

**518-526 West 30th Street,
New York, New York**

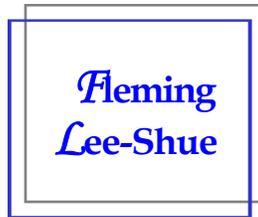
REMEDIAL INVESTIGATION REPORT

**NYC OER Project Number 14CVCP162M
NYC OER E-Designation Project Number: 13EH-N305M**

Prepared for:

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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 |
| DER-10 | New York State Department of Environmental Conservation Technical Guide 10 |
| ESA | Phase I Environmental Site Assessment |
| GPR | Ground penetrating radar |
| GSQ | NYSDEC TOGS 1.1.1 Class GA Ambient Groundwater Quality Standards |
| HASP | Health and Safety Plan |
| HAZWOPER | Hazardous Waste Operations and Emergency Response |
| IRM | Interim Remedial Measure |
| NAPL | Non-aqueous Phase Liquid |
| NYC DEP | New York City Department of Environmental Protection |
| 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 |
| PAH | Polycyclic Aromatic Hydrocarbon |
| PID | Photoionization Detector |
| QEP | Qualified Environmental Professional |
| RCNY | Rules of the City of New York |
| REC | Recognized environmental condition |
| RI | Remedial Investigation |
| RIR | Remedial Investigation Report |
| SCO | Soil Cleanup Objective |
| SPEED | Searchable Property Environmental Electronic Database |
| SVOCs | Semivolatile Organic Compounds |
| USGS | United States Geological Survey |
| VOCs | Volatile Organic Compounds |

CERTIFICATION

I, Arnold F. Fleming, P.E., am a Qualified Environmental Professional, as defined in Title 43 Chapter 1402 of the Rules of the City of New York [RCNY § 43-1402(ar)]. I have primary direct responsibility for implementation of the Remedial Investigation for the 518-526 West 30th Street, (NYC Office of Environmental Remediation Site - 14CVCP162M). I am responsible for the content of this Remedial Investigation Report, have reviewed its contents and certify that this Remedial Investigation Report is accurate to the best of my knowledge and that it contains all available environmental information and data regarding the property.

Arnold F. Fleming
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 Title 43 Chapter 1407 of the Rules of the City of New York [RCNY§ 43-1407(f)]. The remedial investigation (RI) described in this document is consistent with the applicable guidance.

Site Location and Current Usage

The Site is located at 518-526 West 30th St. in the Chelsea section of Manhattan, New York and is identified as Block 701 and Lots 45,52,55,56, and 58 on the New York City Tax Map. Figure 1 shows the Site location. The Site is the second phase in the development of the 500 West 30th St. project. The Site is 23,700-square feet and is bounded by the Lot 16 project to the south and West 30th St. to the north. To the west, the Site is bounded by a 7-story commercial building (Lot 59). To the east the Site is bounded by Lot 44 and the High Line. The High Line is a New York City linear park built on the former elevated New York Central Railroad spur called the West Side Line. A map of the Site boundary is provided as Figure 2. Currently, the Site is a vacant lot. According to the Department of City Planning, the Site is included in the Special West Chelsea District Zone that allows for the development of new residential/ commercial buildings and facilitates the reuse of the High Line as an open linear park.

Summary of Proposed Redevelopment Plan

The Site is an extension of the 500 West 30th St. project. The proposed redevelopment plan will include a single 26-story tower on a 3-story podium base and will encompass current lots 58, 56, 55, 52, and part of lot 45. The proposed residential, mixed-use building will have one cellar level with frontage along 30th St. between 10th Ave. and 11th Ave. The cellar level will be used for mechanical rooms, residential accessory spaces and residential amenities. The cellar will have a slightly larger footprint than the podium base above (additional 15 feet toward the High Line). The cellar will be at least 12 feet deep plus foundations. The first floor will have the residential entrance lobby on 30th St. and retail use along the remainder of the street frontage.



The ground floor has no grade level open spaces proposed. The parking entrance will be located on the first floor as well with primary access 30th St.; there will be a ground floor pedestrian access with the existing building at 529 29th St.. The second floor of the building will house permitted accessory parking for the building along with some mechanical rooms. The third floor, the last podium floor, will consist of open to below spaces for parking at second level, mechanical spaces, and residential units. Floors 4 to 28 will have 190 residential units ranging from studios to three bedrooms. The exterior of the building will be pre-cast concrete panels with brick veneer, with aluminum and glass punched windows and an aluminum and glass storefront for the retail portions on the first floor.

