REMEDIAL INVESTIGATION REPORT

OER Project Name: 300 Lafayette Street

298, 300, 302-308 Lafayette Street

New York, New York

(Block: 510, Lots: 38, 39, and 40)

DCP Project ID # P2013M0115 / CEQR # 77DCP091M

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August 29, 2013

SUBMITTAL INFORMATION

New York City Mayor'sOffice of Environmental Remediation:

Office of Environmental Remediation

100 Gold Street

New York, New York 10038

Location of Subject Property:

298, 300, 302-308 Lafayette Street

New York, New York

Block 510 and Tax Lots 38,39 and Lot 40

DCP Project ID # P2013M0115 / CEQR # 77DCP091M

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REMEDIAL INVESTIGATION REPORT

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
CPP	Citizen Participation Plan
CSM	Conceptual Site Model
DER-10	New York State Department of Environmental Conservation Technical Guide
FID	Flame Ionization Detector
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IRM	Interim Remedial Measure
NAPL	Non-aqueous Phase Liquid
NYC VCP	New York City Voluntary Cleanup Program
NYC DOHMH	New York City Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
NYS DOH	New York State Department of Health Environmental Laboratory Accreditation
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
QEP	Qualified Environmental Professional
RI	Remedial Investigation
RIR	Remedial Investigation Report

Acronym	Definition
SCO	Soil Cleanup Objective
SPEED	Searchable Property Environmental Electronic Database

CERTIFICATION

I, John A. Rhodes, P.E., am a Qualified Environmental Professional, as defined in RCNY § 43-1402(ar). I have primary direct responsibility for implementation of the Remedial Investigation for the 300 Lafayette Street Site. I am responsible for the content of this Remedial Investigation Report (RIR), have reviewed its contents and certify that this RIR is accurate to the best of my knowledge and contains all available environmental information and data regarding the property.

Qualified Environmental Professional:

John A. Rhodes, P.E.

Signature: _____

Date: 2/7/2014

EXECUTIVE SUMMARY

Paco Lafayette, LLC ("Paco") is proposing the development of a 0.3-acre Site located at 298, 300, 302-308 Lafayette Street, comprised of Lots 38, 39 and 40 of Block 510,(the "Site"), at the corner of East Houston Street and Lafayette Street, in the SoHo neighborhood of Manhattan, New York. The proposed development is subject to review under the City Environmental Quality Review (CEQR) due to the need for special permits pursuant to the Zoning Resolution from the City Planning Commission. Pursuant to CEQR, certain types of industrial, manufacturing, and commercial facilities (listed in "Hazardous Materials Appendix 1" of the CEQR Technical Manual) require assessment for hazardous materials. These facilities include: gasoline service stations (the current use on Lot 40); auto repair facilities (a past use on Lot 38 and Lot 39); and battery manufacturers (Lot 39 was once occupied by a battery company).

As recommended by the Phase I ESAs and in conformance with CEQR requirements, a Phase II Subsurface investigation work plan ("IWP") was prepared by Advanced Site Restoration, LLC ("ASR") and submitted to the New York City Department of Environmental Protection ("DEP") in February 2013. In a letter dated March 13, 2013 to Robert Dobruskin, Director of Environmental Assessment and Review Division of NYCDCP, DEP approved the Phase II IWP. Subsequently, the CEQR regulatory oversight was transferred from DEP to the Mayor's Office of Environmental Remediation ("OER"), in conjunction with the proposed "E" designation of Lots 38, 39 and 40 for potential hazardous materials contamination in order to accelerate the Project's Certification under ULURP. A revised Phase II work plan ("Revised IWP") was submitted to OERon April 4, 2013. OER approved the revised Phase II work plan on April 5, 2013. Subsequently, the relocation of a monitoring well was necessary and this modification was approved by OER on May 13, 2013.

An “E” designation will be placed on the Site requiring that Paco conduct testing and sampling to the satisfaction of OER. This Remedial Investigation Report is submitted to comply with this requirement and to request OER approval of the investigation and proposed remediation to allow future issuance of building permits. Building permits are not issued by the Department of Buildings on “E” designated sites without prior approval of the investigation and/or remediation pursuant to Section 11-15 of the NYC Zoning Resolution (Environmental Requirements).

This Remedial Investigation Report (RIR) presents the results of the implementation of the Revised IWP.

The Remedial Investigation Report (RIR) provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy pursuant to RCNY§ 43-1407(f). The remedial investigation (RI) described in this document is consistent with applicable guidance.

Site Location and Current Usage

The Site is identified by the New York City Tax Assessors office as Block 510, Lots 38, 39, and 40. The Site parcel totals approximately 0.3-acre in area, and is located at 298, 300, 302-308 Lafayette Street at the corner of East Houston Street and Lafayette Street, and between Crosby Streetand Lafayette Street in the SoHo neighborhood of Manhattan, New York.

Currently, Lot 40 is used as a gasoline service station and contains an underground storage tank field, dispensers, a canopy and a small convenience kiosk. Lots 38 and 39 contain single-story brick buildings; Lot 38 is currently a bar/restaurant and Lot 39 is currently being used as areal estate sales office.

Summary of Proposed Redevelopment Plan

Paco is proposing a new 7-story commercial development at 298 - 308 Lafayette Street (Block 510, Lots 38, 39, and 40) in the SoHo neighborhood of Manhattan. The proposed project would contain either approximately 21,600 gross square feet (gsf) or 32,600 gsf of retail uses and either 49,500 gsf or 38,500 gsf of office uses depending on whether the second floor is occupied by a retail or office use.

Summary of Past Uses of Site and Areas of Concern

Lot 38 (298 Lafayette a/k/a 133 Crosby Street) contains a one (1) story pub/restaurant. It was originally a five story brick factory, with the present building dating to about the 1930s.

Lot 39 (300 Lafayette a/k/a 135 Crosby Street) contains a one (1) story building. It was originally a six (6) story brick factory which had its upper stories removed between 1934 and 1948.

Lot 40 (302-308 Lafayette a/k/a 21 E. Houston Street) contained a seven (7) story building in the late 19th century, which was demolished during the subway construction beneath Houston Street. A gas station has been present at this location since at least the 1930s.

The AOCs identified for this Site include:

1. Petroleum contamination from the retail gasoline service station on Lot 40.
2. The uppermost stratum (first 15 to 20 feet) is made up of fill materials including brick, gravel, traces of concrete and wood, sand and some fine to course sand and silt

3. Historically Lots 38 and 39 have been used for various commercial businesses, including auto repair companies on Lots 38 and 39 and a battery company on Lot 38.

Summary of the Work Performed under the Remedial Investigation

Paco performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed five (5) soil borings, collected ten (10) soil samples for chemical analysis,and to evaluate soil quality;
3. Installed one (1) groundwater monitoring well, adding to the two (2) existing wells installed in 2006, and collected a groundwater sample from each of the three (3) monitoring wells for chemical analysis to evaluate groundwater quality and flow;
4. Installed three (3) soil vapor probes and collected three (3) samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property is approximately 40 feet above mean sea level (MSL).
2. Depth to groundwater is approximately 40 to 42 feet below ground surface at the Site.
3. Groundwater flow is generally from the northwest to the southeast beneath the Site.
4. Depth to bedrock is approximately 70 to 80 feet below ground surface at the Site.

5. The stratigraphy of the Site, from the surface down, consists of 15 to 20 feet of a sandy fill underlain by another 50 feet of a brown fine to course sand with trace to some silt and gravel.

6. Soil/fill samples collected during the RI showed volatile organic compounds (VOCs), SVOCs, polychlorinated biphenyls (PCBs) or pesticides were not detected above Unrestricted Use Track 1 or Track 2 Commercial Soil Clean-up Objectives (SCOs). Several metals including arsenic (max. of 21.5 ppm), copper (max. of 305 ppm), chromium (max. of 32.3 ppm), lead (max. of 1650 ppm), magnesium (max. of 7,140 ppm), mercury (max. of 20.3 ppm) and zinc (max. of 3,140 ppm) exceeded Unrestricted Use SCOs. Of these metals arsenic, copper, lead and mercury also exceeded their respective Track 2 Commercial SCO.

7. Groundwater samples collected during the RI showed no VOCs or SVOCs exceeded their respective 6NYCRR Part 375 Class GA Groundwater Quality Standards (GQS). Only one pesticide, chlordane at a concentration of 0.071 μg/L, exceeded its standard of 0.050 μg/L. One PCB, Aroclor 1254 at 0.43 μg/L, exceeded its standard of 0.09 μg/L. Dissolved metals including aluminum, iron, manganese and sodium exceeded their respective GQS. None of the four metals detected above the Track 2 Restricted Commercial SCOs in soil exceeded the Class GA Groundwater standards in the tests for dissolved metals.

8. Soil vapor samples collected during the RI showed low to moderate concentrations of VOCs typical of gasoline service station operations in soil vapor samples as would be expected in the vicinity of an operating gasoline service station. Highest concentrations of petroleum-related VOCs included benzene (maximum of 200 $\mu g/m^3$), ethanol (maximum of 260 $\mu g/m^3$), ethylbenzene (maximum of 195 $\mu g/m^3$),

xylene (maximum of 699 $\mu g/m^3$) and toluene (maximum of 2,390 $\mu g/m^3$). These compounds were not detected in soil and groundwater. Chlorinated compounds were detected at low concentrations. Tetrachloroethylene (PCE) was identified in all three soil vapor samples at a maximum concentration of 14 $\mu g/m^3$. Trichloroethylene (TCE) was identified in all three soil vapor samples at a maximum concentration of 6.8 $\mu g/m^3$. Carbon tetrachloride was detected at a maximum concentration of 0.5 $\mu g/m^3$. TCA was not detected in soil vapor. The TCE concentrations are above the monitoring level ranges established within the State DOH soil vapor guidance matrix.

1.0 SITE BACKGROUND

Paco Lafayette, LLC ("Paco") is proposing the development of a 0.3-acre Site located at 298, 300, 302-308 Lafayette Street, comprised of Lots 38, 39 and 40 of Block 510,(the "Site"), at the corner of East Houston Street and Lafayette Street, in the SoHo neighborhood of Manhattan, New York. The proposed development is subject to review under the City Environmental Quality Review (CEQR) due to the need for special permits pursuant to the Zoning Resolution from the City Planning Commission.Pursuant to CEQR, certain types of industrial, manufacturing, and commercial facilities (listed in "Hazardous Materials Appendix 1" of the CEQR Technical Manual) require assessment for hazardous materials. These facilities include: gasoline service stations (the current use on Lot 40); auto repair facilities (a past use on Lot 38 and Lot 39); and battery manufacturers (Lot 39 was once occupied by a battery company).

As recommended by the Phase I ESAs and in conformance with the requirements of the Department of City Planning for the proposed development, a Phase II Subsurface investigation work plan ("IWP") was prepared by Advanced Site Restoration, LLC ("ASR") and submitted to the New York City Department of Environmental Protection ("DEP") in February 2013. In a letter dated March 13, 2013 to Robert Dobruskin, Director of Environmental Assessment and Review Division of NYCDCP, DEP approved the Phase II IWP. Subsequently, the CEQR regulatory oversight was transferred from DEP to OER, in conjunction with the proposed "E" designation of Lots 38, 39 and 40 for potential hazardous materials contamination in order to accelerate the Project's Certification under ULURP. A revised Phase II work plan ("Revised IWP") was submitted to OERon April 4, 2013. OER approved the revised Phase II work plan on April 5, 2013. Subsequently, the relocation of a monitoring well was necessary and this modification was approved by OER on May 13, 2013.

An “E” designation will be placed on the Site requiring thatPaco conduct testing and sampling to the satisfaction of OER. This Remedial Investigation Report is submitted to comply with this requirement and to request OER approval of the investigation to allow future issuance of building permits. Building permits are not issued by the Department of Buildings on “E” designated sites without prior approval of the investigation and/or remediation pursuant to Section 11-15 of the NYC Zoning Resolution (Environmental Requirements).

In accordance with the Revised IWP as approved by the OER, Paco has investigated a 0.3-acre Site located at 298, 300, 302-308 Lafayette Street at the corner of East Houston Street and Lafayette Street, in the SoHo neighborhood of Manhattan, New York. A commercial development is proposed for the property.

The RI work was performed between May 14 and June 29, 2013. This RIR summarizes the nature and extent of contamination and provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy that is protective of human health and the environment consistent with the use of the property pursuant to RCNY§ 43-1407(f).

1.1 Site Location and Current Usage

The Site is located at 298, 300, 302-308 Lafayette Street at the corner of East Houston Street and Lafayette Street, New York and is identified as Block 510 and Lots 38, 39 and 40 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 13,000-square feet and is bounded by Crosby Street to the west, E. Houston St. to the north and Lafayette Street to the east. A map of the Site boundary is shown in Figure 2. Currently, Lot 40 is used as a gasoline service station and contains underground storage tanks, dispensers, a canopy and a small

convenience kiosk. Lots 38 and 39 contain single-story brick buildings; Lot 38 is currently a bar and restaurant and Lot 39 is currently being used as a real estate sales office.

1.2 Proposed Redevelopment Plan

The proposed future use of the Site will consist of a commercial development. Layout of the proposed Site development is presented in Figure 3. The current zoning designation is M1-5B. The project Site is located in Manhattan Community District 2, within the SoHo-Cast Iron Historic District Extension and an M1-5B zoning district. The proposed use is consistent with existing zoning for the property. To facilitate the proposed project, two special permits are required, under Zoning Resolution (ZR) Sections 74-712 and 74-922.

The proposed project consists of a new 7-story commercial development at 298 - 308 Lafayette Street (Block 510, Lots 38, 39, and 40) in the SoHo neighborhood of Manhattan. (See architect's rendering above.) The proposed project would contain approximately 21,600 gross square feet (gsf) or 32,600 gsf of retail uses and either 49,500 gsf or 38,500 gsf of office uses depending on whether the second floor is occupied by a retail or office use.

The proposed development and construction will require a full excavation of the proposed building footprint of approximately thirty (30) feet bgs to accommodate two (2) cellar levels. It is anticipated that this excavation activity will remove any residual soil contamination encountered.

1.3 Description of Surrounding Property

The Site is bounded by East Houston Street to the north, Lafayette Street to the east, Crosby Street to the west, and by a residential apartment building to the south. New York City subway tunnels run down East Houston Street to the north of the Site and Lafayette Street to the east of the Site. Figure 2shows the surrounding land usage.

2.0 SITE HISTORY

2.1 Past Uses and Ownership

Lot 38 (298 Lafayette a/k/a 133 Crosby Street) contains a one (1) story pub/restaurant. It was originally a five story brick factory, with the present building dating to about the 1930s.

Lot 39 (300 Lafayette a/k/a 135 Crosby Street) contains a one (1) story building. It was originally a six (6) story brick factory which had its upper stories removed between 1934 and 1948.

Lot 40 (302-308 Lafayette a/k/a 21 E. Houston Street) contained a seven (7) story building in the late 19th century, which was demolished during the subway construction beneath Houston Street. A gas station has been present at this location since at least the 1930s.

Paco is the current owner of lots 39 and 40 (300 - 308 Lafayette), and the air rights of lot 38 (298 Lafayette), and is under contract to acquire remaining interests and rights in lot 38 (298 Lafayette) which it does not yet own.

2.2 Previous Investigations

Previous investigations included the following:

A geotechnical investigation with report dated December 27, 2001 was performed by Whitestone Associates, Inc. This investigation consisted of three (3) soil borings extending to depths of 20 to 30 feet. In general, for the first 15 to 20 feet these three soil borings encountered man-made fill materials, and medium compact natural sand underneath. None of the three (3) soil borings encountered groundwater or bedrock.

In 2002, a Phase II investigation conducted by Delta on behalf of BP revealed the presence of petroleum contamination reported to NYSDEC under Spill Case No. 02-30042. The reported spill was fully investigated and remediated to the satisfaction of NYSDEC resulting in the issuance of an NFA letter dated March 28, 2006.

Three (3) groundwater monitoring wells were installed in 2006 by Paco. Two (2) of these wells, (EMW-1 and EMW-3) were used in the Revised IWP. Boring logs with well construction details for all three (3) groundwater monitoring wells are provided in Appendix A - Soil Boring Geologic Logs.

A Geotechnical Investigation (2/1/2011) for the Site was performed by Mueser Rutledge Consulting Engineers. Mueser Rutledge installed six (6) geotechnical borings. The soil information from the geotechnical report and our most recent investigation is illustrated in Figures 5 and 6. The geotechnical investigation report is provided in Appendix E - Geotechnical Report. In general, groundwater was encountered approximately 40 to 42 feet below grade at an elevation of approximately zero (0.0) Mean Sea Level (MSL). Construction considerations were provided in the geotechnical report for the proposed development and for protection of the New York City Transit structures adjacent to the Site.

Three (3) Phase I Environmental Site Assessments were performed for Paco by JC Broderick and Associates Inc., covering the three (3) lots, Lot 38, Lot 39 and Lot 40:

1. **Lot 38** - Phase I Environmental Site Assessment (Lot 38) prepared by J.C. Broderick & Associates dated July 2012.
    i. REC 1: Historically the property has been utilized for various commercial businesses including an Auto Repair Shop
2. **Lot 39** -Phase I Environmental Site Assessment (Lot 39) prepared by J.C. Broderick & Associates dated July 2012.
    i. REC 1: Potential contamination due to chemicals and metal cleaning agents from a mechanic shop
    ii. REC 2: Once occupied by a battery company
    iii. REC 3: The adjoining gasoline service station

3. **Lot 40** - Phase I Environmental Site Assessment (Lot 40) prepared by J.C. Broderick & Associates dated July 2012.
    i. REC 1: Currently the site is an active BP Gas Station.

The Phase I reports are provided in electronic form as Appendix F - Phase I Reports.

2.3 Site Inspection

Several site inspections have been conducted at the Site. Prior to drilling for the purposes of the Revised IWP, the Site was inspected by ASR, CEUS Engineering and the NYCT personnel for the proposed boring locations. As a result of these inspections and with the approval of the OER, one proposed boring, B-1, was moved to a safer location.

2.4 Areas of Concern

The AOCs identified for this Site include:

1. Petroleum contamination from the retail gasoline service station on Lot 40.
2. The uppermost stratum (up to 20 feet) is made up of fill materials including brick, gravel, traces of concrete and wood, sand and some fine to course sand and silt
3. Historically Lots 38 and 39 have been used for various commercial businesses, including auto repair on Lots 38 and 39 and a battery company on Lot 38.

A map showing areas of concern is presented in Figure 1.

3.0 PROJECT MANAGEMENT

3.1 Project Organization

The Qualified Environmental Profession (QEP) responsible for preparation of this RIR is John A. Rhodes, P.E, CEUS Engineering, P.C.

Site work was managed by Richard Levato, Advanced Site Restoration, LLC. Geotechnical and environmental borings were done by geotechnical engineers at Meuser Rutledge, and Steven Mueller, P.G., J.C.Broderick & Associates.

3.2 Health and Safety

All work described in this RIR was performed in full compliance with applicable laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements.

3.3 Materials Management

All material encountered during the RI was managed in accordance with applicable laws and regulations.

4.0 REMEDIAL INVESTIGATION ACTIVITIES

Paco performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed five (5) soil borings, and collected ten (10) soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed one (1) groundwater monitoring well, adding to the two (2) existing wells installed in 2006, all of which were located throughout the Site to establish groundwater flow; and collected three (3) groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed three (3) soil vapor probes around Site perimeter and collected three (3) samples for chemical analysis.

4.1 Geophysical Investigation

No geophysical investigation was performed for this project.

4.2 Borings and Monitoring Wells

Drilling and Soil Logging

Boring logs prepared by geologists and geotechnical engineers are attached in Appendix A - Soil Boring Geologic Logs. A map showing the location of soil borings and monitor wells is shown in Figure 4 - Boring Location Map. Figures 5 and 6 are geologic cross-sections showing our interpretation of the subsurface materials.

In general, the uppermost stratums are defined as follows: From the description in the Mueser Rutledge Geotechnical Report, the first general stratum is comprised of "miscellaneous fill that typically consists of a loose to medium compact round fine to course sand, trace to some silt, gravel, brick, trace concrete, wood, ranging from gray gravel, some fine to course sand, brick, trace silt and wood."

The second general stratum is comprised of "loose to medium compact Brown fine to course sand, trace to some silt, trace to some gravel, with a trace of mica". It is typically 50 feet thick and present from approximately elevation +25 to elevation -25.

Groundwater Monitoring Well Construction

The two (2) groundwater monitoring wells installed in 2006, EMW-1 and EMW-3, were installed with 20 foot screens from elevations 10 to -10 feet msl. The recently installed well, B-1, was installed with a 25 foot screen from elevation 10 to -15 feet msl.

Monitor well locations are shown in Figure 4. Well construction details are provided in Table 1 and on the boring logs in Appendix A.

Table 1 Construction Details for Soil Borings and Monitoring Wells

Type	Identification Number	Date of Construction	Total Depth (ft)	Diameter (inches)	Ground Surface Elevation (ft MSL)	Screened Interval (ftbg)	Materials of Construction
Soil & Vapor	B-2	6/21/2013	30	1	40	27.5 to 30	Temp PVC
Soil & Vapor	B-3	6/21/2013	30	1	41	27.5 to 30	Temp PVC
Soil Boring	SB-1	4/2/2013	5		32		
Soil & Vapor	SB-2	4/2/2013	5	0.25	32	3 to 5	Temp PVC
Monitoring Well	B-1	5/14/2013	50	2	40.7	35 to 50	PVC
Monitoring Well	EMW-1	1/17/2006	50	2	40.7	30 to 50	PVC
Monitoring Well	EMW-3	1/17/2006	50	2	40.3	30 to 50	PVC

Type	Identification Number	Date of Construction	Total Depth (ft)	Diameter (inches)	Ground Surface Elevation (ft MSL)	Screened Interval (ftbg)	Materials of Construction
Geotechnical Boring	MR-1	1/10/2011	119.6		39.6		
Geotechnical Boring	MR-2P	1/3/2011	120.0	4	40.3	40 to 50	PVC
Geotechnical Boring	MR-3	12/29/2010	125.0		40.7		
Geotechnical Boring	MR-4P	12/29/2010	123.4	4	40.7	38 to 51	PVC
Geotechnical Boring	MR-4A	1/11/2011	132.6		40.3		
Geotechnical Boring	MR-5	1/7/2011	131.7		40.7		

Soil Vapor Probe Construction

Three (3) soil vapor probes were installed and sampled in conjunction with the soil borings. The soil vapor probe on lot 39 (SB-1) was constructed in a ¾ inch electric hand auger bore hole. Polyethylene tubing (1/4 inch) was extended to a depth of five feet, sealed at the basement grade to prevent surface air infiltration, and then connected to air pumping and sampling equipment. The remaining two soil vapor probes were constructed on lot 40. In the soil vapor probe B-3 a one (1) inch polyethylene tube with one foot slotted section at the bottom was inserted to a depth of 30 feet. Tubing diameter 3/8 inch was inserted to the depth of the slotted section. Grit (#1 size) was placed around and within the one inch pipe from screen section to grade. The pipe and tube were sealed at grade, and tube connected to air pumping and sampling equipment. Several borings attempted near the location of and including boring B-2 met refusal at 16 feet; and therefore, with OER's concurrence, the vapor probe was constructed at a depth of 16 feet. Construction was the same as for B-3 except for the depth difference. Vapor probe construction procedures were in accordance with NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York.*

Survey

As-drilled boring locations for the Mueser Rutledge geotechnical investigation were provided by Mega Engineering Inc. of Hackensack New Jersey. The locations of newly installed borings and monitoring well B-1 (ASR-1) were measured by Advanced Site Restoration (ASR).

Water elevations were measured by ASR using an interface probe. Groundwater was confirmed to be approximately 40 to 42 feet below ground surface at an elevation slightly below zero MSL at the time of measurement.

Water level data are included in Table 2.

Table 2 Groundwater Level Data

Location	Date	Casing Elevation (msl)	DTW (ft)	Water Elevation (msl)
EWM 3	7/29/2013	39.78	40.77	-0.99
ASR 1/B-1	7/29/2013	40.58	41.38	-0.80
EWM 1	7/29/2013	40.58	41.43	-0.85

4.3 Sample Collection and Chemical Analysis

Sampling performed as part of the field investigation was conducted for all Areas of Concern and also considered other means for bias of sampling based on professional judgment, area history, discolored soil, stressed vegetation, drainage patterns, field instrument measurements, odor, or other field indicators. All media, including soil, groundwater and soil vapor, have been sampled and evaluated in the RIR. Discrete (grab) samples have been used for final delineation of the nature and extent of contamination and to determine the impact of contaminants on public health and the environment. The sampling performed and presented in this RIR provides sufficient basis for evaluation of remedial action alternatives, establishment of a qualitative human health exposure assessment, and selection of a final remedy.

Soil Sampling

Ten (10) soil samples were collected for chemical analyses during this RI. Data on soil sample collection for chemical analyses, including dates of collection and sample depths, is reported in Table 4. Figure 4 shows the location of samples collected in this investigation and Figure 8 illustrates the locations of soil chemistry testing results. Laboratories soil analytical data are in Appendices B.

Continuous macro-core soil samples were obtained from each boring and screened in the field using field instrumentation, a MiniRAE 3000 10.6 120V - Pro photoionization detector (PID). Exterior soil borings were done using a track mounted auger (7720 DT Geo-probe). Basement borings SB-1 and SB-2 were advanced by the use of an electric hand auger (BOSCH) to a depth of approximately five feet due to space and access limitations.

Groundwater Sampling

Three (3) groundwater samples were collected for chemical analysis during this RI. See Table 3. Groundwater sample collection dataand analytical results (including filtered and non-filtered samples) are reported in Table5. Figure 4 shows the location of the three (3) groundwater monitoring wells from which samples were obtained. Figure 9 illustrates the locations of the groundwater chemistry testing results. Laboratories analytical results for the groundwater are in Appendix C.

All groundwater monitoring wells were purged by removing three well volumes prior to sampling. Groundwater samples were collected using a peristaltic pump with new tubing and a dedicated, laboratory cleaned baler for each application.

Soil Vapor Sampling

Three (3) soil vapor probes were installed and three (3) soil vapor samples were collected for chemical analysis during this RI (see Table 3).

Sampling procedures were in accordance with NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October, 2006.* The soil vapor probes were purged using a Genilli vapor pump connected to the 3/8 inch vapor probe tubing to remove one to three probe volumes. The purging flow rate was 0.2 liters per minute. Thereafter, vapor samples were collected using a summa canister with a 2 hour regulator.

Soil vapor sampling locations are shown in Figure 4. Figure 10 illustrates the soil vapor chemistry results. Soil vapor sample collection data are reported in Table 6. Soil vapor laboratory analytical results are located in Appendices D.

Chemical Analysis

Chemical analytical work presented in this RIR has been performed in the following manner:

Table 3 Analytical Methods Summary for All Media

Media	Number of Samples	Chemical Analytical Method
Soil	10	• TAL Metals by EPA Method 6010C (rev. 2007); • VOCs by EPA Method 8260C (rev. 2006); • SVOCs by EPA Method 8270D (rev. 2007); • Pesticides by EPA Method 8081B (rev. 2000); • PCBs by EPA Method 8082A (rev. 2000);
Groundwater	3	• TAL Metals by EPA Method 6010C (rev. 2007); • VOCs by EPA Method 8260C (rev. 2006); • SVOCs by EPA Method 8270D (rev. 2007); • Pesticides by EPA Method 8081B (rev. 2000);

		• PCBs by EPA Method 8082A (rev. 2000);
Soil Vapor	3	VOCs by EPA Method TO-15 VOC parameters

The chemical analytical quality assurance is directed by Richard Levato. Chemical analytical laboratory, Phoenix Environmental Laboratories, Inc., used in the RI is NYS ELAP certified. See Appendix B (Soil); C (Groundwater); D (Soil Vapor), for the Laboratory Quality Assurance/Quality Control.

Results of Chemical Analyses

Laboratory data for soil, groundwater and soil vapor are summarized in Tables 4, 5 and 6, respectively. Laboratory data deliverables for all samples evaluated in this RIR are provided in digital form in Appendices B, C and D.

5.0 ENVIRONMENTAL EVALUATION

5.1 Geological and Hydrogeological Conditions

Stratigraphy

Figures 5 and 6 are geologic cross-sections showing our interpretation of the subsurface materials. In general, the first 15 to 20 feet are comprised of miscellaneous fill that typically consists of sands with some silt, gravel, brick, concrete, and wood. Thereafter, native soils are reached, which are comprised predominantly of fine to course brown sand extending another 50 feet in depth.

Hydrogeology

A table of water level data for all monitor wells is included in Table 2. The average depth to groundwater is 41 feet and the range in depth is 40.77 to 41.43 feet. A map of groundwater level elevations with an inferred flow line is shown in Figure 7. Groundwater flow is from the northwest to the southeast.

5.2 Soil Chemistry

Data collected during the RI is sufficient to delineate the vertical and horizontal distribution of contaminants in soil/fill at the Site.A summary table of data for chemical analyses performed on soil samples is included in Table 4. Figure 8 shows the location and posts the values for soil/fill that exceed the 6NYCRR Part 375-6.8Track 1 Unrestricted Use, Track 2 Restricted Residential and Track 2 Commercial Soil Cleanup Objectives (SCO).

Soil contaminant concentrations were consistent with typical urban fill. No volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs) or pesticides were detected in any soil

samples. Detections of semi-volatile organic compounds (SVOCs) were limited to seven (7) compounds in two (2) soil boring locations, with none of the detected compounds exceeding their respective Unrestricted Use Track 1 or Track 2 SCO. Several metals including arsenic (max. of 21.5 ppm), copper (max. of 305 ppm), chromium (max. of 32.3 ppm), lead (max. of 1650 ppm), magnesium (max. of 7,140 ppm), mercury (max. of 20.3 ppm) and zinc (max. of 3,140 ppm) exceeded Unrestricted Use SCOs. Of these metals arsenic, copper, lead and mercury also exceeded their respective Track 2 Commercial SCO. These elevated concentrations did not extend to adjacent samples.

Arsenic exceeded its Commercial SCO of 16.0 mg/kg with a concentration of 20.9 mg/kg in the sample obtained at a depth of 15 feet from boring B-2. However, arsenic at 5 feet in B-2 was at a concentration of 0.8 mg/kg. Arsenic also exceeded its Commercial SCO with a concentration of 21.5 mg/kg in sample SB1 in the basement boring. The other basement boring soil sample (SB2) contained arsenic at 1.4 mg/kg. Other than these two occurrences, no soil samples contained arsenic above the Track 1 Unrestricted Use SCO.

The mercury concentration of 20.3 mg/kg in SB1 and 5.5 mg/kg in SB2 exceeded its Commercial SCO of 2.8 mg/kg. Mercury was below its Commercial SCO in all other soil samples. Both copper and lead slightly exceeded their respective Commercial SCO in soil sample SB1, but were within both Track 1 and Track 2 SCO objectives in SB2.

The soil contaminant concentrations are consistent with typical urban fills; no discharges in the areas of concern are indicated. Further, although some metals may be present in soils beneath the building on Lot 39, significant levels are not indicated and soils should be easily managed as urban fills during excavation for building construction.

5.3 Groundwater Chemistry

Data collected during the RI is sufficient to delineate the distribution of contaminants in groundwater at the Site. A summary table of data for chemical analyses performed on groundwater samples is included in Table 5. Figure 9 shows the location and posts the values for groundwater that exceed the New York State 6NYCRR Part 703.5 Class GA groundwater standards (GQS).

No VOCs or SVOCs exceeded their respective Class GA Groundwater standard. Only one (1) pesticide, chlordane at a concentration of 0.071 µg/L, exceeded its standard of 0.050 µg/L. One (1) PCB, Arochlor 1254 at 0.43 µg/L, exceeded its standard of 0.09 µg/L.

For the four (4) metals detected above the SCO in soil, none of them exceeded the Class GA Groundwater standards in the tests of dissolved metals. Arsenic, copper and lead exceeded the groundwater standards in the unfiltered samples only. Dissolved metals including aluminum, iron, manganese and sodium exceeded their respective GQS.

These results tell us that the limited soil contamination has not made a significant impact on groundwater. Further, that the gasoline service station and former industrial operations appear to have had limited impact on subsurface soil or groundwater conditions.

5.4 Soil Vapor Chemistry

Data collected during the RI is sufficient to delineate the distribution of contaminants in soil vapor at the Site. A summary table of data for chemical analyses performed on soil vapor samples is included in Table 6.

Figure 10 shows the location and posts the values for soil vapor samples with detected concentrations.

VOCs typical of gasoline service station operations were detected in soil vapor samples as would be expected in the vicinity of an operating gasoline service station. Highest concentrations of petroleum-related VOCs included benzene (maximum of 200 $\mu g/m^3$), ethanol (maximum of 260 $\mu g/m^3$), ethylbenzene (maximum of 195 $\mu g/m^3$), xylene (maximum of 699 $\mu g/m^3$) and toluene (maximum of 2,390 $\mu g/m^3$). Acetone was also detected at a maximum of 976 $\mu g/m^3$. These compounds were not detected in soil and groundwater. Once the gasoline service station is closed and all facilities removed, these related soil vapors will be eliminated.

There are also low levels of chlorinated compounds in the soil vapor testing results. Tetrachloroethylene (PCE) was identified in all three soil vapor samples at a maximum concentration of 14 $\mu g/m^3$. Trichloroethylene (TCE) was identified in all three soil vapor samples at a maximum concentration of 6.8 $\mu g/m^3$. Carbon tetrachloride was detected at a maximum concentration of 0.5 $\mu g/m^3$. TCA was not detected in soil vapor. Again, these compounds are absentin soil and groundwater.Groundwater migration from off-Site is not indicated to be a source of these compounds. A soil source of these compounds is not indicated. Further, the concentrations of these chlorinated compounds are low: with the exception of TCE, the concentrations are within the “No Further Action” category of the Soil Vapor/Indoor Air Matrices contained in the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (for low indoor air concentrations).The TCE concentrations are marginally above the monitoring level ranges established within the State DOH soil vapor guidance matrix (5.0$\mu g/m^3$).Therefore, there is no indication that these compounds will pose a threat to the planned development, and are likely to be eliminated altogether after closure of the gasoline service station and the excavation for the new development.

5.5 Prior Activity

Based on an evaluation of the data and information from the RIR, no hazardous waste wasdisposed at this Site.

5.6 Impediments to Remedial Action

There are no known impediments to remedial action at this property other than the site's proximity to New York City Transit Authority (NYCTA) subway improvements below the surface, which may require the review and approval of the NYCTA for certain excavation, remediation and construction activity to the extent applicable.

6.0 Conclusion and Recommendations

Current environmental conditions are consistent with the planned commercial use of the property. We recommend that the gasoline service station facilities be properly closed and decommissioned, all UST's be removed including all associated piping, dispensers and fill-ports in accordance with the NYSDEC regulations and applicable regulations of the Fire Department of the City of New York. Any contaminated soil/fill with stains, odors and/or impacted with petroleum that is encountered during decommissioning of the service station should be managed and disposed of in accordance with the applicable NYSDEC regulations prior to the start of redevelopment.

The proposed development and construction will require a full excavation of the proposed building footprint of approximately thirty (30) feet bgs to accommodate two (2) cellar levels. We recommend that the native soil or the second stratum that is comprised of loose to medium compacted brown fine to course sand with some trace of silt, gravel, mica be reused in accordance with the OER soil reuse and banking program. Additionally, soil/fill materials in the

upper 15 to 20 feet below ground surface may be reusable in some instances; otherwise they should be excavated and transported to an approved waste disposal, recycling or reuse facility in accordance with NYSDEC regulations. All soils leaving or entering the Site will require a testing and sampling protocol.

