cadmium	U	U	U	U	U	U	0.005
Calcium	78.1	71.1	18.1	16.3	34.7	31.7	--
Chromium	U	U	U	U	U	U	0.05
Cobalt	U	U	U	U	U	U	--
Copper	U	U	U	U	U	U	0.2
Iron	***0.418***	U	0.094	U	U	UJ	0.3
Lead	U	U	U	U	U	U	0.025
Magnesium	12.5	11.7	2.68	2.51	8.10	7.13	35
Manganese	0.012	0.009	0.004	0.007	U	0.005	0.3
Mercury	U	U	U	U	UJ	UJ	0.0007
Nickel	U	U	U	U	U	U	0.1
Potassium	1.48	1.61	1.07	1.12	2.83 J+	3.02 J+	--
Selenium	U	U	U	U	U	U	0.01
Silver	U	U	U	U	U	U	0.05
Sodium	***112 J***	***108***	***46.8***	***54.0***	***52.5 J+***	***57.5 J+***	20
Thallium	U	U	U	U	U	U	0.0005
Vanadium	U	U	U	U	U	U	--
Zinc	U	0.020	U	U	U	0.028	2

Footnotes/Qualifiers:

mg/l: Milligrams per liter
--: No standard or guidance value
B: Detected in the calibration
J: Estimated value
J+: Estimated value bias high
U: Analyzed for but not detected
Exceeds Class GA Standard or Guidance Value

TABLE B-3
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
GROUNDWATER SAMPLES
TAL METALS

Sample ID	MW-20-50 Total	MW-20-50 Dissolved	MW-20-50 Total	MW-20-50 Dissolved	MW-20-50 Total	MW-20-50 Dissolved	NYSDEC Class GA Standard or Guidance Value
Sampling Date	12/12/2012	12/12/2012	3/27/2013	3/27/2013	6/27/2013	6/27/2013	
Dilution Factor	1	1	1	1	1	1	
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
METALS							
Aluminum	UB	U	U	U	0.058	UJ	--
Antimony	U	U	U	U	U	U	0.003
Arsenic	U	U	U	U	U	U	0.025
Barium	0.032	0.026	0.020	0.019	0.060	0.049	1
Beryllium	U	U	U	U	U	U	0.003
Cadmium	U	U	U	U	U	U	0.005
Calcium	42.5	43.2	31.4	28.8	33.6	27.6	--
Chromium	U	U	U	U	U	U	0.05
Cobalt	U	U	U	U	U	U	--
Copper	0.004	U	U	U	U	U	0.2
Iron	***1.65***	0.057	0.046	U	***0.376***	UJ	0.3
Lead	U	U	U	U	U	U	0.025
Magnesium	17.0	17.2	10.9	10.1	11.4	9.27	35
Manganese	0.029	0.009	0.004	0.007	0.061	0.007	0.3
Mercury	U	U	U	U	UJ	UJ	0.0007
Nickel	U	U	U	U	U	U	0.1
Potassium	1.21	1.37	1.06	1.11	6.60 J+	7.01 J+	--
Selenium	U	U	U	U	U	U	0.01
Silver	U	U	U	U	U	U	0.05
Sodium	***38.5 J***	***42.1***	***38.2***	***39.6***	***38.8 J+***	***59.5 J+***	20
Thallium	U	U	U	U	U	U	0.0005
Vanadium	U	U	U	U	U	U	--
Zinc	0.034	0.024	U	U	U	U	2

Footnotes/Qualifiers:

mg/l: Milligrams per liter
--: No standard or guidance value
B: Detected in the initial calibaration
J: Estimated value
J+: Estimated value bias high
U: Analyzed for but not detected
Exceeds Class GA Standard or Guidance Value

TABLE B-3
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
GROUNDWATER SAMPLES
TAL METALS