The development will be approximately 270,000 gross square feet (GSF) (including 20,000 square feet of below-grade space) and broken down as follows:

Total Residential Area = 234,000 GSF

Total Commercial Area = 9,000 GSF

Total Parking Area = 10,000 GSF

Total Mechanical Area = 17,000 GSF

The current zoning designation is C6-4, which permits a tower occupied by commercial, residential and/or community facility that may penetrate the sky exposure plane. The C6-4 zoning designation is allowed in mostly major business districts with a floor to area ratio of 10.0 or 15.0 exclusive of an applicable bonus. The proposed use is consistent with the existing zoning for the property.

Summary of Past Uses of Site and Areas of Concern

A Phase I Environmental Site Assessment (ESA) was performed by Fleming Lee-Shue Inc. (FLS) in April 2005 and updated in September 2008. The Phase I ESA constitutes an all appropriate inquiry into the previous ownership and uses of the property to identify recognized environmental conditions (RECs) and areas of concern (AOC).

The Site was occupied by tenement style buildings from before 1890 until circa 1900. A confectionary factory was constructed circa 1910. The confectionary factory operations continued until it was abandoned when the central portion of the factory building was



demolished and replaced by the Central Railroad right of way (the present-day Highline) and a wagon builder circa 1930. The building was occupied by the Metal Purchasing Company from circa 1950 until the late 1990's. The Site was then converted and used as a parking garage until 2007. From 2007 to early 2012, a temporary tent was erected on Lot 52 that accommodated the New York Trapeze School while lots 45, 55, 56 and 58 remained vacant. The temporary tent was dismantled in late 2012. The Site is currently occupied by construction trailers. Based on the Phase I ESA evaluation, no RECs were identified at the Site; however, the presence of urban fill was identified as an on-Site AOC.

Four off-site AOCs were identified for this Site in the Phase I ESA report:

- The historic junkyard and filling station operations on Lot 37, upgradient from the Site.
- The No. 4 fuel oil that was stored in a storage tank located in a vault in the basement of 502-504 West 30th St., up/cross-gradient from the Site.
- The historic auto repair operations beneath the High Line, upgradient from the Site.
- The chemical manufacturer located at 515 West 30th St., upgradient from the Site.

The Phase I ESA Report is provided as Appendix A.

Summary of the Work Performed at the Site

- A Site inspection was conducted as part of the Phase I ESA in 2005 and 2008 to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
- A geophysical survey was completed across the entire Site during the 2007 RI.
- Installation of nine soil borings in 2007 and three soil borings in 2013 across the entire project Site. Collected 18 soil samples in 2007 and six soil samples in 2013 for laboratory analysis from the soil borings to evaluate soil quality.
- Installed three temporary groundwater monitoring points in 2007 and three temporary groundwater monitoring points in 2013 throughout the Site. Three groundwater samples were collected in 2007 and three groundwater samples were collected in 2013 for laboratory analysis to evaluate groundwater quality.
- Four soil vapor screening probes were installed in 2013, and four vapor samples were collected from 1-2 feet above the soil/water interface at each location [approximately 8-9 feet below grade].