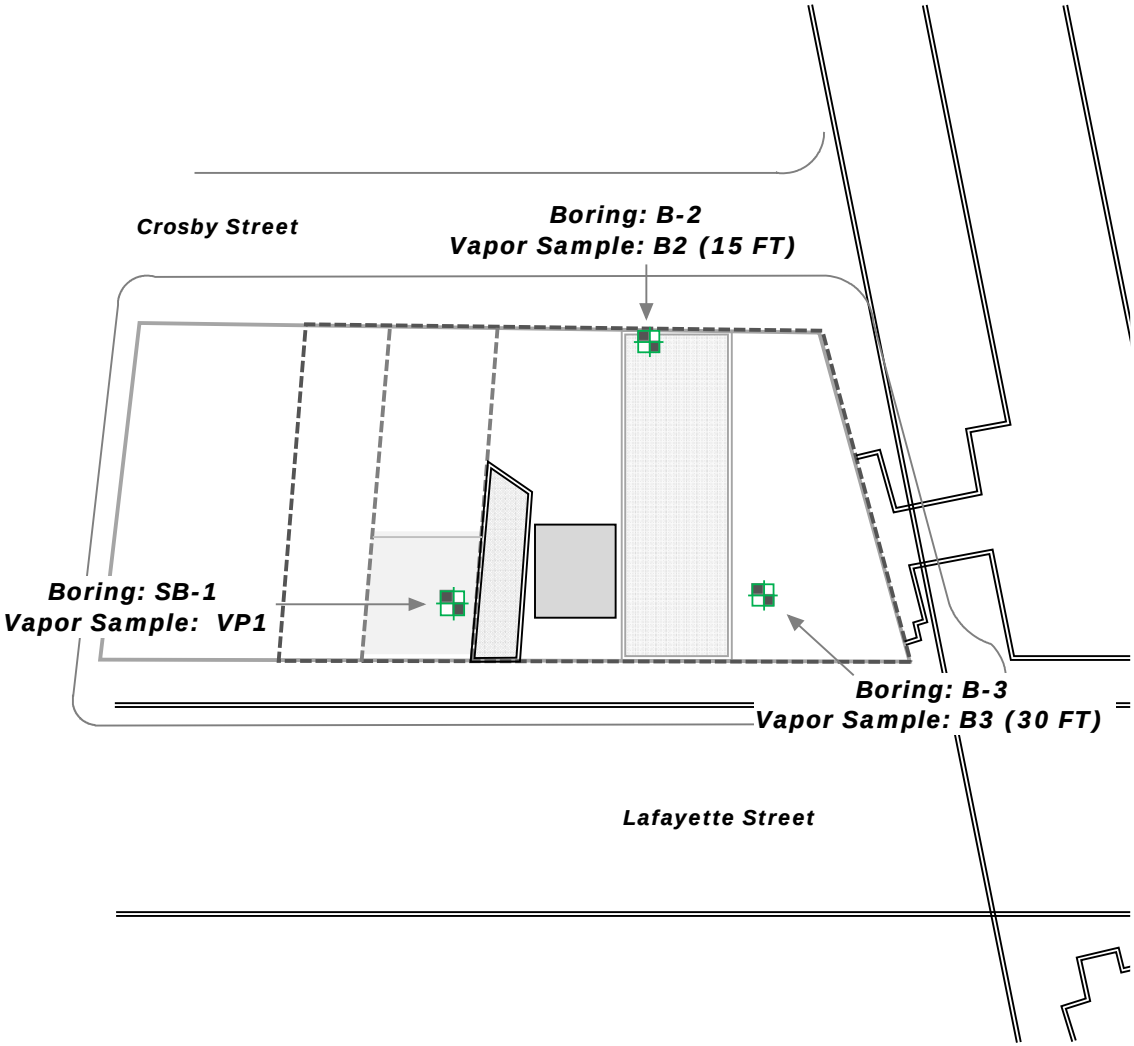
6.0 Conclusion and Recommendations

Current environmental conditions are consistent with the planned commercial use of the property. We recommend that the gasoline service station facilities be properly closed and decommissioned, all UST's be removed including all associated piping, dispensers and fill-ports in accordance with the NYSDEC regulations and applicable regulations of the Fire Department of the City of New York. Any contaminated soil/fill with stains, odors and/or impacted with petroleum that is encountered during decommissioning of the service station should be managed and disposed of in accordance with the applicable NYSDEC regulations prior to the start of redevelopment.

The proposed development and construction will require a full excavation of the proposed building footprint of approximately thirty (30) feet bgs to accommodate two (2) cellar levels. We recommend that the native soil or the second stratum that is comprised of loose to medium compacted brown fine to course sand with some trace of silt, gravel, mica be reused in accordance with the OER soil reuse and banking program. Additionally, soil/fill materials in the upper 15 to 20 feet below ground surface may be reusable in some instances; otherwise they should be excavated and transported to an approved waste disposal, recycling or reuse facility in accordance with NYSDEC regulations. All soils leaving or entering the Site will require a testing and sampling protocol.

Figures

Figures 1 through 10



Graphic Scale (feet)

0 25 50 75 100

Detected Compounds	4/3/2013	6/24/2013	6/24/2013
Analyte (ppbv)	VP1	B3 (30 FT)	B2 (15 FT)
1,2,4-Trimethylbenzene	5.01	5.92	5.92
1,2-Dichloroethane	ND	0.25	ND
1,3,5-Trimethylbenzene	1.38	1.85	1.75
4-Ethyltoluene	1	4.54	4.73
4-Isopropyltoluene	0.24	ND	0.21
4-Methyl-2-pentanone(MIBK)	0.59	ND	2.54
Acetone	22.2	411	116
Benzene	0.79	62.6	33
Bromodichloromethane	ND	0.76	ND
Carbon Disulfide	3.1	7.75	9.51
Carbon Tetrachloride	0.08	ND	0.04
Chloroform	ND	40.6	3.78
Chloromethane	ND	0.83	0.62
Cyclohexane	1.29	4.07	2.56
Dichlorodifluoromethane	0.45	0.5	0.52
Ethanol	7.43	138	58
Ethylbenzene	2.22	44.9	31.7
Heptane	0.73	53.4	21.9
Hexane	0.96	80.6	36.6
Isopropylalcohol	1.25	6.11	3.01
Isopropylbenzene	0.24	0.85	0.6
m,p-Xylene	9.12	161	105
Methyl Ethyl Ketone	3.87	ND	ND
Methylene Chloride	0.49	3.06	0.85
n-Butylbenzene	0.38	0.32	0.38
o-Xylene	4.49	33.1	24.8
Propylene	12.1	89.9	41.8
Styrene	ND	4.3	3.5
Tetrachloroethene	1.89	0.9	2.08
Tetrahydrofuran	ND	9.2	4.51
Toluene	4.12	635	345
Trichloroethene	0.06	1.14	1.27
Trichlorofluoromethane	0.2	0.42	0.48
Trichlorotrifluoroethane	ND	ND	0.14

Soil Vapor Chemistry Results

300 Lafayette Street, NY, NY

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John A. Rhodes, P.E.	RL	July 2013	Figure 10

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ASR

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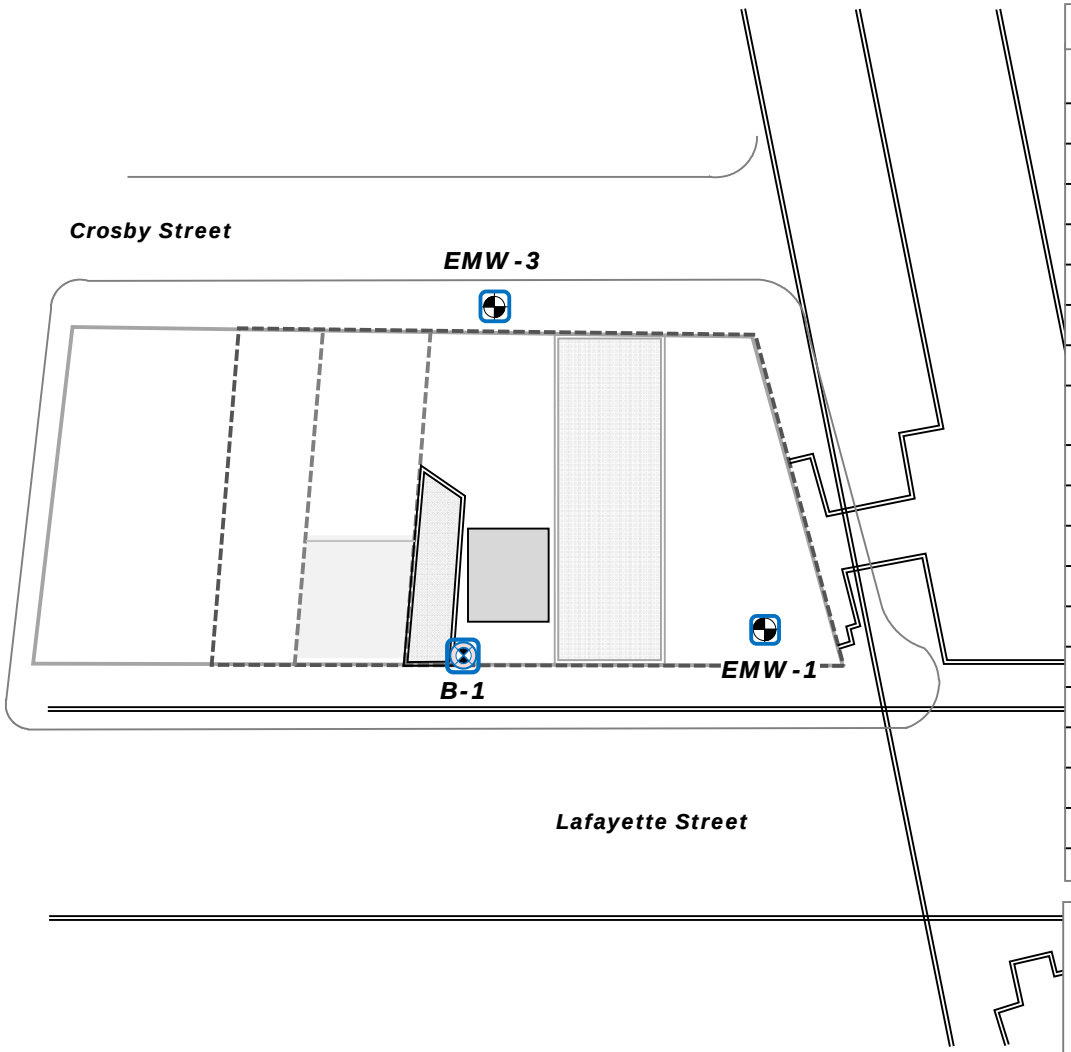

Detected Compounds (µg/L)				
Sampled: 6/24/2013	**TOGs**	**EMW-1**	**EMW-3**	**B-1 (ASR-1)**
VOCs				
Methyl ethyl ketone	50	ND	50	ND
Total VOCs		**ND**	**50**	**ND**
SVOCs				
Benz(a)anthracene	0.002	**0.10**	ND	**0.05**
Benzo(b)fluoranthene	0.002	**0.20**	ND	**0.06**
Benzo(k)fluoranthene	0.002	**0.06**	ND	ND
Bis(2-ethylhexyl)phthalate	5	**15.00**	ND	ND
Chrysene	0.002	**0.22**	ND	ND
Dibenz(a,h)anthracene		0.02	ND	ND
Indeno(1,2,3-cd)pyrene	0.002	**0.05**	ND	ND
Phenanthrene	50	0.18	ND	ND
m&p-cresol		ND	12	ND
Total SVOCs		**15.83**	**12.00**	**0.11**
Pesticides & PCBs				
Chlordane	0.05	ND	ND	**0.07**
Total Pesticides		**ND**	**ND**	**0.07**
PCB-1254	0.09	**0.43**	ND	ND
Total PCBs		**0.43**	**ND**	**ND**

Notes

1. Table Shows Detected Groundwater Contaminants.
2. Highlighted Values are Above TOGs Standard.
3. Concentrations are in µg/L

Graphic Scale (feet)

0 25 50 75 100

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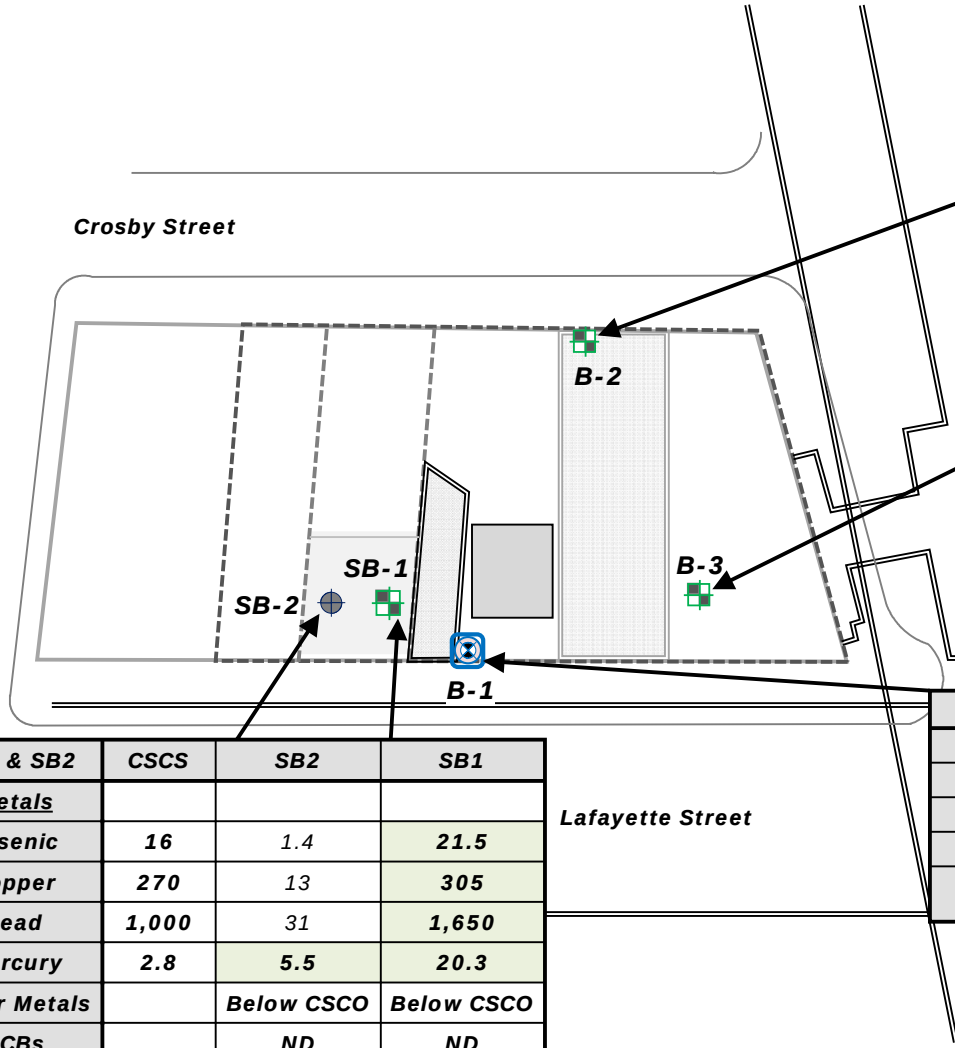
Groundwater Chemistry Results

300 Lafayette Street, NY, NY

DRAWN	CHECKED	DATE	DRAWG NO.
John A. Rhodes, P.E.	RL	July 2013	**Figure 9**



B-2	UCS	B-2 (5 FT)	B-2 (15 FT)
Metals			
Arsenic	16	0.8	20.9
Other Metals		Below CSCO	Below CSCO
PCBs		ND	ND
VOCs		ND	ND
SVOCs		ND	BRL
Pesticides		ND	ND

B-3	UCS	B-3 (5 FT)	B-3 (15 FT)	B-3 (30 FT)
Metals		Below CSCO	Below CSCO	Below CSCO
PCBs		ND	ND	ND
VOCs		ND	ND	ND
SVOCs		BRL	ND	ND
Pesticides		ND	ND	ND

B-1	UCS	B-1 (15 FT)	B-1 (34-35 FT)	B-1 (42-43 FT)
Metals		Below CSCO	Below CSCO	Below CSCO
PCBs		ND	ND	ND
VOCs		ND	ND	ND
SVOCs		ND	ND	ND
Pesticides		ND	ND	ND

SB1 & SB2	CSCS	SB2	SB1
Metals			
Arsenic	16	1.4	21.5
Copper	270	13	305
Lead	1,000	31	1,650
Mercury	2.8	5.5	20.3
Other Metals		Below CSCO	Below CSCO
PCBs		ND	ND
VOCs		ND	ND
SVOCs		ND	ND
Pesticides		ND	ND

Notes

1. Tables Show Soil Contaminants Above the Commercial Soil Clean-up Objective (CSCO).
2. Concentrations are in µg/kg
3. BRL: Below Reporting Limit
   ND: Bot Detected

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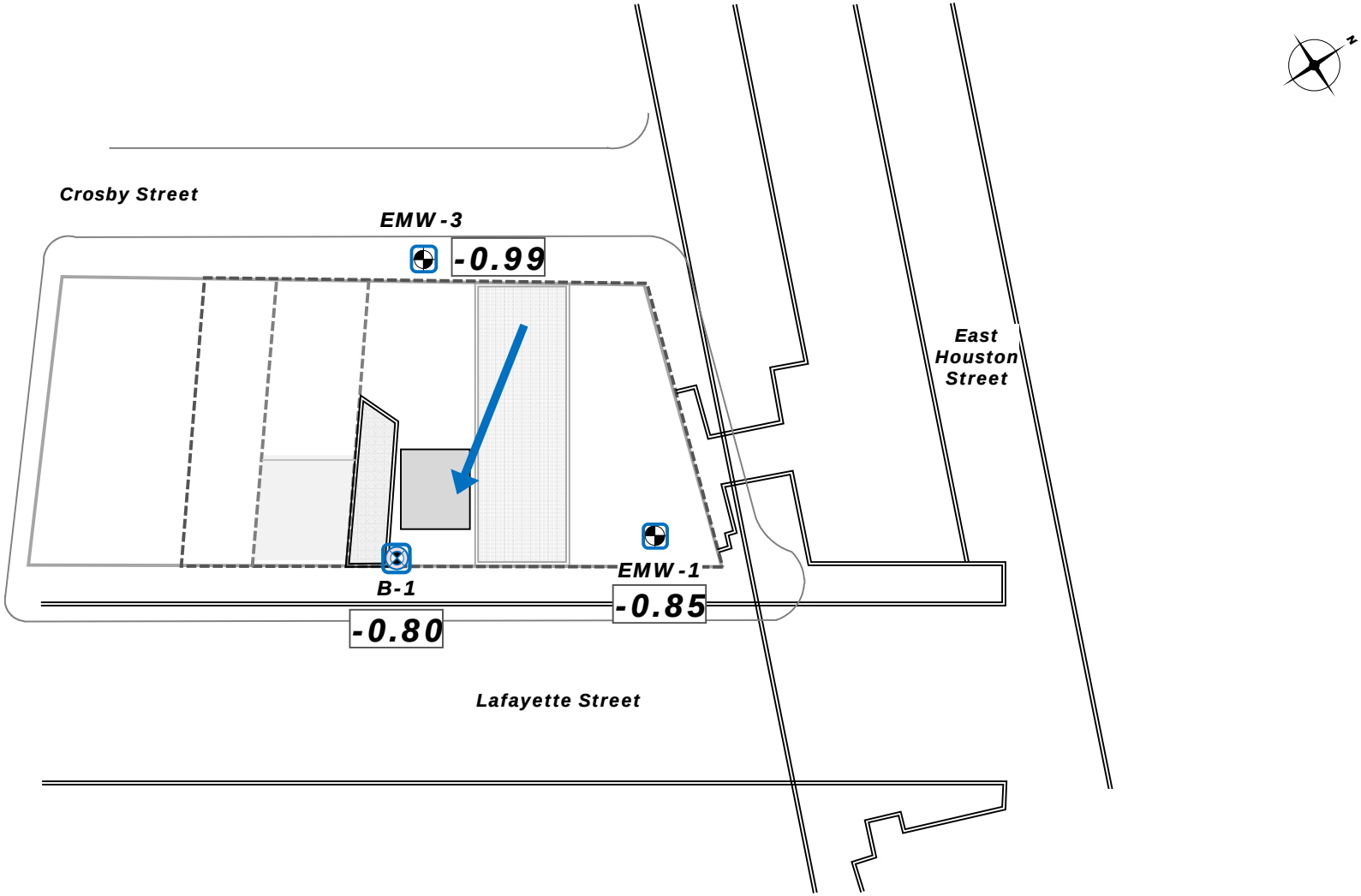
Soil Chemistry Results

300 Lafayette Street, NY, NY

DRAWN	CHECKED	DATE	DRAWG NO.
John A. Rhodes, P.E.	RL	July 2013	Figure 8



Graphic Scale (feet)

0 25 50 75 100

Key

-0.80 Groundwater Elevation (msl)

Groundwater Gradient

Groundwater Gradient 7/29/2013			
300 Lafayette Street, NY, NY			
DRAWN	CHECKED	DATE	DRAWG NO.
John A. Rhodes, P.E.	RL	July 2013	Figure 7

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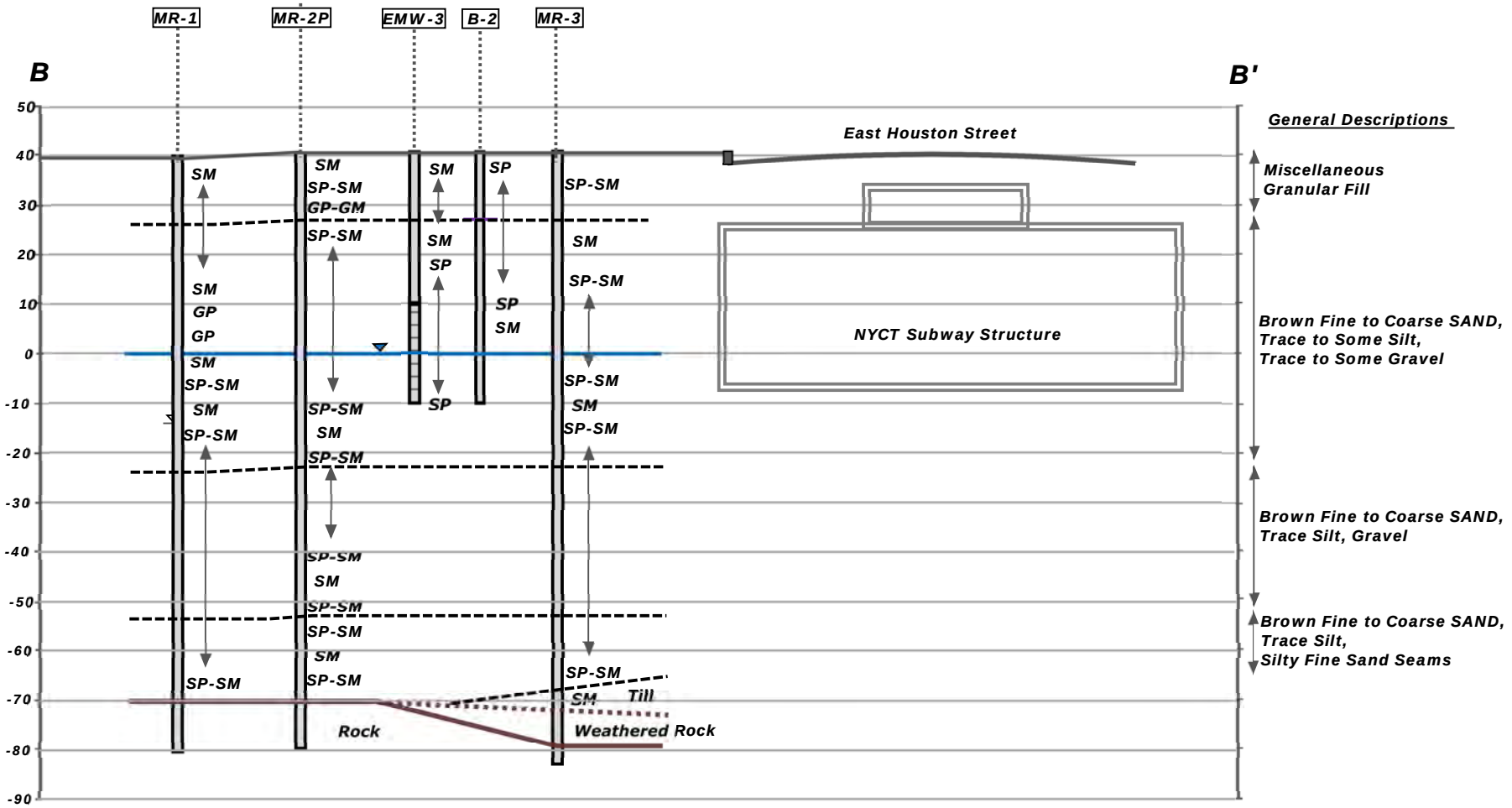

Notes

1. Existing Boring Logs from GEOTECHNICAL INVESTIGATION AT 300 LAFAYETE STREET, NEW YORK, NEW YORK, Mueser Rutledge Consulting Engineers 1/28/2011.

KEY to Symbols

GP Poorly graded gravels, gravel sand mixtures,little or no fines
GM Silty gravels, poorly graded gravel-sand mixtures
SP Poorly graded sands, gravely sands, little or no fines
SM Silty sands, poorly graded sand-silt mixtures

Section B-B'			
300 Lafayette Street, NY, NY			
DRAWN	CHECKED	DATE	DRAWG NO.
John A. Rhodes, P.E.	RL	June 2013	Figure 6

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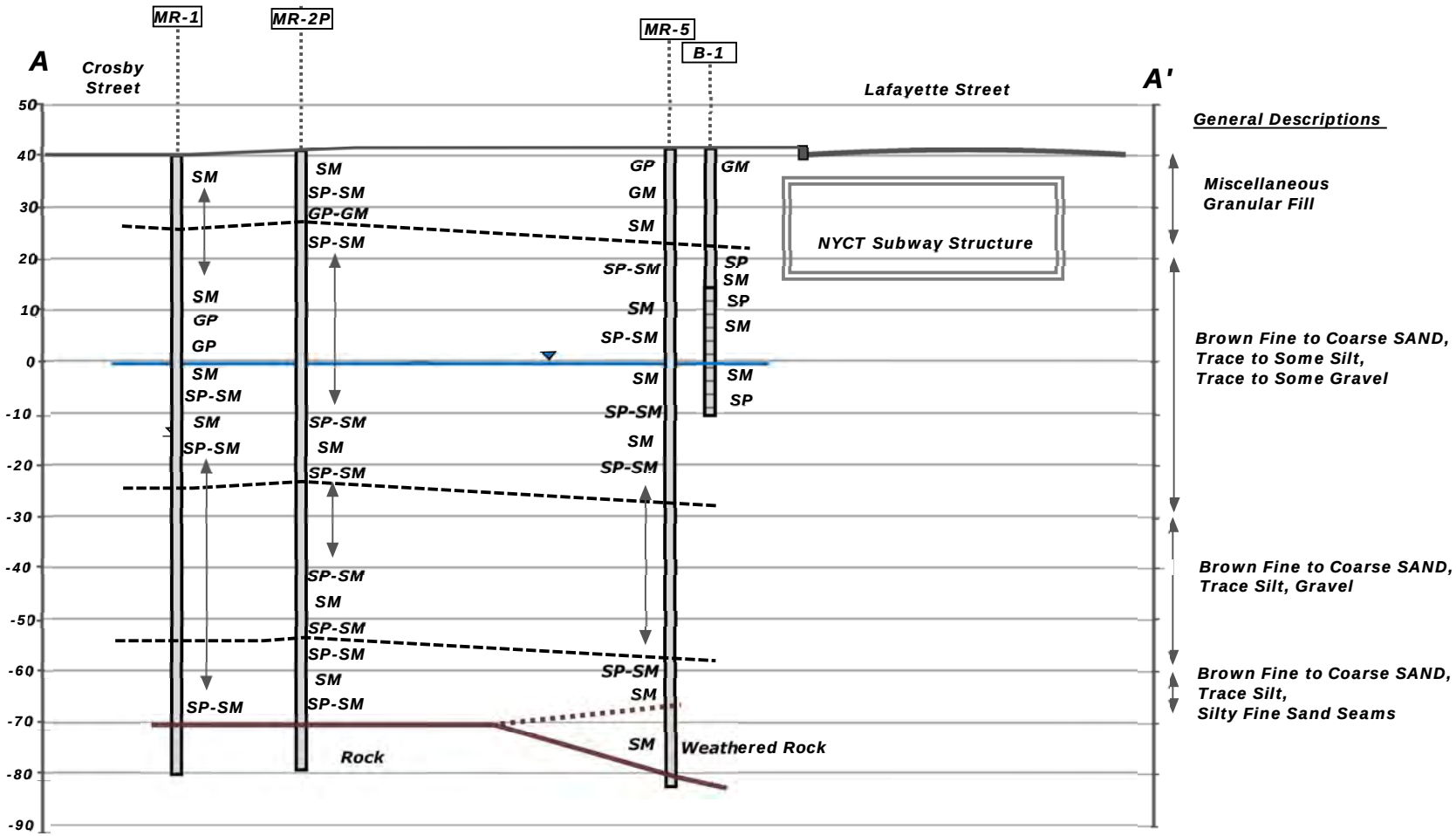

Notes

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KEY to Symbols

GP Poorly graded gravels, gravel sand mixtures,little or no fines
GM Silty gravels, poorly graded gravel-sand mixtures
SP Poorly graded sands, gravely sands, little or no fines
SM Silty sands, poorly graded sand-silt mixtures

Section A-A'			
300 Lafayette Street, NY, NY			
DRAWN	CHECKED	DATE	DRAWG NO.
John A. Rhodes, P.E.	RL	June 2013	Figure 5

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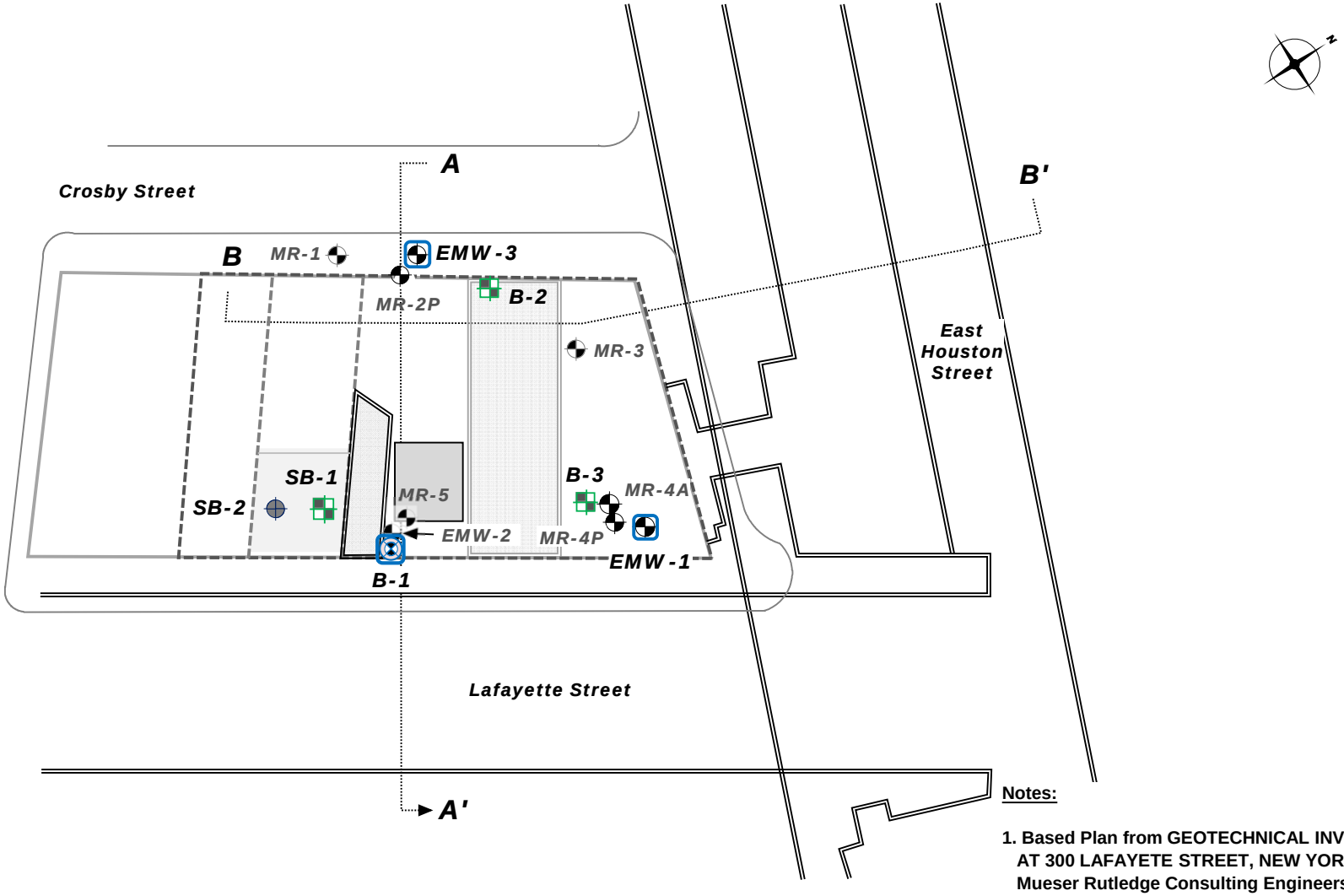

Notes:

1. Based Plan from GEOTECHNICAL INVESTIGATION AT 300 LAFAYETE STREET, NEW YORK, NEW YORK, Mueser Rutledge Consulting Engineers 1/28/2011.

