

A. INTRODUCTION

This chapter evaluates the potential for contaminated materials to exist within or near the Study Area for the Proposed Project. Construction activities associated with the Proposed Project would involve soil disturbance at various locations throughout the study area. The Study Area, for the purposes of this ^chapter, includes the LIRR ROW^ and the area within 100 feet on either side of the right-of-way along the 9.8-mile project length, locations of proposed parking garages, and the area within 200 feet of where changes to grade crossings, including areas to be disturbed for utility installations/relocations, or potential property acquisitions, are proposed. This chapter presents and interprets available information on potentially contaminated sites within the Study Area.

An analysis was conducted to evaluate whether construction or operation of the Proposed Project could potentially increase exposure of people or the environment to contaminated materials, and whether the Proposed Project may result in potential significant adverse impacts to public health and/or the environment. The potential for significant adverse impacts depends on the type of materials present and their location relative to or within the Study Area, their levels, and whether exposure to the contaminated materials would be associated with the Proposed Project, either during construction or during subsequent operations. The potential for significant adverse impacts from contaminated materials can occur when: a) contaminated materials exist on a site, and b) an action would increase pathways to their exposure; or c) an action would introduce new activities or processes involving contaminated materials.

Contaminated materials are substances that pose a threat to human health or the environment. They can include hazardous wastes, which are explicitly defined by regulations promulgated under the Federal Resource Conservation and Recovery Act (RCRA), the regulatory framework for the proper management of both hazardous and non-hazardous waste. The responsibility for regulating contaminated materials falls on the various federal, state and local agencies, including the New York City Department of Health and Mental Hygiene (DOHMH), New York State Department of Health (NYSDOH), New York State Department of Environmental Conservation (NYSDEC), the Department of Transportation (DOT), and the United States Environmental Protection Agency (USEPA). The regulatory obligation is typically dependent upon the nature and occurrence of the specific contaminant.

Many contaminated materials cause physical harm following exposure, either by direct contact, inhalation as vapor or particles in the air, and/or ingestion of contaminated soil/agriculture or groundwater. The effect of these materials on human health is dependent upon the nature and toxicity of the contaminant and the amount of exposure. Public health may also be compromised when contaminated vapors from such materials migrate through the subsurface soil and/or along preferential pathways (e.g., building foundation structures, utility conduits, etc.) and accumulate beneath concrete slabs or infiltrate into buildings through cracks and openings, thereby creating hazardous breathing conditions.

B. PRINCIPAL CONCLUSIONS AND IMPACTS

Soil, soil gas and groundwater beneath a site can become contaminated as a result of past or present uses within the Study Area or on nearby properties. Portions of the Study Area are and/or were used historically for railroad operations and other industrial activities. Common contaminants found in the subsurface at railroad properties include creosote, petroleum products, solvents, volatile and semi-volatile organic compounds, heavy metals, polychlorinated [^] biphenyls (PCBs), pesticides, and herbicides.

Based on the methodology described in the following section, 153 “Category B” sites were identified within the Study Area. As further discussed below, a Category B site is defined as [^] a site that [^] has some reasonable potential to have been impacted by the presence of contaminated materials and thus additional analysis is prudent. As noted below, the identification of a site as “Category B” does not necessarily indicate that the site is contaminated. Subsurface investigations, which would only be performed at the sites within or close to an area where subsurface disturbance would be required for the Proposed Project, would be required to determine that contamination actually exists. No further analysis is recommended for “Category A sites” (defined in the following section).

Several properties that are part of the Proposed Project were identified, either in whole or in part, as Category B sites (see below).

The locations of all Category A and B sites are shown on **Figures 8-1 through 8-22** and correspond to the database summary table included in **Appendix 8-A**.

Soil sampling was conducted within the Project Corridor where soil disturbance is expected. All analytical results were well below the applicable standards except for one soil boring location that exceeded the standard for one contaminant. Soil sampling was also conducted at six additional sites where construction of parking garages is now proposed. All analytical results at those locations were also well below applicable standards, with the exception of two samples that exceeded the commercial Soil Cleanup Objectives for two contaminants, consistent with the nature of the fill material present at those locations. With the control measures identified below, no significant adverse impacts from contaminated materials would result from the construction or operation of the Proposed Project.

C. METHODOLOGY

A review of the environmental history of the Study Area was conducted. Resources consulted in this review are:

- Historical aerial photographs and Sanborn Fire Insurance Maps;
- Federal and state database records for contaminated sites and sites potentially containing hazardous substances; and
- A site reconnaissance limited to publicly accessible portions of the Study Area, focusing on contaminated sites, potentially contaminated sites, and readily identifiable Recognized Environmental Conditions (RECs).

The review portion of this analysis was used to focus the reconnaissance efforts in an attempt to confirm the presence of specific potential issues identified by the regulatory and historical data.

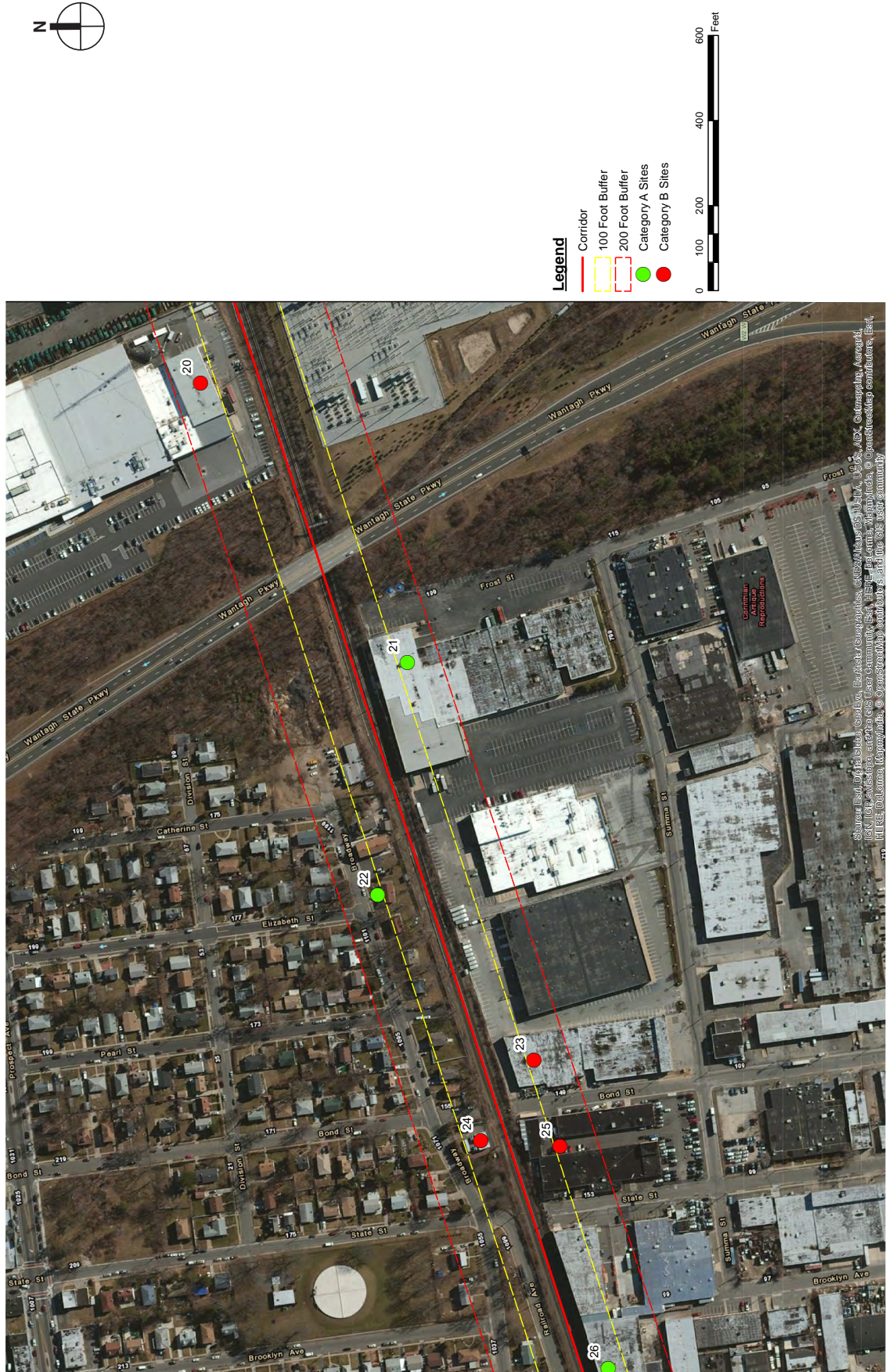
The analysis was conducted in general accordance with the American Society for Testing and Materials (ASTM) Designation E 1527-13 *Standard Practice for Environmental Site*