Summary of Environmental Findings

1. The elevation of the property ranges from 14 to 18 feet.
2. The depth-to-groundwater ranges from 10 to 11 feet below grade.
3. The groundwater flow is generally from southeast to northwest.
4. The depth-to-bedrock at the Site is not known.
5. The stratigraphy consists of approximately 10 to 16 feet of fill material consisting of brick, concrete, ash, cinders and wood in a matrix of silty sand. The fill appears to be evenly dispersed throughout the lots. The fill material is underlain by fine to medium sand, silt with sand and organic clays.
6. One VOC, acetone (max 103 micrograms per kilogram[$\mu\text{g}/\text{kg}$]), was detected at concentrations in excess of Track 1 UUSCOs. The chlorinated VOCs PCE (five samples at a max of 2.8 $\mu\text{g}/\text{kg}$) and TCE (2 samples at a max of 1.1 $\mu\text{g}/\text{kg}$) were detected only at trace levels. Petroleum-related compounds, including benzene, toluene, and xylenes, were also detected at trace levels (all below 20 $\mu\text{g}/\text{kg}$). Several SVOCs including, benzo(a)anthracene (max. 41,500 $\mu\text{g}/\text{kg}$), benzo(a)pyrene (max. 29,600 $\mu\text{g}/\text{kg}$), benzo(b)fluoranthene (max. 18,400 $\mu\text{g}/\text{kg}$), benzo(k)fluoranthene (max. 18,900 $\mu\text{g}/\text{kg}$), chrysene (max. 46,000 $\mu\text{g}/\text{kg}$), dibenzo(a,h)anthracene (max. 7,440 $\mu\text{g}/\text{kg}$), indeno(1,2,3-cd)pyrene (max. 11,700 $\mu\text{g}/\text{kg}$), pyrene (max. 107,000 $\mu\text{g}/\text{kg}$) exceeded their respective Track 1 Unrestricted Use and Track 2 Restricted Residential Use SCOs in shallow soil samples, as well as in two deep soil samples. The maximum concentrations of SVOCs all occurred in one sample which had a total SVOC concentration of approximately 509 ppm. This area will be treated as a hotspot. Eight metals were found in both shallow and deep soil samples above Track 1 Unrestricted Use SCOs, and of these arsenic (max. 40.4 milligrams per kilogram [mg/kg]), barium (max. 947 mg/kg), copper (max. 552 mg/kg), lead (max. 1880 mg/kg), and mercury (max. 116 mg/kg) also exceeded Track 2 Restricted Residential Use SCOs. Pesticides including 4,4'-DDE (max. 58.4 $\mu\text{g}/\text{kg}$) and 4,4'-DDT (max. 67.8 $\mu\text{g}/\text{kg}$) were observed in excess of Track 1 Unrestricted Use SCOs but did not exceed Track 2 Restricted Residential Use SCOs. The PCB Aroclor 1260 was

detected in one sample at a concentration (571 µg/kg) in excess of its Track 1 Unrestricted Use SCO, but below its Track 2 Restricted Residential Use SCO.

7. Although the 2007 groundwater RI did not detect the presence of any VOCs, the 2013 groundwater data detected several VOCs, including ethyl benzene (9.5 ug/L [micrograms per liter]), methylene chloride (max. 5.7 ug/L), and total xylenes (86.8 ug/L) at concentrations exceeding NYSDEC Part 703.5 Groundwater Quality Standards (GQSs). The VOCs chloroform (1.2 ug/L), isopropylbenzene (3.7 ug/L), and toluene (1.5 ug/L) were also detected in 2013 below GQSs. Metals including manganese and sodium were detected exceeding GQSs in 2007, and dissolved metals including iron (max. 16,600 ug/L), manganese (max. 3,660 ug/L), selenium (max. 20.5 ug/L), and sodium (max. 194,000 ug/L) exceeded their respective GQSs in 2013 sampling. The only SVOC detected in either round of sampling was naphthalene in 2013 at 13.5 ug/L, which is above its GQS. Neither the 2007, nor the 2013 sampling showed any detectable pesticides or PCBs.
8. Soil vapor sampling was not conducted in 2007. Remedial Investigations in 2013 detected several petroleum related and chlorinated VOCs at generally low concentrations. Most concentrations were below 25 micrograms per cubic meter (ug/m³). The 2013 RI revealed the presence of the chlorinated VOC, Trichloroethylene (TCE), in three of four samples at a maximum concentration of 7 ug/m³ which is within the monitoring range established by NYSDOH. Tetrachloroethene (PCE) was detected in all four soil vapor samples at a maximum concentration of 13 ug/m³, which is below NYSDOH's monitoring range. Neither 1,1,1-trichloroethane nor carbon tetrachloride were detected in soil vapor.

REMEDIAL INVESTIGATION REPORT

1.0 SITE BACKGROUND

On behalf of West 30th Highline Holdings, L.L.C., FLS has conducted this RI of the Site to assess environmental conditions, confirm the analytical results of the previous subsurface investigation completed in 2007, and incorporate any necessary remedial actions into its plan to redevelop the Site. The Site is a 0.54-acre parcel located at 518-526 West 30th St. in the Chelsea section of Manhattan, New York. The proposed use for the Site includes 26-story mixed-used residential/commercial building. The RI work was performed on January 29 to February 5, 2007 and on February 19, 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). West 30th Highline Holdings, LLC is enrolling the redevelopment project into the NYC Voluntary Cleanup Program (VCP).