Sample ID	MW-21S Total	MW-21S Dissolved	MW-21S Total	MW-21S Dissolved	MW-21S Total	MW-21S Dissolved	NYSDEC Class GA Standard or Guidance Value
Sampling Date	12/12/2012	12/12/2012	3/27/2013	3/27/2013	6/27/2013	6/27/2013	
Dilution Factor	1	1	1	1	1	1	
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
METALS							
Aluminum	UB	U	3.74	UB	0.391	UJ	--
Antimony	U	U	U	U	U	U	0.003
Arsenic	U	U	U	U	U	U	0.025
Barium	0.006	U	0.030	0.006	0.017	0.014	1
Beryllium	U	U	U	U	U	U	0.003
Cadmium	U	U	U	U	U	U	0.005
Calcium	4.32	2.94	10.0	7.36	22.4	15.8	--
Chromium	U	U	U	U	U	U	0.05
Cobalt	U	U	0.009	U	U	U	--
Copper	U	U	0.010	U	U	U	0.2
Iron	***1.22***	0.050	***9.94***	0.202	***0.811***	UJ	0.3
Lead	U	U	U	U	U	U	0.025
Magnesium	2.30	1.48	4.78	3.09	5.09	4.29	35
Manganese	0.069	0.007	***0.596***	0.017	0.126	0.004	0.3
Mercury	U	U	***0.00083***	U	UJ	UJ	0.0007
Nickel	U	U	0.010	U	U	U	0.1
Potassium	2.17	2.23	1.59	1.02	2.44 J+	2.39 J+	--
Selenium	U	U	U	U	U	U	0.01
Silver	U	U	U	U	U	U	0.05
Sodium	4.92 J	6.50	7.32	8.36	***38.1 J+***	13.6 J+	20
Thallium	U	U	U	U	U	U	0.0005
Vanadium	U	U	0.012	U	U	U	--
Zinc	U	U	0.021	U	U	U	2

Footnotes/Qualifiers:

mg/l: Milligrams per liter
--: No standard or guidance value
B: Detected in the calibration
J: Estimated value
J+: Estimated value bias high
U: Analyzed for but not detected
Exceeds Class GA Standard or Guidance Value

TABLE B-3
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
GROUNDWATER SAMPLES
TAL METALS

Sample ID	MW-28S Total	MW-28S Dissolved	MW-28S Total	MW-28S Dissolved	MW-28S Total	MW-28S Dissolved	NYSDEC Class GA Standard or Guidance Value
Sampling Date	12/12/2012	12/12/2012	3/27/2013	3/27/2013	6/27/2013	6/27/2013	
Dilution Factor	1	1	1	1	1	1	
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
METALS							
Aluminum	1.76	UB	1.18	U	0.267	UJ	--
Antimony	U	U	U	U	U	U	0.003
Arsenic	U	U	U	U	U	U	0.025
Barium	0.066	0.050	0.039	0.028	0.058	0.046	1
Beryllium	U	U	U	U	U	U	0.003
Cadmium	U	U	U	U	U	U	0.005
Calcium	29.5	29.7	20.3	19.0	38.8	30.6	--
Chromium	U	U	U	U	U	U	0.05
Cobalt	U	U	U	U	U	U	--
Copper	U	U	0.004	U	U	U	0.2
Iron	***4.40***	0.151	***2.79***	0.052	***0.680***	UJ	0.3
Lead	U	U	U	U	U	U	0.025
Magnesium	7.30	6.92	5.30	4.94	7.34	6.92	35
Manganese	***0.396***	0.108	***0.575***	***0.367***	0.266	0.066	0.3
Mercury	U	U	U	U	UJ	UJ	0.0007
Nickel	U	U	0.012	U	U	U	0.1
Potassium	6.29	6.84	4.79	4.81	5.20 J+	5.38 J+	--
Selenium	U	U	U	U	U	U	0.01
Silver	U	U	U	U	0.029	U	0.05
Sodium	***136 J***	***148***	***34.3***	***37.4***	***112 J+***	***110 J+***	20
Thallium	U	U	U	U	U	U	0.0005
Vanadium	0.005 J+	U	U	U	U	U	--
Zinc	0.024	0.020	0.023	U	0.118	U	2

Footnotes/Qualifiers:

mg/l: Milligrams per liter
--: No standard or guidance value
B: Detected in the initial calibration
J: Estimated value
J+: Estimated value bias high
U: Analyzed for but not detected
Exceeds Class GA Standard or Guidance Value

TABLE B-3
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
GROUNDWATER SAMPLES
TAL METALS