Graphic Scale (feet)

0 25 50 75 100

KEY

- B — Section Line
- Property Line
- Existing Monitoring Wells and Borings
- EMW-3 — Existing Monitoring Well Sampled
- B-1 — Newly Installed Monitoring Well
- B-3 — Soil Boring with Soil & Vapor Samples
- SB-2 — Soil Boring with Soil Samples Only

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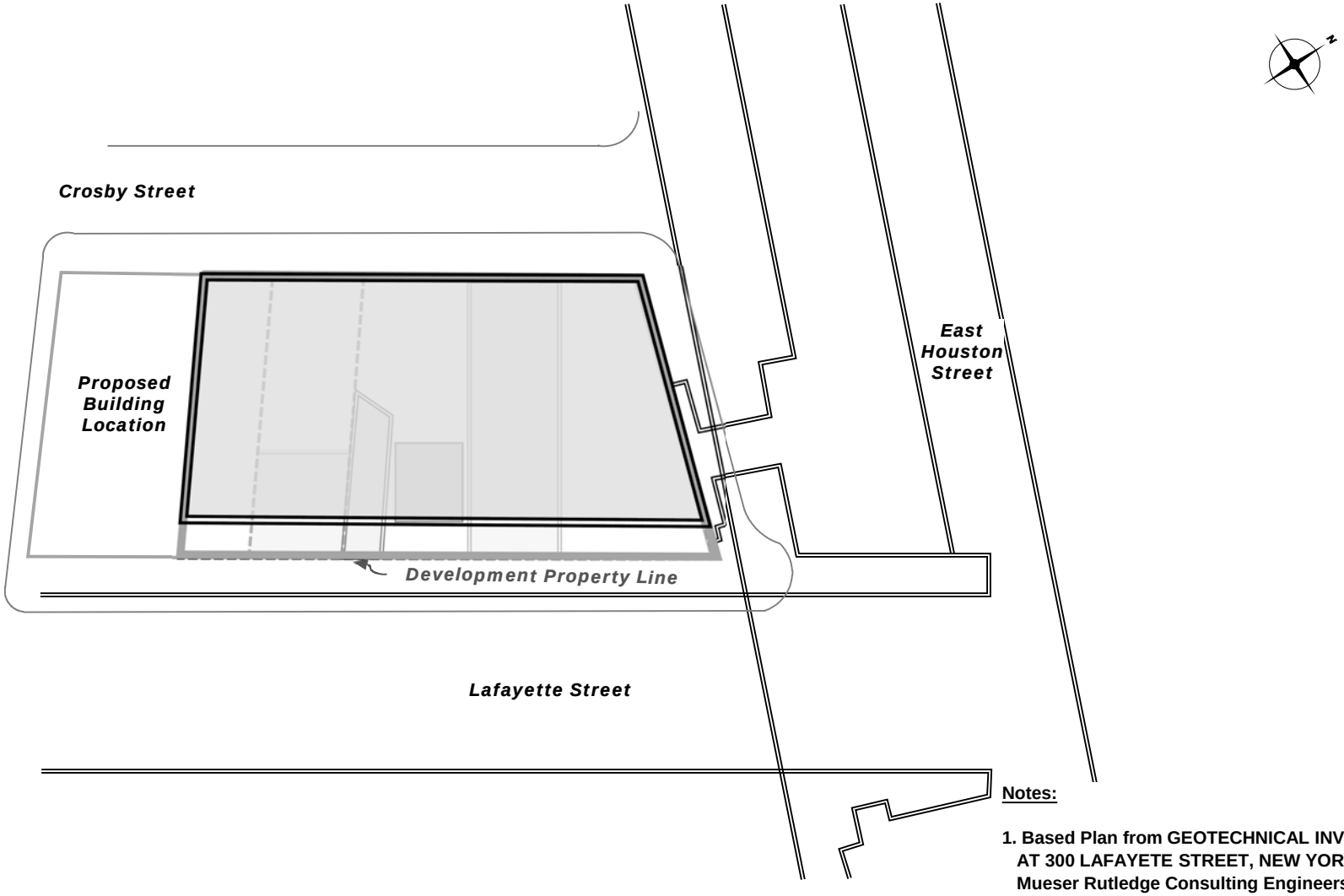
Boring & Section Location Map			
300 Lafayette Street, NY, NY			
DRAWN	CHECKED	DATE	DRAWG NO.
John A. Rhodes, P.E.	RL	July 2013	Figure 4



Notes:

1. Based Plan from GEOTECHNICAL INVESTIGATION AT 300 LAFAYETE STREET, NEW YORK, NEW YORK, Mueser Rutledge Consulting Engineers 1/28/2011.
2. Proposed Building Location from DRAFT FLOOR PLAN-CELLAR 02, Cook & Fox Architects, LLP

Graphic Scale (feet)

0 25 50 75 100

Redevelopment Plan			
300 Lafayette Street, NY, NY			
DRAWN	CHECKED	DATE	DRAWG NO.
John A. Rhodes, P.E.	RL	July 2013	Figure 3

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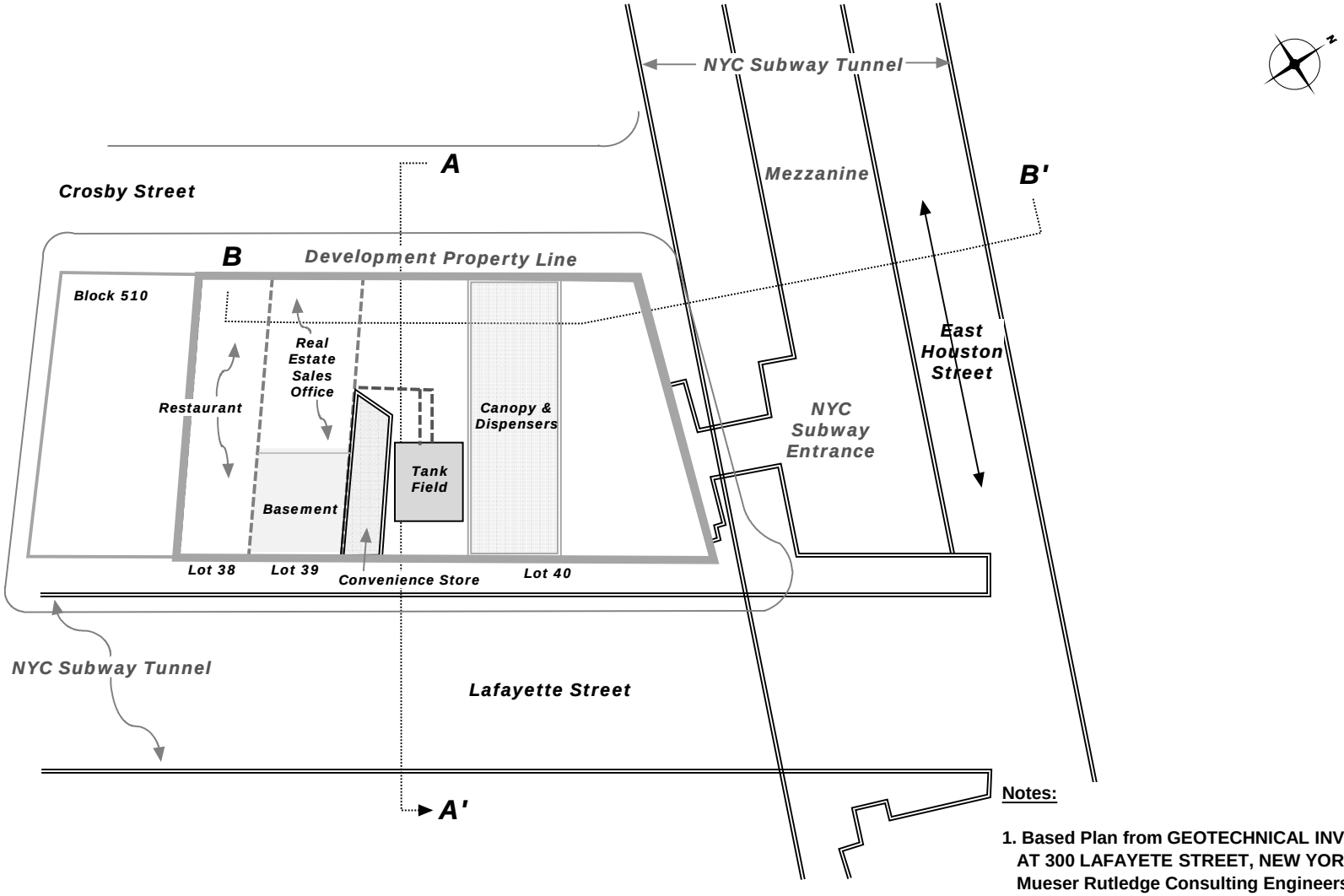
300 Lafayette Street Redevelopment Site

Site Location Map			
300 Lafayette Street, NY, NY			
DRAWN	CHECKED	DATE	DRAWG NO.
John A. Rhodes, P.E.	RL	July 2013	Figure 2



Notes:

1. Based Plan from GEOTECHNICAL INVESTIGATION AT 300 LAFAYETE STREET, NEW YORK, NEW YORK, Mueser Rutledge Consulting Engineers 1/28/2011.

Graphic Scale (feet)

0 25 50 75 100

Site Map			
300 Lafayette Street, NY, NY			
DRAWN	CHECKED	DATE	DRAWG NO.
John A. Rhodes, P.E.	RL	July 2013	Figure 1

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Tables

Tables 4 through 6

Table 6 **Soil Vapor Analytical Data Summary**

	VP1 (SB1)		B3 (30 FT)		B2 (15 FT)	
	5	ft	30	ft	15	ft
	4/3/2013		6/24/2013		6/24/2013	
Detections Highlighted in Blue	**Result**	RL	**Result**	RL	**Result**	RL
Volatiles (TO15) By TO15 (ppbv)						
1,1,1,2-Tetrachloroethane	ND	0.146	ND	0.146	ND	0.146
1,1,1-Trichloroethane	ND	0.183	ND	0.183	ND	0.183
1,1,2,2-Tetrachloroethane	ND	0.146	ND	0.146	ND	0.146
1,1,2-Trichloroethane	ND	0.183	ND	0.183	ND	0.183
1,1-Dichloroethane	ND	0.247	ND	0.247	ND	0.247
1,1-Dichloroethene	ND	0.252	ND	0.252	ND	0.252
1,2,4-Trichlorobenzene	ND	0.135	ND	0.135	ND	0.135
1,2,4-Trimethylbenzene	**5.01**	0.204	**5.92**	0.204	**5.92**	0.204
1,2-Dibromoethane(EDB)	ND	0.13	ND	0.13	ND	0.13
1,2-Dichlorobenzene	ND	0.166	ND	0.166	ND	0.166
1,2-Dichloroethane	ND	0.247	**0.25**	0.247	ND	0.247
1,2-dichloropropane	ND	0.216	ND	0.216	ND	0.216
1,2-Dichlorotetrafluoroethane	ND	0.143	ND	0.143	ND	0.143
1,3,5-Trimethylbenzene	**1.38**	0.204	**1.85**	0.204	**1.75**	0.204
1,3-Butadiene	ND	0.452	ND	0.452	ND	0.452
1,3-Dichlorobenzene	ND	0.166	ND	0.166	ND	0.166
1,4-Dichlorobenzene	ND	0.166	ND	0.166	ND	0.166
1,4-Dioxane	ND	0.278	ND	0.278	ND	0.278
2-Hexanone(MBK)	ND	0.244	ND	0.244	ND	0.244
4-Ethyltoluene	**1**	0.204	**4.54**	0.204	**4.73**	0.204
4-Isopropyltoluene	**0.24**	0.182	ND	0.182	**0.21**	0.182
4-Methyl-2-pentanone(MIBK)	**0.59**	0.244	ND	0.244	**2.54**	0.244
Acetone	**22.2**	0.421	**411**	0.421	**116**	0.421
Acrylonitrile	ND	0.461	ND	0.461	ND	0.461
Benzene	**0.79**	0.313	**62.6**	0.313	**33**	0.313
Benzyl chloride	ND	0.193	ND	0.193	ND	0.193
Bromodichloromethane	ND	0.149	**0.76**	0.149	ND	0.149
Bromoform	ND	0.097	ND	0.097	ND	0.097
Bromomethane	ND	0.258	ND	0.258	ND	0.258
Carbon Disulfide	**3.1**	0.321	**7.75**	0.321	**9.51**	0.321
Carbon Tetrachloride	**0.08**	0.04	ND	0.04	**0.04**	0.04
Chlorobenzene	ND	0.217	ND	0.217	ND	0.217
Chloroethane	ND	0.379	ND	0.379	ND	0.379
Chloroform	ND	0.205	**40.6**	0.205	**3.78**	0.205
Chloromethane	ND	0.484	**0.83**	0.484	**0.62**	0.484
Cis-1,2-Dichloroethene	ND	0.252	ND	0.252	ND	0.252
cis-1,3-Dichloropropene	ND	0.22	ND	0.22	ND	0.22
Cyclohexane	**1.29**	0.291	**4.07**	0.291	**2.56**	0.291
Dibromochloromethane	ND	0.117	ND	0.117	ND	0.117
Dichlorodifluoromethane	**0.45**	0.202	**0.5**	0.202	**0.52**	0.202
Ethanol	**7.43**	0.531	**138**	0.531	**58**	0.531
Ethyl acetate	ND	0.278	ND	0.278	ND	0.278

Table 6 **Soil Vapor Analytical Data Summary**

	VP1 (SB1)		B3 (30 FT)		B2 (15 FT)	
	5	ft	30	ft	15	ft
	4/3/2013		6/24/2013		6/24/2013	
Detections Highlighted in Blue	**Result**	RL	**Result**	RL	**Result**	RL
Volatiles (TO15) By TO15 (ppbv)						
Ethylbenzene	**2.22**	0.23	**44.9**	0.23	**31.7**	0.23
Heptane	**0.73**	0.244	**53.4**	0.244	**21.9**	0.244
Hexachlorobutadiene	ND	0.094	ND	0.094	ND	0.094
Hexane	**0.96**	0.284	**80.6**	0.284	**36.6**	0.284
Isopropylalcohol	**1.25**	0.407	**6.11**	0.407	**3.01**	0.407
Isopropylbenzene	**0.24**	0.204	**0.85**	0.204	**0.6**	0.204
m,p-Xylene	**9.12**	0.23	**161**	0.23	**105**	0.23
Methyl Ethyl Ketone	**3.87**	0.339	ND	0.339	ND	0.339
Methyl tert-butyl ether(MTBE)	ND	0.278	ND	0.278	ND	0.278
Methylene Chloride	**0.49**	0.288	**3.06**	0.288	**0.85**	0.288
n-Butylbenzene	**0.38**	0.182	**0.32**	0.182	**0.38**	0.182
o-Xylene	**4.49**	0.23	**33.1**	0.23	**24.8**	0.23
Propylene	**12.1**	0.581	**89.9**	0.581	**41.8**	0.581
sec-Butylbenzene	ND	0.182	ND	0.182	ND	0.182
Styrene	ND	0.235	**4.3**	0.235	**3.5**	0.235
Tetrachloroethene	**1.89**	0.037	**0.9**	0.037	**2.08**	0.037
Tetrahydrofuran	ND	0.339	**9.2**	0.339	**4.51**	0.339
Toluene	**4.12**	0.266	**635**	0.266	**345**	0.266
Trans-1,2-Dichloroethene	ND	0.252	ND	0.252	ND	0.252
trans-1,3-Dichloropropene	ND	0.22	ND	0.22	ND	0.22
Trichloroethene	**0.06**	0.047	**1.14**	0.047	**1.27**	0.047
Trichlorofluoromethane	**0.2**	0.178	**0.42**	0.178	**0.48**	0.178
Trichlorotrifluoroethane	ND	0.13	ND	0.13	**0.14**	0.13
Vinyl Chloride	ND	0.098	ND	0.098	ND	0.098

Table 5 **Groundwater Analytical Data Summary**

Detections Highlighted in Blue	TOGS-WQ/GA Exceedance Highlight	EMW-1 6/24/2013 Result	RL	EMW-3 6/24/2013 Result	RL	B-1 (ASR-1) 6/24/2013 Result	RL
Metals (Units: mg/l)							
Aluminum	0.1	31.5	0.01	2.69	0.01	116	0.1
Aluminum (Dissolved)	0.1	0.4	0.01	0.39	0.01	0.58	0.01
Antimony	0.003	0.016	0.003	BRL	0.003	0.007	0.003
Antimony (Dissolved)	0.003	BRL	0.003	BRL	0.003	BRL	0.003
Arsenic	0.025	0.009	0.004	0.01	0.004	0.037	0.004
Arsenic (Dissolved)	0.025	BRL	0.004	0.007	0.004	BRL	0.004
Barium	1	0.335	0.002	0.506	0.002	1.91	0.002
Barium (Dissolved)	1	0.03	0.002	0.467	0.002	0.169	0.002
Beryllium	0.003	0.002	0.001	BRL	0.001	0.009	0.001
Beryllium (Dissolved)	0.003	BRL	0.001	BRL	0.001	BRL	0.001
Cadmium	0.005	0.003	0.001	BRL	0.001	0.006	0.001
Cadmium (Dissolved)	0.005	BRL	0.001	BRL	0.001	BRL	0.001
Calcium		66	0.01	144	0.01	109	0.01
Calcium (Dissolved)		56.9	0.01	142	0.01	78.6	0.01
Chromium	0.05	0.101	0.001	0.01	0.001	0.461	0.001
Chromium (Dissolved)	0.05	BRL	0.001	0.002	0.001	0.003	0.001
Cobalt		0.037	0.002	0.009	0.002	0.121	0.002
Cobalt (Dissolved)		0.003	0.001	0.01	0.001	0.003	0.001
Copper	0.2	0.369	0.005	0.061	0.005	0.506	0.005
Copper (Dissolved)	0.2	0.042	0.005	0.008	0.005	BRL	0.005
Iron	0.3	49.5	0.01	60.5	0.01	218	0.1
Iron (Dissolved)	0.3	0.295	0.011	58.4	0.011	0.838	0.011
Lead	0.025	0.261	0.002	0.034	0.002	0.37	0.002
Lead (Dissolved)	0.025	BRL	0.002	0.005	0.002	BRL	0.002
Magnesium	35	24.2	0.01	22.5	0.01	71	0.01
Magnesium (Dissolved)	35	13.1	0.01	21.8	0.01	21.4	0.01
Manganese	0.3	0.576	0.001	13.1	0.01	11.7	0.01
Manganese (Dissolved)	0.3	0.156	0.001	11.3	0.011	2.42	0.011
Mercury	0.0007	BRL	0.0002	BRL	0.0002	BRL	0.0002
Mercury (Dissolved)	0.0007	BRL	0.0002	BRL	0.0002	BRL	0.0002
Nickel	0.1	0.093	0.001	0.018	0.001	0.557	0.001
Nickel (Dissolved)	0.1	0.034	0.001	0.021	0.001	0.034	0.001
Potassium		18.8	0.1	31.7	0.1	42	0.1
Potassium (Dissolved)		12.3	0.1	35.6	0.1	14.2	0.1
Selenium	0.01	BRL	0.01	BRL	0.01	BRL	0.01
Selenium (Dissolved)	0.01	BRL	0.01	BRL	0.01	BRL	0.01
Silver	0.05	BRL	0.001	BRL	0.003	BRL	0.001
Silver (Dissolved)	0.05	BRL	0.001	BRL	0.003	BRL	0.001
Sodium	20	138	1	147	1	148	1
Sodium (Dissolved)	20	141	1.1	134	1.1	148	1.1
Thallium	0.0005	BRL	0.0005	BRL	0.0005	BRL	0.0005
Thallium (Dissolved)	0.0005	BRL	0.0005	BRL	0.0005	BRL	0.0005
Vanadium		0.077	0.002	0.006	0.002	0.268	0.002
Vanadium (Dissolved)		BRL	0.002	BRL	0.002	BRL	0.002
Zinc	5	1.23	0.002	0.429	0.002	1.93	0.002
Zinc (Dissolved)	5	0.054	0.002	0.117	0.002	0.054	0.002

Detections Highlighted in Blue	TOGS-WQ/GA Exceedance Highlight	EMW-1 6/24/2013 Result	RL	EMW-3 6/24/2013 Result	RL	B-1 (ASR-1) 6/24/2013 Result	RL
PCBs By 8082 (Units: µg/L)							
PCB-1016	**0.09**	ND	0.05	ND	0.25	ND	0.05
PCB-1221	**0.09**	ND	0.05	ND	0.25	ND	0.05
PCB-1232	**0.09**	ND	0.05	ND	0.25	ND	0.05
PCB-1242	**0.09**	ND	0.05	ND	0.25	ND	0.05
PCB-1248	**0.09**	ND	0.05	ND	0.25	ND	0.05
PCB-1254	**0.09**	**0.43**	0.05	ND	0.25	ND	0.05
PCB-1260	**0.09**	ND	0.05	ND	0.25	ND	0.05
PCB-1262		ND	0.05	ND	0.25	ND	0.05
PCB-1268		ND	0.05	ND	0.25	ND	0.05
Total PCBs		**0.43**		**0.00**		**0.00**	

Volatiles By SW8260 (Units: µg/L)							
1,1,1,2-Tetrachloroethane	**5**	ND	1	ND	1	ND	1
1,1,1-Trichloroethane	**5**	ND	1	ND	1	ND	1
1,1,2,2-Tetrachloroethane	**5**	ND	0.5	ND	0.5	ND	0.5
1,1,2-Trichloroethane	**1**	ND	1	ND	1	ND	1
1,1-Dichloroethane	**5**	ND	1	ND	1	ND	1
1,1-Dichloroethene	**5**	ND	1	ND	1	ND	1
1,1-Dichloropropene	**5**	ND	1	ND	1	ND	1
1,2,3-Trichlorobenzene		ND	1	ND	1	ND	1
1,2,3-Trichloropropane	**0.04**	ND	1	ND	1	ND	1
1,2,4-Trichlorobenzene		ND	1	ND	1	ND	1
1,2,4-Trimethylbenzene	**5**	ND	1	ND	1	ND	1
1,2-Dibromo-3-chloropropane	**0.04**	ND	1	ND	1	ND	1
1,2-Dibromoethane	**0.0006**	ND	1	ND	1	ND	1
1,2-Dichlorobenzene		ND	1	ND	1	ND	1
1,2-Dichloroethane	**0.6**	ND	0.6	ND	0.6	ND	0.6
1,2-Dichloropropane	**1**	ND	1	ND	1	ND	1
1,3,5-Trimethylbenzene	**5**	ND	1	ND	1	ND	1
1,3-Dichlorobenzene	**3**	ND	1	ND	1	ND	1
1,3-Dichloropropane	**5**	ND	1	ND	1	ND	1
1,4-Dichlorobenzene		ND	1	ND	1	ND	1
2,2-Dichloropropane	**5**	ND	1	ND	1	ND	1
2-Chlorotoluene	**5**	ND	1	ND	1	ND	1
2-Hexanone	**50**	ND	5	ND	5	ND	5
2-Isopropyltoluene	**5**	ND	1	ND	1	ND	1
4-Chlorotoluene	**5**	ND	1	ND	1	ND	1
4-Methyl-2-pentanone		ND	5	ND	5	ND	5
Acetone	**50**	ND	25	ND	25	ND	25
Acrylonitrile	**5**	ND	5	ND	5	ND	5
Benzene	**1**	ND	0.7	ND	0.7	ND	0.7
Bromobenzene	**5**	ND	1	ND	1	ND	1
Bromochloromethane	**5**	ND	1	ND	1	ND	1
Bromodichloromethane	**50**	ND	0.5	ND	0.5	ND	0.5
Bromoform	**50**	ND	1	ND	1	ND	1
Bromomethane	**5**	ND	1	ND	1	ND	1
Carbon Disulfide		ND	5	ND	5	ND	5
Carbon tetrachloride	**5**	ND	1	ND	1	ND	1
Chlorobenzene	**5**	ND	1	ND	1	ND	1
Chloroethane	**5**	ND	1	ND	1	ND	1
Chloroform	**7**	ND	1	ND	1	ND	1
Chloromethane	**5**	ND	1	ND	1	ND	1
cis-1,2-Dichloroethene	**5**	ND	1	ND	1	ND	1
cis-1,3-Dichloropropene	**0.4**	ND	0.4	ND	0.4	ND	0.4

Detections Highlighted in Blue	TOGS-WQ/GA Exceedance Highlight	EMW-1 6/24/2013 Result	RL	EMW-3 6/24/2013 Result	RL	B-1 (ASR-1) 6/24/2013 Result	RL
Dibromochloromethane	**50**	ND	0.5	ND	0.5	ND	0.5
Dibromomethane	**5**	ND	1	ND	1	ND	1
Dichlorodifluoromethane	**5**	ND	1	ND	1	ND	1
Ethylbenzene	**5**	ND	1	ND	1	ND	1
Hexachlorobutadiene	**0.5**	ND	0.4	ND	0.4	ND	0.4
Isopropylbenzene	**5**	ND	1	ND	1	ND	1
m&p-Xylene		ND	1	ND	1	ND	1
Methyl ethyl ketone (2-Butanone)	**50**	ND	5	**50**	5	ND	5
Methyl t-butyl ether (MTBE)		ND	1	ND	1	ND	1
Methylene chloride	**5**	ND	1	ND	1	ND	1
Naphthalene	**10**	ND	1	ND	1	ND	1
n-Butylbenzene	**5**	ND	1	ND	1	ND	1
n-Propylbenzene	**5**	ND	1	ND	1	ND	1
o-Xylene	**5**	ND	1	ND	1	ND	1
p-Isopropyltoluene	**5**	ND	1	ND	1	ND	1
sec-Butylbenzene	**5**	ND	1	ND	1	ND	1
Styrene	**5**	ND	1	ND	1	ND	1
tert-Butylbenzene	**5**	ND	1	ND	1	ND	1
Tetrachloroethene	**5**	ND	1	ND	1	ND	1
Tetrahydrofuran (THF)	**50**	ND	2.5	ND	2.5	ND	2.5
Toluene	**5**	ND	1	ND	1	ND	1
Total Xylenes	**5**	ND	1	ND	1	ND	1
trans-1,2-Dichloroethene	**5**	ND	1	ND	1	ND	1
trans-1,3-Dichloropropene	**0.4**	ND	0.4	ND	0.4	ND	0.4
trans-1,4-dichloro-2-butene	**5**	ND	5	ND	5	ND	5
Trichloroethene	**5**	ND	1	ND	1	ND	1
Trichlorofluoromethane	**5**	ND	1	ND	1	ND	1
Trichlorotrifluoroethane	**5**	ND	1	ND	1	ND	1
Vinyl chloride	**2**	ND	1	ND	1	ND	1
Total VOCs		**0.0**		**50.0**		**0.0**	

Detections Highlighted in Blue	TOGS-WQ/GA Exceedance Highlight	EMW-1 6/24/2013 Result	RL	EMW-3 6/24/2013 Result	RL	B-1 (ASR-1) 6/24/2013 Result	RL
Semivolatiles By SW8270 (SIM), (Units: µg/L)							
1,2,4,5-Tetrachlorobenzene		ND	1.6	ND	11	ND	1.6
Acenaphthene	**20**	ND	0.05	ND	11	ND	0.05
Acenaphthylene		ND	0.05	ND	11	ND	0.05
Benz(a)anthracene	**0.002**	**0.1**	0.02	ND	11	**0.05**	0.02
Benzo(a)pyrene		ND	0.02	ND	11	ND	0.02
Benzo(b)fluoranthene	**0.002**	**0.2**	0.02	ND	11	**0.06**	0.02
Benzo(ghi)perylene		ND	3	ND	11	ND	3
Benzo(k)fluoranthene	**0.002**	**0.06**	0.02	ND	11	ND	0.02
Bis(2-ethylhexyl)phthalate	**5**	**15**	1.6	ND	11	ND	1.6
Chrysene	**0.002**	**0.22**	0.02	ND	11	ND	0.02
Dibenz(a,h)anthracene		**0.02**	0.02	ND	11	ND	0.02
Hexachlorobenzene	**0.04**	ND	0.02	ND	11	ND	0.02
Hexachloroethane	**5**	ND	2.4	ND	11	ND	2.4
Indeno(1,2,3-cd)pyrene	**0.002**	**0.05**	0.02	ND	11	ND	0.02
Pentachloronitrobenzene		ND	0.1	ND	11	ND	0.1
Pentachlorophenol	**1**	ND	0.8	ND	11	ND	0.8
Phenanthrene	**50**	**0.18**	0.05	ND	11	ND	0.05
Pyridine	**50**	ND	0.5	ND	11	ND	0.5

Semivolatiles By SW8270 (Units: µg/L)							
1,2,4-Trichlorobenzene		ND	5	ND	11	ND	5
1,2-Dichlorobenzene		ND	3	ND	11	ND	3
1,2-Diphenylhydrazine		ND	5	ND	11	ND	5
1,3-Dichlorobenzene	**3**	ND	3	ND	11	ND	3
1,4-Dichlorobenzene		ND	5	ND	11	ND	5
2,4,5-Trichlorophenol	**1**	ND	1	ND	11	ND	1
2,4,6-Trichlorophenol	**1**	ND	1	ND	11	ND	1
2,4-Dichlorophenol	**5**	ND	1	ND	11	ND	1
2,4-Dimethylphenol	**1**	ND	1	ND	11	ND	1
2,4-Dinitrophenol	**5**	ND	1	ND	56	ND	1
2,4-Dinitrotoluene	**5**	ND	5	ND	11	ND	5
2,6-Dinitrotoluene	**5**	ND	5	ND	11	ND	5
2-Chloronaphthalene	**10**	ND	5	ND	11	ND	5
2-Chlorophenol	**1**	ND	1	ND	11	ND	1
2-Methylnaphthalene		ND	5	ND	11	ND	5
2-Methylphenol (o-cresol)	**1**	ND	1	ND	11	ND	1
2-Nitroaniline	**5**	ND	5	ND	56	ND	5
2-Nitrophenol	**1**	ND	1	ND	11	ND	1
3&4-Methylphenol (m&p-cresol)		ND	10	**12**	11	ND	10
3,3'-Dichlorobenzidine	**5**	ND	5	ND	22	ND	5
3-Nitroaniline	**5**	ND	5	ND	56	ND	5
4,6-Dinitro-2-methylphenol	**1**	ND	1	ND	56	ND	1
4-Bromophenyl phenyl ether		ND	5	ND	11	ND	5
4-Chloro-3-methylphenol	**1**	ND	1	ND	22	ND	1
4-Chloroaniline	**5**	ND	5	ND	22	ND	5
4-Chlorophenyl phenyl ether		ND	5	ND	11	ND	5
4-Nitroaniline	**5**	ND	5	ND	56	ND	5
4-Nitrophenol	**1**	ND	1	ND	11	ND	1
Acetophenone		ND	5	ND	11	ND	5
Aniline	**5**	ND	5	ND	56	ND	5
Anthracene	**50**	ND	5	ND	11	ND	5
Benzidine	**5**	ND	5	ND	22	ND	5
Benzoic acid		ND	50	ND	56	ND	50
Benzyl butyl phthalate	**50**	ND	5	ND	11	ND	5

Groundwater Analytical Data Summary

Detections Highlighted in Blue	TOGS-WQ/GA Exceedance Highlight	EMW-1 6/24/2013 Result	RL	EMW-3 6/24/2013 Result	RL	B-1 (ASR-1) 6/24/2013 Result	RL
Bis(2-chloroethoxy)methane	**5**	ND	5	ND	11	ND	5
Bis(2-chloroethyl)ether	**1**	ND	1	ND	11	ND	1
Bis(2-chloroisopropyl)ether		ND	5	ND	11	ND	5
Carbazole		ND	5	ND	56	ND	5
Dibenzofuran		ND	5	ND	11	ND	5
Diethyl phthalate	**50**	ND	5	ND	11	ND	5
Dimethylphthalate	**50**	ND	5	ND	11	ND	5
Di-n-butylphthalate	**50**	ND	5	ND	11	ND	5
Di-n-octylphthalate	**50**	ND	5	ND	11	ND	5
Fluoranthene	**50**	ND	5	ND	11	ND	5
Fluorene	**50**	ND	5	ND	11	ND	5
Hexachlorobutadiene	**0.5**	ND	0.5	ND	11	ND	0.5
Hexachlorocyclopentadiene	**5**	ND	5	ND	11	ND	5
Isophorone	**50**	ND	5	ND	11	ND	5
Naphthalene	**10**	ND	5	ND	11	ND	5
Nitrobenzene	**0.4**	ND	0.4	ND	11	ND	0.4
N-Nitrosodimethylamine		ND	5	ND	11	ND	5
N-Nitrosodi-n-propylamine		ND	5	ND	11	ND	5
N-Nitrosodiphenylamine	**50**	ND	5	ND	11	ND	5
Phenol	**1**	ND	1	ND	11	ND	1
Pyrene	**50**	ND	5	ND	11	ND	5
Total SVOCs		**15.83**		**12.00**		**0.11**	

Pesticides By SW8081 (Units: µg/L)							
4,4' -DDD	**0.3**	ND*	0.5	ND*	1.2	ND	0.01
4,4' -DDE	**0.2**	ND*	0.5	ND*	1.2	ND	0.01
4,4' -DDT	**0.2**	ND*	0.5	ND*	1.2	ND	0.01
a-BHC	**0.01**	ND*	0.25	ND*	0.62	ND	0.01
Alachlor	**0.5**	ND*	0.75	ND*	1.9	ND	0.075
Aldrin		ND*	0.015	ND*	0.075	ND	0.002
b-BHC	**0.04**	ND*	0.05	ND*	0.12	ND	0.005
Chlordane	**0.05**	ND*	3	ND*	7.5	**0.071**	0.05
d-BHC	**0.04**	ND*	0.25	ND*	0.62	ND	0.025
Dieldrin	**0.004**	ND*	0.015	ND*	0.038	ND	0.003
Endosulfan I		ND*	0.5	ND*	1.2	ND	0.05
Endosulfan II		ND*	0.5	ND*	1.2	ND	0.05
Endosulfan Sulfate		ND*	0.5	ND*	1.2	ND	0.05
Endrin		ND*	0.5	ND*	1.2	ND	0.01
Endrin Aldehyde	**5**	ND*	0.5	ND*	1.2	ND	0.05
Endrin ketone	**5**	ND*	0.5	ND*	1.2	ND	0.05
g-BHC (Lindane)	**0.05**	ND*	0.25	ND*	0.62	ND	0.025
Heptachlor	**0.04**	ND*	0.25	ND*	0.62	ND	0.01
Heptachlor epoxide	**0.03**	ND*	0.25	ND*	0.62	ND	0.01
Methoxychlor	**35**	ND*	1	ND*	2.5	ND	0.1
Toxaphene	**0.06**	ND*	10	ND*	25	ND	0.25
Total Pesticides		**0.00**		**0.00**		**0.07**	

Table 4

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-1 (15 FT) 5/14/2013 15-16 ft Soil Result	RL	B-1 (34-35 FT) 5/14/2013 34-35 ft Soil Result	RL	B-1 (42-43 FT) 5/14/2013 42-43 ft Soil Result	RL	B-2 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-2 (15 FT) 6/21/2013 15-16 ft Soil Result	RL
Metals, Total (mg/kg)												
Aluminum			**4,460**	49	**3,050**	46	**2,720**	62	**3,410**	52	**5,940**	51
Antimony			BRL	3	BRL	3	BRL	4	BRL	4	BRL	3
Arsenic	7440-38-2	**16**	**1.6**	0.7	**1.3**	0.6	BRL	0.8	**0.8**	0.7	**20.9**	0.7
Barium	7440-39-3	**400**	**68.0**	0.3	**62.1**	0.3	**31.3**	0.4	**48.7**	0.4	**186.0**	0.3
Beryllium	7440-41-7	**590**	**0.3**	0.3	**0.3**	0.2	BRL	0.3	BRL	0.3	**0.3**	0.3
Cadmium	7440-43-9	**9.3**	BRL	0.3	BRL	0.3	BRL	0.4	BRL	0.4	**1.1**	0.3
Calcium			**1,450**	5	**865**	5	**919**	6	**1,080**	5	**21,900**	51
Chromium	16065-83-1	**1,500**	**14.3**	0.3	**8.7**	0.3	**6.2**	0.4	**9.7**	0.4	**14.7**	0.3
Cobalt			**3.6**	0.3	**3.3**	0.3	**2.4**	0.4	**2.6**	0.4	**5.6**	0.3
Copper	7440-50-8	**270**	**27**	0.3	**7**	0.3	**7**	0.4	**8**	0.4	**106**	0.3
Iron			**9,730**	49	**7,470**	46	**6,340**	6	**7,630**	5	**30,300**	51
Lead	7439-92-1	**1,000**	**14**	0.3	**3**	0.3	**3**	0.4	**12**	0.4	**405**	3.4
Magnesium	7439-96-5	**10,000**	**2,290**	5	**2,110**	5	**1,480**	6	**1,420**	5	**2,930**	5
Manganese			**180**	3	**242**	3	**147**	0	**319**	4	**430**	3
Mercury		**2.8**	BRL	0.1	BRL	0.1	BRL	0.1	BRL	0.1	**0.6**	0.1
Nickel	7440-02-0	**310**	**18.4**	0.3	**13.9**	0.3	**8.6**	0.4	**9.2**	0.4	**28.6**	0.3
Potassium			**1,180**	5	**973**	5	**771**	6	**1,090**	5	**1,090**	5
Selenium	7782-49-2	**1,500**	BRL	1.3	BRL	1.2	BRL	1.7	BRL	1.4	BRL	1.4
Silver	7440-22-4	**1,500**	BRL	0.3	BRL	0.3	BRL	0.4	BRL	0.4	BRL	0.7
Sodium			**227**	4.9	**108**	46.0	**123**	6.2	**216**	5.2	**507**	5.1
Thallium			BRL	3.0	BRL	2.7	BRL	3.7	BRL	3.1	BRL	3.1
Vanadium			**13.4**	0.3	**10.0**	0.3	**8.1**	0.4	**10.7**	0.4	**19.9**	0.3
Zinc	7440-66-6	**10,000**	**30**	0.3	**12**	0.3	**11**	0.4	**14**	0.4	**223**	3.4

PCBs By SW 8082 (µg/kg)												
PCB-1016			ND	340.0	ND	330.0	ND	390.0	ND	340.0	ND	370.0
PCB-1221			ND	340.0	ND	330.0	ND	390.0	ND	340.0	ND	370.0
PCB-1232			ND	340.0	ND	330.0	ND	390.0	ND	340.0	ND	370.0
PCB-1242			ND	340.0	ND	330.0	ND	390.0	ND	340.0	ND	370.0
PCB-1248			ND	340.0	ND	330.0	ND	390.0	ND	340.0	ND	370.0
PCB-1254			ND	340.0	ND	330.0	ND	390.0	ND	340.0	ND	370.0
PCB-1260			ND	340.0	ND	330.0	ND	390.0	ND	340.0	ND	370.0
PCB-1262			ND	340.0	ND	330.0	ND	390.0	ND	340.0	ND	370.0
PCB-1268			ND	340.0	ND	330.0	ND	390.0	ND	340.0	ND	370.0
Total PCBs	1336-36-3	**1,000**	ND		ND		ND		ND		ND	