1.1 SITE LOCATION AND CURRENT USAGE

The Site is located at 518-526 West 30th St. in the Chelsea section in Manhattan, New York and is identified as Block 701 and Lots 45,52,55,56 and 58 on the New York City Tax Map. Figure 1 shows the Site location. The Site is the second phase in the development of the 500 West 30th St. project. The Site is 23,700-square feet and is bounded by the Lot 16 project to the south and West 30th St. to the north. To the west, the Site is bounded by a 7-story commercial building (Lot 59). To the east the Site is bounded by Lot 44 and the High Line. The High Line is a New York City linear park built on the former elevated New York Central Railroad spur called the West Side Line. A map of the Site boundary is provided as Figure 2. Currently, the Site is a vacant lot. According to the Department of City Planning, the Site is included in the Special



West Chelsea District Zone that allows for the development of new residential/commercial buildings and facilitates the reuse of the High Line as an open linear park.

1.2 PROPOSED REDEVELOPMENT PLAN

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Total Parking Area = 10,000 GSF

Total Mechanical Area = 17,000 GSF

The current zoning designation is C6-4, which permits a tower occupied by commercial, residential and/or community facility that may penetrate the sky exposure plane. The C6-4



zoning designation is allowed in mostly major business districts with a floor to area ratio of 10.0 or 15.0 exclusive of an applicable bonus. The proposed use is consistent with the existing zoning for the property.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

According to the New York City Office of Environmental Remediation (OER) Searchable Property Environmental E-Database (SPEED) application, no schools, hospitals or day care facilities are located within a 250 to 500-foot radius. The area bordered by West 30th St., 10th Ave., West 26th St. and 8th Ave. is considered a NYS Environmental (EN) Zone, according to OER's SPEED application. This area is located about 475 feet from the Site. The Site appears on the City of New York Department of City Planning Zoning Map 8b and is designated C6-3, which is labeled as a general central commercial district, but allows residential use. The use of the surrounding properties is mainly commercial with some residential uses as well. A plan view of the surrounding land uses is depicted in Figure 3.

2.0 SITE HISTORY

2.1 PAST USES AND OWNERSHIP

The Site was occupied by tenement style buildings from before 1890 until circa 1900. A confectionary factory occupied the Site circa 1910. The confectionary factory operations continued until it was abandoned when the central portion of the factory building was demolished and replaced by the Central Railroad right of way (the present-day Highline) and a wagon builder circa 1930. The building was occupied by the Metal Purchasing Company from circa 1950 until the late 1990's. The Site was then converted and used as a parking garage until 2007. From 2007 to early 2012, a temporary tent was erected on Lot 52 that accommodated the New York Trapeze School while lots 45, 55, 56 and 58 remained vacant. The temporary tent was dismantled in late 2012. The Site is currently occupied by construction trailers.

2.2 PREVIOUS INVESTIGATIONS

In January and February of 2007, FLS conducted a RI at the Site. The New York City Department of Environmental Protection (NYCDEP) placed an "e" designation on this Site, requiring that a subsurface investigation of the Site be performed prior to redevelopment of the Site for residential purposes. The overall redevelopment project includes multiple lots within Block 701, including lots 58, 56, 55, 52, and part of lot 45. The RI was designed to investigate the soil and groundwater quality on all of the lots proposed under the redevelopment Site and to characterize the surface and subsurface soils and groundwater in areas where current and historic operations may have impacted the Site. All investigations on the Site were performed in accordance with NYCDEP "e" designation protocols.

The 2007 RI included the installation of soil borings and temporary groundwater monitoring wells using a truck-mounted Geoprobe® unit. The RI included the collection and evaluation of samples to determine soil and groundwater conditions. Soil and groundwater sampling was conducted from January 29 to February 5, 2007. Soil samples were collected from a total of 9 borings (SB5 to SB7, SB10 to SB13, SB25 and SB26) on lots 58, 56, 55, 52, and part of lot 45. Groundwater samples were collected at 3 of the 11 boring locations [SB6 (GW) and

SB12 (GW), SB13 (GW)]. Soil and groundwater sample locations are depicted on Figure 4. The boring logs are provided as Appendix B.

No visual or olfactory evidence of contamination was observed in any of the borings. Soil samples were analyzed for Target Compound List (TCL) VOCs, TCL SVOCs, Pesticides, PCBs, and Target Analyte List (TAL) Metals. The 2007 soil analytical results are provided as Tables 1A, 2A, 3A and 4A. Groundwater samples were analyzed for TCL VOCs, TCL SVOCs, Pesticides, PCBs, and Total and Dissolved TAL Metals. The 2007 groundwater analytical results are provided as Tables 5A, 6A, 7A and 8A. The analytical results for soil samples were compared to the NYSDEC Track 1 UUSCOs and Track 2 RRUSCOs and the groundwater analytical results were compared to NYSDEC Part 703.5 or the Technical Operational Guidance Series (TOGS) 1.1.1 GQS.