Sample ID	MW-GF-20 Total	MW-GF-20 Dissolved	MW-GF-20 Total	MW-GF-20 Dissolved	MW-GF-20 Total	MW-GF-20 Dissolved	NYSDEC Class GA Standard or Guidance Value
Sampling Date	12/12/2012	12/12/2012	3/27/2013	3/27/2013	6/27/2013	6/27/2013	
Dilution Factor	1	1	1	1	1	1	
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
METALS							
Aluminum	10.6	UB	NS	NS	1.67	UJ	--
Antimony	U	U	NS	NS	U	U	0.003
Arsenic	U	U	NS	NS	U	U	0.025
Barium	0.141	0.035	NS	NS	0.114	0.062	1
Beryllium	U	U	NS	NS	U	U	0.003
Cadmium	U	U	NS	NS	U	U	0.005
Calcium	30.2	27.2	NS	NS	52.0	49.9	--
Chromium	U	U	NS	NS	U	U	0.05
Cobalt	0.023	U	NS	NS	0.015	U	--
Copper	0.038	U	NS	NS	0.013	U	0.2
Iron	***26.8***	***0.590***	NS	NS	***5.46***	UJ	0.3
Lead	U	U	NS	NS	U	U	0.025
Magnesium	10.1	6.94	NS	NS	15.6	14.6	35
Manganese	***1.14***	0.038	NS	NS	***0.752***	U	0.3
Mercury	U	U	NS	NS	UJ	UJ	0.0007
Nickel	0.032	U	NS	NS	0.014	U	0.1
Potassium	5.15	3.41	NS	NS	4.65 J+	5.06 J+	--
Selenium	U	U	NS	NS	U	U	0.01
Silver	U	U	NS	NS	0.029	U	0.05
Sodium	***52.1 J***	***53.2***	NS	NS	***100 J+***	***110 J+***	20
Thallium	U	U	NS	NS	U	U	0.0005
Vanadium	0.032 J+	U	NS	NS	0.007	U	--
Zinc	0.198	0.020	NS	NS	0.077	U	2

Footnotes/Qualifiers:

mg/l: Milligrams per liter
NS: Not sampled
--: No standard or guidance value
B: Detected in the initial calibration
J: Estimated value
J+: Estimated value bias high
U: Analyzed for but not detected
Exceeds Class GA Standard or Guidance Value

TABLE B-3
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
GROUNDWATER SAMPLES
TAL METALS

Sample ID	MW-GF-26 Total	MW-GF-26 Dissolved	MW-GF-26 Total	MW-GF-26 Dissolved	MW-GF-26 Total	MW-GF-26 Dissolved	NYSDEC Class GA Standard or Guidance Value
Sampling Date	12/12/2012	12/12/2012	3/27/2013	3/27/2013	6/27/2013	6/27/2013	
Dilution Factor	1	1	1	1	1	1	
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
METALS							
Aluminum	UB	U	5.54	U	U	UJ	--
Antimony	U	U	U	U	U	U	0.003
Arsenic	U	U	U	U	U	U	0.025
Barium	0.129	0.115	0.191	0.126	0.111	0.087	1
Beryllium	U	U	U	U	U	U	0.003
Cadmium	U	U	U	U	U	U	0.005
Calcium	76.0	66.8	65.8	64.2	40.2	39.0	--
Chromium	U	U	***0.073***	U	U	U	0.05
Cobalt	U	U	0.016	U	U	U	--
Copper	0.004	U	0.022	U	U	0.006	0.2
Iron	***1.87***	0.105	***15.2***	0.068	***0.788***	UJ	0.3
Lead	U	U	U	U	U	U	0.025
Magnesium	31.5	27.6	28.4	27.0	17.4	17.0	35
Manganese	0.084	0.029	***0.850***	0.016	0.132	0.005	0.3
Mercury	U	U	U	U	UJ	UJ	0.0007
Nickel	U	U	0.066	U	U	U	0.1
Potassium	22.6	20.3 J	17.7	17.4	8.60 J+	9.75 J+	--
Selenium	U	U	U	U	U	U	0.01
Silver	U	U	U	U	U	U	0.05
Sodium	***114 J***	***104***	UJ	***97.8 J***	***55.0 J+***	***87.0 J+***	20
Thallium	U	U	U	U	U	U	0.0005
Vanadium	U	U	0.016	U	U	U	--
Zinc	0.036	0.033	0.032	U	0.028	U	2

Footnotes/Qualifiers:

mg/l: Milligrams per liter
--: No standard or guidance value
B: Detected in the initial calibration
J: Estimated value
J+: Estimated value bias high
U: Analyzed for but not detected
Exceeds Class GA Standard or Guidance Value

APPENDIX C

FIELD DOCUMENTATION

TABLE C-1
LONG ISLAND RAIL ROAD
MORRIS PARK YARD - FORMER PAINT STRIPPING BUILDING
RCRA INVESTIGATION
SUMMARY OF FIELD OBSERVATIONS

