38-20 32ND STREET

BLOCK 382, LOT 24

QUEENS, NEW YORK

Remedial Investigation Report

OER Site Number: 17TMP0828Q, 17EHAZ311Q

CEQR Number 08DCP021Q

Dutch Kills Rezoning and Related Actions

Prepared for:

Long Island City Developers Group, LLC

77 Box Street, Brooklyn, New York 11222

Prepared by:

Laurel Environmental Associates, Ltd.

53 West Hills Road, Huntington Station, New York 11746

(631) 673-0612

January 2018

REMEDIAL INVESTIGATION REPORT

TABLE OF CONTENTS

FIGURES

List of Figures

TABLES

List of Tables

APPENDICES

List of Appendices

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 10
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 ELAP	New York State Department of Health Environmental Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
QEP	Qualified Environmental Professional
RI	Remedial Investigation
RIR	Remedial Investigation Report
SCO	Soil Cleanup Objective
SPEED	Searchable Property Environmental Electronic Database

CERTIFICATION

I, Scott Yanuck, 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 38-20 32nd Street Site, (NYC OER Site No. 17EHAZ311Q). 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 Date Signature

EXECUTIVE SUMMARY

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 located at 38-20 32nd Street in the Long Island City section in Queens, New York and is identified as Block 382 and Lot 24 on the New York City Tax Map. Figure 1.0 shows the Site location. The Site is 6,840-square feet in area and is bounded by residential properties to the north, south, and west, and by 32nd Street to the east. A map showing the site boundary is shown on Figure 2.0. Currently, the Site is used for commercial purposes; the building is a two-story masonry block and brick building. The second floor of the building is currently vacant. The ground floor is divided into two (2) separate commercial units of approximately equal size. The southern unit is a photography studio, and the northern unit is utilized by a limousine company for office space and storage of vehicles.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site is as a mixed use residential and community building, including a 12-story hotel and ambulatory diagnostic health care facility. The specific layout of the proposed site redevelopment includes a basement across the entire building footprint, with excavation of the entire parcel to a depth of at least eight (8) feet below ground surface (see Appendix A). The current zoning designation is M1-3 for light industrial purposes. The proposed use is consistent with the planned rezoning of the area surrounding the Site (CEQR 08DCP021Q, Queens Plaza Rezoning).

Summary of Past Uses of Site and Areas of Concern

The Site has been occupied since circa 1940 for industrial and commercial purposes including general contracting, electrical manufacturing, plumbing supply storage, carpentry, auto body and auto repair work, and as a car dispatch office. The current Site occupants include a photography studio and a limousine company.

The AOCs identified for this site in the 2015 Phase I ESA Report, and as part of the 2015 and 2016 Site investigations included:

1. Two (2) USTs located in the northeastern and southeastern corner of the building at the Site.
2. Four (4) ASTs located in the basement of the Site building.
3. Impacted soil and groundwater beneath the Site building.

Summary of the Work Performed under the Remedial Investigation

LEA on behalf of Long Island City Developers Group, LLC performed the following scope of work (2017 sample locations are shown on Figure 5.0):

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed four (4) soil borings (SB-A through SB-D, see Figure 5.0) to a depth of ten feet, across the entire project Site, and collected eight (8) soil samples for chemical analysis from the soil borings to evaluate soil quality. Two (2) soil samples were collected for laboratory analysis from each soil boring location, from depths of 0-2' and 8-10' below the building floor;
3. Four (4) groundwater samples were collected from the existing on-Site monitoring wells for chemical analysis to evaluate groundwater quality (the monitoring wells were properly abandoned after sampling);
4. Installed three (3) soil vapor probes around Site and collected three (3) sub-slab soil vapor samples for chemical analysis.