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-3 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-3 (15 FT) 6/21/2013 15-16 ft Soil Result	RL	B-3 (30 FT) 6/21/2013 29-30 ft Soil Result	RL	SB1 4/2/2013 4-5 ft Soil Result	RL	SB2 4/2/2013 4-5 ft Soil Result	RL
Metals, Total (mg/kg)												
Aluminum			**6,130**	56	**4,450**	50	**3,260**	53	**7,900**	64	**4,660**	55
Antimony			BRL	4	BRL	3	BRL	4	BRL	4	BRL	4
Arsenic	7440-38-2	**16**	**5.5**	0.7	**1.0**	0.7	BRL	0.7	**21.5**	0.8	**1.4**	0.7
Barium	7440-39-3	**400**	**133.0**	0.4	**50.7**	0.3	**33.1**	0.4	**346.0**	0.4	**36.9**	0.4
Beryllium	7440-41-7	**590**	**0.4**	0.3	**0.4**	0.3	**0.4**	0.3	**0.5**	0.3	BRL	0.3
Cadmium	7440-43-9	**9.3**	**1.8**	0.4	BRL	0.3	BRL	0.4	**2.5**	0.4	BRL	0.4
Calcium			**64,800**	56	**1,250**	5	**1,270**	5	**43,800**	64	**11,100**	55
Chromium	16065-83-1	**1,500**	**26.6**	0.4	**15.4**	0.3	**11.0**	0.4	**32.3**	0.4	**12.8**	0.4
Cobalt			**3.5**	0.4	**3.1**	0.3	**2.6**	0.4	**10.8**	0.4	**2.7**	0.4
Copper	7440-50-8	**270**	**64**	0.4	**10**	0.3	**5**	0.4	**305**	4.2	**13**	0.4
Iron			**16,200**	56	**9,350**	50	**6,650**	5	**40,600**	64	**7,660**	55
Lead	7439-92-1	**1,000**	**863**	3.7	**5**	0.3	**3**	0.4	**1,650**	42.0	**31**	0.4
Magnesium	7439-96-5	**10,000**	**7,140**	56	**1,870**	5	**1,740**	5	**6,130**	64	**3,240**	6
Manganese			**258**	4	**368**	3	**187**	4	**349**	4	**125**	0
Mercury		**2.8**	**0.4**	0.1	BRL	0.1	BRL	0.1	**20.3**	4.0	**5.5**	0.6
Nickel	7440-02-0	**310**	**15.5**	0.4	**17.3**	0.3	**18.3**	0.4	**29.3**	0.4	**10.4**	0.4
Potassium			**1,550**	6	**1,310**	5	**1,070**	5	**1,480**	64	**903**	55
Selenium	7782-49-2	**1,500**	BRL	1.5	BRL	1.3	BRL	1.4	BRL	1.7	BRL	1.5
Silver	7440-22-4	**1,500**	BRL	0.6	BRL	0.3	BRL	0.4	BRL	3.0	BRL	3.0
Sodium			**528**	56.0	**210**	5.0	**72**	5.3	**1,610**	6.4	**497**	5.5
Thallium			BRL	3.3	BRL	3.0	BRL	3.2	BRL	3.8	BRL	3.3
Vanadium			**21.1**	0.4	**16.7**	0.3	**9.6**	0.4	**22.3**	0.4	**11.9**	0.4
Zinc	7440-66-6	**10,000**	**3,140**	37.0	**12**	0.3	**11**	0.4	**968**	4.2	**22**	0.4

PCBs By SW 8082 (µg/kg)												
PCB-1016			ND	360.0	ND	350.0	ND	340.0	ND	390.0	ND	340.0
PCB-1221			ND	360.0	ND	350.0	ND	340.0	ND	390.0	ND	340.0
PCB-1232			ND	360.0	ND	350.0	ND	340.0	ND	390.0	ND	340.0
PCB-1242			ND	360.0	ND	350.0	ND	340.0	ND	390.0	ND	340.0
PCB-1248			ND	360.0	ND	350.0	ND	340.0	ND	390.0	ND	340.0
PCB-1254			ND	360.0	ND	350.0	ND	340.0	ND	390.0	ND	340.0
PCB-1260			ND	360.0	ND	350.0	ND	340.0	ND	390.0	ND	340.0
PCB-1262			ND	360.0	ND	350.0	ND	340.0	ND	390.0	ND	340.0
PCB-1268			ND	360.0	ND	350.0	ND	340.0	ND	390.0	ND	340.0
Total PCBs	1336-36-3	**1,000**	ND		ND		ND		ND		ND	

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-1 (15 FT) 5/14/2013 15-16 ft Soil Result	RL	B-1 (34-35 FT) 5/14/2013 34-35 ft Soil Result	RL	B-1 (42-43 FT) 5/14/2013 42-43 ft Soil Result	RL	B-2 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-2 (15 FT) 6/21/2013 15-16 ft Soil Result	RL
Volatiles By SW8260 (µg/kg)												
1,1,1,2-Tetrachloroethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,1,1-Trichloroethane	71-55-6	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,1,2,2-Tetrachloroethane			ND	2.9	ND	2.2	ND	4.3	ND	3.2	ND	5.2
1,1,2-Trichloroethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,1-Dichloroethane	75-34-3	**240,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,1-Dichloroethene	75-35-4	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,1-Dichloropropene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,2,3-Trichlorobenzene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,2,3-Trichloropropane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,2,4-Trichlorobenzene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,2,4-Trimethylbenzene	95-63-6	**190,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,2-Dibromo-3-chloropropane		**190,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,2-Dibromoethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,2-Dichlorobenzene	95-50-1	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,2-Dichloroethane	107-06-2	**30,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,2-Dichloropropane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,3,5-Trimethylbenzene	108-67-8		ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,3-Dichlorobenzene	541-73-1	**280,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,3-Dichloropropane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
1,4-Dichlorobenzene	106-46-7	**130,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
2,2-Dichloropropane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
2-Chlorotoluene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
2-Hexanone			ND	24.0	ND	19.0	ND	35.0	ND	27.0	ND	43.0
2-Isopropyltoluene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
4-Chlorotoluene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
4-Methyl-2-pentanone			ND	24.0	ND	19.0	ND	35.0	ND	27.0	ND	43.0
Acetone	67-64-1	**500,000**	ND	98.0	ND	74.0	ND	140.0	ND	32.0	ND	52.0
Acrylonitrile			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Benzene	71-43-2	**44,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Bromobenzene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Bromochloromethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Bromodichloromethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Bromoform			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Bromomethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Carbon Disulfide			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-3 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-3 (15 FT) 6/21/2013 15-16 ft Soil Result	RL	B-3 (30 FT) 6/21/2013 29-30 ft Soil Result	RL	SB1 4/2/2013 4-5 ft Soil Result	RL	SB2 4/2/2013 4-5 ft Soil Result	RL
Volatiles By SW8260 (µg/kg)												
1,1,1,2-Tetrachloroethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,1,1-Trichloroethane	71-55-6	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,1,2,2-Tetrachloroethane			ND	3.5	ND	2.5	ND	2.8	ND	4.8	ND	3.1
1,1,2-Trichloroethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,1-Dichloroethane	75-34-3	**240,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,1-Dichloroethene	75-35-4	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,1-Dichloropropene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,2,3-Trichlorobenzene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,2,3-Trichloropropane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,2,4-Trichlorobenzene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,2,4-Trimethylbenzene	95-63-6	**190,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,2-Dibromo-3-chloropropane		**190,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,2-Dibromoethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,2-Dichlorobenzene	95-50-1	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,2-Dichloroethane	107-06-2	**30,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,2-Dichloropropane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,3,5-Trimethylbenzene	108-67-8		ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,3-Dichlorobenzene	541-73-1	**280,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,3-Dichloropropane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
1,4-Dichlorobenzene	106-46-7	**130,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
2,2-Dichloropropane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
2-Chlorotoluene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
2-Hexanone			ND	29.0	ND	20.0	ND	23.0	ND	40.0	ND	26.0
2-Isopropyltoluene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
4-Chlorotoluene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
4-Methyl-2-pentanone			ND	29.0	ND	20.0	ND	23.0	ND	40.0	ND	26.0
Acetone	67-64-1	**500,000**	ND	35.0	ND	25.0	ND	28.0	ND	160.0	ND	100.0
Acrylonitrile			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Benzene	71-43-2	**44,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Bromobenzene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Bromochloromethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Bromodichloromethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Bromoform			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Bromomethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Carbon Disulfide			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-1 (15 FT) 5/14/2013 15-16 ft Soil Result	RL	B-1 (34-35 FT) 5/14/2013 34-35 ft Soil Result	RL	B-1 (42-43 FT) 5/14/2013 42-43 ft Soil Result	RL	B-2 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-2 (15 FT) 6/21/2013 15-16 ft Soil Result	RL
Carbon tetrachloride	56-23-5	**22,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Chlorobenzene	108-90-7	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Chloroethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Chloroform	67-66-3	**350,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Chloromethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
cis-1,2-Dichloroethene	156-59-2	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
cis-1,3-Dichloropropene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Dibromochloromethane			ND	2.9	ND	2.2	ND	4.3	ND	3.2	ND	5.2
Dibromomethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Dichlorodifluoromethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Ethylbenzene	100-41-4	**390,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Hexachlorobutadiene	118-74-1	**6,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Isopropylbenzene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
m&p-Xylene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Methyl Ethyl Ketone	78-93-3	**500,000**	ND	29.0	ND	22.0	ND	43.0	ND	32.0	NS	52.0
Methyl t-butyl ether (MTBE)	1634-04-4	**500,000**	ND	9.8	ND	7.4	ND	14.0	ND	11.0	ND	17.0
Methylene chloride	75-09-2	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Naphthalene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
n-Butylbenzene	104-51-8	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
n-Propylbenzene	103-65-1	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
o-Xylene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
p-Isopropyltoluene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
sec-Butylbenzene	135-98-8	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Styrene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
tert-Butylbenzene	98-06-6	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Tetrachloroethene	127-18-4	**150,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Tetrahydrofuran (THF)			ND	9.8	ND	7.4	ND	14.0	ND	11.0	ND	17.0
Toluene	108-88-3	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Total Xylenes	1330-20-7	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
trans-1,2-Dichloroethene	156-60-5	**500,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
trans-1,3-Dichloropropene			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
trans-1,4-dichloro-2-butene			ND	9.8	ND	7.4	ND	14.0	ND	11.0	ND	17.0
Trichloroethene	79-01-6	**200,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Trichlorofluoromethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Trichlorotrifluoroethane			ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7
Vinyl chloride	75-01-4	**13,000**	ND	4.9	ND	3.7	ND	7.1	ND	5.3	ND	8.7

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-3 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-3 (15 FT) 6/21/2013 15-16 ft Soil Result	RL	B-3 (30 FT) 6/21/2013 29-30 ft Soil Result	RL	SB1 4/2/2013 4-5 ft Soil Result	RL	SB2 4/2/2013 4-5 ft Soil Result	RL
Carbon tetrachloride	56-23-5	**22,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Chlorobenzene	108-90-7	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Chloroethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Chloroform	67-66-3	**350,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Chloromethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
cis-1,2-Dichloroethene	156-59-2	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
cis-1,3-Dichloropropene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Dibromochloromethane			ND	3.5	ND	2.5	ND	2.8	ND	4.8	ND	3.1
Dibromomethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Dichlorodifluoromethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Ethylbenzene	100-41-4	**390,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Hexachlorobutadiene	118-74-1	**6,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Isopropylbenzene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
m&p-Xylene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Methyl Ethyl Ketone	78-93-3	**500,000**	ND	35.0	ND	25.0	ND	28.0	ND	48.0	ND	31.0
Methyl t-butyl ether (MTBE)	1634-04-4	**500,000**	ND	12.0	ND	8.2	ND	9.4	ND	16.0	ND	10.0
Methylene chloride	75-09-2	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Naphthalene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
n-Butylbenzene	104-51-8	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
n-Propylbenzene	103-65-1	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
o-Xylene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
p-Isopropyltoluene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
sec-Butylbenzene	135-98-8	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Styrene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
tert-Butylbenzene	98-06-6	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Tetrachloroethene	127-18-4	**150,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Tetrahydrofuran (THF)			ND	12.0	ND	8.2	ND	9.4	ND	16.0	ND	10.0
Toluene	108-88-3	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Total Xylenes	1330-20-7	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
trans-1,2-Dichloroethene	156-60-5	**500,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
trans-1,3-Dichloropropene			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
trans-1,4-dichloro-2-butene			ND	12.0	ND	8.2	ND	9.4	ND	16.0	ND	10.0
Trichloroethene	79-01-6	**200,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Trichlorofluoromethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Trichlorotrifluoroethane			ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2
Vinyl chloride	75-01-4	**13,000**	ND	5.8	ND	4.1	ND	4.7	ND	8.0	ND	5.2

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-1 (15 FT) 5/14/2013 15-16 ft Soil Result	RL	B-1 (34-35 FT) 5/14/2013 34-35 ft Soil Result	RL	B-1 (42-43 FT) 5/14/2013 42-43 ft Soil Result	RL	B-2 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-2 (15 FT) 6/21/2013 15-16 ft Soil Result	RL
Semivolatiles By SW 8270 (µg/kg)												
1,2,4,5-Tetrachlorobenzene		**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
1,2,4-Trichlorobenzene		**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
1,2-Dichlorobenzene		**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
1,2-Diphenylhydrazine		**500,000**	ND	350	ND	340	ND	390	ND	340	ND	370
1,3-Dichlorobenzene		**5,600**	ND	240	ND	240	ND	270	ND	240	ND	260
1,4-Dichlorobenzene		**5,600**	ND	240	ND	240	ND	270	ND	240	ND	260
2,4,5-Trichlorophenol		**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
2,4,6-Trichlorophenol		**56,000**	ND	240	ND	240	ND	270	ND	240	ND	260
2,4-Dichlorophenol		**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
2,4-Dimethylphenol		**56,000**	ND	240	ND	240	ND	270	ND	240	ND	260
2,4-Dinitrophenol		**1,000**	ND	550	ND	540	ND	620	ND	540	ND	590
2,4-Dinitrotoluene		**560**	ND	240	ND	240	ND	270	ND	240	ND	260
2,6-Dinitrotoluene		**5,600**	ND	240	ND	240	ND	270	ND	240	ND	260
2-Chloronaphthalene		**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
2-Chlorophenol		**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
2-Methylnaphthalene		**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
2-Methylphenol (o-cresol)	95-48-7	**6,700**	ND	240	ND	240	ND	270	ND	240	ND	260
2-Nitroaniline		**500,000**	ND	550	ND	540	ND	620	ND	540	ND	590
2-Nitrophenol			ND	240	ND	240	ND	270	ND	240	ND	260
3&4-Methylphenol (m&p-cresol)	106-44-5; 108-39-4		ND	350	ND	340	ND	390	ND	340	ND	370
3,3'-Dichlorobenzidine			ND	240	ND	240	ND	270	ND	240	ND	260
3-Nitroaniline			ND	550	ND	540	ND	620	ND	540	ND	590
4,6-Dinitro-2-methylphenol			ND	1,000	ND	980	ND	1,100	ND	980	ND	1,100
4-Bromophenyl phenyl ether			ND	350	ND	340	ND	390	ND	340	ND	370
4-Chloro-3-methylphenol			ND	240	ND	240	ND	270	ND	240	ND	260
4-Chloroaniline			ND	240	ND	240	ND	270	ND	240	ND	260
4-Chlorophenyl phenyl ether			ND	240	ND	240	ND	270	ND	240	ND	260
4-Nitroaniline			ND	550	ND	540	ND	620	ND	540	ND	590
4-Nitrophenol			ND	1,000	ND	980	ND	1,100	ND	980	ND	1,100
Acenaphthene	83-32-9	**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
Acenaphthylene	208-96-8	**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
Acetophenone			ND	240	ND	240	ND	270	ND	240	ND	260
Aniline			ND	1,000	ND	980	ND	1,100	ND	980	ND	1,100
Anthracene	120-12-7	**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
Benz(a)anthracene	56-55-3	**1,000**	ND	240	ND	240	ND	270	ND	240	**400**	260
Benzidine			ND	420	ND	410	ND	470	ND	400	ND	450

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-3 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-3 (15 FT) 6/21/2013 15-16 ft Soil Result	RL	B-3 (30 FT) 6/21/2013 29-30 ft Soil Result	RL	SB1 4/2/2013 4-5 ft Soil Result	RL	SB2 4/2/2013 4-5 ft Soil Result	RL
Semivolatiles By SW 8270 (µg/kg)												
1,2,4,5-Tetrachlorobenzene		**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
1,2,4-Trichlorobenzene		**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
1,2-Dichlorobenzene		**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
1,2-Diphenylhydrazine		**500,000**	ND	1,800	ND	350	ND	340	ND	4,000	ND	350
1,3-Dichlorobenzene		**5,600**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
1,4-Dichlorobenzene		**5,600**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2,4,5-Trichlorophenol		**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2,4,6-Trichlorophenol		**56,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2,4-Dichlorophenol		**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2,4-Dimethylphenol		**56,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2,4-Dinitrophenol		**1,000**	ND	2,900	ND	560	ND	550	ND	6,400	ND	550
2,4-Dinitrotoluene		**560**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2,6-Dinitrotoluene		**5,600**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2-Chloronaphthalene		**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2-Chlorophenol		**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2-Methylnaphthalene		**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2-Methylphenol (o-cresol)	95-48-7	**6,700**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
2-Nitroaniline		**500,000**	ND	2,900	ND	560	ND	550	ND	6,400	ND	550
2-Nitrophenol			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
3&4-Methylphenol (m&p-cresol)	106-44-5; 108-39-4		ND	1,800	ND	350	ND	340	ND	4,000	ND	350
3,3'-Dichlorobenzidine			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
3-Nitroaniline			ND	2,900	ND	560	ND	550	ND	6,400	ND	550
4,6-Dinitro-2-methylphenol			ND	5,300	ND	1,000	ND	990	ND	12,000	ND	1,000
4-Bromophenyl phenyl ether			ND	1,800	ND	350	ND	340	ND	4,000	ND	350
4-Chloro-3-methylphenol			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
4-Chloroaniline			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
4-Chlorophenyl phenyl ether			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
4-Nitroaniline			ND	2,900	ND	560	ND	550	ND	6,400	ND	550
4-Nitrophenol			ND	5,300	ND	1,000	ND	990	ND	12,000	ND	1,000
Acenaphthene	83-32-9	**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Acenaphthylene	208-96-8	**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Acetophenone			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Aniline			ND	5,300	ND	1,000	ND	990	ND	12,000	ND	1,000
Anthracene	120-12-7	**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Benz(a)anthracene	56-55-3	**1,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Benzidine			ND	2,200	ND	420	ND	410	ND	4,800	ND	420

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-1 (15 FT) 5/14/2013 15-16 ft Soil Result	RL	B-1 (34-35 FT) 5/14/2013 34-35 ft Soil Result	RL	B-1 (42-43 FT) 5/14/2013 42-43 ft Soil Result	RL	B-2 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-2 (15 FT) 6/21/2013 15-16 ft Soil Result	RL
Benzo(a)pyrene	50-32-8	**1,000**	ND	240	ND	240	ND	270	ND	240	**280**	260
Benzo(b)fluoranthene	205-99-2	**5,600**	ND	240	ND	240	ND	270	ND	240	**350**	260
Benzo(ghi)perylene	191-24-2	**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
Benzo(k)fluoranthene	207-08-9	**56,000**	ND	240	ND	240	ND	270	ND	240	ND	260
Benzoic acid			ND	1,000	ND	980	ND	1,100	ND	980	ND	1,100
Benzyl butyl phthalate			ND	240	ND	240	ND	270	ND	240	ND	260
Bis(2-chloroethoxy)methane			ND	240	ND	240	ND	270	ND	240	ND	260
Bis(2-chloroethyl)ether			ND	350	ND	340	ND	390	ND	340	ND	370
Bis(2-chloroisopropyl)ether			ND	240	ND	240	ND	270	ND	240	ND	260
Bis(2-ethylhexyl)phthalate			ND	240	ND	240	ND	270	ND	240	ND	260
Carbazole			ND	520	ND	510	ND	580	ND	510	ND	560
Chrysene	218-01-9	**56,000**	ND	240	ND	240	ND	270	ND	240	**410**	260
Dibenz(a,h)anthracene	53-70-3	**560**	ND	240	ND	240	ND	270	ND	240	ND	260
Dibenzofuran			ND	240	ND	240	ND	270	ND	240	ND	260
Diethyl phthalate			ND	240	ND	240	ND	270	ND	240	ND	260
Dimethylphthalate			ND	240	ND	240	ND	270	ND	240	ND	260
Di-n-butylphthalate			ND	240	ND	240	ND	270	ND	240	ND	260
Di-n-octylphthalate			ND	240	ND	240	ND	270	ND	240	ND	260
Fluoranthene	206-44-0	**500,000**	ND	240	ND	240	ND	270	ND	240	**780**	260
Fluorene	86-73-7	**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
Hexachlorobenzene			ND	240	ND	240	ND	270	ND	240	ND	260
Hexachlorobutadiene			ND	240	ND	240	ND	270	ND	240	ND	260
Hexachlorocyclopentadiene			ND	240	ND	240	ND	270	ND	240	ND	260
Hexachloroethane			ND	240	ND	240	ND	270	ND	240	ND	260
Indeno(1,2,3-cd)pyrene	193-39-5	**5,600**	ND	240	ND	240	ND	270	ND	240	ND	260
Isophorone			ND	240	ND	240	ND	270	ND	240	ND	260
Naphthalene	91-20-3	**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
Nitrobenzene			ND	240	ND	240	ND	270	ND	240	ND	260
N-Nitrosodimethylamine			ND	350	ND	340	ND	390	ND	340	ND	370
N-Nitrosodi-n-propylamine			ND	240	ND	240	ND	270	ND	240	ND	260
N-Nitrosodiphenylamine			ND	350	ND	340	ND	390	ND	340	ND	370
Pentachloronitrobenzene			ND	350	ND	340	ND	390	ND	340	ND	370
Pentachlorophenol	87-86-5	**6,700**	ND	350	ND	340	ND	390	ND	340	ND	370
Phenanthrene	85-01-8	**500,000**	ND	240	ND	240	ND	270	ND	240	**800**	260
Phenol	108-95-2	**500,000**	ND	240	ND	240	ND	270	ND	240	ND	260
Pyrene	129-00-0	**500,000**	ND	240	ND	240	ND	270	ND	240	**740**	260
Pyridine			ND	350	ND	340	ND	390	ND	340	ND	370

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-3 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-3 (15 FT) 6/21/2013 15-16 ft Soil Result	RL	B-3 (30 FT) 6/21/2013 29-30 ft Soil Result	RL	SB1 4/2/2013 4-5 ft Soil Result	RL	SB2 4/2/2013 4-5 ft Soil Result	RL
Benzo(a)pyrene	50-32-8	**1,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Benzo(b)fluoranthene	205-99-2	**5,600**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Benzo(ghi)perylene	191-24-2	**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Benzo(k)fluoranthene	207-08-9	**56,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Benzoic acid			ND	5,300	ND	1,000	ND	990	ND	12,000	ND	1,000
Benzyl butyl phthalate			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Bis(2-chloroethoxy)methane			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Bis(2-chloroethyl)ether			ND	1,800	ND	350	ND	340	ND	4,000	ND	350
Bis(2-chloroisopropyl)ether			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Bis(2-ethylhexyl)phthalate			ND	1,300	ND	240	ND	240	ND	2,800	**270**	240
Carbazole			ND	2,700	ND	520	ND	510	ND	6,000	ND	520
Chrysene	218-01-9	**56,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Dibenz(a,h)anthracene	53-70-3	**560**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Dibenzofuran			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Diethyl phthalate			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Dimethylphthalate			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Di-n-butylphthalate			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Di-n-octylphthalate			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Fluoranthene	206-44-0	**500,000**	**1,400**	1,300	ND	240	ND	240	ND	2,800	ND	240
Fluorene	86-73-7	**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Hexachlorobenzene			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Hexachlorobutadiene			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Hexachlorocyclopentadiene			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Hexachloroethane			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Indeno(1,2,3-cd)pyrene	193-39-5	**5,600**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Isophorone			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Naphthalene	91-20-3	**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Nitrobenzene			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
N-Nitrosodimethylamine			ND	1,800	ND	350	ND	340	ND	4,000	ND	350
N-Nitrosodi-n-propylamine			ND	1,300	ND	240	ND	240	ND	2,800	ND	240
N-Nitrosodiphenylamine			ND	1,800	ND	350	ND	340	ND	4,000	ND	350
Pentachloronitrobenzene			ND	1,800	ND	350	ND	340	ND	4,000	ND	350
Pentachlorophenol	87-86-5	**6,700**	ND	1,800	ND	350	ND	340	ND	4,000	ND	350
Phenanthrene	85-01-8	**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Phenol	108-95-2	**500,000**	ND	1,300	ND	240	ND	240	ND	2,800	ND	240
Pyrene	129-00-0	**500,000**	**1,400**	1,300	ND	240	ND	240	ND	2,800	ND	240
Pyridine			ND	1,800	ND	350	ND	340	ND	4,000	ND	350

Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-1 (15 FT) 5/14/2013 15-16 ft Soil Result	RL	B-1 (34-35 FT) 5/14/2013 34-35 ft Soil Result	RL	B-1 (42-43 FT) 5/14/2013 42-43 ft Soil Result	RL	B-2 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-2 (15 FT) 6/21/2013 15-16 ft Soil Result	RL
Pesticides By SW8081 (µg/kg)												
4,4' -DDD	72-55-9	**62,000**	ND	33.0	ND	32.0	ND	38.0	ND	33.0	ND	36.0
4,4' -DDE	50-29-3	**47,000**	ND	33.0	ND	32.0	ND	38.0	ND	33.0	ND	36.0
4,4' -DDT	72-54-8	**92,000**	ND	33.0	ND	32.0	ND	38.0	ND	33.0	ND	36.0
a-BHC	319-84-6	**3,400**	ND	16.0	ND	16.0	ND	19.0	ND	16.0	ND	18.0
Alachlor			ND	16.0	ND	16.0	ND	19.0	ND	16.0	ND	18.0
Aldrin	309-00-2	**680**	ND	5.1	ND	5.0	ND	5.9	ND	5.1	ND	5.6
b-BHC	319-85-7	**3,000**	ND	16.0	ND	16.0	ND	19.0	ND	16.0	ND	18.0
Chlordane	5103-71-9	**24,000**	ND	51.0	ND	50.0	ND	59.0	ND	51.0	ND	56.0
d-BHC	319-86-8	**500,000**	ND	16.0	ND	16.0	ND	19.0	ND	16.0	ND	18.0
Dieldrin	60-57-1	**1,400**	ND	5.1	ND	5.0	ND	5.9	ND	5.1	ND	5.6
Endosulfan I	959-98-8	**200,000**	ND	16.0	ND	16.0	ND	19.0	ND	16.0	ND	18.0
Endosulfan II	33213-65-9	**200,000**	ND	33.0	ND	32.0	ND	38.0	ND	33.0	ND	36.0
Endosulfan sulfate	1031-07-8	**200,000**	ND	33.0	ND	32.0	ND	38.0	ND	33.0	ND	36.0
Endrin	72-20-8	**89,000**	ND	33.0	ND	32.0	ND	38.0	ND	33.0	ND	36.0
Endrin aldehyde			ND	33.0	ND	32.0	ND	38.0	ND	33.0	ND	36.0
Endrin ketone			ND	33.0	ND	32.0	ND	38.0	ND	33.0	ND	36.0
g-BHC (Lindane)	58-89-9	**9,200**	ND	5.1	ND	5.0	ND	5.9	ND	5.1	ND	5.6
Heptachlor	76-44-8	**15,000**	ND	10.0	ND	10.0	ND	12.0	ND	10.0	ND	11.0
Heptachlor epoxide			ND	16.0	ND	16.0	ND	19.0	ND	16.0	ND	18.0
Methoxychlor			ND	160.0	ND	160.0	ND	190.0	ND	160.0	ND	180.0
Toxaphene			ND	160.0	ND	160.0	ND	190.0	ND	160.0	ND	180.0

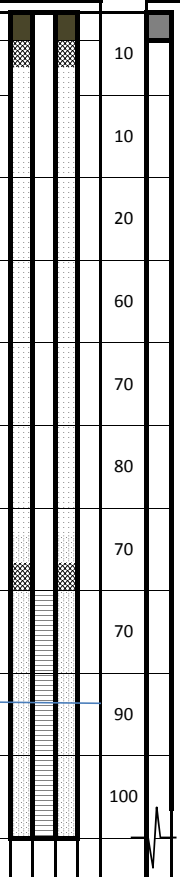
Soil Analytical Data Summary

Detections Highlighted in Blue	CAS No.	Commercial Soil Clean-up Objective / Exceedance Highlight	B-3 (5 FT) 6/21/2013 5-6 ft Soil Result	RL	B-3 (15 FT) 6/21/2013 15-16 ft Soil Result	RL	B-3 (30 FT) 6/21/2013 29-30 ft Soil Result	RL	SB1 4/2/2013 4-5 ft Soil Result	RL	SB2 4/2/2013 4-5 ft Soil Result	RL
Pesticides By SW8081 (µg/kg)												
4,4' -DDD	72-55-9	**62,000**	ND	34.0	ND	33.0	ND	33.0	ND*	190.0	ND	33.0
4,4' -DDE	50-29-3	**47,000**	ND	34.0	ND	33.0	ND	33.0	ND*	190.0	ND	33.0
4,4' -DDT	72-54-8	**92,000**	ND	34.0	ND	33.0	ND	33.0	ND*	190.0	ND	33.0
a-BHC	319-84-6	**3,400**	ND	17.0	ND	17.0	ND	16.0	ND*	93.0	ND	16.0
Alachlor			ND	17.0	ND	17.0	ND	16.0	ND*	93.0	ND	16.0
Aldrin	309-00-2	**680**	ND	5.4	ND	5.2	ND	5.1	ND*	29.0	ND	5.1
b-BHC	319-85-7	**3,000**	ND	17.0	ND	17.0	ND	16.0	ND*	93.0	ND	16.0
Chlordane	5103-71-9	**24,000**	ND	54.0	ND	52.0	ND	51.0	ND*	290.0	ND	51.0
d-BHC	319-86-8	**500,000**	ND	17.0	ND	17.0	ND	16.0	ND*	93.0	ND	16.0
Dieldrin	60-57-1	**1,400**	ND	5.4	ND	5.2	ND	5.1	ND*	29.0	ND	5.1
Endosulfan I	959-98-8	**200,000**	ND	17.0	ND	17.0	ND	16.0	ND*	93.0	ND	16.0
Endosulfan II	33213-65-9	**200,000**	ND	34.0	ND	33.0	ND	33.0	ND*	190.0	ND	33.0
Endosulfan sulfate	1031-07-8	**200,000**	ND	34.0	ND	33.0	ND	33.0	ND*	190.0	ND	33.0
Endrin	72-20-8	**89,000**	ND	34.0	ND	33.0	ND	33.0	ND*	190.0	ND	33.0
Endrin aldehyde			ND	34.0	ND	33.0	ND	33.0	ND*	190.0	ND	33.0
Endrin ketone			ND	34.0	ND	33.0	ND	33.0	ND*	190.0	ND	33.0
g-BHC (Lindane)	58-89-9	**9,200**	ND	5.4	ND	5.2	ND	5.1	ND*	29.0	ND	5.1
Heptachlor	76-44-8	**15,000**	ND	11.0	ND	10.0	ND	10.0	ND*	58.0	ND	10.0
Heptachlor epoxide			ND	17.0	ND	17.0	ND	16.0	ND*	93.0	ND	16.0
Methoxychlor			ND	170.0	ND	170.0	ND	160.0	ND*	930.0	ND	160.0
Toxaphene			ND	170.0	ND	170.0	ND	160.0	ND*	930.0	ND	160.0

Appendix A

Soil Boring Geologic Logs

Client:	**Paco Lafyette**		Boring No:
Project:	**Lafayette Avenue**		**B-1**
Location:	**300 Lafayette Avenue, NY, NY**		
Drilling Contractor:	J.C. Broderick	Logged By:	CPT
Drilling Method:	Geoprobe 7720DT	Date Started:	5/14/2013
Sampling Method:	Split Spoon	Date Completed:	5/14/2013



Sample Number	Recovery (%)	Depth (ft)	PID	Symbol	Soil Description and Remarks	
	10	0	0.0	GM	FILL: Red Brick Granite, Sandy Gravel (Bluestone w/ Coarse sand)	
	10	5	0.0	GM	FILL: Red Brick Granite, Sandy Gravel (Bluestone w/ silty sand)	
B1 (15 FT)	20	10	0.0	GM SP	FILL: Silty Sand w/ Gravel to 14' Brown Coarse SAND 14' to 15', Native Soil	Soil Sample 14' to 15'
	60	15	0.0	SM	Brown Coarse SAND, Silt	
	70	20	0.0	SM	Brown Coarse SAND, silt (intermitant silt layers)	
	80	25	0.0	SP	Brown Coarse SAND	
B1 (34-35 FT)	70	30	0.0	SM	Medium to Coarse SAND, little silt	Soil Sample 34' to 35'
	70	35	0.0	SM	Medium to Coarse SAND, little silt	
B1 (42-43 FT)	90	40	0.0	SM	Medium SAND, some silt, Groundwater at 42'	Soil Sample 42' to 43'
	100	45	0.0	SM SP	Medium SAND, some silt 45' to 48' Coarse SAND 48' to 50' End of boring @ 50'	
		50				

PID: Photoionization detector

Well screen

Casing

Bentonite

Clean Sand

Filter sand

Client:		**Paco Lafyette**	Boring No: **B-2**
Project:		**Lafayette Avenue**	
Location:		**300 Lafayette Avenue, NY, NY**	
Drilling Contractor:	J.C. Broderick	Logged By:	CPT
Drilling Method:	Geoprobe 7720DT	Date Started:	6/21/2013
Sampling Method:	Split Spoon	Date Completed:	6/21/2013

Sample Number	Blow Counts	Well Construction	Recovery (%)	Depth (ft)	PID	Symbol	Soil Description and Remarks	
				0				
			15		0.0	SP	FILL: Brown Medium Sand, gravel (Crushed Red Brick Granite)	
			5	5	0.0	SP	FILL: Brown Medium Sand, gravel (Crushed Red Brick Granite)	
			20	10	0.0	SP	FILL: Brown Medium Sand, gravel (Crushed Red Brick Granite)	
S1			10	15	0.0	SM	Brown Medium Sand, some silt, gravel	Soil Sample 19' to 20'
			0	20	0.0		No Recovery	
V1			0	25	0.0		No Recovery Refusal at 30'; End of boring @ 30'	Vapor Sample 30'
				30				

PID: Photoionization detector

Client:		**Paco Lafyette**	Boring No: **B-3**
Project:		**Lafayette Avenue**	
Location:		**300 Lafayette Avenue, NY, NY**	
Drilling Contractor:	J.C. Broderick	Logged By:	CPT
Drilling Method:	Geoprobe 7720DT	Date Started:	6/21/2013
Sampling Method:	Split Spoon	Date Completed:	6/21/2013

Sample Number	Recovery (%)	Depth (ft)	PID	Symbol	Soil Description and Remarks
		0			
	2		0.0	GP	FILL: Sandy gravel (Crushed Red Brick, w/ weathered concrete)
S1	5	5	0.0	GP	FILL: Sandy gravel (Crushed Red Brick, w/ weathered concrete) Soil Sample 5' to 6'
	25	10	0.0	GM	FILL: Sandy gravel (Crushed Red Brick, w/ weathered concrete)
S2	60	15	0.0	SP	Brown Medium SAND; Native Soil Soil Sample 15' to 16'
	50	20	0.0	SM	Brown Medium SAND, some silt
	50	25	0.0	SM	Brown Coarse to Fine Silty SAND
V1		30			End of boring @ 30'; Vapor Sample 30'

PID: Photoionization detector

Client:	**Paco Lafyette**		Boring No:
Project:	**Lafayette Avenue**		**SB-1**
Location:	**300 Lafayette Avenue, NY, NY**		
Drilling Contractor:	ASR	Logged By:	R. Levato
Drilling Method:	Bosch 11245 EVS	Date Started:	4/2/2013
Sampling Method:	Split Spoon	Date Completed:	4/2/2013

Sample Number	Recovery (%)	Depth (ft)	PID	Symbol	Soil Description and Remarks
		0			
			0.0		Concrete Floor 10"
		1	0.0	GP	FILL: Brown sandy gravel
		2	0.0	SP	Brown coarse SAND, gravel
		3	9.2	SP	Brown coarse to medium SAND, some gravel
SB1 VP1		4 5	6.0	SP	Brown fine to medium SAND, some gravel, loose — Soil Sample 4' to 5' Vapor Sample 5'

PID: Photoionization detector

Client:	**Paco Lafyette**		Boring No: **SB-2**
Project:	**Lafayette Avenue**		
Location:	**300 Lafayette Avenue, NY, NY**		
Drilling Contractor:	ASR	Logged By:	R. Levato
Drilling Method:	Bosch 11245 EVS	Date Started:	4/2/2013
Sampling Method:	Split Spoon	Date Completed:	4/2/2013

Sample Number	Recovery (%)	Depth (ft)	PID	Symbol	Soil Description and Remarks
		0			
			0.0		Concrete Floor 10"
		1	0.0	GP	FILL: Brown sandy gravel (w/ weathered concrete)
		2	0.0	SM	Orange fine SAND
		3	0.0	SM	Orange fine SAND
SB2		4	0.0	SM	Orange fine SAND Soil Sample 4' to 5'
		5			

PID: Photoionization detector

Project: Gasoline Service Station **Project Location: 21 E. Houston Street, New York , New York** **Project Number:**	**Log of Boring MW-1** Sheet 1 of 2 (EMW-1)

Date(s) Drilled	**January 17, 2006**	Logged By	**Anthony Addesso**	Checked By	**S. Muller**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**4 3/4 inch Auger**	Total Depth of Borehole	**50 feet bgs**
Drill Rig Type	**Canterra**	Drilling Contractor	**Miller Environmental**	Approximate Surface Elevation	**42 feet MSL**
Groundwater Level and Date Measured	**43.38 feet ATD**	Sampling Method(s)	**Grab**	Hammer Data	
Borehole Backfill	**Cuttings**	Location	**Northeast Property line.**		