**LIRR Expansion Project
Floral Park to Hicksville**

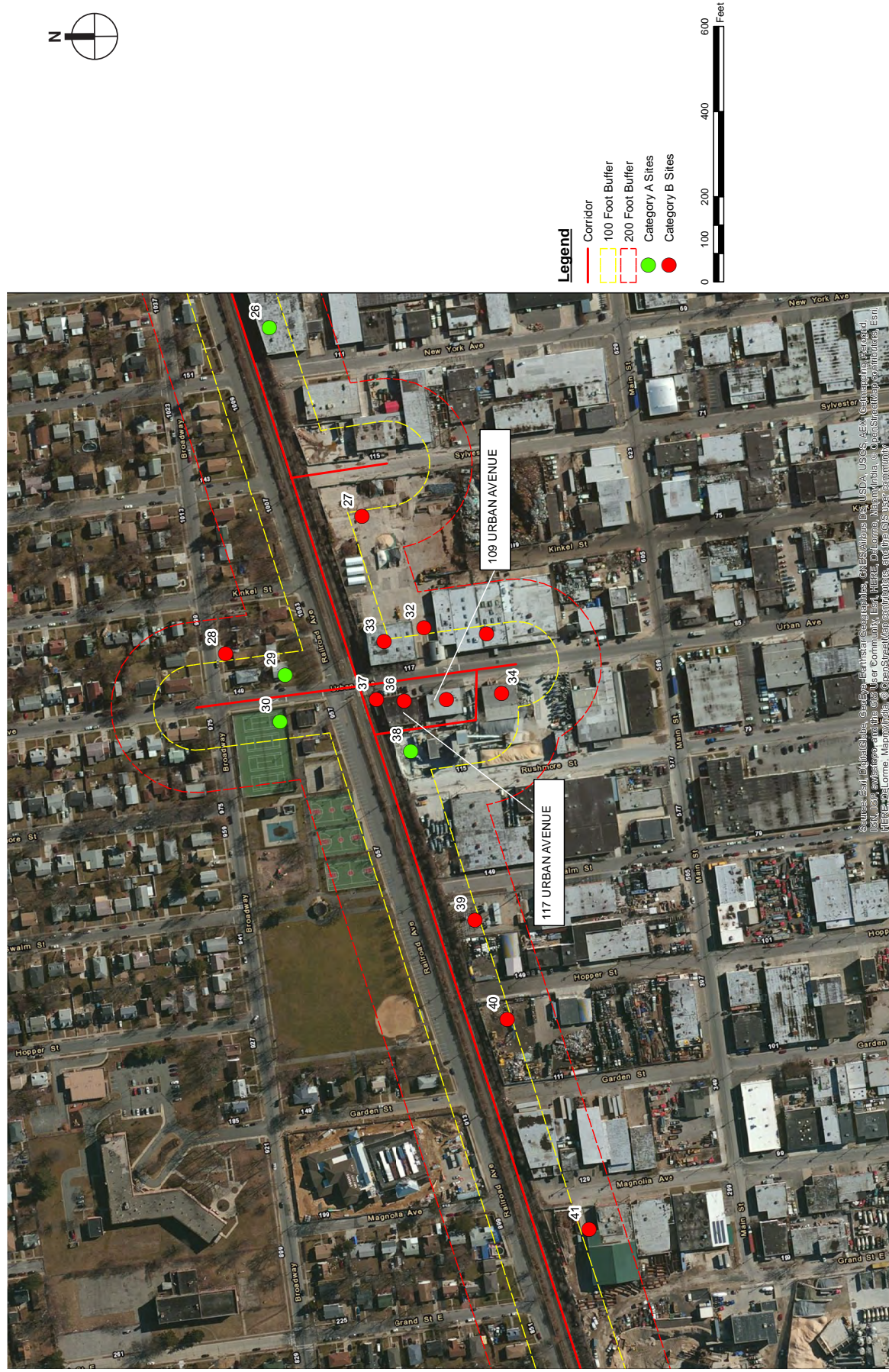


LIRR Expansion Project Floral Park to Hicksville



LIRR Expansion Project
Floral Park to Hicksville

Contaminated Materials Study Sites
Figure 8-5

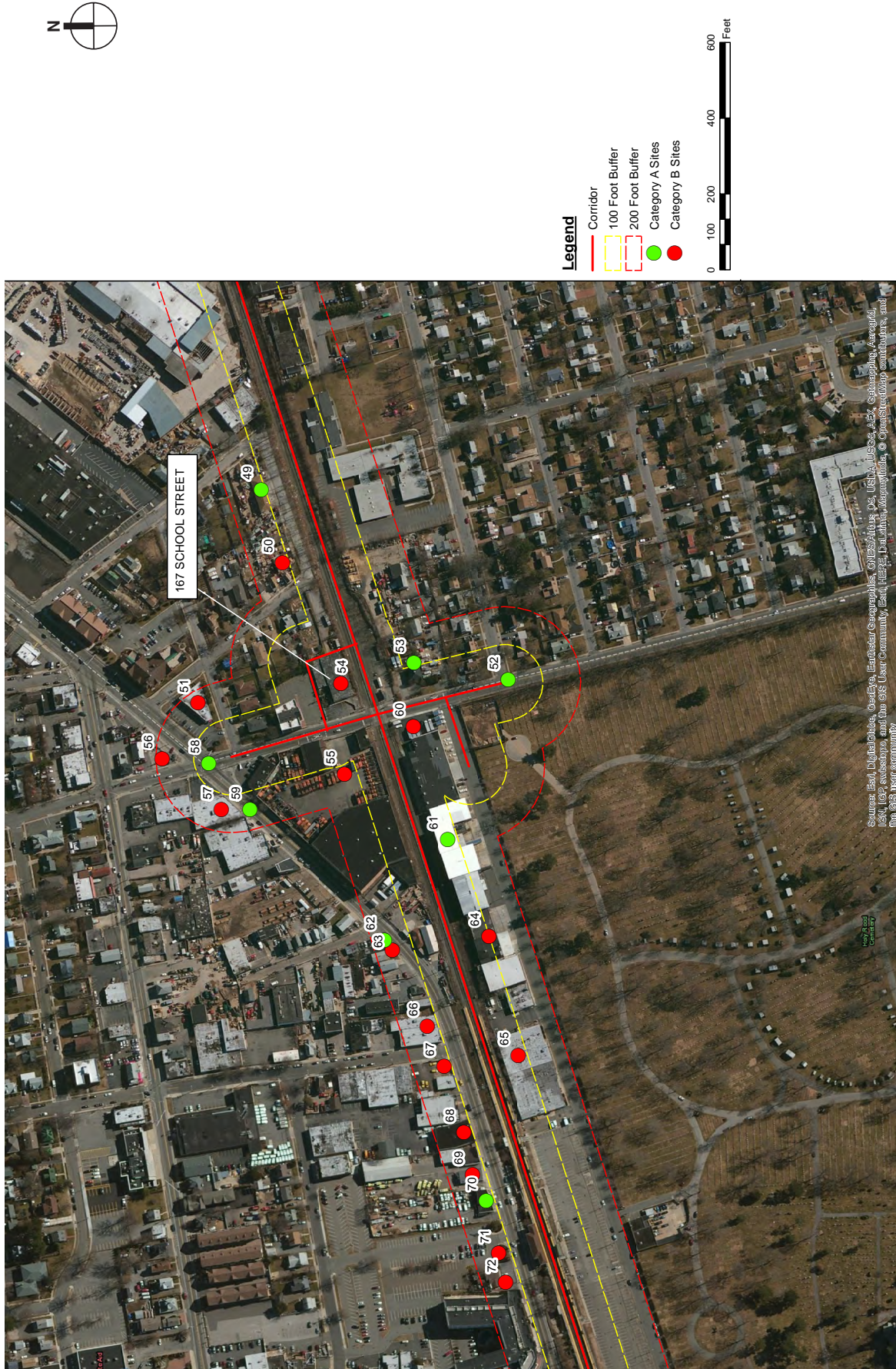


Contaminated Materials Study Sites
Figure 8-6



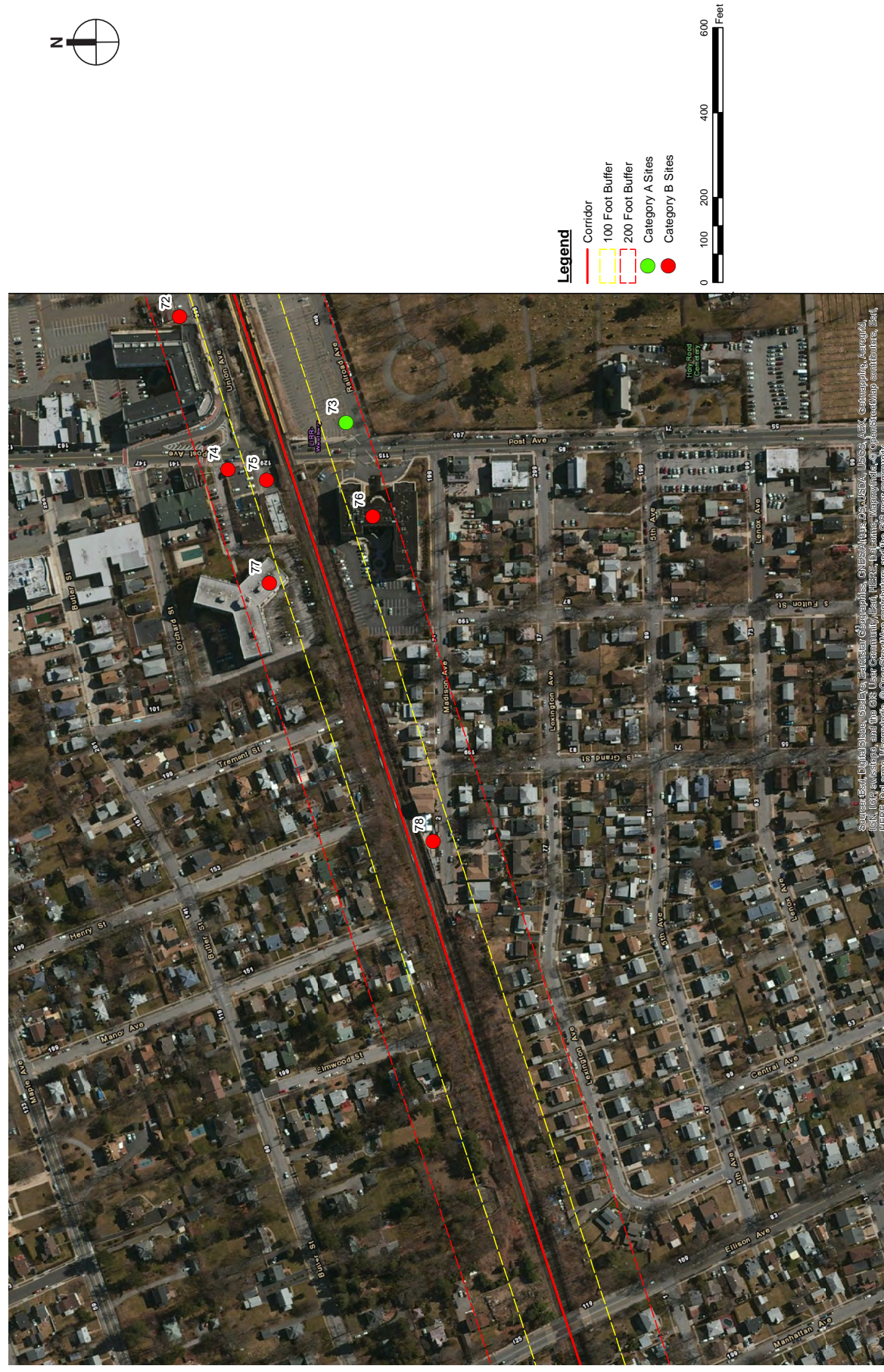
Source: Matrix New World

LIRR Expansion Project
Floral Park to Hicksville
Contaminated Materials Study Sites
Figure 8-7