Due to access constraints within the Site building, the RI sampling activities were conducted in two phases, in June 2017 and August 2017. The initial phase of sampling was conducted on June 16, 2017 in the northern portion of the building prior to complete occupancy of this area by the limousine company, and included soil sampling at SB-C and SB-D, groundwater sampling at MW-3 and MW-4, and sub-slab soil vapor sampling at SV-1 and SV-2. Access to the southern portion of the building for sampling was not available until August 2017, due to concerns about disruptions to the photographer's business by the sampling (the business closed for vacation during August, allowing sampling to be conducted unimpeded). As a result, the remainder of the

sampling program was conducted on August 2, 2017 (groundwater sampling at MW-1 and MW-2) and August 3, 2017 (soil sampling as SB-A and SB-B, and sub-slab soil sampling at SV-3).

Summary of Environmental Findings

1. Elevation of the property is 31 feet.
2. Depth to groundwater ranges from 13.20 to 15.10 feet at the Site.
3. Groundwater flow is generally from the west to the east beneath the Site.
4. Depth to bedrock is estimated to be 73 feet at the Site.
5. The stratigraphy of the site, from the surface below the concrete floor of the Site building within the four (4) soil borings advanced during the 2017 investigation generally consisted of tan to brown-black silt and clay or silty clay to a depth of 2 to 4 feet. This material was underlain by 2 to 6 feet of silty fine sand (although was absent at SB-A), followed by tan silty clay to sandy clay to 10 feet, the terminal depths of the borings (except at SB-C where the silty sand was observed from 4 to 10 feet). At SB-B, the zone from 3 to 6.5 feet was comprised of tan silty fine sand. Photoionization detector (PID) readings of 0.1 parts per million (ppm) to 38 ppm (this reading was measured in the 0 to 2-foot interval at boring SB-C, which was collected for analysis) were measured in the soil samples, and no odors were noted in any of the soil samples. These materials are similar to those previously recorded for the Site, as documented in boring logs from previous investigations.
6. The soil sampling results were compared to NYSDEC 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCOs) and Restricted-Residential Use Soil Cleanup Objectives (RRSCOs). Soil/fill samples collected during the RI showed only two (2) soil samples, SB-A 0-2' and SB-C 0-2', that contained any analytes at concentrations exceeding the Unrestricted Use SCOs, including copper, lead, and mercury in both samples, plus zinc in the SB-C 0-2' sample. These metals were not detected at concentrations exceeding Track 1 SCOs in the deeper samples from borings SB-A or SB-C. VOCs, SVOCs, pesticides and PCBs were not detected in any soil sample. Overall, soil chemistry is unremarkable and does not indicate any disposal of waste.
7. Groundwater samples collected during the RI showed that two (2) VOCs were detected in groundwater at concentrations exceeding their New York State 6 NYCRR Part 703.5

Class GA groundwater quality standards (GQSs), including benzene (at 19 ug/L) in the sample from MW-1 and trichlorofluoromethane in the samples from MW-1, MW-2, and MW-4 at a maximum concentration of 160 ug/L. Two SVOCs were detected in groundwater at concentrations exceeding their GQSs, including bis (2-ethylhexyl) phthalate in the sample from MW-4 at 24 .7ug/L and naphthalene in the samples from MW-2 and MW-4 at maximum concentration of 17.2 ug/L. No pesticides or PCBs were detected in any of the groundwater samples. Several metals were identified and only antimony, magnesium, manganese, and sodium exceeded their respective GQSs in dissolved samples.

8. Soil vapor results were conservatively compared to the indoor air guidelines in Table 3.1 Air Guideline Values (AGVs) presented in the New York State Department of Health (NYSDOH)'s *Final Guidance for Evaluating Soil Vapor Intrusion*, dated October 2006. Soil vapor samples collected during the RI showed 23 individual VOCs that were detected in the soil vapor samples. Soil vapor samples detected low levels of petroleum related and elevated concentrations of chlorinated compounds. Highest concentrations were detected for trichlorofluromethane at 11,000 ug/m^3.Tthree (3) chlorinated VOCs including 1,1,1-trichloroethane detected in two samples at maximum concentration of 150 ug/m^3, tetrachloroethene (PCE) detected in all three samples ranging from 63 ug/m^3 to 4,300 ug/m^3, and trichloroethene (TCE) detected in two samples at maximum concentration of 37 ug/m^3. Concentrations of above chlorinated compounds are above the guidance values established by NYSDOH and require mitigation. Although indoor air samples were not collected as part of the RI, per the May 2017 updated matrices in the NYSDOH guidance, the PCE concentration detected in sample SV-1 (4,300 micrograms per cubic meter ug/m^3) would yield a decision of "mitigate", no matter what the PCE concentration in the indoor air.