Soil Boring	Concrete Cracked? (Yes/No)	Concrete Thickness	Depth Below Concrete	Soil Characteristics	Sample Depth	Sample Location (Lat./Long.)
SS-01	Yes	4"	0-8"	Wooden railroad tie, no creosote odor	0-6" and 6-12"	40.69688543
			8-11"	Brown and black cinder, ash fill, no odor		-73.82549924
			11-19"	Moist, thick brown clay, no odor		
SS-02	Yes	7"	0-6"	Brown and black cinder, ash fill, no odor	0-6" and 1-1.5'	40.69691898
			6-12"	Thick brown clay, no odor		-73.8253771
			1-1.5'	Thick brown clay, no odor		
SS-03	No	11"	0-1"	Brown and black cinder, ash fill, no odor	0-6"	40.69695658
			1-6"	Thick brown clay, no odor		-73.82527915
SS-04	No	7"	0-2"	Brown and black cinder, ash fill, no odor	0-6" and 6-12"	40.69684317
			2"-12"	Thick brown clay, moist, no odor		-73.82542239
SS-05	No	5"	0-3"	Brown and black cinder, ash fill, no odor	0-6" and 6-12"	40.69688314
			3" - 3'	Thick brown clay, moist, no odor		-73.82530538
			3-4'	Brown clay with pebbles, drier/looser, no odor, refusal at 4'		
SS-06	Yes	7"	0-3"	Gravel, fill, heavy creosote/naphthalene odor	0-6", 6-12" and 2.5-3'	40.6967712
			3-6"	Brown clay, moist, with slight naphthalene odor		-73.82544186
			6-12"	Brown clay, with slight naphthalene odor		
			1-2.5'	Brown clay, with slight naphthalene odor		
			2.5'-3.5'	Brown clay, no odor, refusal at 3.5'		
SS-07	No	7"	0-3"	Brown and black cinder, ash fill, no odor	0-6" and 6-12"	40.6968084
			3-12"	Thick brown clay, no odor		-73.82531945
SS-08	Yes	7"	0-6"	Brown and black cinder, ash fill, no odor	0-6" and 6-12"	40.69680612
			6"-2'	Thick brown clay, no odor, refusal at 2'		-73.82525199

APPENDIX D

DATA VALIDATION CHECKLISTS

DATA VALIDATION CHECKLIST

Project Name:	LIRR-Morris Park RCRA Closure
Project Number:	3455-1A
Sample Date(s):	December 12, 2012
Sample Team:	Edward Domaradzki (Analytical Chemists)
Matrix/Number of Samples:	Water/ 6 Field Duplicates/ 0 Trip Blanks / 0 Field Blanks/ 0
Analyzing Laboratory:	Analytical Chemists, Farmingdale, NY
Analyses:	Metals: Total by SW846 Method 6010B and mercury by Method 7470A
Laboratory Report No:	1212088 Date:12/23/2013

ANALYTICAL DATA PACKAGE DOCUMENTATION GENERAL INFORMATION

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Sample results		X		X	
2. Parameters analyzed		X		X	
3. Method of analysis		X		X	
4. Sample collection date		X		X	
5. Laboratory sample received date		X		X	
6. Sample analysis date		X		X	
7. Copy of chain-of-custody form signed by Lab sample custodian		X		X	
8. Narrative summary of QA or sample problems provided		X		X	

QA - quality aMWurance

Comments:

The data package has been reviewed in accordance with the NYSDEC 6/05 ASP Quality Assurance/ Quality Control (QA/QC) requirements. A validation was conducted on the data package and any applicable qualification of the data was determined using the USEPA National Functional Guidelines of Inorganic Data Review, January 2010, method performance criteria, and Dvirka and Bartilucci Consulting Engineers, a Division of D&B Engineers and Architects, P.C. professional judgment. The qualification of data discussed within this data validation checklist did not impact the usability of the sample results.

Custody Numbers:1212088
SAMPLE AND ANALYSIS LIST

Sample ID	Lab ID	Sample Collection Date	Parent Sample	Analysis				
				VOC	SVOC	PCB	MET	MISC
MW-20-50	1212088-01	12/12/12					X	
MW-GF-26	1212088-02	12/12/12					X	
MW-GF-20	1212088-03	12/12/12					X	
MW-11-60	1212088-04	12/12/12					X	
MW-21S	1212088-05	12/12/12					X	
MW-28S	1212088-06	12/12/12					X	

INORGANIC ANALYSES
METALS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times		X		X	
2. Blanks					
A. Preparation and calibration blanks		X	X		
B. Field blanks					X
3. Initial calibration verification %R		X	X		
4. Continuing calibration verification %R		X		X	
5. CRDL standard %R					X
6. Interference check sample %R					X
7. Laboratory control sample %R		X		X	
8. Spike sample %R		X	X		
9. Post digestive spike sample %R					X
10. Duplicate %RPD		X		X	
11. Serial dilution check %D					X
12. Total verse dissolved results		X		X	
13. Field duplicates RPD					X

%R - percent recovery %D - percent difference RPD - relative percent difference

Comments:
Performance was acceptable, with the following exceptions:

Potassium (dissolved) in sample MW-GF-26 was analyzed at secondary dilutions due to initial analysis exceeding calibration range. However, this metal was not detected above the reporting limit in the samples at the secondary dilution. The original analysis was reported and was qualified as estimated (J) based on exceeding calibration range.