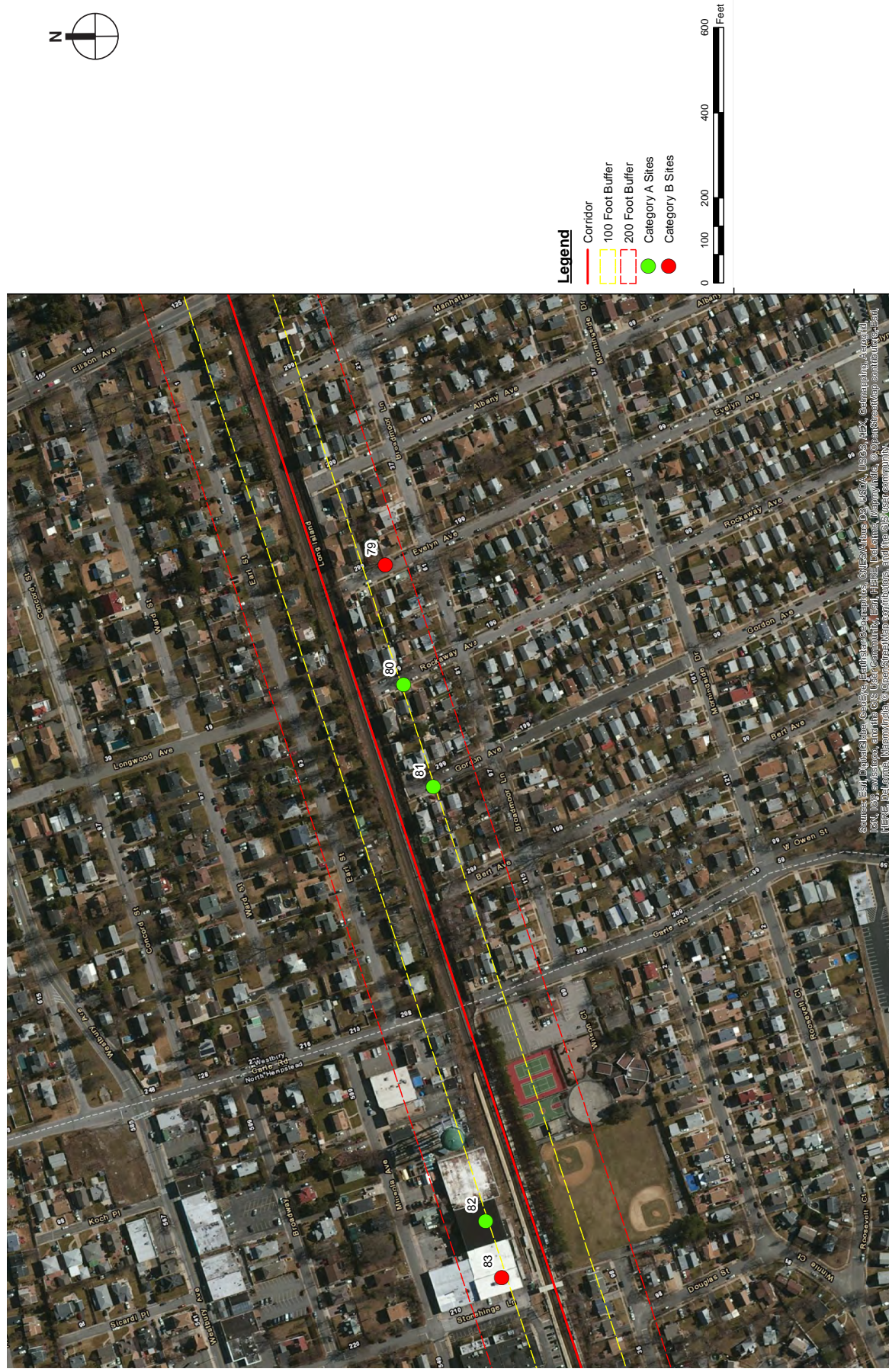


LIRR Expansion Project
Floral Park to Hicksville

Contaminated Materials Study Sites
Figure 8-8



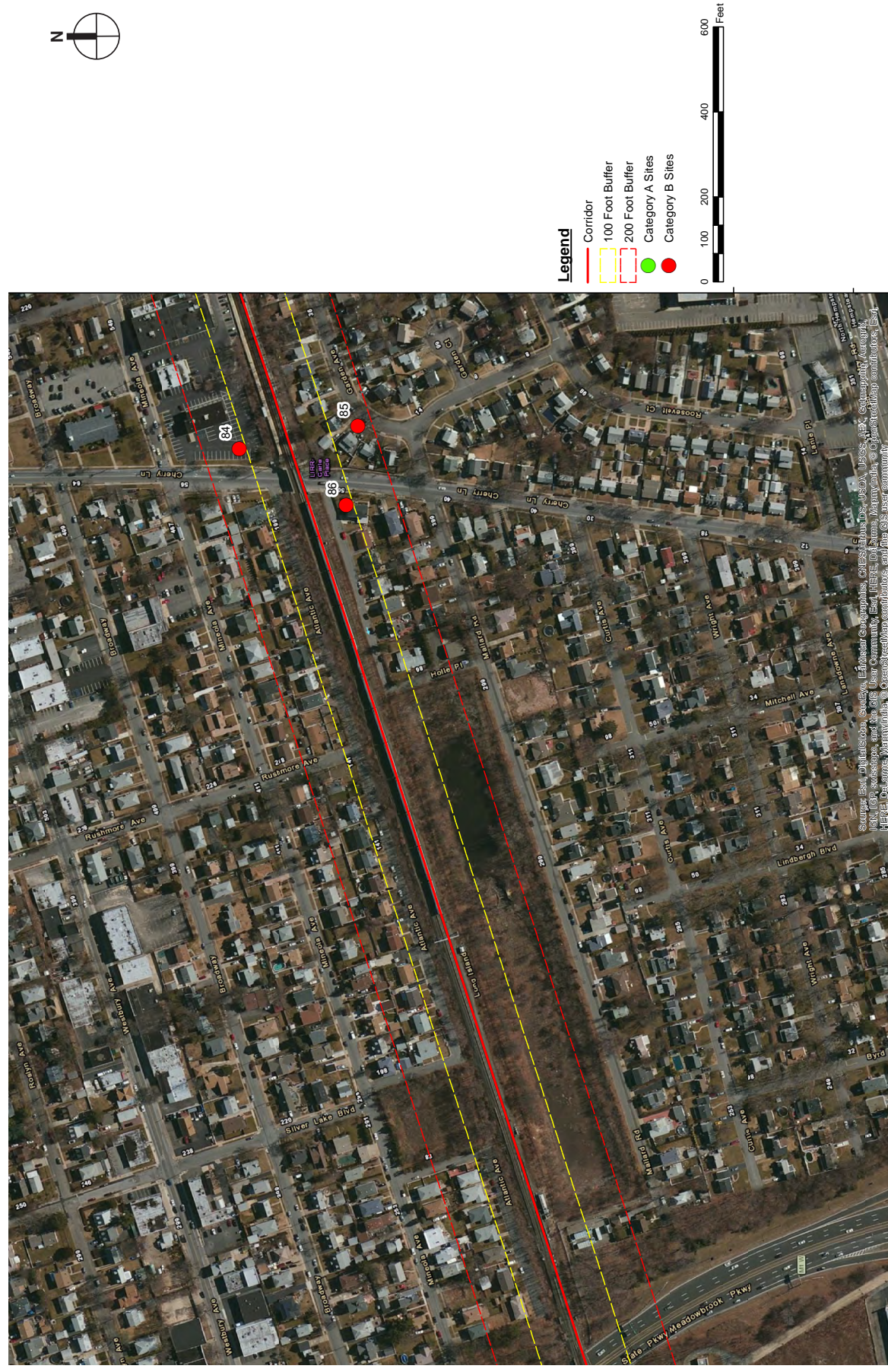
Contaminated Materials Study Sites



Source: Matrix New World

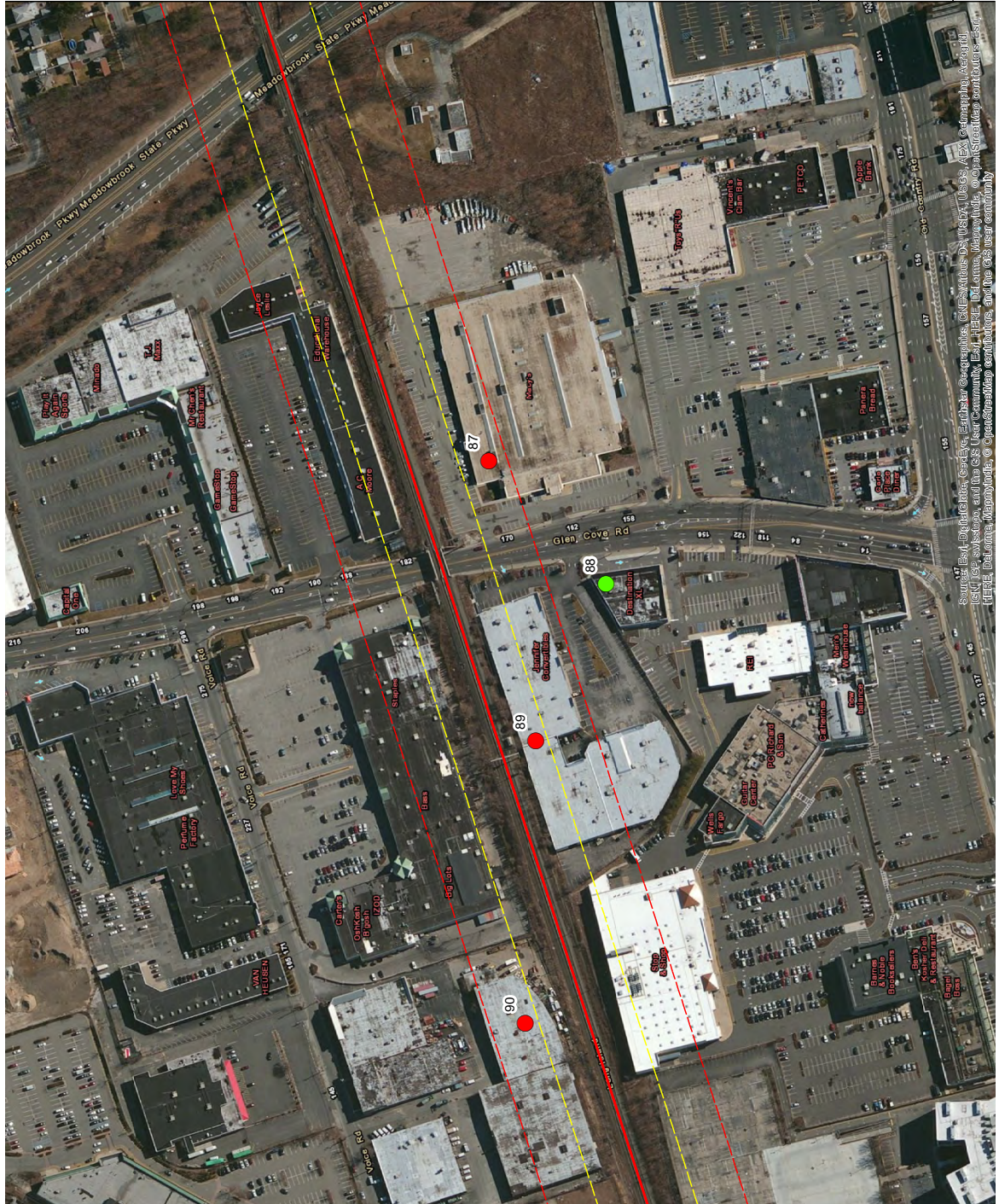
**LIRR Expansion Project
Floral Park to Hicksville**