REMEDIAL INVESTIGATION REPORT

1.0 SITE BACKGROUND

Long Island City Development Group, LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 0.16-acre site located at 38-20 32nd

Street in the Long Island City section of Queens, New York. The current Site use is commercial, with mixed residential and community use (hotel and health care facility) proposed for the property. The RI work was performed between June 16, 2017 and August 3, 2017. 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 38-20 32nd Street in the Long Island City section in Queens, New York and is identified as Block 382 and Lot 24 on the New York City Tax Map. Figure 1.0 shows the Site location. The Site is 6,840-square feet in area and is bounded by residential properties to the north, south, and west, and by 32nd Street to the east. A map showing the site boundary is shown on Figure 2.0. Currently, the Site is used for commercial purposes; the building is a two-story masonry block and brick building. The second floor of the building is currently vacant. The ground floor is divided into two (2) separate commercial units of approximately equal size. The southern unit is a photography studio, and the northern unit is utilized by a limousine company for office space and storage of vehicles.

1.2 Proposed Redevelopment Plan

The proposed future use of the Site is as a mixed use residential and community building, including a 12-story hotel and ambulatory diagnostic health care facility. The specific layout of the proposed site redevelopment includes a basement across the entire building footprint, with excavation of the entire parcel to a depth of at least eight (8) feet below ground surface (see Appendix A). The current zoning designation is M1-3 for light industrial purposes. The proposed use is consistent with the planned rezoning of the area surrounding the Site (CEQR 08DCP021Q, Queens Plaza Rezoning).

1.3 Description of Surrounding Property

The properties located directly adjoining and surrounding the Site to the north and west are mixed residential and commercial in nature. The properties directly adjoining and surrounding the Site to the south are residential in nature. The property across 32nd Street from the Site is occupied by the AHRC Cyril Weinberg Center (address of 32-03 39th Avenue), which is a day service center for adults with developmental disabilities. These uses represent sensitive

receptors for the Site. Land use surrounding the Site is shown on Figure 2.0. The surrounding area is zoned for light manufacturing (M1-3).

2.0 SITE HISTORY

2.1 Past Uses and Ownership

The Site has been occupied since circa 1940 for industrial and commercial purposes including general contracting, electrical manufacturing, plumbing supply storage, carpentry, auto body and auto repair work, and as a car dispatch office. The current Site occupants include a photography studio and a limousine company.

2.2 Previous Investigations

A Phase I Environmental Site Assessment (ESA) was prepared by Laurel Environmental Associates, Ltd. (***LEA***) and is documented in a report dated July 9, 2015. At the time of the site inspection, the property was occupied by an auto body and auto repair shop, with a car dispatch office. ***LEA*** identified four (4) active 275-gallon aboveground storage tanks (ASTs) at the Site. Two (2) of the tanks were used for heating oil, and two (2) of the tanks were used for waste oil storage. A historic underground storage tank (UST) was identified on a Sanborn Fire Insurance Map from 1947, and a remote fill was observed in the sidewalk. The status of the historic UST was unknown, and was identified as a recognized environmental condition (REC). The presence of existing floor and trench drains within the building at the site, with unknown discharge points, was also considered a REC. Due to potential petroleum hydrocarbon (PHC) and non-PHC sources within applicable search distances, a vapor encroachment condition (VEC) could not be ruled out. The Site is an E-Designation site, ID # 08DCP021Q, for rezoning purposes of approximately 70-acres of land associated with Queens Plaza. The Site requires approved workplans for testing and remediation of any significant issues from the New York City Office of Environmental Remediation prior to redevelopment. The Phase I ESA Report is included in Appendix B.