2A. Aluminum (total and dissolved) was detected in the initial calibration associated with all samples. Aluminum was qualified as non-detected (UB) for total samples MW-20-50, MW-GF-26, MW-11-60 and MW-21S; and dissolved samples MW-GF-20 and MW-28S.

3. The %Rs for arsenic and vanadium were above QC limits in the initial calibration. Only vanadium (total) was detected and qualified as estimated high (J+) in samples MW-GF-20 and MW-28S.

8. The %R was below QC limits in the spike for sodium (total). Sodium (total) was qualified as estimated (J/UJ) based on spike %R in all samples.

DATA VALIDATION AND QUALIFICATION SUMMARY **Laboratory Numbers:1212088**

Sample ID	Analyte(s)	Qualifier	Reason(s)
Metals			
MW-GF-26	Potassium (dissolved)	J	Analyzed at secondary dilutions due to initial analysis exceeding calibration range. However, this metal was not detected above the reporting limit.
MW-20-50, MW-GF-26, MW-11-60 and MW-21S	Aluminum (total)	UB	Detected in the initial calibration
MW-GF-20 and MW-28S	Aluminum (dissolved)		
MW-GF-20 and MW-28S	Vanadium (total)	J+	The %R was above QC limits in the initial calibration
All samples	Sodium (total)	J/UJ	The %R was below QC limits in the spike

VALIDATION PERFORMED BY & DATE:	Donna M. Brown 12/30/2013
VALIDATION PERFORMED BY SIGNATURE:	

DATA VALIDATION CHECKLIST

Project Name:	LIRR-Morris Park RCRA Closure
Project Number:	3455-1A
Sample Date(s):	March 27, 2013
Sample Team:	Edward Domaradzki (Analytical Chemists)
Matrix/Number of Samples:	Water/6 Field Duplicates/ 0 Trip Blanks / 0 Field Blanks/ 0
Analyzing Laboratory:	Analytical Chemists, Farmingdale, NY
Analyses:	Metals: Total by SW846 Method 6010B and mercury by Method 7470A
Laboratory Report No:	1303218 Date:12/23/2013

ANALYTICAL DATA PACKAGE DOCUMENTATION GENERAL INFORMATION

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Sample results		X		X	
2. Parameters analyzed		X		X	
3. Method of analysis		X		X	
4. Sample collection date		X		X	
5. Laboratory sample received date		X		X	
6. Sample analysis date		X		X	
7. Copy of chain-of-custody form signed by Lab sample custodian		X		X	
8. Narrative summary of QA or sample problems provided		X		X	

QA - quality aMWurance

Comments:

The data package has been reviewed in accordance with the NYSDEC 6/05 ASP Quality Assurance/ Quality Control (QA/QC) requirements. A validation was conducted on the data package and any applicable qualification of the data was determined using the USEPA National Functional Guidelines of Inorganic Data Review, January 2010, method performance criteria, and Dvirka and Bartilucci Consulting Engineers, a Division of D&B Engineers and Architects, P.C. professional judgment. The qualification of data discussed within this data validation checklist did not impact the usability of the sample results.

Custody Numbers:1303218
SAMPLE AND ANALYSIS LIST

Sample ID	Lab ID	Sample Collection Date	Parent Sample	Analysis				
				VOC	SVOC	PCB	MET	MISC
MW-8-60	1303218-01	3/27/13					X	
MW-20-50	1303218-02	3/27/13					X	
MW-GF-26	1303218-03	3/27/13					X	
MW-11-60	1303218-05	3/27/13					X	
MW-21S	1303218-06	3/27/13					X	
MW-28S	1303218-07	3/27/13					X	

INORGANIC ANALYSES
METALS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times		X		X	
2. Blanks					
A. Preparation and calibration blanks		X	X		
B. Field blanks					X
3. Initial calibration verification %R		X		X	
4. Continuing calibration verification %R		X		X	
5. CRDL standard %R					X
6. Interference check sample %R					X
7. Laboratory control sample %R		X		X	
8. Spike sample %R		X		X	
9. Post digestive spike sample %R					X
10. Duplicate %RPD		X		X	
11. Serial dilution check %D					X
12. Total verse dissolved results		X	X		
13. Field duplicates RPD					X

%R - percent recovery %D - percent difference RPD - relative percent difference

Comments:
Performance was acceptable, with the following exceptions:

2A. Aluminum (total and dissolved) was detected in the continuing calibration associated with all samples. Aluminum was qualified as non-detected (UB) for total sample MW-11-60; and dissolved sample MW-21S.