Contaminated Materials Study Sites
Figure 8-10



Source: Matrix New World

**LIRR Expansion Project
Floral Park to Hicksville**

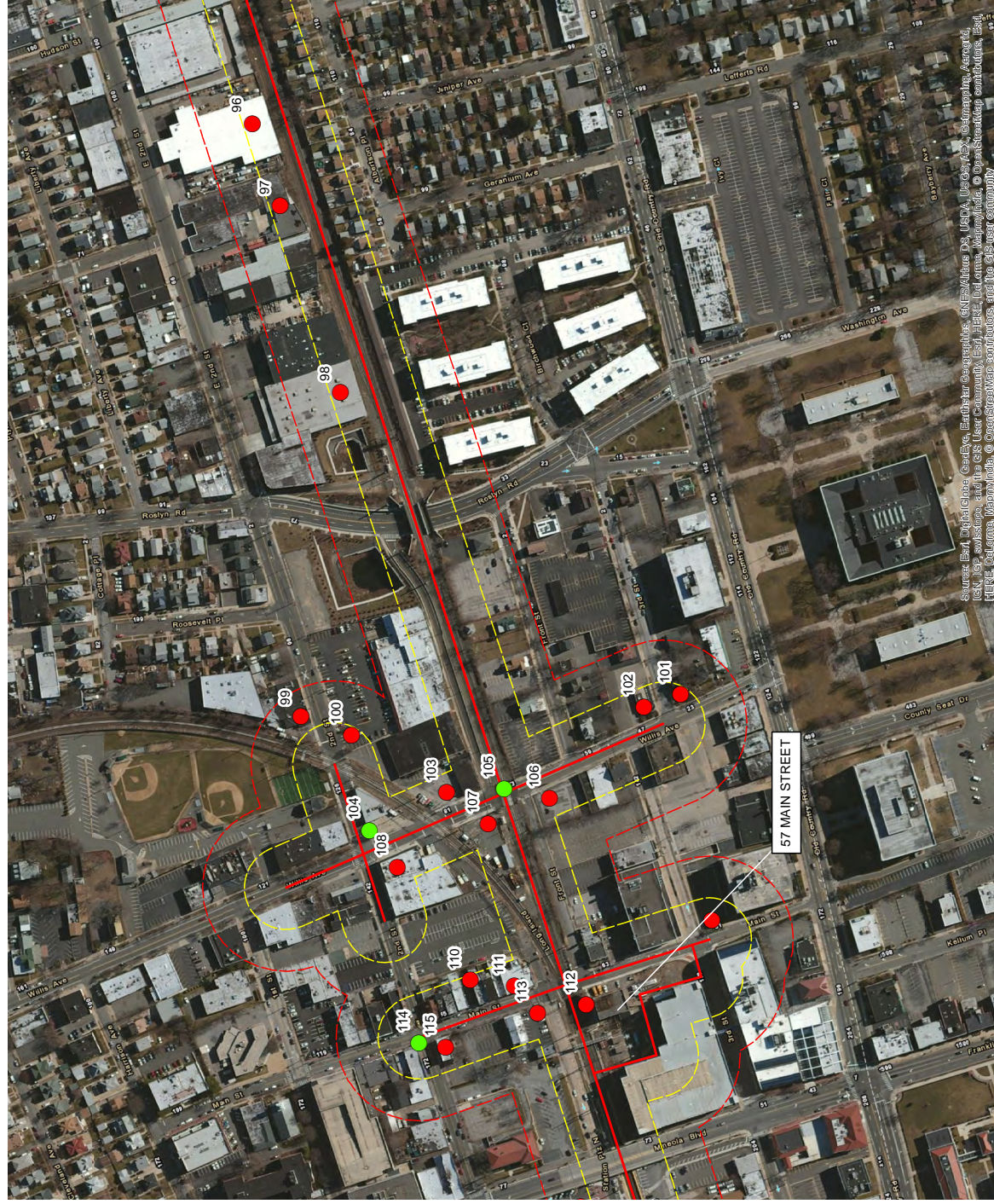


Contaminated Materials Study Sites
Figure 8-12

LIRR Expansion Project
Floral Park to Hicksville



Contaminated Materials Study Sites



Contaminated Materials Study Sites
Figure 8-14



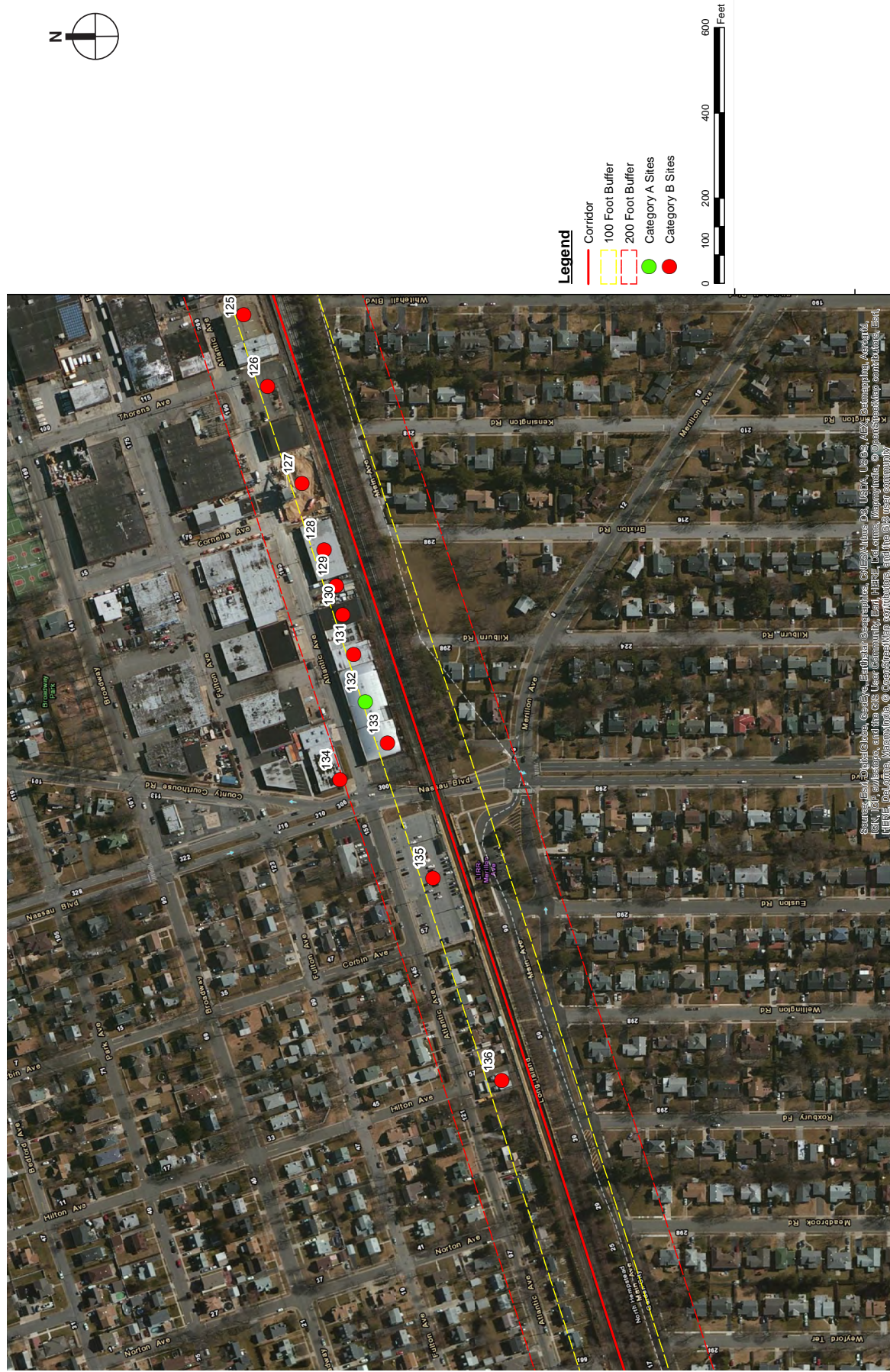
LIRR Expansion Project
Floral Park to Hicksville