Elevation, feet	Depth, feet	Sample Type	Sample Number	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines	PID Reading, ppm	Well Log	REMARKS AND OTHER TESTS
42	0					AC		Asphalt and base material.						
						SM		SAND, light brown, medium to fine, dry.						
						SM		SILTY SAND, brown.						
37	5					SM		SILTY SAND, very fine-grained, brown, poorly graded.						
						SM		SILTY SAND, fine grained, light tan, dry.						
32	10					SW		SILTY SAND, light brown, some coarse sand, dry.						
27	15					SW		SILTY SAND, brown medium to coarse.						
22	20													
17	25													
12	30													

Figure

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Project: Gasoline Service Station
Project Location: 21 E. Houston Street, New York , New York
Project Number:

Log of Boring MW-1

Sheet 2 of 2

Elevation, feet	Depth, feet	Sample Type	Sample Number	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines	PID Reading, ppm	Well Log	REMARKS AND OTHER TESTS
12	30					SW		SILTY SAND, brown medium to coarse. (cont.)						
7	35													
2	40													Composite of auger
								(ATD) ▽						
-3	45		MW-1									0.0		
-8	50					NONE		Bottom of Boring at 50 feet bgs						
-13	55													
-18	60													
-23	65													

Figure

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Project: Gasoline Service Station **Project Location: 21 E. Houston Street, New York , New York** **Project Number:**	**Log of Boring MW-2** Sheet 1 of 2 (EMW-2)

Date(s) Drilled	**January 17, 2006**	Logged By	**Anthony Addesso**	Checked By	**S. Muller**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**4 3/4 inch Auger**	Total Depth of Borehole	**50 feet bgs**
Drill Rig Type	**Canterra**	Drilling Contractor	**Miller Environmental**	Approximate Surface Elevation	**42 feet MSL**
Groundwater Level and Date Measured	**43.22 feet ATD**	Sampling Method(s)	**Grab**	Hammer Data	
Borehole Backfill	**Cuttings**	Location	**Southwestern Property line.**		

Elevation, feet	Depth, feet	Sample Type	Sample Number	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines	PID Reading, ppm	Well Log	REMARKS AND OTHER TESTS
42	0					AC		Asphalt and base material.						
						SM		SAND, light brown, medium to fine, dry.						
						SM		SILTY SAND, brown.						
37	5					SM		SILTY SAND, very fine-grained, brown, poorly graded.						
						SM		SILTY SAND, fine grained, light tan, dry.						
32	10					SW		SILTY SAND, light brown, some coarse sand, dry.						
27	15					SW		SILTY SAND, brown medium to coarse.						
22	20													
17	25													
12	30													

Figure

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Project: Gasoline Service Station
Project Location: 21 E. Houston Street, New York , New York
Project Number:

Log of Boring MW-2

Sheet 2 of 2

Elevation, feet	Depth, feet	Sample Type	Sample Number	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines	PID Reading, ppm	Well Log	REMARKS AND OTHER TESTS
12	30					SW		SILTY SAND, brown medium to coarse. (cont.)						
7	35													
2	40													Composite of auger
								(ATD) ▽						
-3	45		MW-2									0.0		
-8	50					NONE		Bottom of Boring at 50 feet bgs						
-13	55													
-18	60													
-23	65													

Figure

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Project: Gasoline Service Station **Project Location: 21 E. Houston Street, New York , New York** **Project Number:**	**Log of Boring MW-3** Sheet 1 of 2 (EMW-3)

Date(s) Drilled	**January 17, 2006**	Logged By	**Anthony Addesso**	Checked By	**S. Muller**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**4 3/4 inch Auger**	Total Depth of Borehole	**50 feet bgs**
Drill Rig Type	**Canterra**	Drilling Contractor	**Miller Environmental**	Approximate Surface Elevation	**42 feet MSL**
Groundwater Level and Date Measured	**43.55 feet ATD**	Sampling Method(s)	**Grab**	Hammer Data	
Borehole Backfill	**Cuttings**	Location	**Northwestern Property line.**		

Elevation, feet	Depth, feet	Sample Type	Sample Number	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines	PID Reading, ppm	Well Log	REMARKS AND OTHER TESTS
42	0					AC		Asphalt and base material.						
						SM		SAND, light brown, medium to fine, dry.						
						SM		SILTY SAND, brown.						
37	5					SM		SILTY SAND, very fine-grained, brown, poorly graded.						
						SM		SILTY SAND, fine grained, light tan, dry.						
32	10					SW		SILTY SAND, light brown, some coarse sand, dry.						
27	15					SW		SILTY SAND, brown medium to coarse.						
22	20													
17	25													
12	30													

Figure

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Project: Gasoline Service Station
Project Location: 21 E. Houston Street, New York , New York
Project Number:

Log of Boring MW-3

Sheet 2 of 2

Elevation, feet	Depth, feet	Sample Type	Sample Number	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines	PID Reading, ppm	Well Log	REMARKS AND OTHER TESTS
12	30					SW		SILTY SAND, brown medium to coarse. (cont.)						
7	35													
2	40													Composite of auger
								(ATD) ▽						
-3	45		MW-3									0.0		
-8	50					NONE		Bottom of Boring at 50 feet bgs						
-13	55													
-18	60													
-23	65													

Figure

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Appendix B

Soil Analytical Data

(Provided in Electronic Form Only)

Appendix C

Groundwater Analytical Data

(Provided in Electronic Form Only)

Appendix D

Groundwater Analytical Data

(Provided in Electronic Form Only)

Appendix E

Geotechnical Report

GEOTECHNICAL INVESTIGATION
AT
300 LAFAYETTE STREET
NEW YORK, NEW YORK

LargaVista Companies
364 Maspeth Avenue
Brooklyn, NY 11211

Mueser Rutledge Consulting Engineers
14 Penn Plaza – 225 West 34th Street
New York, NY 10122

February 1, 2011

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Director of Finance and Administration

Martha J. Huguet
Director of Marketing

February 1, 2011

LargaVista Companies
364 Maspeth Avenue
Brooklyn, NY 11211

Attention: Mr. Marcello Porcelli, President

Re: Geotechnical Investigation
300 Lafayette Street
New York, NY
MRCE File No. 11476

Gentlemen:

In accordance with our proposal dated March 18, 2010, Mueser Rutledge Consulting Engineers (MRCE) has completed the geotechnical investigation at the 300 Lafayette Street project site. This report summarizes our field investigation and presents a summary of the results along with our interpretation and recommendations.

1. EXHIBITS

The following Exhibits are attached to illustrate our Report:

Figure No. 1	Historic Maps
Drawing No. B-1	Boring Location Plan
Drawing No. GS-1	Geologic Section A-A
Drawing No. GS-2	Geologic Section B-B
Drawing No. GS-R	Geotechnical Reference Standards
Drawing No. RC-1	Rock Core Classification Criteria
Appendix A	MRCE Boring Logs
Appendix B	Logs of Previous Monitoring Wells

2. PROJECT DESCRIPTION AND SITE HISTORY

The project site consists of the north portion of the block bounded by Crosby, East Houston, Lafayette and Jersey Streets in Manhattan, New York. The site consists of

Lots 38, 39, and 40 of Block 510.

Currently the site contains a gasoline/service station along East Houston Street on Lot 40. The gas station includes a canopy covering the gas pumps and a store at the south side of the lot. Lot 39 is occupied by a one-story building serving as a car wash. Lot 38 is occupied by a one-story building containing a bar. New York City Transit (NYCT) subways underlie both Houston and Lafayette Streets.

Historical maps and land books indicate that Lot 40 once extended further north and contained a 7-story building. Five and 6-story buildings once occupied Lots 38 and 39. Between 1927 and 1934, the 5 to 7-story structures were demolished and Houston Street was widened, perhaps to allow construction of the subway. Portions of historic Manhattan Landbook Plates which show the project site are shown on Figure No.1.

The B/D/F/M NYCT subway line runs below East Houston Street. The Broadway/Lafayette Station extends along East Houston between Mercer and Lafayette Streets. The station underlies a portion of the sidewalk along the north side of the project site and there are entrances from the sidewalk. The 4, 5, and 6 subway line runs beneath Lafayette Street and crosses above the Houston Street subway. There is connection between the Bleeker Street Station to the north and the Broadway-Lafayette Street Station.

Subway tunnels are shown on Drawing Nos. B-1, GS-1 and GS-2. CAD rendering of the subway structures was provided by FNA Associates in Fairfield, NJ. They reported that drawings for the subway tunnel below Lafayette Street were not available, so the information shown on the drawings was extrapolated from other sections of the 4/5/6 tunnels.

We understand that the proposed development includes a new building occupying the entire site. The building will consist of 8 floors plus a mechanical floor on top the building. We understand that a single basement is being considered.

3. EXISTING GROUND SURFACE ELEVATIONS

All elevations in this report are referenced to the Borough President of Manhattan Datum in which El. 0.0 is 2.75 feet above National Geodetic Vertical Datum defined as Mean Sean Level at Sandy Hook, New Jersey in 1929.

Based on survey drawings provided by LargaVista, existing grades at the site range from approximately Elev. +40 to Elev. +41. In general, topography is fairly flat, sloping down slightly to the west and south.

As-drilled locations and elevations for MRCE borings were surveyed as part the subsurface investigation. As-drilled locations and elevations are shown on Drawing Nos. B-1, GS-1 and GS-2 and are reported on the log of each boring in Appendix A.

4. SUBSURFACE INVESTIGATIONS

4.1 Previous Investigations at the Site

Cook + Fox Architects, LLP provided a report by Whitestone Associates, Inc., dated December 27, 2001 describing a geotechnical investigation performed on Lot 40 for the current service station. That investigation consisted of three borings extending to depths of 20 to 30 feet. In general, those borings encountered about 15 to 20 feet of manmade fill underlain by medium compact natural sand. The borings did not encounter groundwater or bedrock. The data from that investigation is not incorporated in this report.

LargaVista also provided installation logs for three monitoring wells installed at the service station in 2006. The logs are included in Appendix B of this report.

4.2 Present Investigation

The present boring investigation consisted of 5 borings. Three of the borings were drilled in the lot of the gas station currently occupying Lot 40 and two borings were drilled on the sidewalk of Crosby Street. Locations of borings are shown on Drawing No. B-1.

Due to the proximity of the site to NYCT subway tunnels, approval to perform the borings was required from the NYCT Outside Projects office. MRCE prepared a package including a description of the drilling procedures for the proposed borings and drawings showing their distance from the subway tunnels in plan and section. The package was submitted to NYTA by others and the drawings were approved prior to the start of the investigation.

The borings were performed by Aquifer Drilling and Testing, Inc.(ADT) of New Hyde Park, New York, from December 29, 2010 through January 12, 2011. All borings were continuously inspected by MRCE Resident Engineer, Mr. Michael McMaster who prepared field logs of all borings. The borings were made using truck-mounted drill rigs and rotary drilling techniques with casing and drilling mud to stabilize the boreholes.

Borings were hand augured to a depth of approximately 6 feet in order to clear any existing utilities. The ADT hand auguring crew used a jackhammer to break through asphalt or concrete at

the ground surface. A combination of Vactron vacuuming equipment, compressed air hammer and hand auguring tools were then used to remove the first 6 ft of soil in the borings.

Below a depth of 6 ft, soil samples were generally taken every five feet until bedrock was encountered. Soil samples were obtained using a two-inch outside diameter, split-spoon sampler driven with a 140 pound hammer falling freely for 30 inches or an automatic hammer. The number of blows required to drive the sampler through each of the four six-inch increments was recorded. The sum of the blows for the second and third six-inch intervals is defined as the Standard Penetration Test (SPT) Resistance, or N-Value. The N-Value is an index of the in-situ density of the material and is reported in blows per foot (bpf). Soil samples were placed in jars for preservation.

Two different types of hammers were used during the investigation. A manual "safety" hammer was used for Boring MR-1 and a portion of MR-4P. An automatic hammer was used for Borings MR-2, 3 and 5. Automatic hammers are more efficient at transferring energy to the drilling rods and sampler to drive it through the 2 ft sampling interval and therefore typically result in lower N-values than manual hammers. At this site, samples driven by the automatic hammer typically had N-Values that were approximately 70 percent of the N-Values for samples in the same stratum at a similar depth driven by the safety hammer. This relationship is typical in clean, sandy soils such as those underlying the project site. Therefore, in the discussion of soil properties below, all automatic hammer N-Values have been converted to the safety hammer equivalent by multiplying by a factor of 1.4.

A minimum of 10 feet of bedrock was cored in all borings. Core runs were typically five feet long and used a double tube, N-series, diamond bit core barrel. Each core run was logged, including sketching the jointing patterns, measuring recovery lengths and calculating Rock Quality Designation (RQD). RQD is the sum of the lengths of core pieces of intact rock over four inches in length expressed as a percentage of the total core run. Fractures which occur as a result of the drilling operations or removal of the core samples are designated mechanical breaks and are not considered when measuring RQD.

Upon completion of the investigation, all soil samples and rock cores were delivered to our laboratory for verification of field classifications. Soil and rock sample descriptions are provided on the boring logs in Appendix A.

Boring No. MR-4P was abandoned before rock could be cored due to equipment difficulties. In order to obtain the rock core samples, ADT drilled an offset hole, MR-4A, approximately 5 ft north of MR-4P. ADT drilled without sampling to the top of rock and then cored 10 ft of rock in MR-4A.

Standpipe piezometers were installed in two borings, MR-2P and MR-4P to determine groundwater levels at the site. Installation logs of the piezometers are included with the boring logs in Appendix A. Water levels measured in the piezometers are reported on the logs and also shown on the Geologic Sections (Dwg Nos GS-1 and GS-2). Borings that did not receive a piezometer were backfilled upon completion by tremie-grouting with a cement-bentonite mixture.

Upon completion of the boring investigation, the as-drilled boring locations were surveyed on January 20, 2011 by Mega Engineering, Inc. of Hackensack, NJ under sub-contract to ADT and are shown on Drawing No. B-1.

5. SUBSURFACE SOIL AND ROCK CONDITIONS

Our interpretation of the subsurface conditions at the site is illustrated on the geologic sections on Drawings Nos. GS-1 and GS-2. Boring information shown on the sections includes sample number and position, N-Value and Unified Soil Classification System (USCS) symbol for soil samples. For rock cores, core run number and position, percent recovery, and RQD are shown. The boring legend and explanation of the USCS symbols area shown on Drawing No. GS-R. Rock core classification criteria are described on Drawing No. RC-1.

The soil and rock strata encountered at the site are described below, in sequence of increasing depth below ground surface. The strata are classified in accordance with the New York City Building Code and the Unified Soil Classification System. All N-Values are reported in manual safety hammer equivalent values. Environmental contamination / characteristics of the soil and groundwater were not within the scope of our investigation.

Stratum F – Fill (NYC Class 7)
This uppermost stratum is present in all borings and is a miscellaneous fill that typically consists of a loose to medium compact brown fine to coarse sand, trace to some silt, gravel, brick, trace concrete, wood, ranging to gray gravel, some fine to coarse sand, brick, trace silt and wood. The thickness of Stratum F typically ranges from about 13 to 20 ft where encountered by borings.

N-Values in the Fill stratum range from 2 to 111 bpf. Typical values are less than 20 bpf, with an average of about 12 bpf. Higher values are attributed to obstructions such as concrete, wood and other debris.

Strata S1, S2, S3

Underlying the fill are three sand strata, consisting of fine to coarse sand with varying silt and gravel contents. The sand strata become denser with depth and are differentiated primarily by

compactness.

Stratum S1 – Sand (NYC Class 3b)
Stratum S1 is loose to medium compact brown fine to coarse sand, trace to some silt, trace to some gravel, trace mica. It is typically 50 ft thick and present from approximately Elev. +25 and Elev. -25.

The average N-Value of the stratum is 20 bpf, with a range of 6 to 39 bpf. N-Values below 10 bpf typically occurred in the upper 5 to 10 feet of Stratum S1 (shallower than approx Elev. +20).

Stratum S2 – Sand (NYC Class 3b)
Stratum S2 is medium compact brown fine to coarse sand, trace silt, trace gravel. It is typically 30 ft thick and present from approximately Elev. -25 and Elev. -55. N-Values range from 21 to 44 bpf with an average of 29 bpf.

Stratum S3 – Sand (NYC Class 3a)
Stratum S3 is compact brown fine to coarse sand, trace silt, silty fine sand seams, gravel. It ranges from 15 ft to 20 ft thick and is present from approximately Elev. -55 and Elev. -70. N-Values range from 39 to 69 bpf with an average of 51 bpf.

Stratum T – Till (NYC Class 3a)
A thin stratum of glacial till was encountered in Borings MR-3, MR-4 and MR-5 only. It consists of brown silty fine to coarse sand, some rock fragments or gravel. Four samples of Till were recovered in borings, all with N-Values greater than 100 bpf. Thickness ranges from 4 to 7 ft.

Stratum WR – Weathered Rock (NYC Class 1d) Borings MR-3 and MR-4P encountered zones of weathered rock at the bedrock surface. It consists of weathered, slightly to moderately weathered gray gneissic schist, jointed to broken, weathered joints.

Stratum R – Bedrock (NYC Class 1b) Rock cores recovered in the borings consists of medium hard, slightly weathered to unweathered gray gneissic schist, jointed to moderately jointed, weathered and iron stained joints. Clay-filled or mineral-coated joints are present in some cores. Several rock cores also had trace to some pegmatite or amphibolite.

Rock core recoveries ranged from 85 to 100 percent, with typical values greater than 98 percent. RQD ranged from 50 to 86 percent, with an average of 74 percent. Rock core sketches are included in the boring logs.

6. GROUNDWATER CONDITIONS

Two wellpoint piezometers were installed at the site during the present MRCE investigation in order to measure groundwater levels. The piezometers were screened in Stratum S1 below the groundwater table. The elevation of groundwater in these piezometers was observed at Elev. 0 in January, 2011.

Groundwater levels for three previously installed monitoring wells at the site range from approximately Elev. -1 to Elev. -1.5. Those levels were recorded in January, 2006. Logs of the previously installed monitoring wells are included in Appendix B.

7. SEISMIC RECOMMENDATIONS

Proposed structures must be designed in accordance with the NYC Building Code Seismic Provisions. Based on the N-values determined from the subsurface investigation, Site Class D is applicable for this site. The site class is determined by using the average N-values in the top 100 ft of the soil profile in Table 1615.1.1 of the NYC Building Code.

For the liquefaction assessment required by Section 1813 of the building code, Structural Occupancy Category II was assumed. Based on Figure 1813.1, the potential for liquefaction at this site is unlikely due to the depth of groundwater, 40 feet below grade, and the compactness of Stratum S1.

8. FOUNDATION RECOMMENDATIONS

The foundation design must take into account the existing NYCT subway structures adjacent to the site. All foundations installed within the zone of influence of any NYCT structure must meet the requirements in the New York City Transit General Notes and be approved by their Outside Projects office. The influence line of the subway structures as defined in the General Notes starts at the bottom of the subway structure and extends to the ground surface at a 1:1 slope. Therefore, the zone of influence of the subway structures includes the entire north and east edges of the site. Our recommendations are below:

Foundations Outside the Influence Line of Subway Structures

Stratum F is unsuitable for support of building foundations. Below Elev. +20, Stratum S1, in an undisturbed condition, is suitable for support of shallow foundations at an allowable bearing capacity of 3 tons per square foot (tsf). Beyond the NYCT influence line, a mat or spread footings can be used for support of the new structure columns.

Foundations Within a the Influence Line of the Subway Structures

Along the north and east edges of the site, the foundation loads must be supported below the zone of influence of the subway structures. Drilled pile foundations such as internal flush minipiles or augered cast-in-place piles could be used to transfer the loads below the influence line. Driven piles could also be used, but they would have to be placed in a pre-augered cased hole within the influence zone of the subway. No piles are permitted to be installed within 3 ft of the subway structures. The type and diameter of the pile, the depth to which the piles will be installed, and the pile spacing will largely depend on the new building's column loads.

If shallow foundations are lowered below the influence line, they can be designed with an allowable bearing pressure of 3 tsf.

Slab Support

The basement slab will be supported on the lower portion of Stratum F or in Stratum S1. Both materials are suitable for the support of slabs on grade, but the fill stratum will require some evaluation and treatment. The fill should be proof compacted with a heavy, walk-behind mechanical compactor upon exposure to verify its integrity. Hard points, such as foundation elements of previous structures or layers of debris, should be removed a minimum of one foot below slab subgrade. If unsatisfactory material is encountered, that material should be removed and replaced with compacted granular fill. The fill should be placed in level lifts, a maximum of 12 inches thick, and compacted to a minimum of 95 percent of modified Proctor maximum dry density (ASTM D1557). Concrete slabs on grade should be supported on a 6-inch thick gravel bedding course.

Lateral Support

Permanent basement walls should be designed to withstand long-term, at-rest earth pressures, surcharge, and temporary water pressures. At-rest pressures can be regarded as an equivalent fluid pressure of 60 pounds per cubic foot. Extreme water levels may occur due to temporary conditions, such as a water main break flooding the wall up to street grade. For these temporary conditions, the combined earth and water pressure should be regarded as an equivalent fluid pressure of 90 pcf. For this case of temporary loading, the walls can be designed with ultimate capacity capable of supporting this temporary loading condition.

Settlement

At the recommended bearing capacity for shallow foundations, we estimate that new footing settlements will be less than one inch, provided that the subgrade is undisturbed. Settlement will be concurrent with load application during construction. Differential settlements will have to be

taken into account if a combination of shallow and pile foundations are used.

9. CONSTRUCTION CONSIDERATIONS

Support of Excavation

Support of excavation adjacent to subway structures must be designed in accordance with NYCT design standards and is subject to their review and approval. The excavation for one basement level will likely extend to a depth of about 20 feet. The excavation support system must support the adjacent street and sidewalk and not impose loading on the subway structures. An excavation support system such as a braced steel H-pile and timber lagging system will be suitable for this project. Soldier piles must be installed in pre-drilled holes within the NYCT influence zone. Internal rakers can be used to brace the system along East Houston and Lafayette Streets. Bracing with tiebacks may be considered on the Crosby Street side. For design of a temporary support of excavation system to a depth of about 20 feet, a total unit weight of soil of 115 pcf and an angle of internal friction of 30 degrees should be used.

There is an existing building to the south of the proposed site that may need to be underpinned depending on the depth of the proposed excavation and the foundation level of the existing building. Manhattan Land Books indicate that the building does not have a basement. Foundation levels must be verified prior to construction.

Dewatering

The groundwater depth is approximately 40 feet below grade, corresponding to about Elev. 0.0. Assuming an excavation depth of about 20 ft, major dewatering should not be required, as the excavation will not extend below the groundwater table. Minor dewatering of the excavation will be required to remove accumulated rainwater or other flows such as leaking utilities.

Monitoring of NYCT Structures

Subway structures must be monitored during construction to show that any movements or vibrations induced during construction are within tolerances allowed by NYCT. The monitoring program must be submitted to and approved by NYCT.

As the project progresses, we would be pleased to provide additional services including design of building foundations, design of support of excavation along transit facilities, as well as for the entire project site perimeter, and preparation of geotechnical-related specifications.

Very truly yours,

MUESER RUTLEDGE CONSULTING ENGINEERS

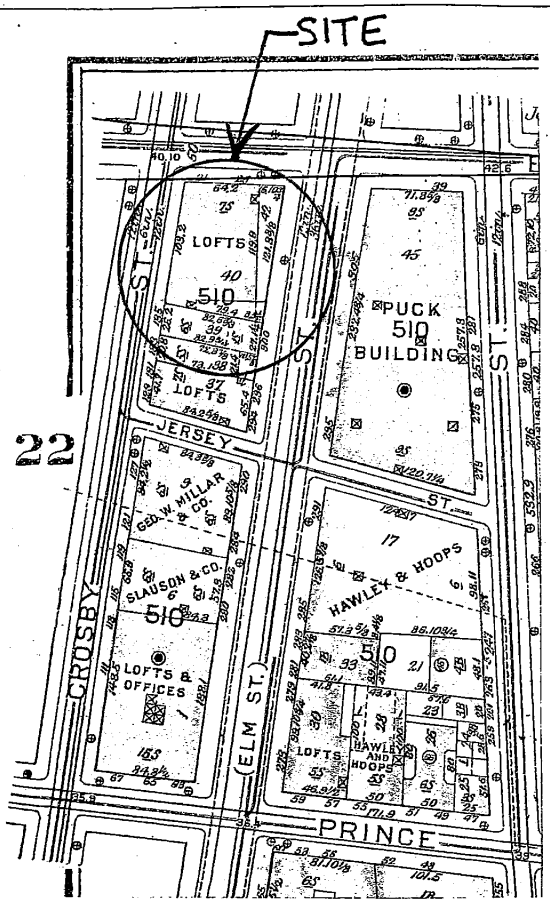
By: Alfred H. Brand

Alfred H. Brand

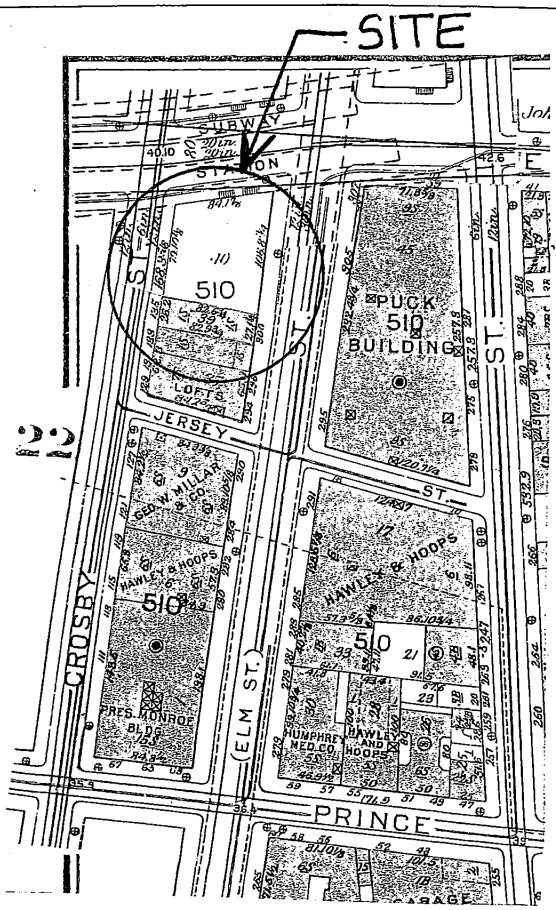
CL:RTW:AHB
F:\114\11476\Report\11476 Report.doc

EXHIBITS

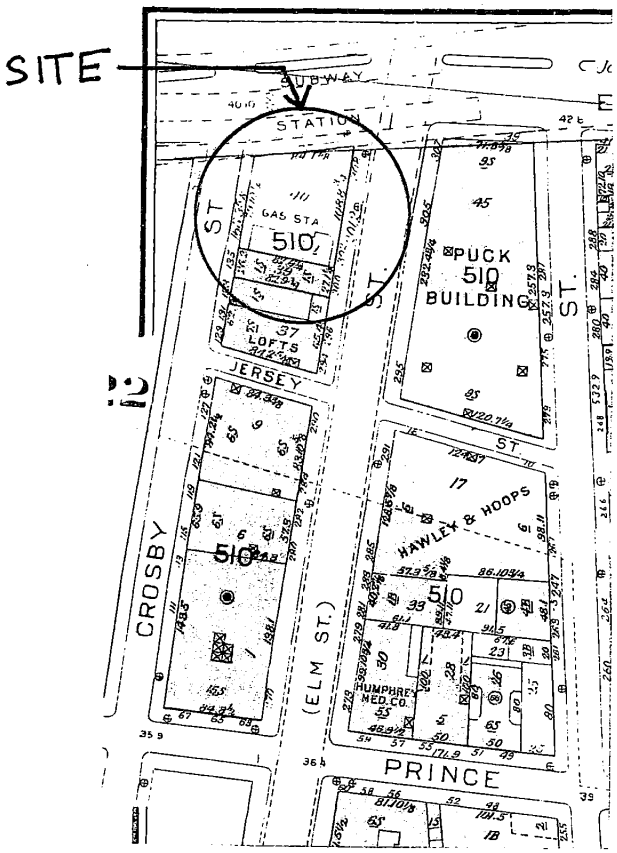
Figure No. 1 – Historic Maps
Drawing No. B-1 - Boring Location Plan
Drawing No. GS-1 - Geologic Profile A-A
Drawing No. GS-2 - Geologic Profile B-B
Drawing No. GS-R - Geotechnical Reference Standards
Drawing No. RC-1 - Rock Core Classification Criteria



1927



1934



1955

SOURCE:
Land Book of the Borough of Manhattan,
G.W. Bromley and Co.,
various years

300 LAFAYETTE STREET			
NEW YORK		NEW YORK	
LARGAVISTA COMPANIES			
BROOKLYN		NEW YORK	
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK, NY 10122			
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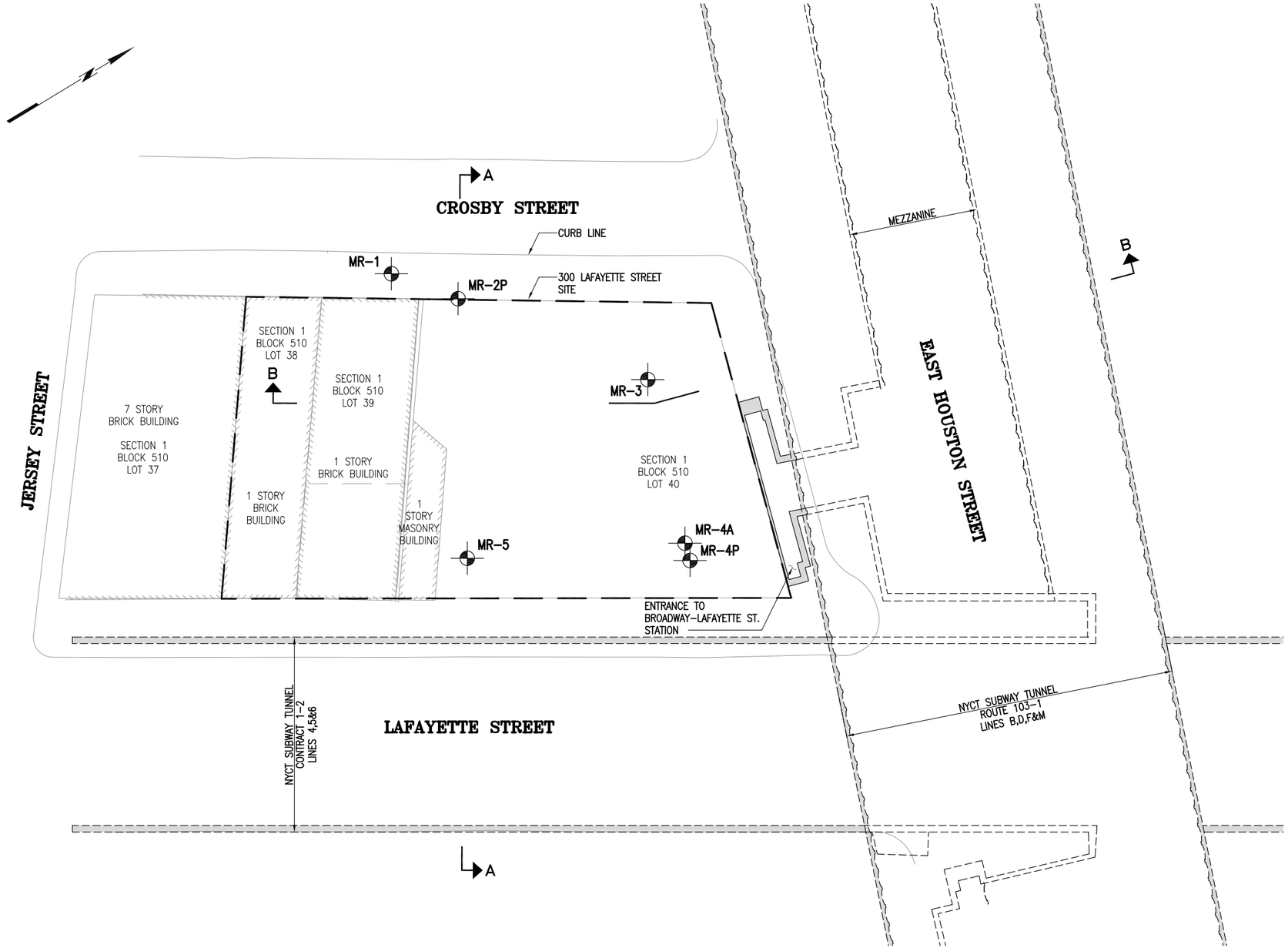
HOSTORIC MAPS			FIG NO. 1



NOTES:

1. BASE PLAN PROVIDED BY COOK & FOX ARCHITECTS.
2. AS-DRILLED BORING LOCATIONS PROVIDED BY MEGA ENGINEERING, INC. OF HACKENSACK, NJ.
3. LOCATIONS OF SUBWAY STRUCTURES UNDER HOUSTON STREET WERE TAKEN FROM THE FOLLOWING NYCT DRAWINGS: ROUTE 103, SECTION 1 – DRAWING NO. 413, CONTRACT DRAWING FILE 6001, DWG NO. 123.
4. DRAWINGS FOR NYCT CONTRACT 1-2 SUBWAY STRUCTURES UNDER LAFAYETTE STREET ARE NOT AVAILABLE. LOCATION OF SUBWAY STRUCTURES UNDER LAFAYETTE STREET WERE TAKEN FROM DRAWINGS FOR OTHER NEARBY SECTIONS OF CONTRACT 1-2.
5. ALL SUBWAY LOCATIONS AND DRAWINGS WERE PROVIDED BY SAS STRESSTEEL, INC.
6. FOR GEOLOGIC SECTIONS A-A AND B-B SEE DRAWINGS NOS. GS-1 AND GS-2, RESPECTIVELY.