A Phase II Subsurface Investigation Report was conducted by ***LEA*** and is documented in a reported dated September 15, 2015, as revised October 1, 2015. As part of a geophysical investigation, ***LEA*** identified two (2) anomalies indicative of 1,000-gallon USTs. Soil borings were advanced at four (4) locations in proximity to the geophysical anomalies. Laboratory analysis of the soil samples showed exceedances of 6 NYCRR Part 375-6.8(a) Unrestricted Use

Soil Cleanup Objectives (SCOs) for petroleum related volatile organic compounds (VOCs). Groundwater was collected from two (2) temporary wells at the Site. Petroleum related VOCs were detected at levels exceeding New York State Class GA Groundwater Standards and Guidance Values. The semi-volatile organic compound (SVOC) naphthalene was also detected in the groundwater samples at levels exceeding the Class GA Groundwater Guidance Value. The floor and trench drains at the Site were confirmed by ***LEA*** to discharge directly into the public sanitary sewer system. Based on these results, the NYSDEC was notified and they assigned Spill Case Number 15-06214 to the Site. ***LEA*** recommended test pits/and or remedial excavation in the areas of concern, and removal of the identified suspect USTs. In-situ chemical injections were recommended to address the contaminated groundwater at the Site. Sample locations from the 2015 investigation are shown on Figure 3.0, and the 2015 investigation report is included in Appendix C.

As required by the NYSDEC in response to the spill case, ***LEA*** implemented a follow-up investigation, in February 2016, including:

- Advancing soil borings and soil sampling at four (4) additional interior locations;
- Installing and sampling four (4) permanent monitoring wells;
- Well surveying to determine groundwater flow direction; and
- Laboratory analysis of soil and groundwater samples for VOCs and petroleum-related SVOCs.

Groundwater was determined to be flowing toward the east. No compounds were detected in soil at concentrations exceeding Protection of Groundwater SCOs. VOCs were detected at concentrations exceeding Class GA Groundwater Standards and Guidance Values in the samples from wells MW-1, MW-2, and MW-4. Class GA Groundwater Standards and Guidance Values for SVOCs were exceeded in the samples from MW-1 and MW-4. Sample locations from the 2016 investigation are shown on Figure 4.0, and the 2016 investigation report is included in Appendix C.

In June 2017, the four (4) ASTs located in the basement of the Site building were cleaned and removed for proper off-Site disposal. Since tenant spaces within the building was occupied, abandonment rather than removal of the USTs was selected. The northern UST was opened, emptied, and cleaned in June. Since the UST was enclosed within a concrete vault and showed no evidence of leakage, it was abandoned in place by filling with sand and recycled concrete aggregate (RCA), with NYSDEC authorization. Access to the southern UST was not available

until August 2017, when it was opened, emptied, cleaned, and abandoned in place by filling with sand, with NYSDEC authorization. Tank locations are shown on Figures 3.0, 4.0, and 5.0, and the report documenting the tank removal program is included in Appendix D.

2.3 Site Inspection

On June 14, 2017, ***LEA*** Senior Geologist Brian McCabe conducted an inspection of the Site to select Remedial Investigation sample locations and to assess potential logistical issues for the removal of the four (4) ASTs from the building basement and abandonment of the two (2) USTs below the ground floor of the Site building (see Figure 2.0). All portions of the building were inspected at this time, even though access to the southern portion of the building was not available for sampling until August 2017.

2.4 Areas of Concern

The AOCs identified for this site in the 2015 Phase I ESA Report, and as part of the 2015 and 2016 Site investigations included:

4. Two (2) USTs located in the northeastern and southeastern corner of the building at the Site.
5. Four (4) ASTs located in the basement of the Site building.
6. Impacted soil and groundwater beneath the Site building.

The Phase I ESA Report is presented in Appendix B.