Contaminated Materials Study Sites
Figure 8-15



LIRR Expansion Project
Floral Park to Hicksville

Contaminated Materials Study Sites
Figure 8-16



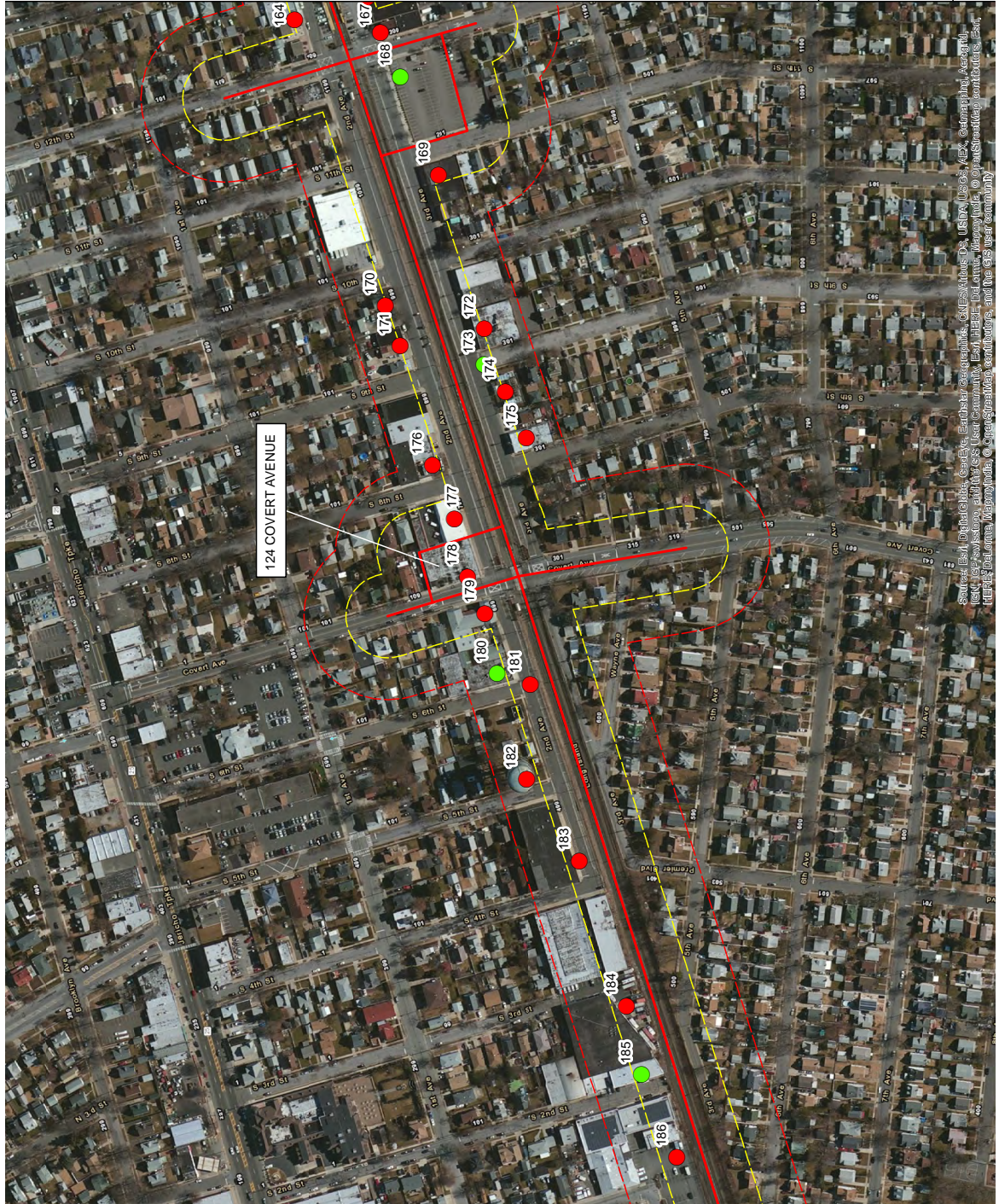
Contaminated Materials Study Sites
Figure 8-17



Contaminated Materials Study Sites



**LIRR Expansion Project
Floral Park to Hicksville**



Source: Matrix New World

LIRR Expansion Project
Floral Park to Hicksville

Contaminated Materials Study Sites
Figure 8-20



**LIRR Expansion Project
Floral Park to Hicksville**



LIRR Expansion Project
Floral Park to Hicksville

Contaminated Materials Study Sites
Figure 8-22

Assessments: Phase I Environmental Site Assessment Process (ASTM E1527-13). However, the search radius for off-site properties was modified to 100 feet from the right-of-way, which is appropriate for a corridor project. The term REC is defined in E1527-13 as “the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.” Data collection ^ associated with this analysis ^ was also performed in general accordance with the New York State Department of Environmental Conservation (NYSDEC) Records Search Requirements included in Appendix 3A of Draft DER-10, *Technical Guidance for Site Investigation and Remediation*.

Following data acquisition, sites were divided into two groups (Categories A and B) depending upon the likelihood of potential contamination, based on the professional judgment of geologists, engineers, and environmental health and safety professionals. Category A included sites that did not appear reasonably likely to have been affected such that on-site soil, soil gas, or groundwater would have been contaminated, and therefore did not warrant additional analysis. Category B included sites that had some reasonable potential to have been contaminated and where additional analysis is prudent. Examples of the types of sites identified and their categorization include the following:

- Category A: Small quantity hazardous waste generators, fuel oil tanks with no known spills, electrical vaults with no known spills, closed status spills, closed status petroleum bulk storage sites, spills confined to manholes or vaults, and spills on surface streets.
- Category B: Active status spills, large quantity hazardous waste generators^, auto wreckers^, auto repair shops^, machine shops^, metalworks^, paint shops^, dry cleaners^, gas stations^, underground petroleum storage tanks^, rail yards^, bulk petroleum and chemical storage facilities^, known contaminated soil and groundwater^, electric substations^, and miscellaneous manufacturers.

The selection of Category B sites was exercised conservatively so as to reduce the possibility of eliminating a potentially contaminated site from further investigation. As noted previously, the identification as “Category B” does not necessarily indicate that contamination is present at the parcel, but rather that additional investigation is warranted to determine if contamination is present and whether construction activity associated with the Proposed Project could expose workers or residents to contaminated materials.

Information interpreted from Sanborn Maps and aerial photographs included potential RECs (e.g., filling stations, gas tanks, etc.) was incorporated into the database summary table included in **Appendix 8-A**. Copies of Sanborn Maps and aerial photographs are also included as **Appendix 8-B**.

Based on comments received, Phase I Environmental Site Assessments (ESAs) compliant with ASTM 1527-13 were also conducted at four additional locations where property acquisition would occur, as well as at six locations where parking structures have been proposed. In conducting these analyses, efforts were taken to assess the RECs associated with each site, determining whether additional subsurface investigations were warranted.

Based upon the analysis of the historic use of the Project Corridor, an investigation of subsurface soil conditions was performed at 39 locations where soil disturbance is likely and which represented likely typical conditions throughout the Project Corridor. Additional subsurface soil investigations were also conducted at the six locations where parking structures have been

proposed. All subsurface investigations were completed in accordance with the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER) document *Technical Guidance for Site Investigation and Remediation* (DER-10). The corridor soil borings were advanced to depths varying from approximately three feet to 25 feet below grade surface (bgs), dependent upon anticipated construction depths and the limitations of drilling equipment. The proposed parking structure soil borings were advanced to 20 ft-bgs, although the proposed construction depth is anticipated to be 15 ft-bgs. Multiple sample locations were not accessible by a drill rig and at those locations samples were advanced with hand tools to refusal, which generally was less than 10 feet bgs. Soil borings were visually inspected and screened with a photo-ionization detector (PID) and continuously logged for lithology.

For the corridor study samples, composite soil samples were collected at two-foot intervals and analyzed for: Toxicity Characteristics Leaching Procedure (TCLP) list; RCRA characteristics, including ignitability and reactivity; USEPA Target Compound List (TCL) semi-volatile organic compounds (SVOCs); TCL polychlorinated biphenyls (PCBs); Target Analyte List (TAL) metals; TCL pesticides; TCL herbicides; and dioxin. One grab sample from each boring was analyzed for TCL volatile organic compounds (VOCs) and was taken from the discrete six-inch interval with the greatest evidence of contamination determined visually or with readings from the PID. If there was no indication of contamination, the VOC grab sample was collected from the 0.5 to two-foot bgs interval.

For the proposed parking structures samples, one grab sample from each boring was analyzed for TCL VOCs; TCL SVOCs; TCL PCBs; TAL metals; TCL pesticides; and TCL herbicides; and was taken from the discrete 6-inch interval with the greatest evidence of contamination determined visually or with readings from a PID. If there was no indication of contamination, the sample was collected from the 0.5-2.0 ft. bgs interval. Additionally, composite soil samples were collected from soil from the surface to 15 ft-bgs interval and analyzed for the full TCLP list and RCRA Characteristics, including ignitability and reactivity.

D. EXISTING CONDITIONS

LONG ISLAND RAIL ROAD RIGHT-OF-WAY, LIRR STATIONS & GRADE CROSSINGS

The review of documents (historical maps, aerial photograph review, database review and study area reconnaissance) utilized to establish existing conditions identified the following general history:

- During the 1940s, the eastern portion of the Study Area between New Cassel and Hicksville contained primarily undeveloped and/or agricultural land, based on available aerial photographs. The remainder of the eastern end of the study area contained a mixture of sparse residential and commercial uses. Aerial photographs and Sanborn Map coverage [^] were not available for this time period for the western portion of the study area.
- During the 1950s, the eastern end of the study area in the vicinity of Hicksville appeared to remain primarily agricultural land, with the early development of some industrial areas, identified as primarily automotive and manufacturing. Moving west from New Cassel towards Carle Place, usage was increasingly residential in nature, with a cemetery in Westbury, south of the railroad. Additional commercial/industrial development was identified in the vicinity of Carle Place, including dry cleaners, automotive and

manufacturing facilities. From Carle Place west towards Mineola the development appeared more residential, with a Garden City Golf Club to the south of the railroad between Mineola and Garden City. From Garden City west to Floral Park, the development was primarily residential with some interspersed commercial and automotive uses, including gasoline stations and dry cleaners.

- By the 1960s the majority of the agricultural land had been developed with residential, commercial, or industrial uses, including those uses previously noted as well as truck rental, equipment manufacturing, oil refining, etc., with some concentrated industrial uses along the railroad including the New Cassel Industrial Area (NCIA) located south of Railroad Avenue between Grand Boulevard and Frost Street, which included various manufacturing and industrial uses, including electronic equipment manufacturing, metal furniture manufacturing, machine shops, plastics manufacturing, tool and die shops, transformer yards, pharmaceutical manufacturers, medical equipment sterilization facilities, and gravel and stone yards. The majority^ of the study area was developed by the 1960s and no significant changes were identified since that time.

Electrified railways require the operation of substations to convert electrical power to a form suitable for providing power to a rail system. Electrical equipment in substations (e.g., transformers, batteries, capacitors, switches, and voltage regulators) is known to contain hazardous materials, including mercury, PCB-containing oils and dielectric fluids, acids, and asbestos within associated insulating materials. Eight substations were identified within the Study Area, two of which, the Mineola and Floral Park substations, were remediated for mercury-related contamination in 2012, with no further investigation warranted. Solvents, oils and/or other chemicals used as part of former substation maintenance activities also have the potential to affect environmental conditions.

Structural elements of rail line operations often contain hazardous substances in the building materials, including lead-based paint and asbestos. Suspected structures include bridges, pedestrian tunnels, overpasses, station buildings, and signal huts.