BORING LEGEND

MR-1 – BORING DRILLED BY AQUIFER DRILLING BETWEEN DECEMBER 2010 AND JANUARY 2011 AND TESTING UNDER THE INSPECTION OF MRCE

"P" – INDICATES PIEZOMETER INSTALLATION

"A" – INDICATES OFFSET LOCATION

GRAPHIC SCALE

16' 8' 0 16' 32'

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REV.	DATE	BY	DESCRIPTION
2	01-28-11	C.L.	AS-DRILLED BORING LOCATIONS
1	10-12-10	C.L.	RELOCATED BORING MR-1

300 LAFAYETTE STREET

NEW YORK NEW YORK

LARGAVISTA COMPANIES

BROOKLYN NEW YORK

MUESER RUTLEDGE CONSULTING ENGINEERS

14 PENN PLAZA – 225 W. 34TH STREET, NY, NY 10122

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GRAPHIC	CH'KD BY: C.L.	DATE: 09-30-10	11476

BORING LOCATION PLAN

DRAWING NUMBER B-1

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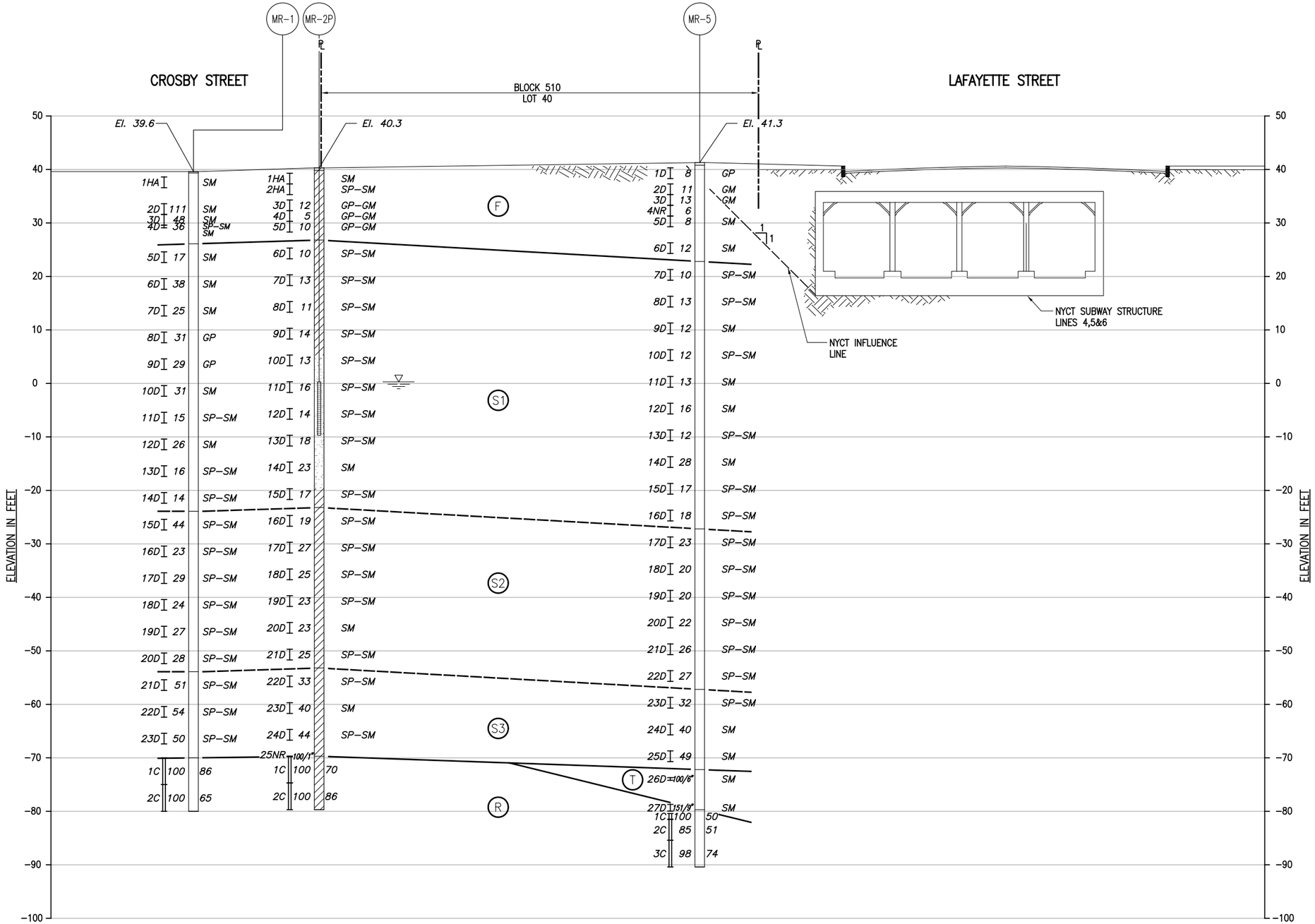

NOTES:

1. ALL SPLIT SPOON SAMPLES WERE DRIVEN USING AN AUTOMATIC HAMMER, EXCEPT ALL SAMPLES IN MR-1 AND SAMPLES 13D THROUGH 25D IN MR-4P (MR-4P IS NOT SHOWN ON THIS SECTION) ALL N-VALUES SHOWN ARE FIELD VALUES AND HAVE NOT BEEN FACTORED.
2. STRATIFICATIONS ARE NECESSARY INTERPOLATIONS BETWEEN AND BEYOND BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
3. AS-DRILLED BORING ELEVATIONS WERE PROVIDED BY MEGA ENGINEERING, INC. OF HACKENSACK, NJ.
4. ELEVATIONS SHOWN ARE REFERENCED TO THE BOROUGH PRES OF MANHATTAN DATUM, WHERE EL. 0 IS 2.75 FEET ABOVE THE USGS NATIONAL GEODETIC VERTICAL DATUM (NGVD), MEAN SEA LEVEL AT SANDY HOOK, NJ 1929.
5. GROUNDWATER LEVELS SHOWN WERE MEASURED IN JANUARY, 2011.
6. SEE DRAWING NO. GS-R FOR BORING LEGEND AND SUMMARY OF UNIFIED SOIL CLASSIFICATION SYSTEM.
7. SEE DRAWING NO. RC-1 FOR ROCK CORE CLASSIFICATION CRITERIA.
8. LOCATIONS AND ELEVATIONS OF SUBWAY STRUCTURES UNDER HOUSTON STREET WERE TAKEN FROM THE FOLLOWING NYCT DRAWINGS: ROUTE NO. 103 – DRAWING NO. 48
   ROUTE 103, SECTION 1 – DRAWING NOS. 383, 384, 390
9. DRAWINGS FOR NYCT CONT 1-2 SUBWAY STRUCTURES UNDER LAFAYETTE STREET ARE NOT AVAILABLE. LOCATIONS AND ELEVATIONS OF SUBWAY STRUCTURES UNDER LAFAYETTE STREET WERE TAKEN FROM DRAWINGS FOR OTHER SECTIONS OF CONT 1-2.
10. ALL SUBWAY LOCATIONS AND DRAWINGS WERE PROVIDED BY FNA ASSOCIATES INC.
11. SAMPLE DESCRIPTIONS AND STRATIFICATION ARE BY MRCE.
12. COMPLETE SOIL AND ROCK SAMPLE DESCRIPTIONS ARE PROVIDED ON THE BORING LOGS IN APPENDIX A.
13. BORINGS ADVANCED WITH MUD ROTARY DRILLING TECHNIQUES; STABILIZED WATER LEVELS WERE NOT OBSERVED IN BORINGS NOS. MR-1, MR-3 AND MR-5.

GENERAL STRATA DESCRIPTIONS:

(F) **FILL** – MISCELLANEOUS GRANULAR FILL

(S1) **SAND 1** – LOOSE TO MEDIUM COMPACT BROWN FINE TO COARSE SAND, TRACE TO SOME SILT, TRACE TO SOME GRAVEL, TRACE MICA

(S2) **SAND 2** – MEDIUM COMPACT BROWN FINE TO COARSE SAND, TRACE SILT, GRAVEL

(S3) **SAND 3** – COMPACT BROWN FINE TO COARSE SAND, TRACE SILT, SILTY FINE SAND SEAMS, GRAVEL

(T) **TILL** – COMPACT BROWN SILTY FINE TO COARSE SAND, SOME ROCK FRAGMENTS OR GRAVEL

(WR) **WEATHERED ROCK** – WEATHERED, SLIGHTLY TO MODERATELY WEATHERED, GRAY GNEISSIC SCHIST, JOINTED TO BROKEN, WEATHERED JOINTS,

(R) **BEDROCK** – MEDIUM HARD SLIGHTLY WEATHERED TO UNWEATHERED GRAY GNEISSIC SCHIST, JOINTED TO MODERATELY JOINTED, TRACE TO SOME AMPHIBOLITE OR PEGMATITE, IRON STAINED, WEATHERED JOINTS

GRAPHIC SCALE

10' 5' 0 10' 20'

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BROOKLYN NEW YORK

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GRAPHIC	CH'KD BY: C.L.	DATE: 02-01-11	11476

GEOLOGIC SECTION A-A

DRAWING NUMBER GS-1

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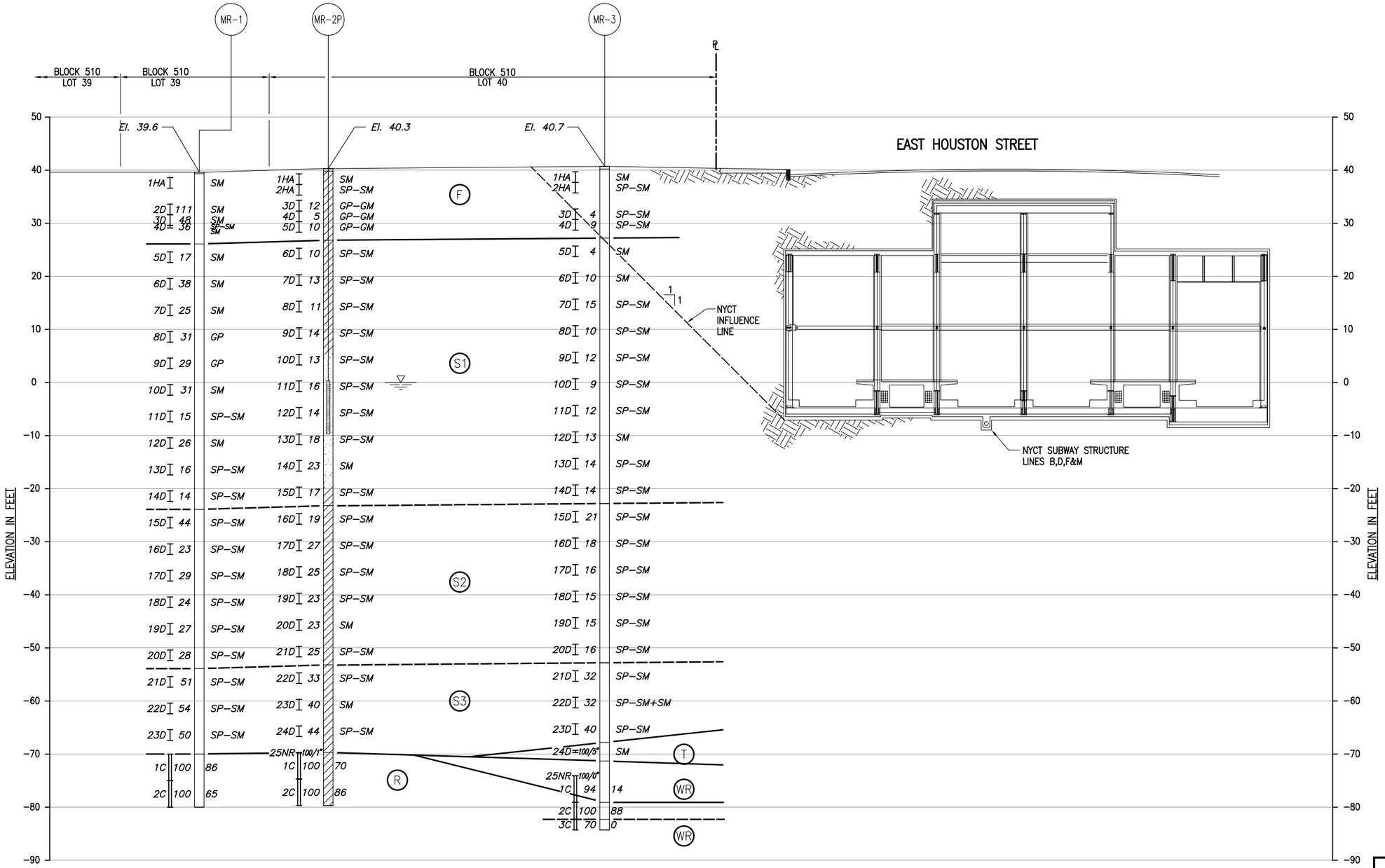

NOTES:

1. FOR NOTES SEE DRAWING GS-1.

GENERAL STRATA DESCRIPTIONS:

(F) **FILL** – MISCELLANEOUS GRANULAR FILL

(S1) **SAND1** – LOOSE TO MEDIUM COMPACT BROWN FINE TO COARSE SAND, TRACE TO SOME SILT, TRACE TO SOME GRAVEL, TRACE MICA

(S2) **SAND2** – MEDIUM COMPACT BROWN FINE TO COARSE SAND, TRACE SILT, GRAVEL

(S3) **SAND3** – COMPACT BROWN FINE TO COARSE SAND, TRACE SILT, SILTY FINE SAND SEAMS, GRAVEL

(T) **TILL** – COMPACT BROWN SILTY FINE TO COARSE SAND, SOME ROCK FRAGMENTS OR GRAVEL

(WR) **WEATHERED ROCK** – WEATHERED, SLIGHTLY TO MODERATELY WEATHERED, GRAY GNEISSIC SCHIST, JOINTED TO BROKEN, WEATHERED JOINTS,

(R) **BEDROCK** – MEDIUM HARD SLIGHTLY WEATHERED TO UNWEATHERED GRAY GNEISSIC SCHIST, JOINTED TO MODERATELY JOINTED, TRACE TO SOME AMPHIBOLITE OR PEGMATITE, IRON STAINED, WEATHERED JOINTS

GRAPHIC SCALE

10' 5' 0 10' 20'

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GRAPHIC	CH'KD BY: C.L.	DATE: 02-01-11	11476

GEOLOGIC SECTION B–B

DRAWING NUMBER GS–2

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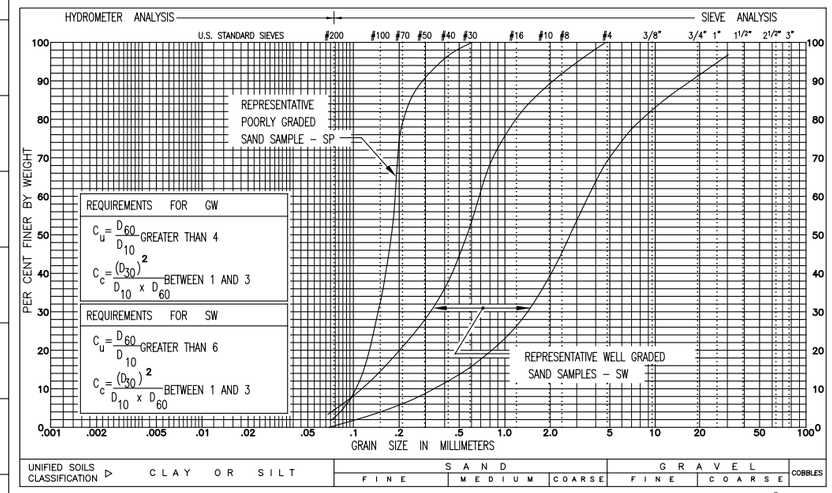
UNIFIED SOIL CLASSIFICATION (INCLUDING IDENTIFICATION AND DESCRIPTION)

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	FIELD IDENTIFICATION PROCEDURES (EXCLUDING PARTICLES LARGER THAN 3 IN. AND BASING FRACTIONS ON ESTIMATED WEIGHTS)
1	2		3	4	5
COARSE-GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE MORE THAN HALF OF MATERIAL IS ABOUT THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE. (FOR VISUAL CLASSIFICATION, THE 1/4 -IN. SIZE MAY BE USED AS EQUIVALENT TO THE NO. 4 SIEVE SIZE)	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.	WIDE RANGE IN GRAIN SIZES AND SUBSTANTIAL AMOUNTS OF ALL INTERMEDIATE PARTICLE SIZES.
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.	PREDOMINANTLY ONE SIZE OR A RANGE OF SIZES WITH SOME INTERMEDIATE SIZES MISSING.
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT-MIXTURES.	NONPLASTIC FINES OR FINES WITH LOW PLASTICITY (FOR IDENTIFICATION PROCEDURES SEE ML BELOW)
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES.	PLASTIC FINES (FOR IDENTIFICATION PROCEDURES SEE CL BELOW)
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE.	CLEAN SANDS (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.	WIDE RANGE IN GRAIN SIZES AND SUBSTANTIAL AMOUNTS OF ALL INTERMEDIATE PARTICLE SIZES.
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.	PREDOMINANTLY ONE SIZE OR A RANGE OF SIZES WITH SOME INTERMEDIATE SIZES MISSING.
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND-SILT-MIXTURES.	NONPLASTIC FINES OR FINES WITH LOW PLASTICITY (FOR IDENTIFICATION PROCEDURES SEE ML BELOW)
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES.	PLASTIC FINES (FOR IDENTIFICATION PROCEDURES SEE CL BELOW)
FINE-GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE THE NO. 200 SIEVE SIZE IS ABOUT					IDENTIFICATION PROCEDURES ON FRACTION SMALLER THAN NO. 40 SIEVE SIZE
					DRY STRENGTH (CRUSHING CHARACTERISTICS) / DILATANCY (REACTION TO SHAKING) / TOUGHNESS (CONSISTENCY NEAR PL)
	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50		ML	INORGANIC SILTS, SANDY SILTS, ROCK FLOUR, OR CLAYEY SILTS WITH SLIGHT PLASTICITY.	NONE TO SLIGHT / QUICK TO SLOW / NONE
			CL	INORGANIC CLAYS, OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS.	MEDIUM TO HIGH / NONE TO VERY SLOW / MEDIUM
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY.	SLIGHT TO MEDIUM / SLOW / SLIGHT
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS.	SLIGHT TO MEDIUM / SLOW TO NONE / SLIGHT TO MEDIUM
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.	HIGH TO VERY HIGH / NONE / HIGH
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS.	MEDIUM TO HIGH / NONE TO VERY SLOW / SLIGHT TO MEDIUM
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS.	READILY IDENTIFIED BY COLOR, ODOR, SPONGY FEEL AND FREQUENTLY BY FIBROUS TEXTURE.

BOUNDARY CLASSIFICATIONS: SOILS POSSESSING CHARACTERISTICS OF TWO GROUPS ARE DESIGNATED BY COMBINATIONS OF GROUP SYMBOLS, I.E.: SP-SC POORLY GRADED SAND WITH CLAY BINDER.

LABORATORY CLASSIFICATION CRITERIA

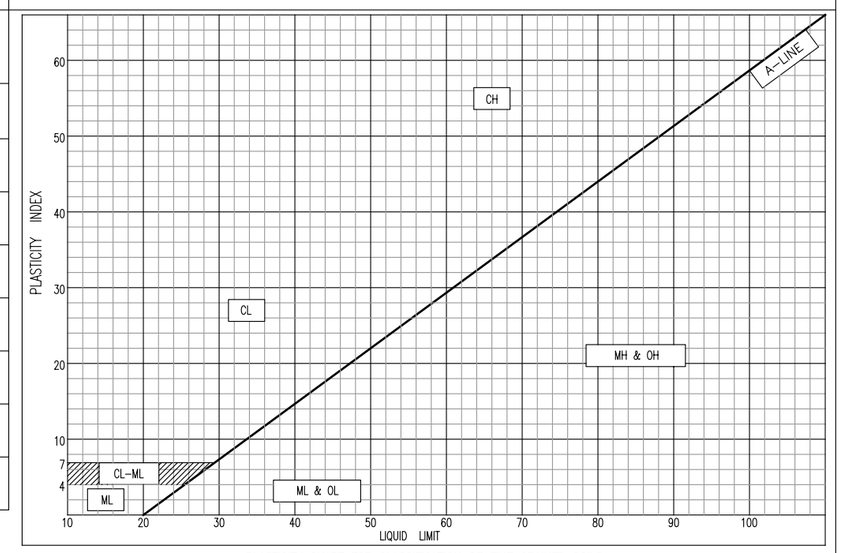


COBBLE 3–12"
BOULDER > 12"

GRAIN SIZE PLOT

DEPENDING ON PERCENTAGE OF FINES (FRACTION SMALLER THAN NO. 200 SIEVE SIZE) COARSE GRAINED SOILS ARE CLASSIFIED AS FOLLOWS:

LESS THAN 5%	GW, GP, SW, SP
MORE THAN 12%	GM, GC, SM, SC
5% TO 12%	BORDERLINE CASES REQUIRING USE OF DUAL SYMBOLS, I.E.: SP-SM, GP-GM.



PLASTICITY CHART FOR CLASSIFICATION OF FINE GRAINED SOILS

TERMINOLOGY USED IN MRCE SOIL DESCRIPTIONS

DEGREE OF COMPACTION FOR NON-PLASTIC SOIL

DEGREE OF COMPACTION	BLOWS* PER FOOT
LOOSE	0 TO 10
MEDIUM COMPACT	11 TO 29
COMPACT	30 TO 50
VERY COMPACT	GREATER THAN 50

* STANDARD PENETRATION RESISTANCE USING 140 LB. HAMMER FREE FALLING 30 INCHES TO DRIVE A 2 INCH O.D. SPLIT-SPOON SAMPLER.

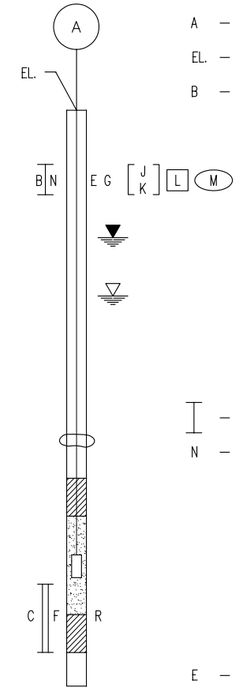
CONSISTENCY OF CLAY AND CLAYEY SILT+

CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH (TSF)	IDENTIFICATION CHARACTERISTICS
SOFT	LESS THAN 0.5	EASILY REMOLDED WITH SLIGHT FINGER PRESSURE
MEDIUM	0.5 TO 1.0	REQUIRES SUBSTANTIAL PRESSURE FOR REMOLDING
STIFF	1.0 TO 4.0	DIFFICULT TO REMOLD WITH FINGERS
HARD	GREATER THAN 4.0	CANNOT BE REMOLDED WITH FINGERS

\+ NONPLASTIC SILTS ARE DESCRIBED USING DEGREE OF COMPACTION AS PRESENTED FOR NON-PLASTIC SOIL.

DESCRIPTION OF CONSTITUENT PERCENTAGES AS USED IN SOIL SAMPLE CLASSIFICATIONS

1% TO 12% – "TRACE"
13% TO 30% – "SOME"
31% TO 49% – ADJECTIVE FORM OF SOIL GROUP (EG. SANDY)
EQUAL AMOUNT – "AND" (EG. SAND AND GRAVEL)



BORING LEGEND

A — NUMBER, TYPE AND LOCATION OF BORING

EL. — GROUND SURFACE ELEVATION AT BORING

B — NUMBER AND TYPE OF SAMPLE

D – DRY SAMPLE TAKEN WITH 2 INCH O.D. SPLIT SPOON

U – UNDISTURBED SAMPLE TAKEN WITH 3 INCH O.D. FIXED PISTON TYPE SAMPLER

UD – UNDISTURBED SAMPLE EXTRUDED IN FIELD AND PLACED IN JAR DUE TO POOR RECOVERY OR DISTURBANCE

S – THIN TUBE SAMPLE TAKEN WITH SHELBY TUBE SAMPLER

W – WASH SAMPLE

NR – NO RECOVERY

— LENGTH OF SAMPLE ATTEMPT

N — STANDARD PENETRATION RESISTANCE. NUMBER OF BLOWS FROM 140 LB. HAMMER FREE FALLING 30 INCHES REQUIRED TO DRIVE 2 INCH O.D. SPLIT SPOON SAMPLER ONE FOOT AFTER INITIAL PENETRATION OF 6 INCHES, UNLESS A SPECIFIC PENETRATION IS INDICATED.

P – PRESSED OR PUSH SAMPLE

WH – SAMPLE TAKEN UNDER WEIGHT OF HAMMER AND RODS

WR – SAMPLE TAKEN UNDER WEIGHT OF RODS

E — AVERAGE NATURAL WATER CONTENT OF SAMPLE, IN PERCENT OF DRY WEIGHT

G — UNIFIED SOIL CLASSIFICATON GROUP SYMBOL OF SAMPLE

[J] = ATTERBERG LIQUID LIMIT VALUE
[K] = ATTERBERG PLASTIC LIMIT VALUE

[L] — COMPRESSIVE STRENGTH IN TSF DETERMINED FROM UNCONFINED COMPRESSION TEST

(M) — COMPRESSIVE STRENGTH IN TSF DETERMINED FROM UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

— GROUNDWATER LEVEL OBSERVED IN BORING
*– MUD LEVEL

— GROUNDWATER LEVEL OBSERVED IN PIEZOMETER

C — ROCK CORE NUMBER

— LENGTH OF CORE RUN

F — LENGTH OF CORE RECOVERED EXPRESSED AS A PERCENT OF THE LENGTH OF CORE RUN

R — ROCK QUALITY DESIGNATION–THE SUM OF THE LENGTHS OF PIECES OF RECOVERED CORE WHICH ARE EQUAL TO OR GREATER THAN FOUR INCHES IN LENGTH, EXPRESSED AS A PERCENTAGE OF THE TOTAL LENGTH OF CORE RUN. LENGTHS ARE MEASURED BETWEEN IN-SITU SEPARATIONS AND MECHANICAL BREAKS RESULTING FROM CORING ARE IGNORED.

IMPERVIOUS SEAL

SAND FILTER SURROUNDING PIEZOMETER INTAKE ELEMENT

INTAKE ELEMENT

COBBLE OR BOULDER

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NEW YORK, NY 10122

GEOTECHNICAL REFERENCE STANDARDS

DRAWING NO. GS–R

TABLE R–1 ROCK CORE CLASSIFICATION CRITERIA

HARDNESS/SOUNDNESS CLASSIFICATION	TYPICAL GEOLOGIC CLASSIFICATION	IDENTIFICATION CHARACTERISTICS	GENERAL MINIMUM CORING CHARACTERISTICS				INTACT SPECIMEN TYPICAL MINIMUM COMPRESSIVE STRENGTH
			NX OR LARGER		BX OR SMALLER		
			REC	RQD	REC	RQD	PSI
HARD ROCK UNWEATHERED MAY BE JOINTED	–CRYSTALLINE IGNEOUS, OR METAMORPHIC ROCKS –HIGHLY SILICEOUS SEDIMENTARY ROCKS	– UNWEATHERED FABRIC – RINGS WHEN STRUCK WITH BAR – SHARP AND HARD FRACTURE SURFACE WHEN BROKEN MECHANICALLY – MAY BE JOINTED, BUT JOINTS ARE GENERALLY TIGHT. JOINTS MAY BE IRON STAINED. – DOES NOT DISINTEGRATE UPON EXPOSURE – DOES NOT SLAKE IN WATER	95 OR MORE	85 OR MORE	85 OR MORE	75 OR MORE	3000
MEDIUM HARD ROCK SLIGHTLY WEATHERED MAY BE CLOSELY JOINTED	AS FOR HARD ROCKS AND: – MODERATELY SILICEOUS SEDIMENTARY ROCKS – CERTAIN CALCAREOUS ROCKS	AS FOR HARD ROCK, EXCEPT: – FABRIC MAY BE IRON STAINED – MAY BE CLOSELY JOINTED, BUT JOINTS ARE GENERALLY TIGHT. JOINTS HAVE SLIGHT WEATHERING OR MAY BE IRON STAINED.	70	50	50	40	1500
INTERMEDIATE ROCK MODERATELY WEATHERED MAY BE CLOSELY JOINTED	AS FOR MEDIUM HARD ROCKS AND: – MOST SEDIMENTARY ROCKS OTHER THAN COMPACTION SHALES – MOST CALCAREOUS ROCKS WHICH ARE NOT POROUS	AS FOR MEDIUM HARD ROCK, EXCEPT: – MODERATELY WEATHERED FABRIC – WEATHERED JOINTS – THUDS WHEN STRUCK BY BAR – CAN BE INDENTED WITH A STEEL NAIL – BREAKS READILY WITH HAMMER – PIECES OF WEATHERED SURFACE CAN BE BROKEN OFF BY HAND – DOES NOT DISINTEGRATE UPON EXPOSURE – UNWEATHERED PIECES DO NOT SLAKE	50	35	35	25	500
WEATHERED ROCK HIGHLY WEATHERED MAY BE BROKEN	AS FOR INTERMEDIATE ROCKS AND: – COMPACTION SEDIMENTARIES – CALCAREOUS ROCKS WITH SOIL–FILLED CAVITIES	AS FOR INTERMEDIATE ROCK, EXCEPT: – HIGHLY WEATHERED FABRIC – CAN BE BROKEN EASILY, CRUMBLES WITH DIFFICULTY BY HAND – CAN BE SCRAPED BY KNIFE – MAY SOFTEN UPON EXPOSURE – MAY SLAKE IN WATER – STANDARD PENETRATION RESISTANCE EXCEEDS 50 BLOWS/FOOT	LESS THAN 50	LESS THAN 35	LESS THAN 35	LESS THAN 25	150
			WHEN RECOVERED WITH SOIL SAMPLING TECHNIQUES, DESCRIBED AS FOR SOILS INCLUDING USC GROUP SYMBOLS. (WTHD ROCK) ADDED TO DESCRIPTION.				
DECOMPOSED ROCK (RESIDUAL SOILS)	ALL ROCK TYPES	– ROCK TEXTURE AND STRUCTURE OFTEN PRESERVED – GENERALLY SOIL–LIKE IN CONSISTENCY – CAN BE CRUMPLED BY SLIGHT HAND PRESSURE – CAN BE PEELED WITH A KNIFE – STANDARD PENETRATION RESISTANCE LESS THAN 50 BLOWS/FOOT	GENERALLY RECOVERED WITH SOIL SAMPLING TECHNIQUES AND DESCRIBED AS FOR SOILS INCLUDING USC GROUP SYMBOLS. (DEC ROCK) ADDED TO DESCRIPTION.				

TABLE R–2 WEATHERING AND JOINTING DEFINITIONS

DEGREE OF FABRIC WEATHERING

FABRIC WEATHERING		CHARACTERISTIC
Unweathered	UnW	No decomposition or discoloration rings when struck
Slightly Weathered	SlW	Iron Stained Rings when struck
Moderately Weathered	MdW	Deteriorated fabric Thuds when struck
Highly Weathered	HiW	Friable, easily broken by hand
Decomposed	Dec	Soil–like

DEGREE OF JOINT WEATHERING

JOINT WEATHERING		CHARACTERISTIC
Iron stained joints	FeJtS	Indicates movement of water along joints
Weathered joints	WJts	Joints are not tight and do not match. Joints have friable edges.

DEGREE OF JOINTING

JOINTING		JOINT FREQUENCY
Massive	Mssv	Less than 1 joint in 4 feet
Blocky	Blky	1 joint every 2 to 4 feet
Moderately Jointed	MdJtd	1 joint every foot to 2 feet
Jointed	Jtd	1 to 2 joints per foot
Closely Jointed	ClJtd	2 to 4 joints per foot
Broken	Bkn	More than 4 joints per foot

Vertical joints are ignored in RQD and joint frequency evaluations, but are noted in written descriptions and and on core sketches.

TABLE R–3 ABBREVIATIONS FOR ROCK CORE CLASSIFICATION

Blocky	Blky	Intermediate	Int
Broken	Bkn	Light	Lt
Brown	brn	Lignite	lign
Calcareous or Calcite	calc	Limestone	lms
Cavities	cvts	Jointed	Jtd
Chlorite	chl	Joints	Jts
Clay, Clayey	cl	Massive	Mssv
Closely Jointed	ClJtd	Medium Hard	MdHd
Coating on joint surface	coat	Mica, Micaceous	Mic
Crushed	crsh	Moderately Jointed	MdJtd
Dark	dk	Moderately Weathered	MdW
Decomposed	Dec	Pockets	pkts
Ditto	do	Quartz	qtz
Dolomite, Dolomitic	Dol	Recovery	Rec
Iron stained Joints	FeJts	Rock Quality Designation	RQD
Iron Stained	FeStn	Sand	sa
Feldspar	feld	Sandstone	ss
Foliation	Fol	Schist, Schistose	sch
Fractured	frct	Shale	sh
Fragments	fgmts	Shear zone	Sz
Gneiss, Gneissic	gns	Siliceous	sil
Gouge	gog	Silt	si
Granite, Granitic	gr	Slickensided	slks
Gray	gry	Slightly Weathered	SlW
Hard	Hd	Unweathered	UnW
Highly Weathered	HiW	Weathered	Wthd
Hornblende	Hbl	Weathered Joints	WJts
Injected	inj	Vein	Vn
Interbedded	Intrbd	Vertical Joints	VJts

NOTES:

1. ROCK CORE DESCRIPTIONS REPRESENT ONLY THE MATERIAL RECOVERED IN THE CORING OPERATIONS.
2. GENERAL MINIMUM CORING CHARACTERISTICS ASSUME ROCK CORING WITH A DOUBLE TUBE SERIES "M" OR EQUIVALENT CORE BARREL USING GOOD CORING TECHNIQUES AND EQUIPMENT.
3. REC – RECOVERY IS THE LENGTH OF CORE RECOVERED, EXPRESSED AS A PERCENTAGE OF THE LENGTH OF CORE RUN.
4. RQD – ROCK QUALITY DESIGNATION IS THE SUM OF THE LENGTHS OF CORE PIECES FOUR INCHES OR LONGER EXPRESSED AS A PERCENTAGE OF THE TOTAL LENGTH OF CORE RUN. LENGTHS ARE MEASURED BETWEEN IN–SITU SEPARATIONS; MECHANICAL BREAKS RESULTING FROM CORING AND VERTICAL JOINTS ARE IGNORED.