3.0 PROJECT MANAGEMENT

3.1 Project Organization

The Qualified Environmental Profession (QEP) responsible for preparation of this RIR is Scott Yanuck.

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

LEA on behalf of Long Island City Developers Group, LLC performed the following scope of work (2017 sample locations are shown on Figure 5.0):

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed four (4) soil borings (SB-A through SB-D, see Figure 5.0) to a depth of ten feet, across the entire project Site, and collected eight (8) soil samples for chemical analysis from the soil borings to evaluate soil quality. Two (2) soil samples were collected for laboratory analysis from each soil boring location, from depths of 0-2' and 8-10' below the building floor;
3. Four (4) groundwater samples were collected from the existing on-Site monitoring wells for chemical analysis to evaluate groundwater quality (the monitoring wells were properly abandoned after sampling);
4. Installed three (3) soil vapor probes around Site and collected three (3) sub-slab soil vapor samples for chemical analysis.

Due to access constraints within the Site building, the RI sampling activities were conducted in two phases, in June 2017 and August 2017. The initial phase of sampling was conducted on June 16, 2017 in the northern portion of the building prior to complete occupancy of this area by the limousine company, and included soil sampling at SB-C and SB-D, groundwater sampling at MW-3 and MW-4, and sub-slab soil vapor sampling at SV-1 and SV-2. Access to the southern portion of the building for sampling was not available until August 2017, due to concerns about disruptions to the photographer's business by the sampling (the business was closed for vacation when the sampling occurred in August). As a result, the remainder of the sampling program was conducted on August 2, 2017 (groundwater sampling at MW-1 and MW-2) and August 3, 2017 (soil sampling as SB-A and SB-B, and sub-slab soil sampling at SV-3).

4.1 Geophysical Investigation

Since a comprehensive geophysical survey was conducted as part of the 2015 Site investigation (see Figure 3.0), a geophysical survey was not conducted as part of this investigation.

4.2 Borings and Monitoring Wells

Drilling and Soil Logging

Soil below the concrete floor of the Site building within the four (4) soil borings advanced during this investigation generally consisted of tan to brown-black silt and clay or silty clay to a depth of 2 to 4 feet. This material was underlain by 2 to 6 feet of silty fine sand (although was absent at SB-A), followed by tan silty clay to sandy clay to 10 feet, the terminal depths of the borings (except at SB-C where the silty sand was observed from 4 to 10 feet). At SB-B, the zone from 3 to 6.5 feet was comprised of tan silty fine sand. Photoionization detector (PID) readings of 0.1 parts per million (ppm) to 38 ppm (this reading was measured in the 0 to 2-foot interval at boring SB-C, which was collected for analysis) were measured in the soil samples, and no odors were noted in any of the soil samples. Groundwater was not encountered in any of the borings (the depth to groundwater in the monitoring wells was approximately 13 to 15 feet below the top of casing).

Boring logs prepared by a ***LEA*** geologist are attached in Appendix E. A map showing the location of soil borings and monitoring wells is shown on Figure 5.0.

Groundwater Monitoring Well Construction

As noted above, four (4) permanent monitoring wells, designated MW-1 through MW-4, were installed at the Site as part of the 2016 investigation. The wells were each constructed using a 10-foot length of 2-inch diameter PVC well screen set to depths between 18.5 and 24 feet below the building floor. Monitoring well locations are shown on Figures 4.0 and 5.0. Since the monitoring wells were originally installed in response to Spill Case Number 15-06214, which was opened in response to the USTs at the Site, the monitoring wells were properly abandoned after completion of the sampling conducted under this program, as the USTs were abandoned in place, the spill was closed and tanks de-registered.

Survey

Sample locations for this investigation were measured from known points within the building and are shown on Figure 5.0.

Water Level Measurement

Prior to sampling each monitoring well, the depth to water and depth to bottom were measured using an electronic water level indicator. The depth to groundwater in the wells was 15.10 feet (MW-3) and 14.50 feet (MW-4) in June 2017, and was 13.45 feet (MW-1) and 13.20 (MW-2) feet (MW-1) in August 2017 (all measurements are feet below the top of casing).