12. Sodium was detected in the dissolved result and not in the total sample for MW-GF-26. Sodium was qualified as estimated (J/UJ) in the total and dissolved sample for MW-GF-26.

DATA VALIDATION AND QUALIFICATION SUMMARY **Laboratory Numbers:1303218**

Sample ID	Analyte(s)	Qualifier	Reason(s)
Metals			
Total sample MW-11-60; and Dissolved sample MW-21S	Aluminum	UB	Detected in the continuing calibration
MW-GF-26	Total and dissolved sodium	J/UJ	Detected in the dissolved result and not in the total sample

VALIDATION PERFORMED BY & DATE:	Donna M. Brown 12/30/2013
VALIDATION PERFORMED BY SIGNATURE:	

DATA VALIDATION CHECKLIST

Project Name:	LIRR-Morris Park RCRA Closure
Project Number:	3455-1A
Sample Date(s):	May 2, 2013
Sample Team:	Albert Albano (LIRR)
Matrix/Number of Samples:	Soil/ 16 Field Duplicates/ 0 Trip Blanks / 0 Field Blanks/ 0
Analyzing Laboratory:	Analytical Chemists, Farmingdale, NY
Analyses:	Volatile Organic Compounds (VOCs): by SW846 8260C Metals: Total by SW846 Method 6010B and mercury by Method 7471
Laboratory Report No:	1305047 Date:12/23/2013

ANALYTICAL DATA PACKAGE DOCUMENTATION GENERAL INFORMATION

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Sample results		X		X	
2. Parameters analyzed		X		X	
3. Method of analysis		X		X	
4. Sample collection date		X		X	
5. Laboratory sample received date		X		X	
6. Sample analysis date		X		X	
7. Copy of chain-of-custody form signed by Lab sample custodian		X		X	
8. Narrative summary of QA or sample problems provided		X		X	

QA - quality assurance

Comments:

The data packages have been reviewed in accordance with the NYSDEC 6/05 ASP Quality Assurance/ Quality Control (QA/QC) requirements. A validation was conducted on the data package and any applicable qualification of the data was determined using the USEPA National Functional Guidelines of June 2008, or USEPA National Functional Guidelines of Inorganic Data Review, January 2010, method performance criteria, and Dvirka and Bartilucci Consulting Engineers, a Division of D&B Engineers and Architects, P.C. professional judgment. The qualification of data discussed within this data validation checklist did not impact the usability of the sample results.

Custody Numbers:1305047
SAMPLE AND ANALYSIS LIST

Sample ID	Lab ID	Sample Collection Date	Parent Sample	Analysis				
				VOC	SVOC	PCB	MET	MISC
SS-07(0-6”)	1305047-01	5/2/13					X	
SS-07(6-12”)	1305047-02	5/2/13					X	
SS-06(0-6”)	1305047-03	5/2/13		X			X	
SS-06(6-12”)	1305047-04	5/2/13		X			X	
SS-06(2.5-3’)	1305047-05	5/2/13		X			X	
SS-08(0-6”)	1305047-06	5/2/13					X	
SS-08(6-12”)	1305047-07	5/2/13					X	
SS-05(0-6”)	1305047-08	5/2/13					X	
SS-05(6-12”)	1305047-09	5/2/13					X	
SS-03(0-6”)	1305047-10	5/2/13					X	
SS-01(0-6”)	1305047-11	5/2/13					X	
SS-01(6-12”)	1305047-12	5/2/13					X	
SS-04(0-6”)	1305047-13	5/2/13					X	
SS-04(6-12”)	1305047-14	5/2/13					X	
SS-02(0-6”)	1305047-15	5/2/13					X	
SS-02(1-1.5’)	1305047-16	5/2/13					X	