TABLE R–4 ROCK CORE SKETCH KEY

SKETCH SYMBOLS

- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand

JOINT ORIENTATION AND CONDITION

			SURFACE – CONDITION				
Parallel	–	//	Curved	–	C	Slick	– 1
Crossing	–	X	Irregular	–	I	Smooth	– 2
Foliation	–	F	Straight	–	S	Rough	– 3
Stratification	–	S					
Unfoliated or Unstratified	–	U					
Mechanical Break	–	MB					

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NEW YORK, NY 10122

ROCK CORE CLASSIFICATION CRITERIA

DRAWING NO. RC–1

APPENDIX A

MRCE GEOTECHNICAL BORING LOGS

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New York, NY 10122
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www.mrce.com

BORING LOG

BORING NO. MR-1
SHEET 1 OF 6
FILE NO. 11476
SURFACE ELEV. 39.6
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,149.84 E: -8,162.51

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
09:30						Conc	0.25			
12-29-10 Wednesday Partly Cloudy 35 °F	1HA	1.0	HAND AUGER		Brown coarse to fine sand, some gravel, silt, trace brick (Fill) (SM)					
		3.0								
							5			
10:30										
12:45	2D	6.0	39-67	3"	Tan and brown gravelly coarse to fine sand, some silt, brick (Fill) (SM)					
01-07-11 Friday Snow 25 °F		8.0	44-31							
	3D	8.0	28-29	20"	Red brown fine to coarse sand, some gravel, silt, trace cemented silt (Fill) (SM)					
		10.0	19-18				10			
	4D	10.0	18-20	16"	Top (6"): Brn f-c sa, tr si (Fill) (SP-SM) Bot (10"): Brn c-f sa, sm gvl, si, tr brk (Fill) (SM)					
14:45		12.0	16-18							
09:00										
01-10-11 Monday Partly Cloudy 28 °F							13.5			
							15			
	5D	15.0	9-8	3"	Brown medium to fine sand, some silt (SM)					
		17.0	9-14							
							20			
	6D	20.0	17-18	8"	Brown coarse to fine sand, some silt, trace gravel (SM)					
		22.0	20-20							
							25			
	7D	25.0	12-12	10"	Brown fine to coarse sand, some silt, trace gravel (SM)					
		27.0	13-12							
							30			
	8D	30.0	15-16	1"	Gray gravel (GP)					1
		32.0	15-10			S1				
							35			
	9D	35.0	14-16	1"	Do 8D (GP)					2
		37.0	13-12							
							40			
	10D	40.0	15-13	12"	Brown medium to fine sand, some gravel, silt, trace coarse sand (SM)					
		42.0	18-19							
							45			
	11D	45.0	6-7	14"	Brown fine to medium sand, trace silt, mica (SP-SM)					
		47.0	8-10							
							50			

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BORING LOG

BORING NO. MR-1
SHEET 2 OF 6
FILE NO. 11476
SURFACE ELEV. 39.6
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,149.84 E: -8,162.51

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-10-11	12D	50.0	10-14	16"	Brown fine to medium sand, some silt, trace mica (SM)					
		52.0	12-13							
							55			
	13D	55.0	6-7	12"	Brown fine to medium sand, trace silt, mica (SP-SM)					
		57.0	9-11			S1				
							60			
	14D	60.0	6-6	11"	Brown medium to fine sand, trace silt, coarse sand (SP-SM)					
		62.0	8-7							
							63.5			
							65			
	15D	65.0	12-20	14"	Brown medium to fine sand, trace silt (SP-SM)					
		67.0	24-18							
							70			
	16D	70.0	9-12	10"	Do 15D (SP-SM)					
		72.0	11-12							
							75			
	17D	75.0	12-14	10"	Brown fine to medium sand, trace silt, coarse sand (SP-SM)					
		77.0	15-14							
						S2				
							80			
	18D	80.0	10-12	6"	Brown fine to coarse sand, trace silt (SP-SM)					
		82.0	12-11							
							85			
	19D	85.0	12-14	12"	Brown fine to coarse sand, trace silt, silty fine sand seams (SP-SM)					
		87.0	13-12							
							90			
	20D	90.0	10-14	10"	Brown coarse to fine sand, trace silt, gravel (SP-SM)					
15:00		92.0	14-15							
09:00 01-11-11 Tuesday Partly Cloudy 30 °F							93.5			
							95			
	21D	95.0	25-25	16"	Brown fine to coarse sand, trace silt, silty fine sand seams (SP-SM)					
		97.0	26-22			S3				
							100			

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BORING LOG

BORING NO. MR-1
SHEET 3 OF 6
FILE NO. 11476
SURFACE ELEV. 39.6
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,149.84 E: -8,162.51

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-11-11	22D	100.0	15-24	14"	Brown fine to medium sand, trace silt, silty fine sand seams (SP-SM)					
		102.0	30-26							
						S3	105			
	23D	105.0	17-27	10"	Brown coarse to fine sand, some gravel, trace silt, silty fine sand seams (SP-SM)					
		107.0	23-23							
	1C	109.6	REC=100%	60"	Medium Hd, SIW to UnW gry gneissic sch, some amphibolite, moderately jtd to jtd, iron stained to wthd jts		109.6		CT=5	3, 4
		114.6	RQD=86%						CT=6	
									CT=6	
									CT=5	
									CT=6	
	2C	114.6	REC=100%	60"	Medium Hd, SIW to UnW gry gneissic sch, moderately jtd to jtd, iron stained to wthd jts	R	115		CT=5	
		119.6	RQD=65%						CT=6	
									CT=7	
									CT=6	
01-12-11									CT=6	
15:45							119.6			5
							125			
							130			
							135			
							140			
							145			
							150			

MUESER RUTLEDGE CONSULTING ENGINEERS

ROCK CORE SKETCH

BORING NO.	MR-1		
SHEET	4	**OF**	6
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	39.6
		RES ENGR.	M McMaster

Run #	Start Depth	End Depth	Rec	RQD
1C	109.6	114.6	100%	86%

Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD

1C

MB<10°

1.0

J<60°//FS2 w

2.0

J<45°//FS2 sl w

J<60°//FS2 fe + w

J<10°XFS2 fe + w

3.0

J<60°//FS2 fe + w

J<10°XFS3 sl w

4.0

J<10°XFS3 sl w

J<60°//FS2 sl w

5.0

ROCK CORE SKETCH
LEGEND

JOINTING

J - Joint
MB - Mechanical Break
< - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified
w - Weathered joints
slw - Slightly weathered joints
fe - Iron stained joints
slfe - Slightly iron stained joints
min - Mineral coated joints

SURFACE

C - Curved
I - Irregular
S - Straight

CONDITION

1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS

Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

MUESER RUTLEDGE CONSULTING ENGINEERS

ROCK CORE SKETCH

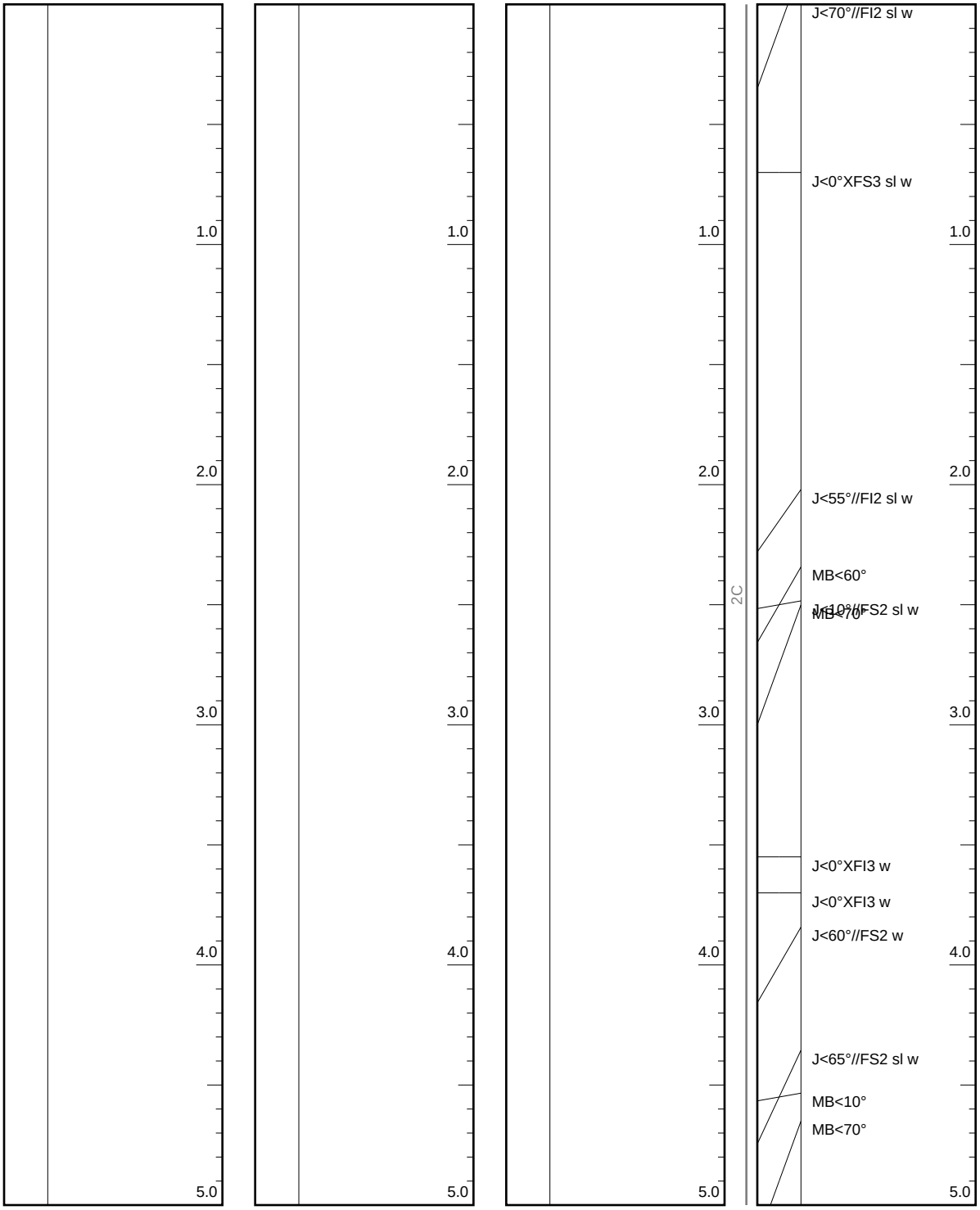
BORING NO.	MR-1		
SHEET	5	**OF**	6
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	39.6
		RES ENGR.	M McMaster

Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD
2C	114.6	119.6	100%	65%



ROCK CORE SKETCH
LEGEND

JOINTING

- J - Joint
- MB - Mechanical Break
- < - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified
- w - Weathered joints
- slw - Slightly weathered joints
- fe - Iron stained joints
- slfe - Slightly iron stained joints
- min - Mineral coated joints

SURFACE

- C - Curved
- I - Irregular
- S - Straight

CONDITION

- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS

- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	MR-1
		SHEET	6 **OF** 6
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	39.60
BORING LOCATION	See Boring Location Plan	**VER. DATUM**	Borough of Manhattan Datum
NORTHING 11149.84	**EASTING** -8162.51	**HOR. DATUM**	Manhattan Coordinate System

EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG	Truck
CASING USED	
4" dia	30' depth
3" dia	109 depth
ADVANCEMENT METHOD	Mud Rotary
DRILL RODS	NWJ
ROTARY BIT DIAMETER, IN.	3 7/8, 2 7/8
DRILLING MUD USED	Bentonite
AUGER	4" Hand Auger
SAMPLERS	
HAMMER TYPE	Safety Hammer
WEIGHT: 140 lbs	DROP: 30" RATE:
D-SAMPLER	2" O.D. Split Spoon
U-SAMPLER	
S-SAMPLER	
OTHER	
ROCK CORING	
CORING FEED	Hydraulic
CORE BARREL	NX Double Tube
CORE BIT	NX Diamond Bit

REMARKS

1 8D:Gravel caught in tip.
2 9D:Gravel caught in tip.
3 Rig Chatter at 109'.
4 Hard Drilling at 109'.
5 Borehole ended at 119.6'.

LEGEND

TV = TORVANE SHEAR STRENGTH, TSF
CT = CORING TIME, MINUTES PER FOOT
CB = CASING BLOWS PER FOOT
OLT = OTHER LAB TESTING PERFORMED
PP = POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH, TSF

REMARK TYPES

LC = LOST CIRCULATION
HD = HARD DRILLING
RC = RIG CHATTER
CBJ = CORE BARREL JAMMED
PO = PETROLEUM ODOR
CW = CHANGE IN WASH
SS = SLICKENSIDED

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATIONS
					No water level observations made.

☐ PIEZOMETER INSTALLED SKETCH SHOWN ON

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	103.60	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10.00	OTHER (HAND AUGER LIN. FT.)	6

BORING CONTRACTOR	Aquifer Drilling and Testing		
DRILLER	John Campbell	HELPER(S)	Prim Gopaul
RESIDENT ENGINEER	Michael McMaster	DATE	01-12-11
CLASSIFICATION CHECK	Cheryl Moss		

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BORING LOG

BORING NO. MR-2P
SHEET 1 OF 6
FILE NO. 11476
SURFACE ELEV. 40.3
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,167.89 E: -8,154.60

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
09:45						CONC	0.5			
01-03-11 Monday Sunny 30 °F	1HA	1.0	HAND AUGER		Brown fine to coarse sand, some silt, gravel, trace brick (Fill) (SM)					
		3.0								
	2HA	3.0	HAND AUGER		Brown fine to coarse sand, some gravel, trace silt, brick (Fill) (SP-SM)					
		5.0					5			
13:30										
11:30	3D	6.0	11-7	1"	Gray fine gravel, some coarse sand, brick, trace silt (Fill) (GP-GM)	F				
01-04-11 Tuesday Partly Cloudy 35 °F		8.0	5-3							
	4D	8.0	5-2	3"	Gray gravel, some coarse sand, brick, trace silt (Fill) (GP-GM)					
		10.0	3-2				10			
	5D	10.0	2-5	12"	Gray gravel, some fine to coarse sand, brick, trace silt (Fill) (GP-GM)					
		12.0	5-13							
							13.5			
							15			
	6D	15.0	6-5	10"	Brown coarse to fine sand, trace silt (SP-SM)					
		17.0	5-6							
							20			1 (RC)
	7D	20.0	9-7	12"	Brown coarse to fine sand, trace silt, gravel (SP-SM)					
14:30		22.0	6-6							
08:00										
01-05-11 Wednesday Sunny 35 °F							25			
	8D	25.0	5-5	20"	Brown coarse to fine sand, trace silt (SP-SM)					
		27.0	6-6							
							30			
	9D	30.0	6-6	18"	Brown fine to coarse sand, trace silt, gravel (SP-SM)					
		32.0	8-8			S1				
							35			
	10D	35.0	6-6	16"	Brown coarse to fine sand, trace silt, gravel (SP-SM)					
		37.0	7-8							
							40			
	11D	40.0	7-7	16"	Brown medium to fine sand, trace silt, coarse sand (SP-SM)					
		42.0	9-9							
							45			
	12D	45.0	7-6	18"	Brown fine to medium sand, trace silt, mica (SP-SM)					
		47.0	8-8							
							50			

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BORING LOG

BORING NO. MR-2P
SHEET 2 OF 6
FILE NO. 11476
SURFACE ELEV. 40.3
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,167.89 E: -8,154.60

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-05-11	13D	50.0	6-8	16"	Brown fine to medium sand, trace silt, mica (SP-SM)					
		52.0	10-8							
							55			
	14D	55.0	7-11	24"	Brown silty fine sand, trace mica (SM)					
		57.0	12-14			S1				
							60			
	15D	60.0	8-9	18"	Brown fine to coarse sand, trace silt, gravel (SP-SM)					
		62.0	8-11							
							63.5			
							65			
	16D	65.0	8-9	16"	Brown coarse to fine sand, trace silt (SP-SM)					
		67.0	10-10							
							70			
	17D	70.0	14-13	17"	Brown fine to coarse sand, trace silt (SP-SM)					
		72.0	14-13							
							75			
	18D	75.0	10-10	16"	Brown fine to medium sand, trace silt (SP-SM)					
		77.0	15-14							
						S2				
							80			
	19D	80.0	14-13	18"	Brown fine to coarse sand, trace gravel, silt (SP-SM)					
		82.0	10-10							
							85			
	20D	85.0	11-11	16"	Brown coarse to fine sand, some silt, trace gravel (SM)					
		87.0	12-13							
							90			
	21D	90.0	12-13	16"	Brown fine to coarse sand, trace silt (SP-SM)					
		92.0	12-16							
							93.5			
							95			
	22D	95.0	20-17	20"	Brown coarse to fine sand, trace silt, gravel (SP-SM)					
		97.0	16-21			S3				
							100			

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BORING LOG

BORING NO. MR-2P
SHEET 3 OF 6
FILE NO. 11476
SURFACE ELEV. 40.3
RES ENGR. M McMaster

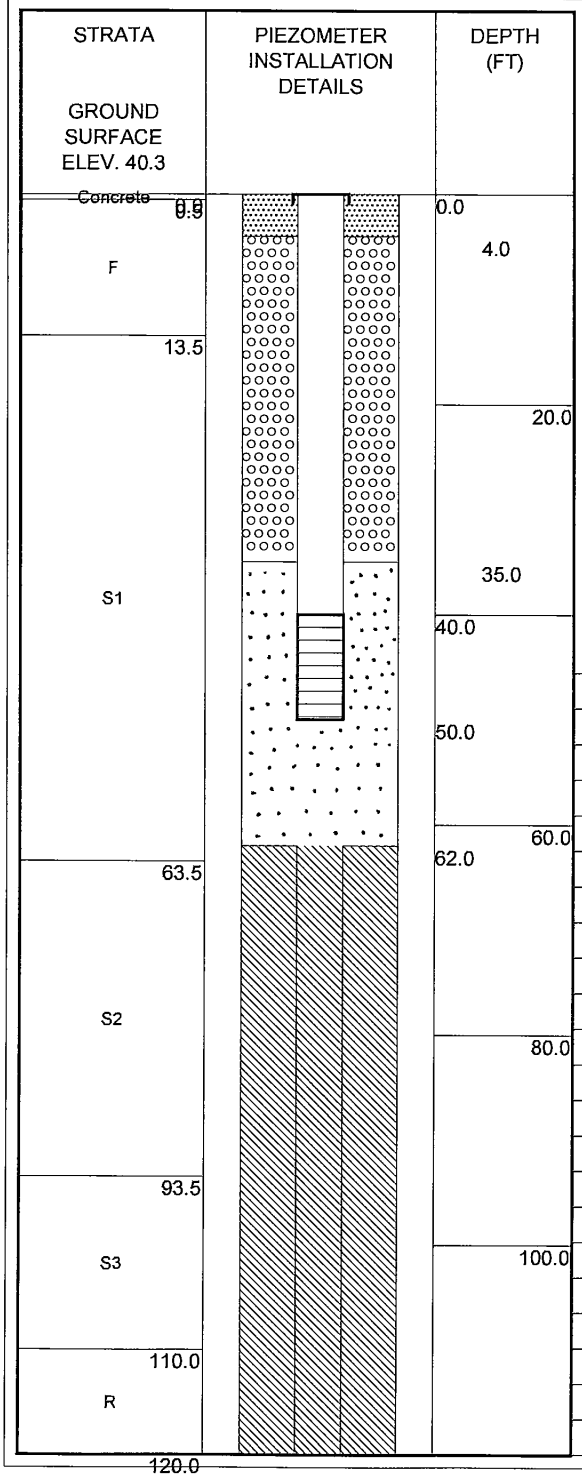
PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,167.89 E: -8,154.60

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-05-11	23D	100.0	15-20	20"	Brown silty fine to medium sand, trace coarse sand (SM)					
		102.0	20-19							
							105			
	24D	105.0	21-24	16"	Brown coarse to fine sand, trace silt, gravel (SP-SM)	**S3**				
		107.0	20-26							
										2 (RC)
14:45							**110**			3 (HD)
07:15 01-06-11 Thursday Cloudy 30 °F	25NR	110.0	100/1"-	0"	No recovery				CT=4	
		110.1	-						CT=5	
	1C	110.0	REC=100%	60"	Medium Hd, SIW gry gneissic schist, jtd to bkn, wthd jts, trace black amphibolite				CT=5	
		115.0	RQD=70%						CT=4	
							115		CT=4	
	2C	115.0	REC=100%	60"	Medium Hd, UnW to SIW gry gneissic sch, blky to moderately jtd, iron stained to wthd jts and cl filled jts	**R**			CT=6	
		120.0	RQD=86%						CT=7	
									CT=7	
									CT=6	
15:00							**120**		CT=7	
										4
							125			
							130			
							135			
							140			
							145			
							150			

MUESER RUTLEDGE CONSULTING ENGINEERS

PIEZOMETER RECORD

BORING NO. MR-2P
SHEET 4 **OF** 6
PROJECT 300 Lafayette St
FILE NO. 11476
LOCATION New York, NY
PIEZOMETER NO.
DATE OF INSTALLATION 1/6/2011
RES ENGR. Michael McMaster



PIEZOMETER TYPE PVC

INTAKE POINT

depth to bottom, ft = 62
depth to top, ft = 35
length, ft = 27 =L
diameter, in = 4 , ft = 0.3 =2R

STANDPIPE/RISER

elevation of rim, ft = 39.8
diameter, in = 2.25 , ft = 0.2 =2r

CAP

elevation of cap, ft = 40.0
diameter, in = 5.0

READING TIME		DEPTH - RIM TO WATER	ELEVATION OF WATER	REMARKS
DATE	CLOCK			
1/14/2011	8:35 AM	39.80	0.00	
1/24/2011	7:32 AM	39.70	0.10	

Gravel Grout
Sand Bentonite

GROUND SURFACE ELEV. 40.3

BORING NO. MR-2P

MUESER RUTLEDGE CONSULTING ENGINEERS

ROCK CORE SKETCH

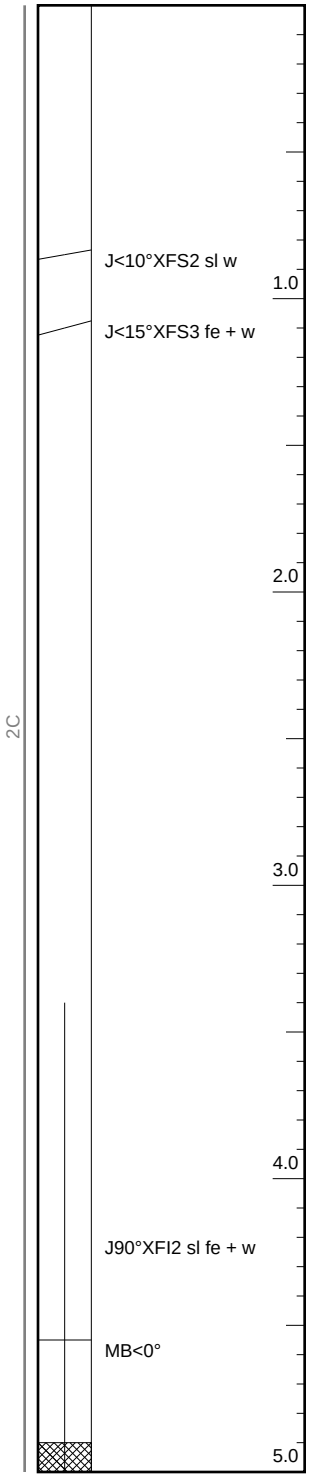
BORING NO.	MR-2P		
SHEET	5	**OF**	6
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	40.3
		RES ENGR.	M McMaster

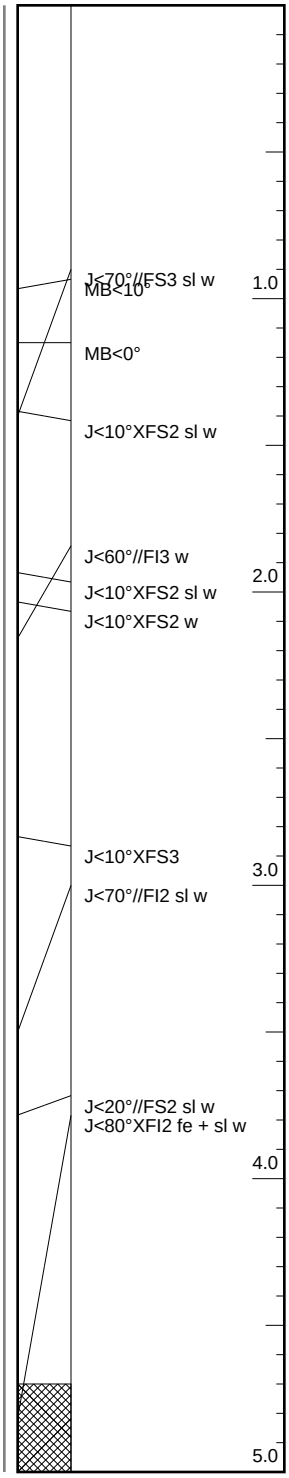
Run #	Start Depth	End Depth	Rec	RQD
2C	115.0	120.0	100%	86%

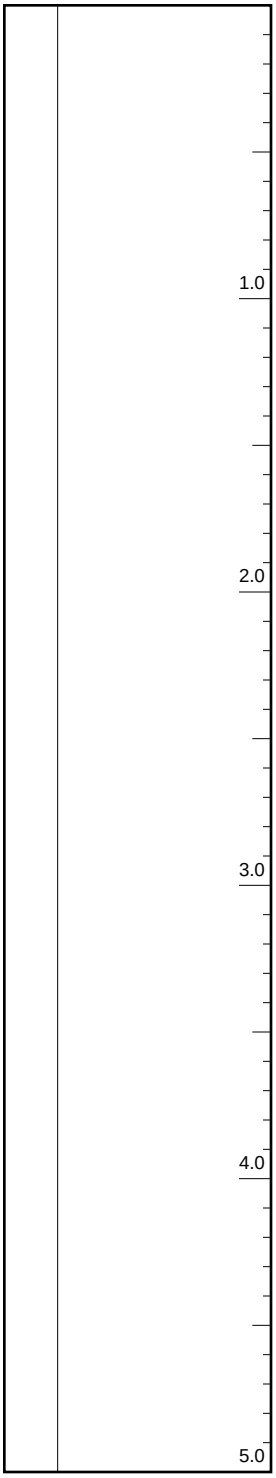
Run #	Start Depth	End Depth	Rec	RQD
1C	110.0	115.0	100%	70%

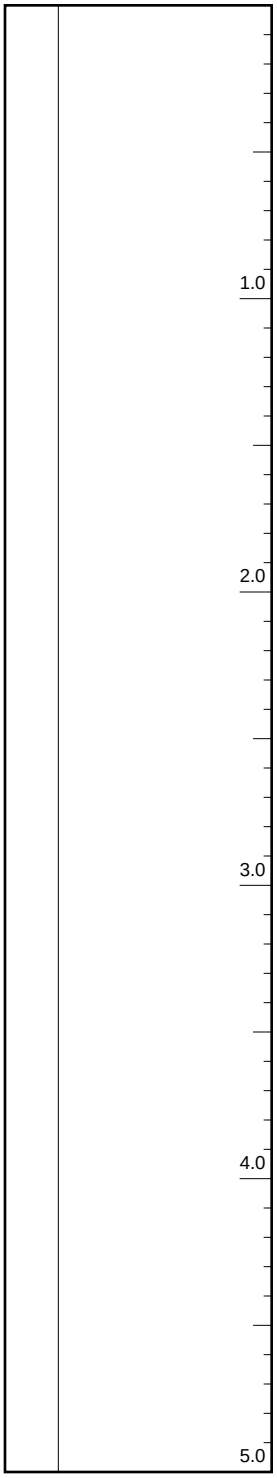
Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD









ROCK CORE SKETCH
LEGEND

JOINTING

- J - Joint
- MB - Mechanical Break
- < - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified
- w - Weathered joints
- slw - Slightly weathered joints
- fe - Iron stained joints
- slfe - Slightly iron stained joints
- min - Mineral coated joints

SURFACE

- C - Curved
- I - Irregular
- S - Straight

CONDITION

- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS

- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	MR-2P
		SHEET	6 **OF** 6
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	40.30
BORING LOCATION	See Boring Location Plan	**VER. DATUM**	Borough of Manhattan Datum
NORTHING 11167.89	**EASTING** -8154.6	**HOR. DATUM**	Manhattan Coordinate System

EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG: Truck
CASING USED
- 4" dia: 25 depth
- 3" dia: 115.5 depth

ADVANCEMENT METHOD: Mud Rotary
DRILL RODS: NWJ
ROTARY BIT DIAMETER, IN.: 5 7/8, 3 7/8, 2 7/8
DRILLING MUD USED: Revert
AUGER: 4" Hand Auger
SAMPLERS
- HAMMER TYPE: Automatic
  - WEIGHT: 140 lbs DROP: 30" RATE:
- D-SAMPLER: 2" O.D. Split Spoon
- U-SAMPLER:
- S-SAMPLER:
- OTHER:

ROCK CORING
- CORING FEED: Hydraulic
- CORE BARREL: NX Double Tube
- CORE BIT: NX Diamond Bit

REMARKS

1 Rig Chatter at 19'.
2 Rig Chatter at 108'.
3 Hard Drilling at 109'.
4 Borehole ended at 120.0'.

LEGEND

TV = TORVANE SHEAR STRENGTH, TSF
CT = CORING TIME, MINUTES PER FOOT
CB = CASING BLOWS PER FOOT
OLT = OTHER LAB TESTING PERFORMED
PP = POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH, TSF

REMARK TYPES

LC = LOST CIRCULATION
HD = HARD DRILLING
RC = RIG CHATTER
CBJ = CORE BARREL JAMMED
PO = PETROLEUM ODOR
CW = CHANGE IN WASH
SS = SLICKENSIDED

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATIONS
					See piezometer installation record.

☒ PIEZOMETER INSTALLED SKETCH SHOWN ON 4

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	104.00	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10.00	OTHER (HAND AUGER LIN. FT.)	6

BORING CONTRACTOR: Aquifer Drilling and Testing
DRILLER: Paul Gaddis HELPER(S): Cnris Chaillou
RESIDENT ENGINEER: Michael McMaster DATE: 01-06-11
CLASSIFICATION CHECK: Cheryl Moss

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BORING LOG

BORING NO. MR-3
SHEET 1 OF 5
FILE NO. 11476
SURFACE ELEV. 40.7
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,219.19 E: -8,129.36

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
11:00						CONC	0.5			
12-29-10	1HA	1.0	HAND		Brown fine to coarse sand, some silt, gravel, trace concrete, brick (Fill) (SM)					
Wednesday		3.0	AUGER							
Partly Cloudy	2HA	3.0	HAND		Brown fine to coarse sand, some gravel, brick, trace concrete, silt (Fill) (SP-SM)					
35 °F		5.0	AUGER				5			
						F				
	3D	8.0	3-2	8"	Gray brown fine to coarse sand and brick, trace silt (Fill) (SP-SM)					
		10.0	2-2				10			
	4D	10.0	4-5	6"	Red brown fine to coarse sand, some brick, trace gravel, silt (Fill) (SP-SM)					
		12.0	4-3							
14:00										
07:30							13.5			1 (HD)
12-30-10							15			
Thursday	5D	15.0	2-2	4"	Brown fine to coarse sand, some silt, gravel (SM)					
Sunny		17.0	2-3							
35 °F							20			
	6D	20.0	7-5	12"	Brown fine to coarse sand, some silt (SM)					
		22.0	5-4							
							25			
	7D	25.0	8-8	16"	Brown fine to coarse sand, trace silt, gravel, fine sand seams (SP-SM)					
		27.0	7-7							
							30			
	8D	30.0	6-6	12"	Brown medium to fine sand, some gravel, trace silt, coarse to medium sand seams (SP-SM)					
		32.0	4-4			S1				
							35			
	9D	35.0	4-5	12"	Brown fine to medium sand, trace silt (SP-SM)					
		37.0	7-6							
							40			
	10D	40.0	4-4	14"	Do 9D (SP-SM)					
		42.0	5-5							
							45			
	11D	45.0	5-5	15"	Brown fine to medium sand, trace silt, mica (SP-SM)					
		47.0	7-7							
							50			

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BORING LOG

BORING NO. MR-3
SHEET 2 OF 5
FILE NO. 11476
SURFACE ELEV. 40.7
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,219.19 E: -8,129.36

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 12-30-10	12D	50.0	7-7	20"	Brown fine to medium sand, some silt, trace mica (SM)					2
		52.0	6-7							
							55			
	13D	55.0	6-6	18"	Brown coarse to fine sand, trace silt (SP-SM)					
		57.0	8-6			S1				
							60			
	14D	60.0	5-6	15"	Do 13D (SP-SM)					
		62.0	8-9							
							63.5			
							65			
	15D	65.0	7-8	16"	Brown medium to fine sand, trace silt (SP-SM)					
		67.0	13-11							
							70			
	16D	70.0	8-9	20"	Brown medium to fine sand, trace silt, coarse sand, gravel (SP-SM)					
		72.0	9-8							
							75			
	17D	75.0	9-8	20"	Brown medium to fine sand, trace silt, coarse sand, mica (SP-SM)					
		77.0	8-7							
						S2				
							80			
	18D	80.0	7-7	18"	Brown medium to fine sand, trace coarse sand, silt, gravel (SP-SM)					
		82.0	8-7							
							85			
	19D	85.0	6-7	19"	Brown medium to fine sand, trace coarse sand, silt (SP-SM)					
		87.0	8-8							
							90			
	20D	90.0	6-7	18"	Do 19D (SP-SM)					
14:30		92.0	9-9							
07:30 01-03-11 Monday Sunny 30 °F							93.5			
							95			
	21D	95.0	13-15	18"	Brown fine to coarse sand, trace silty fine sand seams, silt (SP-SM)					
		97.0	17-14			S3				
							100			

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BORING LOG

BORING NO. MR-3
SHEET 3 OF 5
FILE NO. 11476
SURFACE ELEV. 40.7
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,219.19 E: -8,129.36

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-03-11	22D	100.0	14-15	22"	Brown fine to coarse sand, some silty fine sand seams, trace silt (SP-SM+SM)					
		102.0	17-15							
										3 (RC)
						S3	105			
	23D	105.0	16-17	18"	Brown fine to medium sand, trace silt, coarse sand, silty fine sand seams (SP-SM)					
		107.0	23-18							
							108.5			
						T	110			4 (RC)
	24D	110.0	100/5"-	4"	Brown silty fine to coarse sand, some rock fragments (SM)					5 (HD)
		110.4	-				112			6 (HD)
						WR				
	25NR	114.8	100/0"-	0"	No recovery		115		CT=3	
		114.8	-						CT=3	
	1C	114.8	REC=94%	56"	Wthd, slightly to moderately wthd zones, gry gneissic schist, cljtd to bkn, wthd jts				CT=3	
		119.8	RQD=14%						CT=4	
									CT=4	
	2C	119.8	REC=100%	38"	Medium Hd, UnW to SIW gry gneissic schist, jtd to moderately jtd, wthd jts		119.8		CT=3	
		123.0	RQD=88%			R			CT=4	
									CT=4	
16:00							123		CT=1	
01-04-11*	3C	123.0	REC=70%	17"	Wthd, slightly to moderately wthd zones, gry gneissic schist, cljtd to bkn, wthd jts	WR			CT=5	
		125.0	RQD=0%				125		CT=5	
										7
							130			
							135			
							140			
							145			
							150			

MUESER RUTLEDGE CONSULTING ENGINEERS

ROCK CORE SKETCH

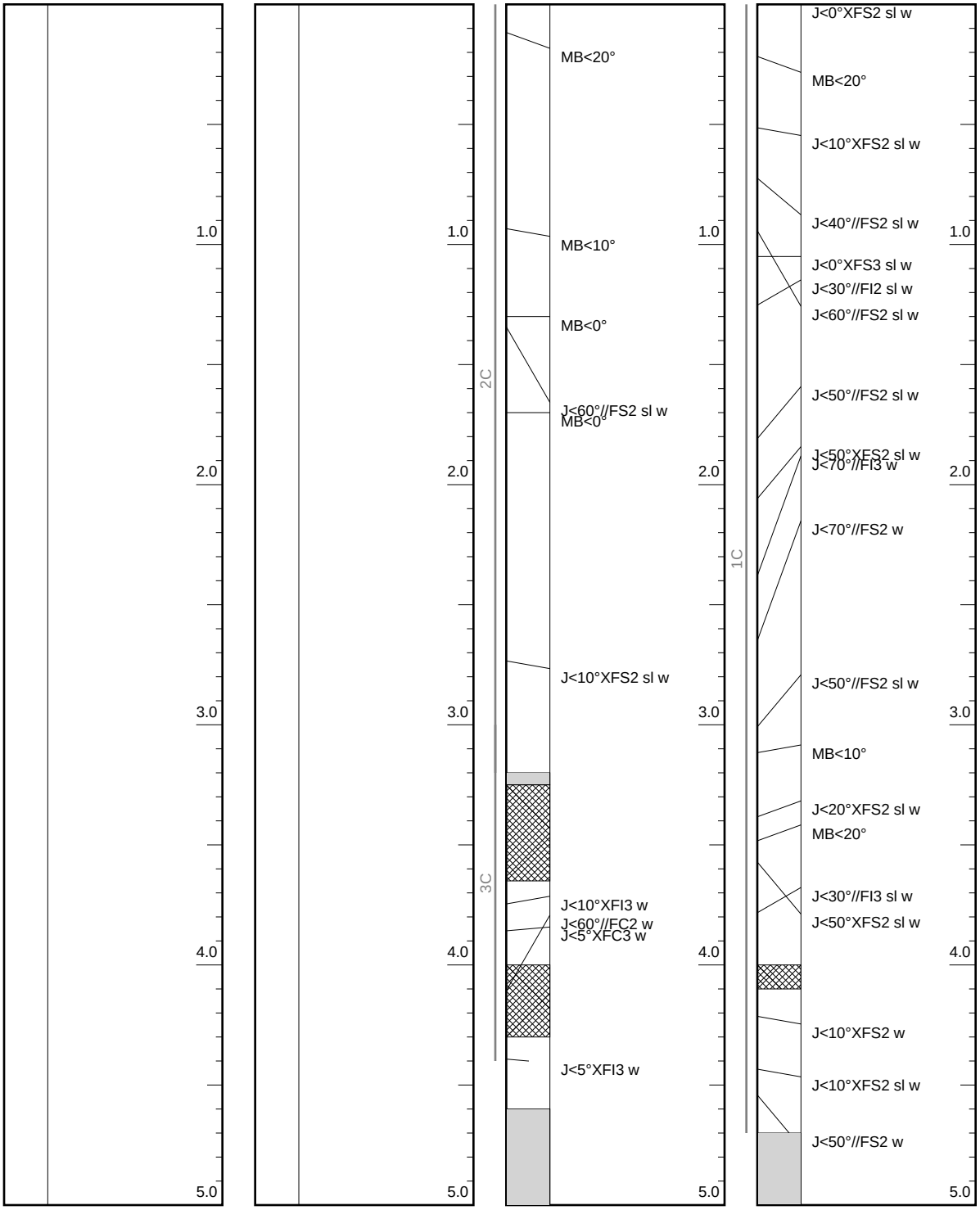
BORING NO.	MR-3		
SHEET	4	**OF**	5
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	40.7
		RES ENGR.	M McMaster

Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD
2C	119.8	123.0	100%	88%
3C	123.0	125.0	70%	0%

Run #	Start Depth	End Depth	Rec	RQD
1C	114.8	119.8	94%	14%



ROCK CORE SKETCH
LEGEND

JOINTING

- J - Joint
- MB - Mechanical Break
- < - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified
- w - Weathered joints
- slw - Slightly weathered joints
- fe - Iron stained joints
- slfe - Slightly iron stained joints
- min - Mineral coated joints

SURFACE

- C - Curved
- I - Irregular
- S - Straight

CONDITION

- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS

- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	MR-3
		SHEET	5 **OF** 5
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	40.70
BORING LOCATION	See Boring Location Plan	**VER. DATUM**	Borough of Manhattan Datum
NORTHING 11219.19	**EASTING** -8129.36	**HOR. DATUM**	Manhattan Coordinate System

EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG: Truck
CASING USED
- 4" dia: 35 depth
- 3" dia: 115 depth

ADVANCEMENT METHOD: Mud Rotary
DRILL RODS: NWJ
ROTARY BIT DIAMETER, IN.: 3 7/8, 2 7/8
DRILLING MUD USED: Bentonite
AUGER: 4" Hand Auger
SAMPLERS
- HAMMER TYPE: Automatic
- WEIGHT: 140 lbs DROP: 30" RATE:
- D-SAMPLER: 2" O.D. Split Spoon
- U-SAMPLER:
- S-SAMPLER:
- OTHER:

ROCK CORING
- CORING FEED: Hydraulic
- CORE BARREL: NX Double Tube
- CORE BIT: NX Diamond Bit

REMARKS

1 Hard Drilling at 13'.
2 Hole Collapsed to 30'
3 Rig Chatter at 102'.
4 Rig Chatter at 109.5'.
5 Hard Drilling at 110.5'.
6 Hard Drilling with soft zones at 111'.
7 Borehole ended at 125.0'.

DP 01-04-11*: Drilled from 123 to 125 on 01-04-11 from 07:30 to 01-05-11 at 09:00. Cloudy 35°F.

LEGEND

TV = TORVANE SHEAR STRENGTH, TSF
CT = CORING TIME, MINUTES PER FOOT
CB = CASING BLOWS PER FOOT
OLT = OTHER LAB TESTING PERFORMED
PP = POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH, TSF

REMARK TYPES

LC = LOST CIRCULATION
HD = HARD DRILLING
RC = RIG CHATTER
CBJ = CORE BARREL JAMMED
PO = PETROLEUM ODOR
CW = CHANGE IN WASH
SS = SLICKENSIDED

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATIONS
					No water level observations made.

☐ PIEZOMETER INSTALLED SKETCH SHOWN ON

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	109.80	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10.20	OTHER (HAND AUGER LIN. FT.)	5

BORING CONTRACTOR: Aquifer Drilling and Testing
DRILLER: Paul Gaddis HELPER(S): Chris Chaillou
RESIDENT ENGINEER: Michael McMaster DATE: 01-05-11
CLASSIFICATION CHECK: Cheryl Moss

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BORING LOG

BORING NO. MR-4P
SHEET 1 OF 6
FILE NO. 11476
SURFACE ELEV. 40.7
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,228.12 E: -8,078.78

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
12:30						CONC	0.5			
12-29-10	1HA	1.0	HAND		Brown fine to coarse sandy gravel, some concrete, silt (Fill) (GM)					
Wednesday		3.0	AUGER							
Partly Cloudy	2HA	3.0	HAND		Brown fine to coarse sand, some gravel, silt, trace brick (Fill) (SM)					
35 °F		5.0	AUGER				5			
14:00										
10:15	3D	6.0	4-3	6"	Gray brown gravel, some brick, trace coarse to fine sand, silt (Fill) (GP-GM)	F				
12-30-10		8.0	3-1							
Thursday	4D	8.0	2-4	7"	Brown coarse to fine sand, some gravel, brick, silt (Fill) (SM)					
Sunny		10.0	5-5				10			
35 °F	5D	10.0	1-1	9"	Brown coarse to fine sand, some brick, silt, trace gravel, concrete (Fill) (SM)					
		12.0	1-1							
							13.5			
							15			
	6D	15.0	4-4	8"	Red brown medium to fine sand, some silt, trace mica (SM)					
		17.0	3-4							
	7D	19.0	2-2	15"	Brown fine to medium sand, some silt, trace coarse sand, mica (SM)		20			
		21.0	3-4							
	8D	24.0	5-5	14"	Brown fine to medium sand, trace coarse sand, silt, gravel (SP-SM)		25			
		26.0	8-11							
	9D	29.0	5-4	12"	Brown fine to coarse sand, trace silt, gravel (SP-SM)		30			
		31.0	5-5							
						S1				
	10D	34.0	6-6	15"	Brown fine to medium sand, trace silt (SP-SM)		35			
		36.0	5-7							
	11D	39.0	9-10	16"	Do 10D (SP-SM)		40			
		41.0	9-6							
	12D	44.0	8-8	16"	Brown fine sand, some silt (SM)		45			
		46.0	8-7							
14:30										
09:00							50			1, 2
01-04-11										
Tuesday										

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BORING LOG

BORING NO. MR-4P
SHEET 2 OF 6
FILE NO. 11476
SURFACE ELEV. 40.7
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,228.12 E: -8,078.78

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-04-11										
	13D	53.0	9-6	9"	Brown fine to coarse sand, trace silt (SP-SM)					
		55.0	7-9			S1	55			
							58.5			
							60			
	14D	60.0	11-13	12"	Do 13D (SP-SM)					
		62.0	11-13							
										3
							65			
	15D	65.0	18-17	14"	Brown fine to coarse sand, trace silt, gravel, decomposed gravel fragments (SP-SM)					
		67.0	17-16							
							70			
	16D	70.0	12-13	12"	Brown fine to coarse sand, trace gravel, silt (SP-SM)					
		72.0	13-13							
							75			
	17D	75.0	13-16	13"	Do 16D (SP-SM)	S2				
		77.0	18-17							
							80			
	18D	80.0	11-14	8"	Brown coarse to fine sand, trace silt (SP-SM)					
		82.0	11-14							
14:30							85			
07:15 01-05-11 Wednesday Sunny 35 °F	19D	85.0	13-16	14"	Brown fine to coarse sand, trace gravel, silt, silt seams (SP-SM)					
		87.0	15-17							
							90			
	20D	90.0	14-14	11"	Brown coarse to fine sand, trace silt (SP-SM)					
		92.0	14-19							
							93.5			
							95			
	21D	95.0	15-20	13"	Brown medium to fine sand, trace coarse sand, silt (SP-SM)					
		97.0	19-17			S3				
							100			

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BORING LOG

BORING NO. MR-4P
SHEET 3 OF 6
FILE NO. 11476
SURFACE ELEV. 40.7
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,228.12 E: -8,078.78

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-05-11	22D	100.0	20-23	14"	Brown fine to medium sand, trace silt (SP-SM)					
		102.0	23-26							
							105			
	23D	105.0	18-22	14"	Brown coarse to fine sand, trace gravel, silt (SP-SM)					
		107.0	28-28			S3				
										4 (RC)
							110			
	24D	110.0	25-25	20"	Brown fine to medium sand, trace silt (SP-SM)					
		112.0	26-30							
							113.5			
						T	115			
	25D	115.0	30-47	15"	Top (9"): Brn f-m sandy si, sm gvl (ML)					
		116.3	100/4"-		Bot (6"): Brn f-c sa, sm si, rk fgmts (SM)					5 (HD)
							117.5			
14:45	1C	118.6	REC=23%	8"	Wthd, slightly to moderately wthd zones, gry gneissic schist, jtd to cljtd, wthd jts	T/WR			CT=1	
07:00		121.6	RQD=12%				120		CT=1	
01-06-11	2C	121.6	REC=0%				121		CT=5	
		123.4			SEE REMARK #6	WR				
15:00							123.4			6
							125			
							130			
							135			
							140			
							145			
							150			

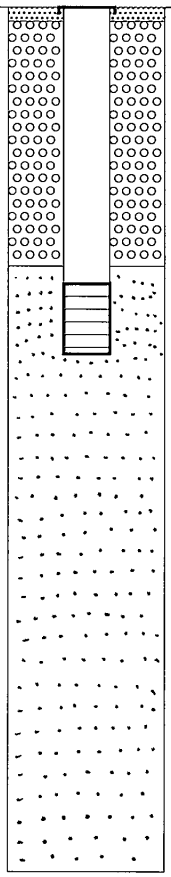
BORING NO. MR-4P

MUESER RUTLEDGE CONSULTING ENGINEERS

PIEZOMETER RECORD

BORING NO. MR-4P
SHEET 4 **OF** 6
PROJECT 300 Lafayette St
FILE NO. 11476
LOCATION New York, NY
PIEZOMETER NO.
DATE OF INSTALLATION 1/7/2011
RES ENGR. Michael McMaster

STRATA		PIEZOMETER INSTALLATION DETAILS	DEPTH (FT)
GROUND SURFACE ELEV. 40.7			
Concrete	0.0		0.0
F	2.0		2.0
S1	13.5		30.0
			37.0
			39.5
			49.5
S2	58.5		60.0
S3	93.5		90.0
T	113.5		
T/WR	117.5		
WR	121.0		120.0
	123.4		123.4
			150.0



PIEZOMETER TYPE PVC

INTAKE POINT

depth to bottom, ft = 51
depth to top, ft = 38
length, ft = 13 =L
diameter, in = 4 , ft = 0.3 =2R

STANDPIPE/RISER

elevation of rim, ft = 40.4
diameter, in = 2.25 , ft = 0.2 =2r

CAP

elevation of cap, ft = 40.6
diameter, in = 5.0

READING TIME		DEPTH - RIM TO WATER	ELEVATION OF WATER	REMARKS
DATE	CLOCK			
1/14/2011	8:20 AM	40.30	0.10	
1/24/2011	9:48 AM	40.30	0.10	

Gravel
Grout
Sand
Bentonite

GROUND SURFACE ELEV. 40.7

BORING NO. MR-4P

MUESER RUTLEDGE CONSULTING ENGINEERS

ROCK CORE SKETCH

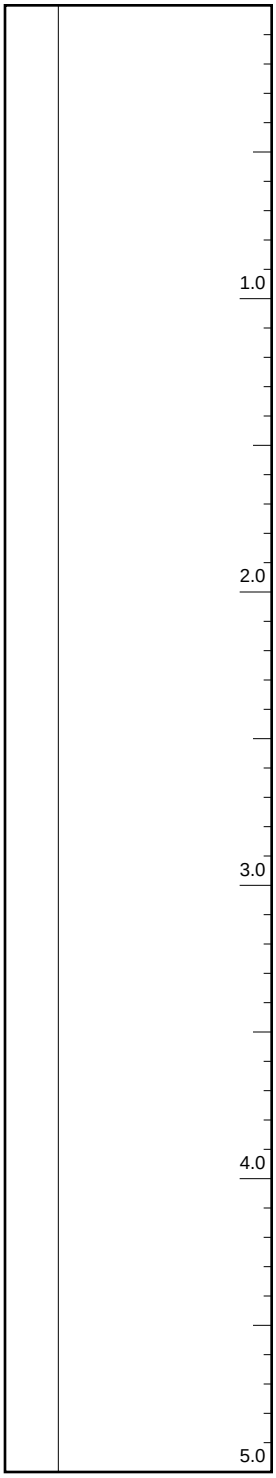
BORING NO.	MR-4P		
SHEET	5	**OF**	6
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	40.7
		RES ENGR.	M McMaster

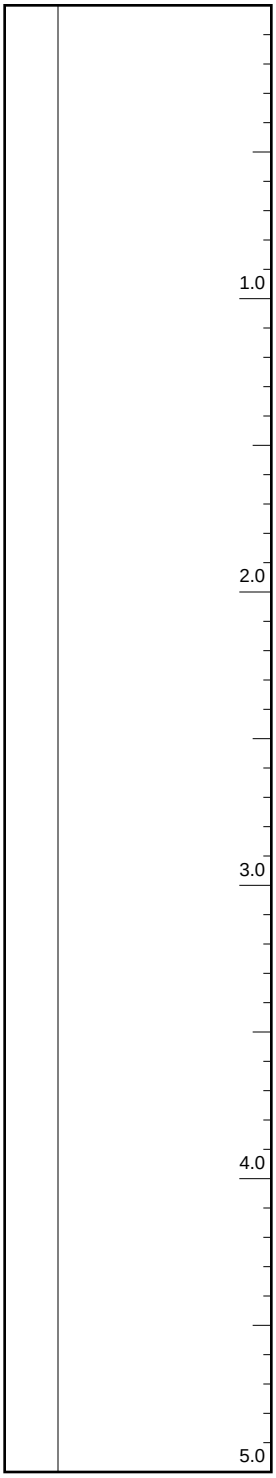
Run #	Start Depth	End Depth	Rec	RQD

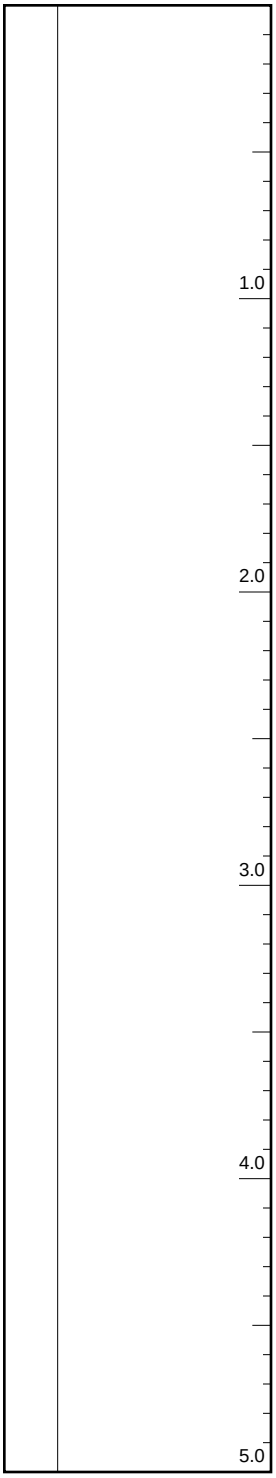
Run #	Start Depth	End Depth	Rec	RQD

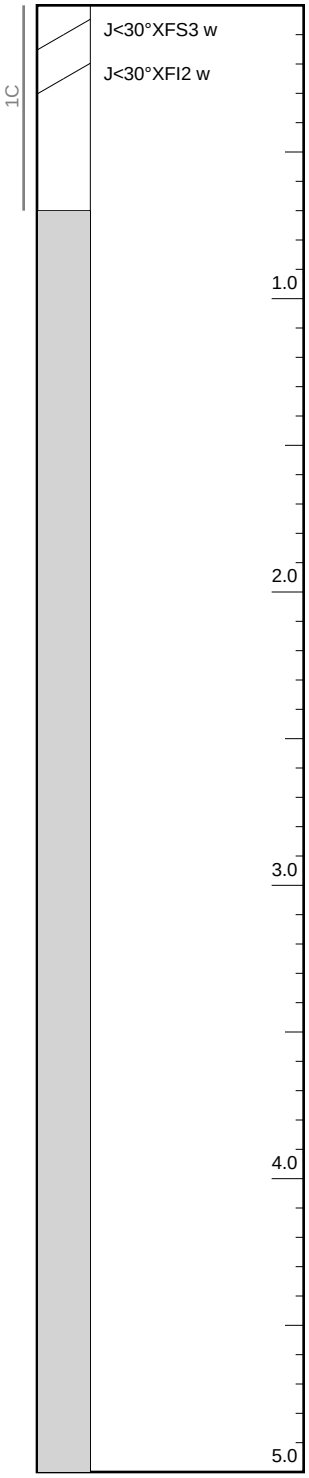
Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD
1C	118.6	121.6	23%	12%









ROCK CORE SKETCH
LEGEND

JOINTING

- J - Joint
- MB - Mechanical Break
- < - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified
- w - Weathered joints
- slw - Slightly weathered joints
- fe - Iron stained joints
- slfe - Slightly iron stained joints
- min - Mineral coated joints

SURFACE

- C - Curved
- I - Irregular
- S - Straight

CONDITION

- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS

- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	MR-4P
		SHEET	6 **OF** 6
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	40.70
BORING LOCATION	See Boring Location Plan	**VER. DATUM**	Borough of Manhattan Datum
NORTHING 11228.12	**EASTING** -8078.78	**HOR. DATUM**	Manhattan Coordinate System

EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG	Truck
CASING USED	
4" dia	50' depth
3" dia	120.5 depth
ADVANCEMENT METHOD	Mud Rotary
DRILL RODS	NWJ
ROTARY BIT DIAMETER, IN.	3 7/8, 2 7/8
DRILLING MUD USED	Revert
AUGER	4" Hand Auger
SAMPLERS	
HAMMER TYPE	Safety Hammer
WEIGHT: 140 lbs	DROP: 30" RATE:
D-SAMPLER	2" O.D. Split Spoon
U-SAMPLER	
S-SAMPLER	
OTHER	
ROCK CORING	
CORING FEED	Hydraulic
CORE BARREL	NX Double Tube
CORE BIT	NX Diamond Bit

REMARKS

1 Lost Circulation from 40'-49'
2 Rig switched at 50'. Automatic hammer used from 0' to 50'.
3 Hole collapsed to 45' to bottom of casing
4 Rig Chatter at 107'.
5 Hard Drilling with soft zones from 116.4-117.5
6 Borehole ended at 123.4' due to core bit lost in hole.

LEGEND

TV = TORVANE SHEAR STRENGTH, TSF
CT = CORING TIME, MINUTES PER FOOT
CB = CASING BLOWS PER FOOT
OLT = OTHER LAB TESTING PERFORMED
PP = POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH, TSF

REMARK TYPES

LC = LOST CIRCULATION
HD = HARD DRILLING
RC = RIG CHATTER
CBJ = CORE BARREL JAMMED
PO = PETROLEUM ODOR
CW = CHANGE IN WASH
SS = SLICKENSIDED

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATIONS
					See piezometer installation record.

☒ PIEZOMETER INSTALLED SKETCH SHOWN ON 4

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	114.90	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	3.00	OTHER (HAND AUGER LIN. FT.)	6

BORING CONTRACTOR	Aquifer Drilling and Testing		
DRILLER	Glenn, John Campbell	HELPER(S)	Prim Gopaul
RESIDENT ENGINEER	Michael McMaster	DATE	01-06-11
CLASSIFICATION CHECK	Cheryl Moss		

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BORING LOG

BORING NO. MR-4A
SHEET 1 OF 5
FILE NO. 11476
SURFACE ELEV. 40.8
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,227.01 E: -8,083.61

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
10:45										1
01-11-11										
Tuesday										
Partly Cloudy										
30 °F										
							5			
							10			
							15			
							20			
							25			
							30			
							35			
							40			
							45			
							50			

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BORING LOG

BORING NO. MR-4A
SHEET 2 OF 5
FILE NO. 11476
SURFACE ELEV. 40.8
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,227.01 E: -8,083.61

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-11-11										
							55			
							60			
							65			
							70			
							75			
							80			
							85			
							90			
							95			
							100			

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BORING LOG

BORING NO. MR-4A
SHEET 3 OF 5
FILE NO. 11476
SURFACE ELEV. 40.8
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,227.01 E: -8,083.61

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-11-11										
							105			
							110			
							115			
										2 (RC)
										3 (HD)
14:45							**120**			
07:00 01-12-11 Wednesday Cloudy 30 °F										4
	1C	122.6	REC=100%	60"	Medium Hd, UnW to SIW gry gneissic sch, jtd, iron stained to SIW and mineral coated jts		**122.6**		CT=4	
		127.6	RQD=84%						CT=5	
							125		CT=5	
									CT=6	
									CT=4	
	2C	127.6	REC=98%	59"	Medium Hd, UnW to SIW gry schistose gns, moderately jtd to jtd, FeJts, trace white pegmatite	R			CT=4	
		132.6	RQD=84%						CT=4	
							130		CT=5	
									CT=6	
01-26-11									CT=5	
14:45							**132.6**			5
							135			
							140			
							145			
							150			

MUESER RUTLEDGE CONSULTING ENGINEERS

ROCK CORE SKETCH

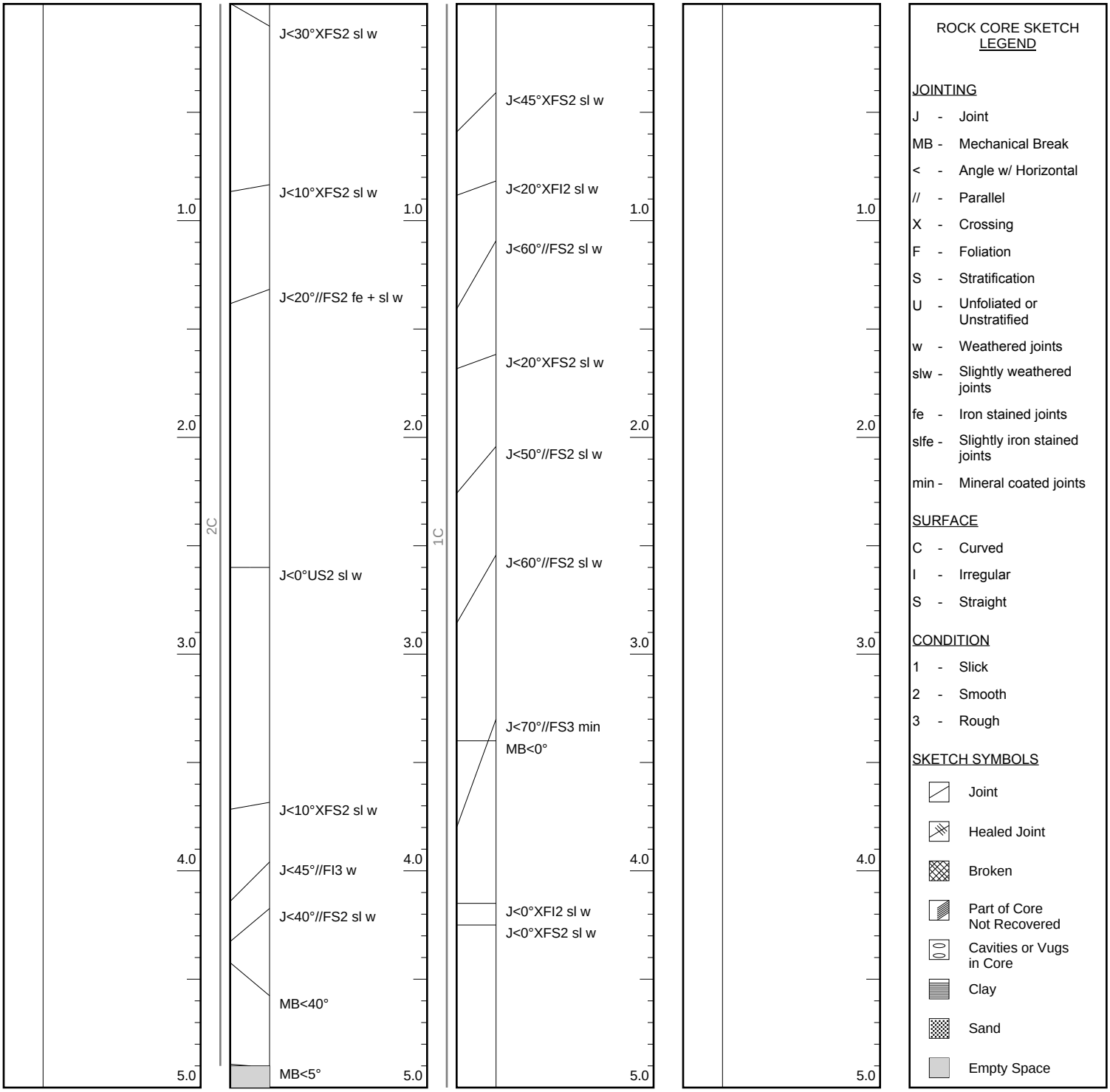
BORING NO.	MR-4A		
SHEET	4	**OF**	5
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	40.8
		RES ENGR.	M McMaster

Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD
2C	127.6	132.6	98%	84%

Run #	Start Depth	End Depth	Rec	RQD
1C	122.6	127.6	100%	84%

Run #	Start Depth	End Depth	Rec	RQD



MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	MR-4A
		SHEET	5 **OF** 5
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	40.80
BORING LOCATION	See Boring Location Plan	**VER. DATUM**	Borough of Manhattan Datum
NORTHING 11227.01	**EASTING** -8083.61	**HOR. DATUM**	Manhattan Coordinate System

EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG: Truck
CASING USED
- 4" dia: 5 depth
- 3" dia: 122 depth

ADVANCEMENT METHOD: Mud Rotary
DRILL RODS: NWJ
ROTARY BIT DIAMETER, IN.: 3 7/8, 5 7/8, 2 7/8
DRILLING MUD USED: Bentonite
AUGER:
SAMPLERS
- HAMMER TYPE: Automatic
- WEIGHT: 140 lbs DROP: 30" RATE:
- D-SAMPLER: 2" O.D. Split Spoon
- U-SAMPLER:
- S-SAMPLER:
- OTHER:

ROCK CORING
- CORING FEED: Hydraulic
- CORE BARREL: NX Double Tube
- CORE BIT: NX Diamond Bit

REMARKS

1 Borehole advanced with roller bit without soil sampling.
2 Rig Chatter at 117.5'.
3 Hard Drilling at 118.5'.
4 Soft zone at 120'.
5 Borehole ended at 132.6'.

LEGEND

TV = TORVANE SHEAR STRENGTH, TSF
CT = CORING TIME, MINUTES PER FOOT
CB = CASING BLOWS PER FOOT
OLT = OTHER LAB TESTING PERFORMED
PP = POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH, TSF

REMARK TYPES

LC = LOST CIRCULATION
HD = HARD DRILLING
RC = RIG CHATTER
CBJ = CORE BARREL JAMMED
PO = PETROLEUM ODOR
CW = CHANGE IN WASH
SS = SLICKENSIDED

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATIONS
					No water level observations made.

☐ PIEZOMETER INSTALLED SKETCH SHOWN ON

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.		NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10.00	OTHER (DRILLED WITHOUT SAMPLING LIN. FT.)	122.6

BORING CONTRACTOR: Aquifer Drilling and Testing
DRILLER: Paul Gaddis HELPER(S): Chris Chaillou
RESIDENT ENGINEER: Michael McMaster DATE: 01-26-11
CLASSIFICATION CHECK: Cheryl Moss

Mueser Rutledge Consulting Engineers
14 Penn Plaza - 225 West 34th Street
New York, NY 10122
T: 917 339-9300 F: 917 339-9400
www.mrce.com

BORING LOG

BORING NO. MR-5
SHEET 1 OF 5
FILE NO. 11476
SURFACE ELEV. 41.3
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,166.48 E: -8,082.76

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
08:00						CONC	0.5			
01-07-11	1D	1.0	5-4	3"	Gray gravel, some concrete, wood, trace coarse to fine sand, silt (Fill) (GP)					
Friday		3.0	4-2							
Snow										1 (LC)
30 °F	2D	4.0	2-5	10"	Gray coarse to fine sandy gravel, some wood, silt (Fill) (GM)		5			
		6.0	6-7							2 (HD)
	3D	6.0	7-9	10"	Gray coarse to fine sandy gravel, some silt, trace wood (Fill) (GM)					
		8.0	4-3							
	4NR	8.0	7-4	0"	No recovery					
		10.0	2-1			F	10			
	5D	10.0	1-3	5"	Gray gravelly coarse to fine sand, some silt, trace concrete (Fill) (SM)					
		12.0	5-4							
							15			
	6D	15.0	2-6	8"	Gray brown coarse to fine sand, some brick, silt, trace gravel (Fill) (SM)					
		17.0	6-7							
							18.5			
							20			
	7D	20.0	2-4	9"	Brown coarse to fine sand, trace silt, gravel (SP-SM)					
		22.0	6-8							
							25			
	8D	25.0	4-8	14"	Do 7D (SP-SM)					
		27.0	5-7							
							30			
	9D	30.0	6-6	14"	Brown fine to medium sand, some silt (SM)					
		32.0	6-6							
						S1	35			
	10D	35.0	5-6	16"	Brown medium to fine sand, trace silt (SP-SM)					
		37.0	6-8							
							40			
	11D	40.0	5-6	18"	Brown fine sand, some silt, trace mica (SM)					
		42.0	7-7							
							45			
	12D	45.0	4-8	17"	Brown silty fine sand, trace mica (SM)					
		47.0	8-12							
							50			

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BORING LOG

BORING NO. MR-5
SHEET 2 OF 5
FILE NO. 11476
SURFACE ELEV. 41.3
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,166.48 E: -8,082.76

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-07-11	13D	50.0	8-7	13"	Brown coarse to fine sand, trace silt (SP-SM)					
		52.0	5-6							
							55			
	14D	55.0	10-14	20"	Brown fine sand, some silt (SM)					
		57.0	14-17							
						S1	60			
	15D	60.0	7-8	18"	Brown medium to fine sand, trace silt (SP-SM)					
		62.0	9-11							
							65			
	16D	65.0	6-8	22"	Brown fine to medium sand, trace silt (SP-SM)					
		67.0	10-9							
							68.5			
							70			
	17D	70.0	9-11	18"	Brown coarse to fine sand, trace silt (SP-SM)					
		72.0	12-13							
							75			
	18D	75.0	9-10	19"	Brown coarse to fine sand, trace silt, gravel (SP-SM)					
		77.0	10-12							
							80			
	19D	80.0	10-9	17"	Brown medium to fine sand, trace coarse sand, silt (SP-SM)					
		82.0	11-12							
						S2				
							85			
	20D	85.0	9-10	12"	Brown coarse to fine sand, trace silt (SP-SM)					
		87.0	12-15							
							90			
	21D	90.0	9-11	12"	Brown medium to fine sand, trace silt, silty fine sand layers (SP-SM)					
15:00		92.0	15-21							
08:45 01-10-11 Monday Partly Cloudy 28 °F							95			
	22D	95.0	10-12	12"	Brown medium to fine sand, trace silt (SP-SM)					
		97.0	15-16							
							98.5			
						S3	100			

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BORING LOG

BORING NO. MR-5
SHEET 3 OF 5
FILE NO. 11476
SURFACE ELEV. 41.3
RES ENGR. M McMaster

PROJECT: 300 Lafayette St
LOCATION: New York, NY
COORDINATES: N: 11,166.48 E: -8,082.76

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE REC	SAMPLE DESCRIPTION	STRATA	DEPTH	WATER CONTENT	FIELD TESTS	REMARKS (TYPE)
Cont'd 01-10-11	23D	100.0	14-17	17"	Brown coarse to fine sand, trace silt (SP-SM)					
		102.0	15-17							
							105			
	24D	105.0	15-20	22"	Brown silty fine to medium sand, trace mica (SM)					
		107.0	20-17			S3				
							110			
	25D	110.0	15-21	16"	Brown fine to medium sand, some silt, trace gravel, mica (SM)					
		112.0	28-30							
							113.5			3 (RC)
							115			
	26D	115.0	100/6"-	5"	Black and brown gravelly coarse to fine sand, some silt (SM)					4 (HD)
		115.5	-			T				
							120			
	27D	120.0	40-51	14"	Gray and black and brown fine to coarse sand, some rock fragments, silt, mica (SM)		**121**			
		121.3	100/3"-						CT=7	
	1C	121.7	REC=100%	13"	Medium Hd, SIW gry gneissic schist, jtd, FeJts				CT=1	5 (CBJ)
		122.8	RQD=50%						CT=6	
	2C	122.8	REC=85%	40"	Medium Hd, SIW gry gneissic sch, jtd to moderately jtd, iron stained to wthd jts, trace white pegmatite		**125**		CT=6	
		126.7	RQD=51%						CT=7	
	3C	126.7	REC=98%	59"	Medium Hd, SIW to UnW gry gneissic sch, moderately jtd to jtd, iron stained to wthd jts	R			CT=5	
		131.7	RQD=74%						CT=7	
									CT=6	6 (CW)
							130		CT=7	
									CT=6	
16:30							**131.7**		CT=6	7
							135			
							140			
							145			
							150			

MUESER RUTLEDGE CONSULTING ENGINEERS

ROCK CORE SKETCH

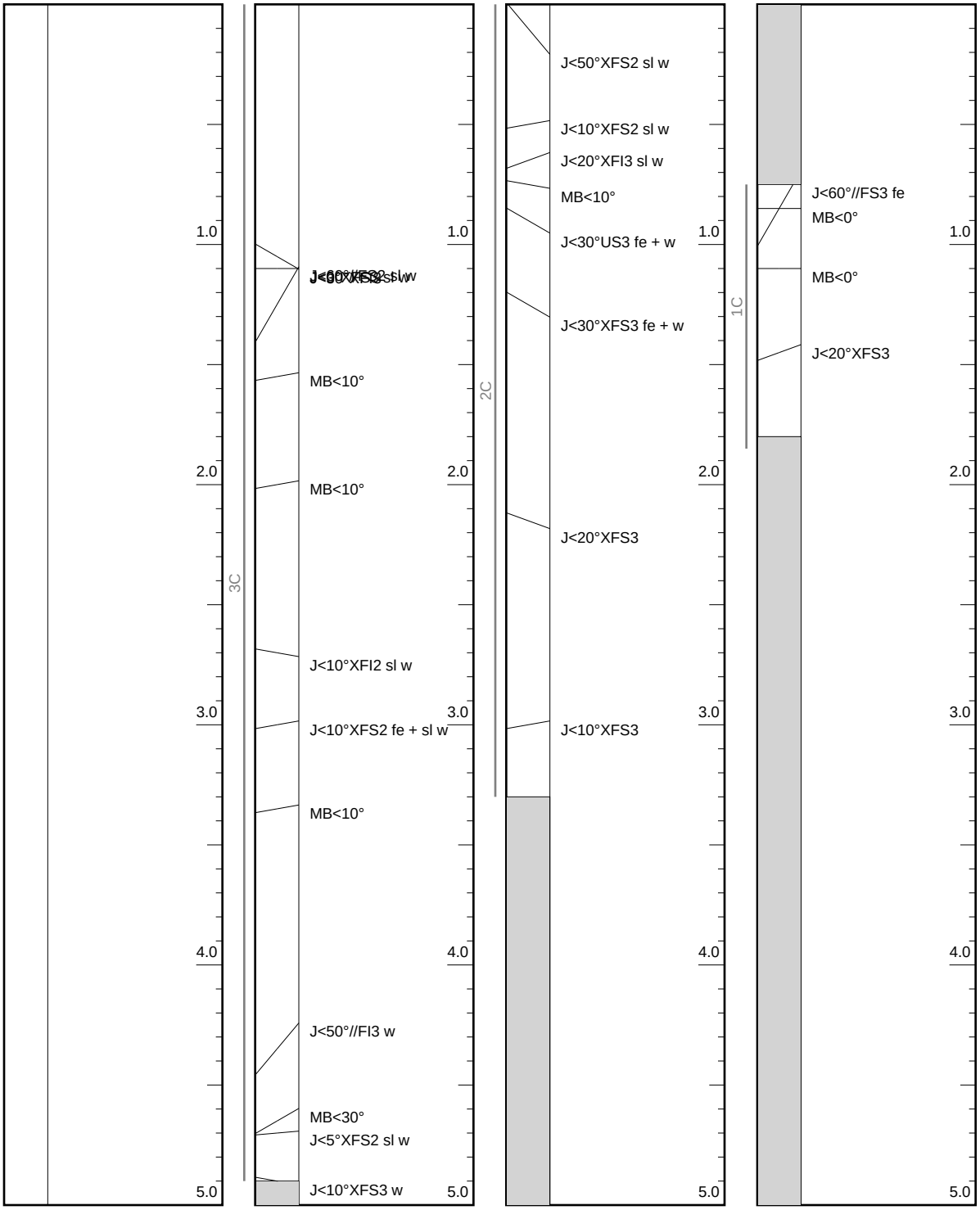
BORING NO.	MR-5		
SHEET	4	**OF**	5
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	41.3
		RES ENGR.	M McMaster

Run #	Start Depth	End Depth	Rec	RQD

Run #	Start Depth	End Depth	Rec	RQD
3C	126.7	131.7	98%	74%

Run #	Start Depth	End Depth	Rec	RQD
2C	122.8	126.7	85%	51%

Run #	Start Depth	End Depth	Rec	RQD
1C	121.7	122.8	100%	50%



ROCK CORE SKETCH
LEGEND

JOINTING

J - Joint
MB - Mechanical Break
< - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified
w - Weathered joints
slw - Slightly weathered joints
fe - Iron stained joints
slfe - Slightly iron stained joints
min - Mineral coated joints

SURFACE

C - Curved
I - Irregular
S - Straight

CONDITION

1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS

Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	MR-5
		SHEET	5 **OF** 5
PROJECT	300 Lafayette St	**FILE NO.**	11476
LOCATION	New York, NY	**SURFACE ELEV.**	41.30
BORING LOCATION	See Boring Location Plan	**VER. DATUM**	Borough of Manhattan Datum
NORTHING 11166.48	**EASTING** -8082.76	**HOR. DATUM**	Manhattan Coordinate System

EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG	Truck
CASING USED	
4" dia	20 depth
3" dia	122 depth
ADVANCEMENT METHOD	Mud Rotary
DRILL RODS	NWJ
ROTARY BIT DIAMETER, IN.	3 7/8, 5 7/8, 2 7/8
DRILLING MUD USED	Bentonite
AUGER	
SAMPLERS	
HAMMER TYPE	Automatic
WEIGHT: 140 lbs	DROP: 30" RATE:
D-SAMPLER	2" O.D. Split Spoon
U-SAMPLER	
S-SAMPLER	
OTHER	
ROCK CORING	
CORING FEED	Hydraulic
CORE BARREL	NX Double Tube
CORE BIT	NX Diamond Bit

REMARKS

1 Lost Circulation from 0' to 20'.
2 Hard Drilling from 5' to 14'. Wood in wash.
3 Rig Chatter at 113'.
4 Hard Drilling with soft zones from 115.5' to 120'
5 1C:Core Barrel Jammed at 122.8'.
6 Change in Wash at 128.4'.
7 Borehole ended at 131.7'.

LEGEND

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OLT = OTHER LAB TESTING PERFORMED
PP = POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH, TSF

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CBJ = CORE BARREL JAMMED
PO = PETROLEUM ODOR
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SS = SLICKENSIDED

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATIONS
					No water level observations made.

☐ PIEZOMETER INSTALLED SKETCH SHOWN ON

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	121.70	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10.00	OTHER	

BORING CONTRACTOR	Aquifer Drilling and Testing		
DRILLER	Paul Gaddis	HELPER(S)	Chris Chaillou
RESIDENT ENGINEER	Michael McMaster	DATE	01-10-11
CLASSIFICATION CHECK	Cheryl Moss		

Appendix F

Phase I Reports

(Provided in Electronic Form Only)