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, 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. The samples collected during this investigation are summarized in Table I, and sample locations are shown on Figure 5.0.

Table I: RI Sample Summary

Medium	Sample Location/Depth	Analytical Parameters/Method
Soil	SB-A, 0-2' SB-A, 8-10' SB-B, 0-2' SB-B, 8-10' SB-C, 0-2' SB-C, 8-10' SB-D, 0-2' SB-D, 8-10' Dup (duplicate 6/16/2017) Field Blank Soil (field blank 6/16/2017) Dup (duplicate 8/3/2017) Field Blank Water (field blank 8/3/2017) Trip Blank (trip blank 8/3/2017)	VOCs / USEPA 8260 SVOCs / USEPA8270 Pesticides / USEPA 8081 PCBs / USEPA 8082 Target Analyte List (TAL) metals / USEPA 6010 and 7471
Groundwater	MW-1 MW-2 MW-3 MW-4 Dup (duplicate 6/16/2017) Field Blank Water (field blank 6/16/2017) Trip Blank (trip blank 6/16/2017) Dup (duplicate 8/2/2017) Field Blank Water (field blank 8/2/2017) Trip Blank (trip blank 8/2/2017)	VOCs / USEPA 8260 SVOCs / USEPA8270 Pesticides / USEPA 8081 PCBs / USEPA 8082 TAL metals* / USEPA 6010 and 7471
Soil Vapor	SV-1 SV-2 SV-3	VOCs / USEPA TO-15

All samples analyzed by York Analytical Laboratories of Stratford, Connecticut
'* Total and dissolved metals analyzed in groundwater and duplicate samples

Soil Sampling

Eight (8) soil samples (two (2) from each of the four (4) soil borings, at depths of 0 to 2 feet and 8 to 10 feet were collected for chemical analysis during this RI. All samples were collected using a Model 6712DT Geoprobe® direct push rig, and dedicated acetate sampling sleeves. Data on soil sample collection for chemical analyses, including sample depths, are reported in Table I. Figure 5.0 shows the location of samples collected in this investigation. The analytical laboratory, analytical parameters, and analytical methods for the soil samples are shown in Table I. Analytical results are presented below.

As noted in Table I, quality assurance/quality control (QA/QC) samples collected during the soil sampling portion of the program included a duplicate sample, a field blank sample, and a trip blank for each phase of the investigation.

Groundwater Sampling

Four (4) groundwater samples were collected for chemical analysis during this RI. Samples were collected using low-flow procedures, with a peristaltic pump and dedicated tubing for each monitoring well sampled. During the August 2017 sampling event (MW-1 and MW-2), parameters monitored during purging included pH, turbidity, specific conductivity, oxidation/ reduction potential (ORP), and temperature, and are summarized in Table II. Water quality parameters could not be measured during the June 2017 sampling event (MW-3 and MW-4) due to equipment failure; these monitoring wells were purged of at least five (5) gallons (more than three casing volumes) prior to sampling. The monitoring wells were purged and sampled at a flow rate of approximately 0.1 to 0.25 liter per minute, depending on the well yield. Figure 5.0 shows the location of groundwater sampling locations. The analytical laboratory, analytical parameters, and analytical methods for the groundwater samples are shown in Table I. Analytical results are presented below.

Table II: Parameters Measured During Monitoring Well Purging

Well	Reading	pH	Turbidity (NTUs)	Specific Conductivity (µS/cm)	Oxidation/ Reduction Potential (Mv)	Temperature (ºC)
MW-1 (8/2/17	1	7.07	12.2	2257.3	-45.8	22.7
	2	7.60	6.75	2167.4	-43.6	22.45
	3	7.05	5.8	2174.5	-43.5	22.36
MW-2 (8/2/17)	1	6.98	30.2	1410.9	337.6	20.37
	2	9.89	38.6	1229.2	308.5	22.12
	3	6.87	18.7	1289.2	273.8	24.47
MW-3 (6/16/17)	1	NM	NM	NM	NM	NM
	2	NM	NM	NM	NM	NM
	3	NM	NM	NM	NM	NM
MW-4 (6/16/17)	1	NM	NM	NM	NM	NM
	2	NM	NM	NM	NM	NM
	3	NM	NM	NM	NM	NM

NM: Not measured (due to equipment failure in field)

As noted in Table I, QA/QC samples collected during the groundwater sampling portion of the program included a duplicate sample, a field blank sample, and a trip blank for each phase of the investigation.

Soil Vapor Sampling

Three (3) temporary soil vapor probes were installed and three (3) soil vapor samples were collected for chemical analysis during this RI. At each location, the building floor was cored using a drill, a Vapor Pin® temporary sampling point was installed, and the soil vapor sample point was leak-checked using helium. Each sample was collected using an evacuated 6-liter Summa canister equipped with a flow controller set at 0.05 liter per minute, to collect the sample over a 2-hour period. Soil vapor sampling locations are shown in Figure 5.0. Methodologies used for soil vapor assessment conform to the *NYS DOH Final Guidance on Soil Vapor Intrusion, October 2006*, as amended.

Chemical Analysis

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

Factor	Description
Quality Assurance Officer	The laboratory chemical analytical quality assurance is directed by Aaron Patak
Chemical Analytical Laboratory	Chemical analytical laboratory used in the RI is NYS ELAP certified and was York Analytical Laboratories, Inc., of Stratford, Connecticut
Chemical Analytical Methods	Soil analytical methods: • TAL Metals by USEPA Methods 6010C (rev. 2007) and 7471. • VOCs by USEPA Method 8260C (rev. 2006). • SVOCs by USEPA Method 8270D (rev. 2007). • Pesticides by USEPA Method 8081B (rev. 2000). • PCBs by USEPA Method 8082A (rev. 2000). Groundwater analytical methods: • TAL Metals by USEPA Methods 6010C (rev. 2007) and 7471. • VOCs by USEPA Method 8260C (rev. 2006). • SVOCs by USEPA Method 8270D (rev. 2007). • Pesticides by USEPA Method 8081B (rev. 2000). • PCBs by USEPA Method 8082A (rev. 2000).

	Soil vapor analytical methods: • VOCs by USEPA TO-15.

Results of Chemical Analyses

Laboratory data for soil, groundwater and soil vapor are summarized in Tables III, IV, and V, respectively. Laboratory data deliverables for all samples evaluated in this RIR are provided in Appendix F (June 2017 samples) and Appendix G (August 2017 samples).

5.0 ENVIRONMENTAL EVALUATION

5.1 Geological and Hydrogeological Conditions

Stratigraphy

Soil below the concrete building foundation within the four (4) soil borings advanced during this investigation generally consisted of tan to brown-black silt and clay or silty clay to a depth of 2 to 4 feet. This material was underlain by 2 to 6 feet of silty fine sand (absent at SB-A), followed by tan silty clay to sandy clay to 10 feet, the terminal depths of the borings (except at SB-C where the silty sand was observed from 4 to 10 feet). At SB-B, the zone from 3 to 6.5 feet was comprised of tan silty fine sand. Photoionization detector (PID) readings of 0.1 parts per million (ppm) to 38 ppm (this reading was measured in the 0 to 2-foot interval at boring SB-C, which was collected for analysis) were measured in the soil samples, and no odors were noted in any of the soil samples. These materials are similar to those previously recorded for the Site, as documented in boring logs from previous investigations (see Appendix C). Groundwater was not encountered in any of the borings (the depth to groundwater in the monitoring wells was approximately 13 to 15 feet below the top of casing).

Hydrogeology

During the 2017 groundwater sampling events, the average depth to groundwater in the monitoring wells was 14.80 feet below the top of well casing in June 2017 (15.10 feet in MW-3 and 14.50 feet in MW-4), and was 13.33 feet in August 2017 (13.45 feet in MW-1 and 13.20 in MW-2). As determined during the 2016 site investigation, groundwater flow is from west to east. Due to the nearly 2-month time differential between depth to groundwater measurements at MW-1/MW-2 and MW-3/MW-4 during this RI, a groundwater elevation contour map was not prepared for the data from this investigation.

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 compounds detected in soil samples, in comparison to 6 NYCRR Part 375-6.8 Track 1 (Unrestricted Use) Soil Cleanup Objectives (SCOs) is included as Table III. Figure 5.0 shows the sample locations.

As shown in Table III, only two (2) soil samples, SB-A 0-2' and SB-C 0-2', contained any analytes at concentrations exceeding the Track 1 SCOs, including copper, lead, and mercury in both samples, plus zinc in the SB-C 0-2' sample. These metals were not detected at concentrations exceeding Track 1 SCOs in the deeper samples from borings SB-A or SB-C, showing that the planned redevelopment of the Site will adequately address these soil impacts.

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 compounds detected in groundwater samples is included in Table IV. Exceedance of applicable groundwater standards are shown.

Two VOCs were detected in groundwater at concentrations exceeding their New York State 6 NYCRR Part 703.5 Class GA groundwater standards, including benzene in the sample from MW-1 and trichlorofluoromethane in the samples from MW-1, MW-2, and MW-4. Two SVOCs were detected in groundwater at concentrations exceeding their Class GA groundwater standards, including bis (2-ethylhexyl) phthalate in the sample from MW-4 and naphthalene in the samples from MW-2 and MW-4. Except for naphthalene, none of these compounds were detected in any of the RI soil samples, indicating that the source for these compounds is not the Site. Although naphthalene was detected at low concentrations in RI soil samples from SB-A and SB-D, the presence of the existing building at the Site would prevent mobilization of any soil contamination into groundwater. In addition, MW-2 is located well upgradient of the USTs and the USTs were found to be encased in concrete, with no evidence of a release observed (see report in Appendix D), suggesting an off-Site source for the SVOCs detected in groundwater.

No pesticides or PCBs were detected in any of the groundwater samples. Metals that were detected at concentrations above Class GA groundwater standards included antimony (dissolved sample from MW-1), magnesium (all total samples and dissolved samples from MW-1, MW-2, and MW-3), manganese (total and dissolved samples from MW-1 and MW-4), and sodium (all total and dissolved samples).

The detected parameters and extent of detections indicate that the sample results represent a regional zone of impacted groundwater, rather than a Site-related source. Since groundwater in this area is not utilized for drinking water, no groundwater remediation is recommended.

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 compounds detected in the soil vapor samples is included in Table V.

Twenty-three (23) individual VOCs were detected in the soil vapor samples. Of these, only three (3), 1,1,1-trichloroethane, tetrachloroethene (PCE), and trichloroethene (TCE), have guidance values included in the 2006 NYSDOH document titled *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, as amended (NYSDOH guidance). Indoor air samples were not collected due to the proposed development to demolish the building. Although indoor air samples were not collected as part of the RI, per the May 2017 updated matrices in the NYSDOH guidance, the PCE concentration detected in sample SV-1 (4,300 micrograms per cubic meter) would yield a decision of "mitigate", no matter what the PCE concentration in the indoor air. While the concentrations of these VOCs detected in the RI soil samples do not suggest an on-Site source, it is recommended that a mitigation system (e.g., vapor barrier and/or passive or active sub-slab depressurization system) be incorporated into the design for Site redevelopment. In addition, since the anticipated timeframe for Site redevelopment is on the order of 2019 or later, it is recommended that indoor air samples be collected within the Site building, to determine whether unacceptable levels of compounds included in the NYSDOH guidance are present in indoor air within the building.

5.5 Prior Activity

Based on an evaluation of the data and information from the RIR, disposal of significant amounts of hazardous waste is not suspected at this site.

5.6 Impediments to Remedial Action

There are no known impediments to remedial action at this property.