ORGANIC ANALYSES
VOCS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times		X		X	
2. Blanks					
A. Method blanks		X	X		
B. Trip blanks					X
C. Field blanks					X
3. Matrix spike (MS) %R		X		X	
4. Matrix spike duplicate (MSD) %R		X		X	
5. MS/MSD precision (RPD)		X		X	
6. Laboratory control sample (LCS) %R		X		X	
7. Surrogate spike recoveries		X		X	
8. Instrument performance check		X		X	
9. Internal standard retention times and areas		X		X	
10. Initial calibration RRF's and %RSD's		X		X	
11. Continuing calibration RRF's and %D's		X	X		
12. Transcriptions – quant report vs. Form I		X		X	
13. Field duplicates RPD					X
14. Tentatively Identified Compounds (TICs)					X

VOCs - volatile organic compounds
%D - percent difference
RRF - relative response factor
%R - percent recovery
%RSD - percent relative standard deviation
RPD - relative percent difference

Comments:
Performance was acceptable, with the following exceptions:

2A. 1,2,3-Trichlorobenzene was detected in the method blank. 1,2,3-Trichlorobenzene was not detected in the associated samples; therefore qualification of the data was not required.

11. Chloroethane %D was above QC limits in the continuing calibration associated with all samples. Chloroethane was qualified as an estimated detection limit (UJ) in all samples.

INORGANIC ANALYSES
METALS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times		X		X	
2. Blanks					
A. Preparation and calibration blanks		X		X	
B. Field blanks					X
3. Initial calibration verification %R		X		X	
4. Continuing calibration verification %R		X	X		
5. CRDL standard %R					X
6. Interference check sample %R					X
7. Laboratory control sample %R		X		X	
8. Spike sample %R		X	X		
9. Post digestive spike sample %R					X
10. Duplicate %RPD		X	X		
11. Serial dilution check %D					X
12. Total verse dissolved results					X
13. Field duplicates RPD					X

%R - percent recovery %D - percent difference RPD - relative percent difference

Comments:
Performance was acceptable, with the following exceptions:

Potassium in samples SS-07(0-6") and SS-08(6-12") and magnesium in sample SS-06(6-12") were analyzed at secondary dilutions due to initial analysis exceeding calibration range. However, these metals were not detected above the reporting limit in the samples at the secondary dilution. The original analysis was reported and was qualified as estimated (J) based on exceeding calibration range.

4. The %R for mercury was below QC limits in the continuing calibration associated with samples: SS-06(2.5-3'), SS-08(0-6"), SS-08(6-12"), SS-05(0-6"), SS-05(6-12"), SS-03(0-6"), SS-01(0-6"), SS-01(6-12"), SS-04(0-6") and SS-04(6-12"). Mercury was qualified as estimated low (J-) based on calibration results in the above samples.

8. The %R was below QC limits in the spike for the following metals: antimony, arsenic, barium, chromium, copper, lead, selenium and zinc associated with all samples. The %R was above QC limits in the spike for potassium associated with all samples. The above metals were qualified as estimated (J/UJ) based on spike %R in all samples.

10. The duplicate RPD was above QC limits for arsenic, barium, chromium, copper and zinc associated with all samples. The above metals were qualified as estimated (J/UJ) based on duplicate RPD in all samples.

DATA VALIDATION AND QUALIFICATION SUMMARY

Laboratory Numbers:1305047

Sample ID	Analyte(s)	Qualifier	Reason(s)
VOCs			
All samples	Chloroethane	UJ	%D was above QC limits in the continuing calibration
Metals			
SS-07(0-6") and SS-08(6-12")	Potassium	J	Analyzed at secondary dilutions due to initial analysis exceeding calibration range. However, these metals were not detected above the reporting limit.
SS-06(6-12")	Magnesium		
SS-06(2.5-3'), SS-08(0-6"), SS-08(6-12"), SS-05(0-6"), SS-05(6-12"), SS-03(0-6"), SS-01(0-6"), SS-01(6-12"), SS-04(0-6") and SS-04(6-12")	Mercury	J-	The %R was below QC limits in the continuing calibration
All samples	Antimony, arsenic, barium, chromium, copper, lead, potassium, selenium and zinc	J/UJ	The %R was outside QC limits in the spike
All samples	Arsenic, barium, chromium, copper and zinc	J/UJ	The duplicate RPD was above QC limits

VALIDATION PERFORMED BY & DATE:	Donna M. Brown 12/30/2013
VALIDATION PERFORMED BY SIGNATURE:	