Based on the above historical uses, some of the potential contaminants of concern are described below. The list is a summary only and not a comprehensive list of all contaminants that could be encountered:

- Creosote- and Arsenic-Treated Railroad Ties. Wooden railroad ties are treated with creosote as a wood preservative. Railroad ties were also historically treated with an arsenic-based preservative.
- Herbicides, solvents, diesel and other petroleum products. Railroad tracks and rights-of way are often treated with herbicides to limit vegetation growth. Impacts from rail yards may also include spills from herbicides, solvents, diesel and other petroleum products associated with cargo loading and unloading, train car maintenance, fueling, etc.
- Volatile organic compounds (VOCs). Petroleum-related compounds including benzene, toluene, ethylbenzene, and xylene (BTEX), are common, as are a variety of chlorinated compounds including tetrachloroethene (also known as perchloroethylene, or “perc”) and trichloroethene, which are common ingredients in solvents, degreasers, and cleansers, and in chemicals commonly used in dry cleaners. VOCs present the greatest potential for concern, since they can generate vapors, as well as contaminate soil and groundwater. Former or current gasoline stations, auto body shops, dry cleaners, and other industrial land uses are the most likely sources for substantial VOC contamination.

- *Semivolatile organic compounds (SVOCs)*. The most common SVOCs in developed areas are polycyclic aromatic hydrocarbons (PAHs), which are constituents of partially combusted coal or petroleum-derived products, such as coal ash and fuel oil. PAHs are commonly found in urban fill material, which likely underlies some of the more developed urban portions of the study area. In addition, petroleum-related SVOCs could be present, associated with tanks currently or formerly located in or near the study area.
- *Polychlorinated biphenyls (PCBs)*. Commonly used as a dielectric fluid in stationary or train-mounted transformers, some underground high-voltage electric pipelines, and hydraulically-operated machinery, PCBs are of special concern at electrical transformers and railyard/train maintenance locations where leakage into soil may have occurred. PCBs and/or PCB-containing materials were once widely used in manufacturing and industrial applications (e.g., hydraulic lifts, transformers, and plastic manufacturing[^]). PCBs generally travel only short distances in soil.
- *Metals (including lead, arsenic, cadmium, chromium, and mercury)*. Metals contamination is frequently associated with smelters, platers, foundries, and metalworks, and heavy metals are found in paint, ink, petroleum products, and coal ash. These metals tend not to migrate far in soil and, therefore, they are of greatest concern at the site where they are generated. Metals at levels above natural background levels are frequently present in fill material. Mercury contamination is often attributed to releases from faulty electrical equipment, including thermometers, switches, meters, gauges, and batteries, which are found at electrical substations.
- *Pesticides, herbicides, and rodenticides*. These are commonly used to control rodents, insects, and/or vegetation along railroad tracks, in vacant structures and/or at vegetated lots. Although the toxic elements of these chemicals can vary greatly depending upon the type, the toxins can include dioxins, organochlorines, phosphates/phosphides and other contaminants that can accumulate in the fatty tissues of humans and cause organ damage, cancer and various cardiovascular, metabolic and neurological disorders. LIRR has used a variety of pesticides, herbicides, and rodenticides along the right-of-way. Data regarding herbicide use are available for the years 2011 to 2015; only anecdotal information is available for the preceding time period. At this time, the history of pesticide and rodenticide use is not available. All chemicals are applied by licensed applicators and in accordance with USEPA approved label instructions. LIRR Yards and its ROW are typically sprayed once per year. Yards are sprayed manually by the vendor. Chemicals are sprayed by machine along the ROW from a maintenance-of-way hi-rail vehicle by a New York State licensed applicator contracted by the LIRR. Only pesticides and herbicides legally allowed for use are sprayed on LIRR property.

Current herbicide use in the entire LIRR system comprises the following brands of chemicals:

- Accord XRT II
- Dimension 2EW
- Oust Extra
- Westar

A new herbicide application contract that has not yet been implemented has proposed the following chemicals:

- Accord XRT II

- Arsenal Powerline
- Velpar DF
- Proclipse 65 WDG

Federal regulation under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requires that all pesticides distributed or sold in the United States be licensed by the USEPA. Licensing requires stringent testing in accordance with 40 CFR Part 158 to show that the use of such chemicals will not cause “unreasonable adverse effects on the environment” [7 U.S.C. §136 et seq. (1996)]. USEPA has found that they are not persistent in the environment and therefore do not pose a long-term risk to human or wildlife health, and would result in no significant adverse impacts.

- *Fuel oil and gasoline storage tanks.* Numerous properties within and adjacent to the Study Area currently have, or once had, above-ground storage tanks (ASTs) or underground storage tanks (USTs) for fuels, including heating oil and gasoline. Some of these tanks may have been removed, and others, although no longer in use, may remain buried in place or within basements. Some of the tanks are known to have leaked, and others may have leaked, though the leaks have not been discovered or documented. Some spills have been remediated in accordance with New York State regulations, and others are in the process of being remediated.
- *Historic coal yards.* Coal yards were present historically on both sides of the LIRR. Coal contains VOCs (including BTEX) and SVOCs (including PAHs).
- *Fill materials of unknown origin.* In the past, waste materials, including ash, demolition debris, and industrial wastes, were commonly used as fill material. Even fill material consisting primarily of soil may exhibit elevated levels of contamination.
- *Asbestos.* Asbestos is a common component of building materials, especially insulation, fireproofing, tile flooring, plaster, sheetrock, ceiling tile, mastic, and roofing materials. In addition to materials within existing structures, subsurface utility lines may be coated with asbestos or encased in “transite,” an asbestos-containing material (ACM). Asbestos was widely used before 1980. There are well-defined regulatory programs to manage asbestos during demolition and construction work.
- *Lead-based paint.* Lead-based paint (LBP), when released as dust or otherwise, is potentially hazardous, especially to children. The use of LBP was restricted by the Consumer Products Safety Commission in 1978, but the restriction does not apply to industrial paint. LIRR structures (e.g., bridges) have LBP. When LIRR renovates structures containing LBP, all precautions are taken to remove LBP, which is then disposed of as hazardous waste in accordance with the protocols for such disposal. LBP that is released (as dust or otherwise) is potentially hazardous, especially to children.

Based on regulatory databases, aerial photographs, Sanborn maps and a site reconnaissance, a total of 208 individual properties were identified within the Study Area. Of these, 153 were classified as “Category B” sites. These locations are included on **Figures 8-1 through 8-22**, and the data is summarized in **Appendix 8-A**. The following properties that may require disturbance as part of the Proposed Project were classified as “Category B” sites:

- 117 Urban Avenue (site #36) had a NY Aboveground Storage Tank (AST) listing for a 240-gallon aboveground waste oil tank, was historically identified as an auto facility, and is currently Hicksville Auto.

Long Island Rail Road Expansion Project

- 167 School Street (site #54) was shown as a coal yard on historical Sanborn maps.
- 165 East Second Street (site #95) has closed spills and closed leaking underground storage tanks and the potential on-site use of oils and chemicals. Great Neck Saw Manufacturers Inc. was identified as the current tenant.
- ^ Fox's Store (site #111), 70-80 Main Street has a closed leaking underground storage tank and was historically identified as a print shop.
- 115 New Hyde Park Road (site #156) was shown as a Metal Works on historical Sanborn maps.
- 1403 Fourth Avenue (site #157) has closed spills and the potential on-site use of oils and chemicals.
- 124 Covert Avenue (site #178) has an LTANKS (leaking underground storage tank) listing associated with New York Telephone Co. and a leaking No. 2 fuel oil tank. Additionally, Verizon-New Hyde Park was identified as having an in- service aboveground waste oil tank.

PARKING GARAGE PROPERTIES AND ACQUISITION PARCELS

Phase I site assessments were conducted at ten properties that would potentially be disturbed in connection with the Proposed Project: six sites where parking structures would be constructed and four other commercial parcels that would be acquired in connection with other project elements; these reports are included in Appendix 8. Currently, each of the sites that will be utilized for the construction of parking structures serve as surface parking lots; the additional acquisition sites are occupied by commercial uses. A review of historic data for each of the sites revealed a history of commercial and industrial use consistent with the surrounding land uses.

Each of the Phase I reports identified RECs at their applicable properties. The extensive history of surrounding industrial or commercial uses—including dry cleaning facilities—presented a risk of off-site contaminant migrating onto the sites; these areas also presented a risk of potential vapor encroachment conditions in the event of new construction. Additionally, on-site and adjacent ASTs and USTs were identified at seven of the sites. As a result of the identified RECs, additional subsurface testing was performed at the six publicly-owned parcels where access could be obtained, discussed below. Phase 2 testing at the remaining properties would be conducted after acquisition, in advance of any site disturbance.

TRANSPORT OF HAZARDOUS MATERIALS BY FREIGHT TRAINS

All of NY&A's freight train operations are subject to strict federal, state, and local safety regulations that cover both operating conditions and the methods of handling of cargo; this holds particularly true for the transportation of hazardous materials by rail. Like all rail carriers in the United States, NY&A is subject to the regulatory requirements imposed by the Federal Railway Administration (FRA), including rules specifically relating to the handling of hazardous materials. These rules—contained in 49 CFR 174—outline requirements specific to the type of hazardous material being transported, including specifications for car design and documentation. In addition, hazardous materials transporters are regulated by the Pipeline and Hazardous Materials Safety Administration (PHMSA) of the United States Department of Transportation, which promulgates registration and safety requirements in connection with the transportation of hazardous materials. All entities that transport hazardous waste are also regulated by the Environmental Protection Agency pursuant to the Resource Conservation and Recovery Act

(RCRA), which requires substantial documentation and places safety-based restrictions on the means and manner of transport.

At the state level, NY&A must comply with all requirements set forth by the Rail Safety Bureau of the Office of Modal Safety & Security of NYSDOT and comply with any requests for inspection. Additionally, in the event that NY&A is transporting any hazardous waste, they must comply with inspection requests and oversight from the NYSDEC, which oversees New York's hazardous waste regulatory regime. In Nassau County, any activity that involves the storage of toxic or hazardous materials, including both fresh and waste materials, are also regulated by the Nassau County Health Department (NCHD); under Article XI of the Nassau County Public Health Ordinance and its attendant regulations, NCHD provides substantial guidance relating to the methods of storage, the requirements for safe transfer, and necessary registrations and permits. NY&A is also limited to operating within the general parameters set by LIRR with regard to corridor safety.

E. FUTURE WITHOUT THE PROPOSED PROJECT

In the future without the Proposed Project, it is assumed that changes in the use of the Study Area, including changes that require construction or soil excavation, would likely continue and there would still be a potential for disturbance of contaminated materials that could increase exposure. However, unlike the conditions in the future with the Proposed Project, regulatory oversight of any required remediation and/or the implementation of proper environmental health and safety protocols would not necessarily be conducted. Nonetheless, sites currently undergoing remediation under a regulatory program, such as the Floral Park substations, would continue their efforts in those programs.

F. POTENTIAL IMPACTS OF THE PROPOSED PROJECT

Construction of the Proposed Project would require subsurface disturbance along the alignment, at LIRR [^] Stations, at parking garage locations, at properties that would be acquired as part of the Proposed Project and within areas that would require alterations to grade crossings including drainage system installation (see Chapter 13, "Construction"). Given the history of this area, described above, contaminated soil and/or groundwater may be encountered. Excavation and construction activities could disturb these contaminated materials and increase pathways for human exposure if not performed with appropriate safety procedures, air monitoring, and engineering controls (see Section G).

In addition to subsurface disturbance, construction of the Proposed Project would likely require demolition or renovation of existing buildings, structures or equipment, which, based on their ages could include asbestos containing materials (ACM), lead-based paint (LBP), mercury or PCBs, which would also be conducted in accordance with an approved health and safety programs.

LONG ISLAND RAIL ROAD RIGHT-OF-WAY, LIRR STATIONS & GRADE CROSSINGS

RESULTS OF SOIL SAMPLING INVESTIGATION

A subsurface soil sampling program was conducted at 39 locations within the LIRR ROW and near station platforms. Appendix 8-B contains the technical report with the sampling results.

Long Island Rail Road Expansion Project

Soil analytical results were compared to the 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs). The Project Corridor is a railroad right-of-way and thus the applicable SCOs are the Industrial SCOs, or ISCOs. Any site cleanup in this area, to the extent required by law, would be subject to the ISCOs. For informational purposes, and to provide information on the nature of the soil present within the portions of the Project Corridor where there will be site disturbance, results are also compared to the unrestricted use Soil Cleanup Objectives (UUSCOs), which are the most stringent SCOs set forth under Part 375, and the restricted residential Soil Cleanup Objectives (RRSCOs) and commercial Soil Cleanup Objectives (CSCOs). Exceedances of the UUSCOs and ISCOs are summarized below.

Volatile Organic Compounds

Other than acetone, a common laboratory contaminant, there were no detections of any VOCs in excess of any of the SCOs. Acetone was detected at 0.0805 mg/kg at boring SB-24, which is above the UUSCO of 0.05 mg/kg but well below all other Part 375 criteria.

Semi-Volatile Organic Compounds

Two semi-volatile organic compounds (SVOCs), benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene, were detected above the UUSCOs and RRSCOs but below the CSCOs and applicable ISCOs. One or both of these polycyclic aromatic hydrocarbon (PAH) compounds were found in borings SB-21, SB-22, SB-28 and SB-34. The highest concentration of PAHs was present in the sample from boring SB-21, where benzo(b)fluoranthene was detected at 1.07 mg/kg, above the UUSCO and RRSCO of 1 mg/kg. These compounds are frequently found in urban fill materials and are common in railroad sites, where PAHs typically average between 1 and 2 mg/kg, but can be found at concentrations greater than 100 mg/kg. No SVOCs exceeded any CSCO or ISCO. A summary of SVOC exceedances is shown in Table 8-1.

Table 8-1
SVOC Exceedance Summary Table

Sample ID:	SB21	SB22	SB28	SB34				
Date Sampled	11/9/2016	11/9/2016	11/4/2016	11/7/2016	UUSCO	RRSCO	CSCO	ISCO
Benzo(b)fluoranthene	1.07	1.02	1.01	1.03	1	1	5.6	11
Indeno(1,2,3-cd)pyrene	0.358	0.604	0.508	0.433	0.5	0.5	5.6	11
Notes: Concentrations shown are mg/kg Bolded values indicate exceedance of the UUSCO and RSCO								

Polychlorinated Biphenyls

PCB compounds are analyzed as a series of Aroclor mixtures, which were the trade names used for the various PCB products. Two Aroclor mixtures were detected in samples at concentrations exceeding the UUSCOs of 0.1 mg/kg for each compound: Aroclor 1254 was detected at SB-05 (0.302 mg/kg), SB-19 (0.191 mg/kg), and SB-20 (0.251 mg/kg); and Aroclor 1260 was detected at SB-01 (0.200 mg/kg). The RRSCOs, CSCOs and ISCOs were not exceeded for any PCB compound. A summary of exceedances is shown in Table 8-2.

Table 8-2
PCB Exceedance Summary Table

Sample ID:	SB01	SB05	SB19	SB20				
Date Sampled	11/11/2016	11/11/2016	11/9/2016	11/9/2016	UUSCO	RRSCO	CSCO	ISCO
Aroclor 1254	<0.034	0.302	0.191	0.251	0.1	1	1	25
Aroclor 1260	0.2	0.08	<0.034	<0.035	0.1	1	1	25
Notes: Concentrations shown are mg/kg Bolded values indicate exceedance of the UUSCO								

Pesticides

Pesticides were detected at concentrations above the UUSCOs, but multiple orders of magnitude below RRSCOs, CSCOs and ISCOs, in 25 of the 39 samples throughout the corridor. In the remaining 14 samples, pesticides were either not detected or detected at concentrations below the UUSCOs. 4,4'-DDD exceeded the UUSCO at SB-12, SB-21 and SB-22 with a maximum concentration of 0.0109 mg/kg in sample SB-12. 4,4'-DDE exceeded the UUSCO at SB-05, SB-07, SB-11, SB-12, SB-13, SB-19, SB-20, SB-21, SB-22, SB-32, SB-38, SB-39 and SB-40, with the maximum concentration of 0.0486 mg/kg in sample SB-12. 4,4'-DDT was found exceeding the UUSCO at 24 borings across the corridor, with a maximum concentration of 0.0582 mg/kg in sample SB-07. Dieldrin was detected at SB-19, SB-23 and SB-34 at levels exceeding the UUSCO of 0.005 mg/kg, with a maximum concentration of 0.0402 mg/kg in the sample from SB-34. A summary of the sample results where the UUSCOs were exceeded is shown in Table 8-3

Metals

A number of different metals were detected in 16 of the 39 soil samples at levels that were above the UUSCOs. Arsenic, copper, lead, mercury, and zinc were all detected at levels exceeding the UUSCOs in multiple soil borings. All detections were below RRSCOs, CSCOs and ISCOs except arsenic, which was detected at a concentration of 23.8 mg/kg in sample SB-12, exceeding the RRSCO, CSCO and ISCO of 16 mg/kg. Elevated metals compounds are frequently encountered in urban fill materials. A summary of metals exceedances is shown in Table 8-4.

Table 8-3
Pesticides Exceedance Summary Table

Sample ID:	SB01	SB02	SB03	SB05	SB07				
Date Sampled	11/11/2016	11/11/2016	10/31/2016	11/11/2016	10/31/2016	UUSCO	RRSCO	CSCO	ISCO
4,4'-DDD	<0.00065	<0.00066	<0.00070	<0.00067	0.0028	0.0033	13	92	180
4,4'-DDE	<0.00065	<0.00066	0.0026	0.0159	0.0089	0.0033	8.9	62	120
4,4'-DDT	0.0279	0.0074	0.0181	0.015	0.0582	0.0033	7.9	47	94
Dieldrin	<0.00065	<0.00066	<0.00070	<0.00067	<0.00068	0.005	0.2	1.4	2.8
Sample ID:	SB11	SB12	SB13	SB17	SB19				
Date Sampled	11/1/2016	11/2/2016	11/2/2016	11/3/2016	11/9/2016	UUSCO	RRSCO	CSCO	ISCO
4,4'-DDD	<0.00089	0.0109	<0.00073	<0.00069	<0.00068	0.0033	13	92	180
4,4'-DDE	0.0047	0.0486	0.0284	<0.00069	0.0039	0.0033	8.9	62	120
4,4'-DDT	0.0082	0.0281	0.0313	0.007	0.0132	0.0033	7.9	47	94
Dieldrin	<0.00089	<0.00071	<0.00073	<0.00069	0.0094	0.005	0.2	1.4	2.8
Sample ID:	SB20	SB21	SB22	SB23	SB28				
Date Sampled	11/9/2016	11/9/2016	11/9/2016	11/10/2016	11/4/2016	UUSCO	RRSCO	CSCO	ISCO
4,4'-DDD	<0.00071	0.0076	0.004	<0.00065	<0.00065	0.0033	13	92	180
4,4'-DDE	0.0204	0.0235	0.0063	<0.00065	0.0026	0.0033	8.9	62	120
4,4'-DDT	<0.00071	0.0418	0.0475	0.0085	0.0133	0.0033	7.9	47	94
Dieldrin	<0.00071	<0.00072	<0.00070	0.007	<0.00065	0.005	0.2	1.4	2.8
Sample ID:	SB30	SB31	SB32	SB33	SB34				
Date Sampled	11/7/2016	11/4/2016	11/7/2016	11/4/2016	11/7/2016	UUSCO	RRSCO	CSCO	ISCO
4,4'-DDD	<0.00068	<0.00064	<0.00069	<0.00069	<0.00070	0.0033	13	92	180
4,4'-DDE	<0.00068	0.00058 J	0.0139	0.0011	<0.00070	0.0033	8.9	62	120
4,4'-DDT	0.0058	0.0036	0.0291	0.0109	0.0138	0.0033	7.9	47	94
Dieldrin	<0.00068	0.0033	<0.00069	<0.00069	0.0402	0.005	0.2	1.4	2.8
Sample ID:	SB35	SB36	SB38	SB39	SB40				
Date Sampled	11/7/2016	11/8/2016	11/8/2016	11/8/2016	11/10/2016	UUSCO	RRSCO	CSCO	ISCO
4,4'-DDD	<0.00063	<0.00063	<0.00068	<0.00080	<0.00071	0.0033	13	92	180
4,4'-DDE	<0.00063	0.002	0.007	0.0069	0.0035	0.0033	8.9	62	120
4,4'-DDT	0.0104	0.0035	0.0214	0.0138	0.0044	0.0033	7.9	47	94
Dieldrin	<0.00063	<0.00063	<0.00068	<0.00080	<0.00071	0.005	0.2	1.4	2.8
Notes:									
Concentrations shown are mg/kg									
Bolded values indicate exceedance of the UUSCO									

Table 8-4
Metals Exceedance Summary Table

Sample ID:	SB03	SB07	SB12	SB15	SB17	SB19				
Date Sampled	10/31/2016	10/31/2016	11/2/2016	11/3/2016	11/3/2016	11/9/2016	UUSCO	RRSCO	CSCO	ISCO
Arsenic	5.6	4.9	23.8**	2.1	2.5	6.5	13	16	16	16
Copper	37	20.4	32.9	20	25	83.1*	50	270	270	10000
Lead	95.1*	82.7*	56.1	70.1*	75*	53.5	63	400	1000	3900
Mercury	0.058	≤0.035	0.044	≤0.032	0.062	0.079	0.18	0.81	2.8	5.7
Zinc	81.5	69.6	37.2	79.8	63.4	32.5	109	10000	10000	10000
Sample ID:	SB21	SB22	SB27	SB28	SB30					
Date Sampled	11/9/2016	11/9/2016	11/3/2016	11/4/2016	11/7/2016		UUSCO	RRSCO	CSCO	ISCO
Arsenic	13.9*	7.3	4.4	5.5	3.2		13	16	16	16
Copper	38.2	66.3*	52.7*	31.1	36		50	270	270	10000
Lead	125*	378*	42.9	110*	111*		63	400	1000	3900
Mercury	0.21*	0.12	≤0.034	0.099	0.046		0.18	0.81	2.8	5.7
Zinc	92.2	223*	205*	149*	91.8		109	10000	10000	10000
Sample ID:	SB34	SB35	SB36	SB38	SB39					
Date Sampled	11/7/2016	11/7/2016	11/8/2016	11/8/2016	11/8/2016		UUSCO	RRSCO	CSCO	ISCO
Arsenic	3.9	4.2	≤2.0	4.8	2.5		13	16	16	16
Copper	72.7*	70.6*	5.7	70.5*	30.6		50	270	270	10000
Lead	55.7	88*	10.3	196*	31.3		63	400	1000	3900
Mercury	0.1	0.13	0.75*	0.077	≤0.033		0.18	0.81	2.8	5.7
Zinc	95.7	47.8	955*	330*	224*		109	10000	10000	10000
Notes: Concentrations shown are mg/kg Bolded values indicate exceedance of any SCO * next to a value indicates exceedance of the UUSCO ** next to a value indicates exceedance of the UUSCO, RRSCO, CSCO and ISCO										

Cyanide

Cyanide was not detected above SCOs in any of the 39 samples.

Herbicides

Two herbicide compounds, 2,4,5-TP (Silvex) and pentachlorophenol are regulated by NYSDEC and were not detected in any soil samples. Herbicides 2,4-D and dichloroprop were either not detected, or detected at very low concentrations at several sample locations; there are no SCOs for these compounds. The remaining herbicides analyzed were not detected in any of the soil samples. Herbicides 2,4-D and 2,4,5-T are the components that made up the mixture for Agent Orange. 2,4-D, a common herbicide found in many products, was detected at very low concentrations in several locations and has low toxicity for humans, according to the National Pesticide Information Center¹ and USEPA². 2,4,5-T, while known to be toxic, was not detected in any soil samples.

Dioxin

Dioxin, specifically 2,3,7,8-Tetrachlorodibenzodioxin (TCDD), was a by-product of the production of the herbicide 2,4,5-T as well as many other compounds and processes. TCDD does not degrade readily in soil and is known to be toxic over a long period of time. Due to its persistence in soil, TCDD was analyzed in soil samples. TCDD was detected at very low

¹ <http://npic.orst.edu/factsheets/archive/2,4-DTech.html>

² <https://www.epa.gov/ingredients-used-pesticide-products/24-d>

concentrations at several sample locations. There are no SCOs for dioxin compounds, so results were compared to the US Environmental Protection Agency (EPA) regional screening levels (RSLs) for dioxin mixtures, which are 0.0001 mg/kg (100 picograms per gram [pg/g]) for residential soils and 0.00047 mg/kg (470 pg/g) for industrial soils. Dioxin (TCDD) concentrations ranged from non-detect to 4.18 pg/g in sample SB-02. All detections were far below the more stringent RSL of 100 pg/g, and the majority of detections were less than 2 pg/g.

RCRA Characteristics and TCLP Analyses

Sample results were evaluated for RCRA characteristics and full TCLP (see **Appendix 8-B**). The results of these analyses were compared to the EPA's Maximum Concentration of Contaminants for Toxicity Characteristic (CFR 40, Part 261, Table 1) indicating that the soils sampled would not be considered as a hazardous material.

CONCLUSIONS

The results of the soil sampling did not indicate evidence of a petroleum discharge or other potential chemical release along the Project Corridor, LIRR Stations and grade crossings. Accordingly, the analytical results do not require any spill reporting to NYSDEC.

Fill material appears to have been used to raise and level the LIRR ROW when it was developed and that material contains levels of certain metals, pesticides, PCBs, and PAHs that are in excess of NYSDEC's most stringent UUSCOs, indicating that this soil cannot be deemed "clean fill" or uncontaminated native soil. However, all analytical results were well below all applicable standards except for one soil boring location that exceeded the industrial SCO for arsenic (23.8 mg/kg versus 16 mg/kg).

Prior to disturbing soils within the Project Corridor, LIRR Stations or at grade crossings, a Construction Health and Safety Plan (CHASP) and Community Air Monitoring Plan (CAMP) will be developed for implementation during construction activities. Such measures should ensure that soil is handled appropriately to minimize human contact, and to reduce airborne dust, in order to protect construction workers, site employees and neighborhood residents. During construction, it is anticipated that excess soil will be exported from the site for disposal at a facility licensed to accept fill material under 6 NYCRR Part 360 Regulations.

ASBESTOS AND LEAD-BASED PAINT SAMPLING

Sampling of buildings and structures within the LIRR ROW was also performed for ACM and LBP. As expected, these materials are present in a number of buildings and structures and would be remediated during the construction period in accordance with all applicable laws and regulations.

PARKING GARAGE LOCATIONS

Subsurface testing was also conducted at six sites where parking garages have been proposed; testing was not undertaken at the four other acquisition properties that are required as part of the Proposed Project because they are privately owned and access for testing could not be obtained. Summaries of the sampling results are included as Appendix 8-X.

The subsurface sampling did not reveal the presence of VOCs, SVOCs, PAHs, or PCBs exceeding Unrestricted Use soil Soil Cleanup Objectives (SCOs). While pesticides were detected at levels exceeding Unrestricted Use SCOs in four soil samples (SB-03 and SB-04 at Barclay

Street lot, SB-03 at Scally Place lot and SB-02 at John Street lot), none of the samples exceeded the applicable Commercial Use SCOs or other SCOs for restricted residential or industrial uses.

Elevated metals compounds, which are frequently encountered in urban fill materials, were detected in a limited number of locations. Arsenic exceedances of the Unrestricted Use SCO were detected in two samples at two locations, with one sample exceeding the Commercial SCO as well. Lead exceedances of the most stringent Unrestricted Use SCO were also detected at two locations, but these samples did not exceed any other SCOs. The testing revealed one exceedence of the Unrestricted Use SCOs for zinc and copper, and one sample exceeded the Commercial Use SCO for mercury but was below the Industrial Use SCO. Prior to disturbing soils in connection with the construction of the additional parking structures, a Construction Health and Safety Plan (CHASP) and Community Air Monitoring Plan (CAMP) would be developed for implementation during construction activities. Such measures would ensure that soil is handled appropriately to minimize human contact, and to reduce airborne dust, in order to protect construction workers, site employees and neighborhood residents from the minor contamination identified by the Phase 2 testing. During construction, it is anticipated that excess soil will be exported from the site for disposal at a facility licensed to accept fill material under 6 NYCRR Part 360 Regulations.

G. MITIGATION FOR THE PROPOSED PROJECT

The potential for adverse impacts would be avoided by ensuring that construction activities at all locations are performed in accordance with the following protocols:

- ^ Based on the results of the subsurface investigations, a Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) would be prepared for implementation during project construction. These plans would address both the remediation of known or potential unknown environmental conditions that may be encountered during subsurface disturbance associated with project construction. The purpose of the RAP is to present measures for managing contaminated on-site soil and groundwater and USTs, removing any potentially unknown underground petroleum storage tanks in accordance with applicable federal, state, and local regulations. Contaminated soil management protocols would include guidelines for temporary on-site stockpiling and off-site transportation and disposal. The plans would incorporate safety and other measures to minimize the potential for impacts to the community and construction workers. The RAP also would specify the need for engineering controls as warranted based on the testing, such as the incorporation of vapor mitigation systems into the project design.
- To minimize the potential for impacts to the community and construction workers, all demolition, excavation, and construction work involving soil disturbance would be performed under a site-specific environmental ^ Construction Health and ^ Safety Plan (CHASP). The CHASP would also be based on the results of the Phase II study and would specify appropriate testing and/or monitoring, and detail appropriate measures to be implemented (including notification of regulatory agencies, dust suppression techniques, appropriate air monitoring action levels and responses, etc.) if underground storage tanks, soil and groundwater contamination, or other unforeseen environmental conditions are encountered.
- If dewatering is required for construction, testing would be performed to ensure compliance with applicable discharge regulatory requirements. If necessary, pre-treatment would be conducted prior to discharge.

Long Island Rail Road Expansion Project

- Unless there is labeling or test data that indicated that electrical equipment, including transformers, is not mercury- and/or PCB-containing, removal and disposal would be performed in accordance with applicable federal, state and local regulations.
- Prior to any activities required as part of the Proposed Project that could disturb potential ACM, a comprehensive asbestos survey of areas (including underground utility vaults) to be disturbed by the Proposed Project would be conducted that included the sampling of all suspect materials to confirm the presence or absence of asbestos. All identified ACM would be removed and disposed of prior to construction in accordance with all federal, state, and local regulations. Asbestos abatement procedures and containment requirements will be based on the type and quantities of ACM to be removed.
- Any demolition activities with the potential to disturb LBP would be performed in accordance with applicable Occupational Safety and Health Administration regulations including OSHA 29 CFR 1926.62[^] =Lead Exposure in Construction. Methods for lead abatement will comply with LIRR abatement procedures and containment requirements.
- All material that needed to be disposed of (e.g., miscellaneous debris, tires, contaminated soil and any excess fill) would be characterized and disposed of off-site in accordance with applicable federal, state, and local requirements.

With the implementation of these protocols, no significant adverse impacts related to contaminated materials would result from demolition and/or construction activities related to the Proposed Project. Following construction, there would be no further potential for significant adverse impacts. *