Soil:

The soil samples collected during the 2007 RI revealed the presence of volatile organic compounds (VOCs) (Table 1A), semivolatile organic compounds (SVOCs) (Table 2A), metals (Table 3A), pesticides and polychlorinated biphenyls (PCBs) (Table 4A) at concentrations in excess of Track 1 UUSCOs or Track 2 Track 2 RRUSCOs. The VOC acetone (max. 103 micrograms per kilogram[$\mu\text{g}/\text{kg}$]) was detected at concentrations in excess of Track 1 UUSCOs. Several SVOCs including, benzo(a)anthracene (max. 41,500 $\mu\text{g}/\text{kg}$), benzo(a)pyrene (max. 29,600 $\mu\text{g}/\text{kg}$), benzo(b)flouranthene (max. 18,400 $\mu\text{g}/\text{kg}$), benzo(k)flouranthene (max. 18,900 $\mu\text{g}/\text{kg}$), chrysene (max. 46,000 $\mu\text{g}/\text{kg}$), dibenzo(a,h)anthracene (max. 7,440 $\mu\text{g}/\text{kg}$), indeno(1,2,3-cd)pyrene (max. 11,700 $\mu\text{g}/\text{kg}$), pyrene (max. 107,000 $\mu\text{g}/\text{kg}$) exceeded their respective Track 1 Unrestricted Use and Track 2 Restricted Residential Use SCOs in shallow soil samples. Metals were found in both shallow and deep soil samples and included arsenic (max. 40.4 milligrams per kilogram [mg/kg]), barium (max. 947 mg/kg), chromium (max. 60 mg/kg), copper (max. 552 mg/kg), lead (max. 1880 mg/kg), mercury (max. 116 mg/kg), and zinc (max. 355 mg/kg), exceeding Track 1 UUSCOs. Arsenic, barium, copper, lead and mercury also exceeded Track 2 RRUSCOs. Pesticides including 4,4'-DDE (max. 58.4 $\mu\text{g}/\text{kg}$), 4,4'-DDT(max. 67.8 $\mu\text{g}/\text{kg}$) were also observed in excess of Track 1UUSCOs but did not exceed Track 2 Restricted Residential Use SCOs. The PCB Aroclor 1250 (max. 571 $\mu\text{g}/\text{kg}$) was detected at concentration in excess Track 1 UUSCOs.



Groundwater:

The groundwater samples collected during the 2007 RI did not detect the presence of any VOCs (Table 5A), SVOCs (Table 6A), Pesticides and PCBs (Table 8A) at concentrations in excess of NYSDEC Part 703.5 Groundwater Quality Standards (GQS). The groundwater samples collected during the 2007 RI revealed the presence of dissolved metals; including manganese (max. 4,470 µg/L) and sodium (max. 228,000 µg/L) at concentrations in excess of GQS (Table 7A).

2.3 SITE INSPECTION

In April 2005, a qualified FLS representative performed a Phase I ESA and inspected the Site. The structure located at 515 West 30th St. (upgradient to the Site) was previously occupied by a chemical manufacturer. Based upon surface topography, this property is located hydraulically cross-gradient and therefore is not identified as a concern to the Site. No further information regarding the historic operations was obtained through the historic documentation reviewed.

During the inspection, a 1 foot by 2 foot concrete patch was observed just south of the West 30th St. entrance to the parking garage. There is a potential that, based on the location and size of the patch, this patch was a hydraulic lift pit that had been previously closed.

2.4 AREAS OF CONCERN

The Phase I ESA identified the presence of urban fill as an on-site AOC. In addition, the following off-site AOCs were identified in the Phase I report:

- Historic junkyard and filling station operations on Lot 37, upgradient from the Site.
- A No. 4 fuel oil storage tank located in a basement vault at 502-504 West 30th St., up/cross-gradient from the Site.
- Historic auto repair operations beneath the High Line, up-gradient from the Site.
- A chemical manufacturer located at 515 West 30th St., up-gradient from the Site.

3.0 PROJECT MANAGEMENT

3.1 PROJECT ORGANIZATION

The Qualified Environmental Profession (QEP) and Professional Engineer responsible for preparation of this RIR is Arnold, F. Fleming. The project manager is Kevin McGuinness. Qualified FLS field personnel collected the Site data and, based on analysis of the data, developed this RIR.

3.2 HEALTH AND SAFETY

All work described in this RIR was performed in full compliance with applicable laws and regulations specified under Occupational Safety and Health Administration Section 1910.120 and Hazardous Waste Operations and Emergency Response requirements.

3.3 MATERIALS MANAGEMENT

All material encountered during the RI was managed in accordance with applicable laws and regulations. The soil cuttings were put back in the hole after sample collection. The purged groundwater was stored into 55-gallon Department of Transportation approved steel drums which were sealed at the end of the work day. Each drum was labeled with the date, waste type (purge water), and point of contact. All other investigation derived waste generated during the RI (e.g. acetate liners, gloves, etc.) was collected in garbage bags and disposed of in accordance with applicable laws and regulations.

4.0 REMEDIAL INVESTIGATION ACTIVITIES

Following a review of the 2007 RI results for sampling performed on Lot 58, 56, 55, 52, and part of lot 45, the OER required that the following additional Site characterization activities be undertaken to update and verify current site conditions:

Three soil borings will be installed, and a minimum of two soil samples collected from each boring. One soil sample will be collected from the shallow interval (0-2 feet below grade) and one from the deep interval, preferably from the groundwater interface. If elevated photoionization detector (PID), visual, or olfactory evidence of contamination is encountered during borehole advancement, a third soil sample will be collected from the 2-foot interval exhibiting the greatest evidence of contamination.

Three temporary groundwater monitoring wells will be installed and one groundwater sample collected from each well. These groundwater samples will be collected using low-flow sampling techniques.

Four soil vapor screening probes will be installed, and a vapor sample collected from 1-2 feet above the soil/water interface at each location (approximately 8-9 feet below grade).

The scope of the investigatory activities required by OER was utilized to develop a letter work plan which was submitted to OER on February 15, 2013. A copy of the letter work plan is provided as Appendix C.

4.1 GEOPHYSICAL INVESTIGATION

Geophysical surveys were previously conducted at four locations at the Site in 2007. A ground-penetrating radar (GPR) unit was used to pre-screen for underground utilities on January 29, 2007. The results of the GPR survey are detailed in HydroTech Environmental's February 2, 2007, Remote Sensing Survey report, which is included as Appendix D.

4.2 SOIL BORINGS, MONITORING WELLS AND SOIL VAPOR PROBES

On behalf of West 30th Highline Holdings, L.L.C., FLS performed the following RI activities on February 19, 2013:

- Installed three soil borings across the Site and collected two soil samples from each boring to evaluate soil quality;
- Installed three temporary groundwater monitoring points throughout the Site and collected one groundwater sample from each monitoring point to evaluate groundwater quality; and
- Installed four soil vapor probes across the Site and collected one soil gas sample from each probe for laboratory analysis.

The locations of the 2013 soil borings, groundwater sampling points and soil vapor sampling probes are depicted on Figure 5.

Drilling and Soil Logging

Prior to initiating any subsurface work, a “one-call” utility mark-out was done to identify nearby utilities and clear all soil boring and monitoring well locations. Aquifer Drilling and Testing Inc. of New Hyde Park, a New York State licensed driller, advanced three soil borings (SB-1, SB-2 and SB-3) using a track-mounted direct-push Geoprobe® rig. A 2-inch inside diameter (ID) and 60-inch long macrocore sampler was driven to the prescribed depth of 15 feet below grade. Soil samples were collected from each borehole via macrocore acetate liners and logged. The VOC field measurements were collected at discrete intervals along the macrocore sleeve using a PID. After sampling was completed, soil cuttings were returned to each borehole and the borehole was grouted and patched. The boring logs are provided as Appendix E. The soil boring locations are depicted in Figure 5.

Temporary Groundwater Monitoring Well Installation

Four soil borings were converted to temporary monitoring wells (MW-1, MW-2, MW-3 and MW-4). Following the completion of soil sampling, a 1.5- inch ID PVC pipe with a 10 feet screen and 10 feet riser was installed in the borehole to approximately 5 feet into the groundwater. Using a peristaltic pump, each monitoring well was developed to remove sediments and fine soils from the well screen and filter pack, prior to sampling.

The temporary well locations are depicted in Figure 5. The approximate depth at which groundwater was encountered is included in the boring logs which are provided as Appendix E.

Soil Vapor Sampling Probe Installation

Four temporary soil vapor probes were installed by track-mounted direct-push Geoprobe® rig. At each location, a steel expendable point was driven to 1-2 feet above the soil/groundwater interface and the rod was slowly retracted to create an open void space where soil gas could enter for sampling. A sampling cap and tubing was attached to the end of the rods and gas was purged and collected via a 6-liter SUMMA canister with a flow regulator.

Measures were taken to ensure that an adequate surface seal was created prior to sample collection. A helium tracer test was used to ensure that the surrounding air does not infiltrate the sample probe. The soil vapor probe installation and sampling were performed in accordance with the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion (October 2006). The four vapor samples were collected from 1-2 feet above the soil/groundwater interface at each location (approximately 14-15 feet below grade).

4.3 SAMPLE COLLECTION AND LABORATORY ANALYSIS

The soil, groundwater and soil vapor samples were submitted for laboratory analysis. The purpose of this sampling was to confirm the results of the subsurface investigation completed in 2007 and to further delineate the Site conditions. The analytical results presented in this RIR provide sufficient basis for the evaluation of remedial action alternatives, establishment of a qualitative human health exposure assessment and selection of a final remedy.

Soil Sampling

At each boring, two sets of discrete soil samples were collected, one from the shallow interval (0-2 feet below grade) and one from the deeper interval (approximately 14-15 feet below grade). The deep samples were biased toward the areas of highest contamination based on field screening of soils or, if no contamination was identified, at the soil/groundwater interface.

A total of six soil samples were collected for laboratory analysis during this portion of the RI. The analytical results, including collection date and sample depth, are reported in Tables 1B through 4B. The soil sampling locations are depicted on Figure 5.

Groundwater Sampling

Four soil borings (SB-1, SB-2, SB-3 and SB-4) were converted to temporary groundwater monitoring wells (MW-1, MW-2, MW-3 and MW-4) and one groundwater sample was collected from each temporary well for laboratory analysis. Prior to sampling, each well was purged of three well volumes of water to collecting the representative groundwater samples. The analytical results, including dates of collection, are reported in Tables 5B through 8B. The temporary well locations are depicted on Figure 5.

Soil Vapor Sampling

Soil vapor samples were collected from four locations (SG-1, SG-2, SG-3 and SG-4). Using a Geoprobe®, stainless steel soil vapor rods were installed to 6 feet below grade. At each location, a steel expendable point was driven to predetermined depth and the rod was slowly retracted to create an open void space where soil gas could enter for sampling. A sampling cap and tubing was attached to the end of the rods and gas was purged and collected via 6-liter SUMMA canister with a flow regulator. The methodologies used for soil vapor assessment conform to the NYS DOH Final Guidance on Soil Vapor Intrusion (October 2006).

The soil vapor sample locations are depicted on Figure 5. The soil vapor analytical results are summarized in Table 9. The soil vapor sampling logs are included in Appendix F.

Sample Submittal Protocol

The laboratory analytical results presented in this RIR have been performed in the following manner:

| Factor | Description |
|--|---|
| Quality Assurance Officer | The laboratory analytical quality assurance is directed by Kevin McGuinness |
| Analytical Laboratory | Analytical laboratory used in the RI is Accutest Laboratories of Dayton, New Jersey, a state certified ELAP laboratory |
| Requested Laboratory Analysis and Analytical Methods | <u>Soil analytical methods:</u> TAL Metals by EPA Method 6010C (rev. 2007); VOCs by EPA Method 8260C (rev. 2006); SVOCs by EPA Method 8270D (rev. 2007); |



| | |
|--|--|
| | <p>Pesticides by EPA Method 8081B (rev. 2000); PCBs by EPA Method 8082A (rev. 2000);</p> <p><u>Groundwater analytical methods:</u> 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);</p> <p><u>Soil vapor analytical methods:</u> VOCs by TO-15 VOC parameters.</p> |
|--|--|

Results of Laboratory Analyses

The laboratory data for soil, groundwater and soil vapor are summarized in Tables 1B to 8B and Table 9. The laboratory data deliverables for the 2013 samples evaluated in this RIR are provided in digital form in Appendix G.

5.0 ENVIRONMENTAL EVALUATION

5.1 GEOLOGICAL AND HYDROGEOLOGICAL CONDITIONS

The Site is mapped on the Weehawken Quadrangle, New Jersey-New York 7.5 Minute Topographic Map, published in 2011 by the United States Geological Survey (USGS). The review of the topographic map indicates that the Site is located approximately 15 feet above mean sea level.

Geology

Based on information collected during this subsurface investigation there are two soil strata under the Site. The upper stratum is a miscellaneous urban fill with thicknesses ranging from 6 to 11 feet and is comprised of sand, silt, and gravel with asphalt, bricks, ash, wood and concrete fragments. The stratum below the fill layer is native soil consisting of brown silty sand, in moderately moist and dense condition. The underlying native soil layer becomes less dense below the water table. The soil boring logs are presented as Appendix E.

Hydrogeology

Groundwater information collected during this subsurface investigation indicates that groundwater was encountered at depths ranging from approximately 10 to 15 feet below grade. The local groundwater flow is assumed to be north/northwest toward the Hudson River. The water-level data are included in the boring logs which are presented as Appendix E.

5.2 SOIL ANALYTICAL RESULTS

The soil samples collected during the 2013 RI revealed the presence of VOCs, SVOCs, specifically PAHs, and pesticides, at concentrations in excess of Track 1 UUSCOs. One VOC, acetone (max. 51.5 ppb), was detected marginally above Track 1 UUSCOs. The SVOCs were detected at concentrations similar to 2007 results in only one deep soil sample exceeding Track 1 UUSCOs and Track 2 RRUSCOs. The SVOCs included benzo(a)anthracene (max. 5,350 µg/kg), benzo(a)pyrene (max. 4,960 µg/kg), benzo(b)fluoranthene (max. 5,840 µg/kg), benzo(k)fluoranthene (max. 1,900 µg/kg), chrysene (max. 5,280 µg/kg), dibenzo(a,h)anthracene (max. 990 µg/kg) and indeno(1,2,3-cd)pyrene (max. 2750 µg/kg). Metals including nickel,

copper, lead, mercury and zinc were observed in excess of Track 1 UUSCOs in all shallow samples. Only lead at 69 mg/kg, exceeding Track 1 was detected in one deep soil sample. No metals exceeded Track 2 RRUSCOs. One pesticide 4, 4'-DDT (max. 3.7 µg/kg) was detected at concentrations marginally in excess of Track 1 UUSCO.

The data collected during the RI is sufficient to delineate the vertical and horizontal distribution of contaminants in soil/fill at the project Site. The soil sample results are shown on Tables 1B to 4B.

5.3 GROUNDWATER ANALYTICAL RESULTS

The groundwater samples collected during the 2013 Remedial Investigation detected presence of VOCs and metals in groundwater exceeding GQS. Several VOCs, including ethyl benzene (9.5 ug/L), methylene chloride (max. 5.7 ug/L), and total xylenes (86.8 ug/L) were detected in excess of GQS. Dissolved metals including iron (max. 16,600 ug/L), manganese (max. 3,660 ug/L), selenium (max. 20.5 ug/L), and sodium (max. 194,000 ug/L) exceeded their respective GQS. No SVOCs, Pesticides, and PCBs were detected at concentrations exceeding of GQS. The distribution of metals in the groundwater across the entire Site is consistent with the groundwater in the waterfront area. The groundwater sample results are shown on Tables 5B to 8B.

The data collected during the RI is sufficient to delineate the distribution of contaminants in groundwater at the Site. A summary table of the laboratory analyses performed on groundwater samples is included in Table 4. The analytes found to exceed the applicable groundwater standards are shown.

5.4 SOIL VAPOR ANALYTICAL RESULTS

Soil vapor sampling was not conducted in 2007. Remedial Investigations in 2013 detected several petroleum related and chlorinated VOCs at generally low concentrations. Most concentrations were below 25 micrograms per cubic meter (ug/m³). The 2013 RI revealed the presence of the chlorinated VOC, Trichloroethylene (TCE), in three of four samples at a maximum concentration of 7 ug/m³ which is within the monitoring range established by NYSDOH. Tetrachloroethene (PCE) was detected in all four soil vapor samples at a maximum

concentration of 13 $\mu\text{g}/\text{m}^3$, which is below NYSDOH's monitoring range. Neither 1, 1, 1-trichloroethane nor carbon tetrachloride were detected in soil vapor.

The data collected during the RI are sufficient to delineate the distribution of contaminants in soil vapor at the Site. The soil vapor analytical results are shown on Table 9.

5.5 CONCLUSIONS

Based on an evaluation of the data and information from the RIR, hazardous waste was not identified at the Site. 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.