DATA VALIDATION CHECKLIST

Project Name:	LIRR-Morris Park RCRA Closure
Project Number:	3455-1A
Sample Date(s):	June 27, 2013
Sample Team:	Edward Domaradzki (Analytical Chemists)
Matrix/Number of Samples:	Water/ 7 Field Duplicates/ 0 Trip Blanks / 0 Field Blanks/ 0
Analyzing Laboratory:	Analytical Chemists, Farmingdale, NY
Analyses:	Metals: Total by SW846 Method 6010B and mercury by Method 7470A
Laboratory Report No:	1306242 Date:12/23/2013

ANALYTICAL DATA PACKAGE DOCUMENTATION GENERAL INFORMATION

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Sample results		X		X	
2. Parameters analyzed		X		X	
3. Method of analysis		X		X	
4. Sample collection date		X		X	
5. Laboratory sample received date		X		X	
6. Sample analysis date		X		X	
7. Copy of chain-of-custody form signed by Lab sample custodian		X		X	
8. Narrative summary of QA or sample problems provided		X		X	

QA - quality aMWurance

Comments:

The data package has been reviewed in accordance with the NYSDEC 6/05 ASP Quality Assurance/ Quality Control (QA/QC) requirements. A validation was conducted on the data package and any applicable qualification of the data was determined using the USEPA National Functional Guidelines of Inorganic Data Review, January 2010, method performance criteria, and Dvirka and Bartilucci Consulting Engineers, a Division of D&B Engineers and Architects, P.C. professional judgment. The qualification of data discussed within this data validation checklist did not impact the usability of the sample results.

Custody Numbers:1306242
SAMPLE AND ANALYSIS LIST

Sample ID	Lab ID	Sample Collection Date	Parent Sample	Analysis				
				VOC	SVOC	PCB	MET	MISC
MW-8-60	1306242-01	6/27/13					X	
MW-20-50	1306242-02	6/27/13					X	
MW-GF-26	1306242-03	6/27/13					X	
MW-GF-20	1306242-04	6/27/13					X	
MW-11-60	1306242-05	6/27/13					X	
MW-21S	1306242-06	6/27/13					X	
MW-28S	1306242-07	6/27/13					X	

INORGANIC ANALYSES
METALS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times		X		X	
2. Blanks					
A. Preparation and calibration blanks		X	X		
B. Field blanks					X
3. Initial calibration verification %R		X		X	
4. Continuing calibration verification %R		X	X		
5. CRDL standard %R					X
6. Interference check sample %R					X
7. Laboratory control sample %R		X		X	
8. Spike sample %R		X	X		
9. Post digestive spike sample %R					X
10. Duplicate %RPD		X	X		
11. Serial dilution check %D					X
12. Total verse dissolved results		X	X		
13. Field duplicates RPD					X

%R - percent recovery %D - percent difference RPD - relative percent difference

Comments:
Performance was acceptable, with the following exceptions:

2A. Iron, thallium and arsenic (total and dissolved) were detected in the continuing calibration associated with all samples. Dissolved iron was qualified as non-detected (UB) sample MW-8-60.

4. The %Rs for potassium and sodium were above QC limits in the continuing calibration. Potassium and sodium were detected and qualified as estimated high (J+) in all samples.

8. The %R was below QC limits in the spike for and total and dissolved mercury associated with all samples. The %R was above QC limits in the spike for dissolved aluminum and iron associated with all samples. Dissolved aluminum and iron were not detected in the associated samples; therefore, qualification of the data was not required. Total and dissolved mercury was qualified as an estimated detection limit (UJ) based on spike %R in all samples.

10. The duplicate RPD was above QC limits for dissolved aluminum and iron associated with all samples. The above metals were qualified as estimated (UJ) based on duplicate RPD in all samples.

12. Sodium was detected in the dissolved result at a much higher concentration than the total sample for MW-20-50 and MW-GF-26. Sodium was qualified as estimated (J/UJ) in the total and dissolved samples for MW-20-50 and MW-GF-26.

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

DATA VALIDATION AND QUALIFICATION SUMMARY

Laboratory Numbers:1306242

Sample ID	Analyte(s)	Qualifier	Reason(s)
Metals			
MW-8-60	Dissolved iron	UB	Detected in the continuing calibration
All samples	Potassium and sodium	J+	The %Rs were above QC limits in the continuing calibration
All samples	Total and dissolved mercury	UJ	The %R was below QC limits in the spike
All samples	Dissolved aluminum and iron	UJ	The duplicate RPD was above QC limits
MW-20-50 and MW-GF-26	Total and dissolved sodium	J/UJ	Detected in the dissolved result and not in the total sample

VALIDATION PERFORMED BY & DATE:	Donna M. Brown 12/30/2013
VALIDATION PERFORMED BY SIGNATURE: