DECISION DOCUMENT

175-225 3rd Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224209
June 2025

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

DECLARATION STATEMENT - DECISION DOCUMENT

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Statement of Purpose and Basis

This document presents the remedy for the 175-225 3rd Street brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the 175-225 3rd Street site and the public's input to the proposed remedy presented by NYSDEC.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. **Remedial Design**

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.
- Additionally, to incorporate green remediation principles and techniques to the extent

feasible in the future development at this site, any future on-site buildings will include, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise™ (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

2. Excavation

The existing on-site buildings will be demolished and materials which cannot be beneficially reused on site will be taken off-site for proper disposal in order to implement the remedy.

Excavation and off-site disposal of contaminant source areas, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil exceeding the 6 NYCRR Part 371 hazardous criteria for lead;
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

All soils in the upper two feet which exceed the restricted residential soil cleanup objectives (SCOs) will be excavated and transported off-site for disposal. In addition, excavation and removal of petroleum contaminated soil exceeding applicable PGWSCOs will be extended to the groundwater table (approximately 3.5 to 8.75 feet below grade). Excavation of soil to a depth of 4 feet below grade in the portion of the site subject to the in-situ solidification (ISS) treatment

described in Remedy Element 5.

Approximately 27,866 cubic yards of contaminated soil will be removed from the site. Collection and analysis of confirmation samples at the remedial excavation depth will be used to verify that SCOs for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify NYSDEC, submit the sample results and, in consultation with NYSDEC, determine if further remedial excavation is necessary. Further excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, and regulations and facility-specific permits.

3. Backfill

Backfill meeting the requirements of 6 NYCRR Part 375-6.7(d)(1) will be brought in to replace the excavated soil and establish the designed grades at the site. Approximately 27,866 cubic yards of clean fill will be imported for this purpose.

4. Cover System

A site cover will be required in areas where the upper two feet of exposed surface soil will exceed the applicable SCOs, to allow for future restricted residential use of the site. Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

Where the soil cover is required over the ISS treatment area, it will consist of a minimum of four feet of soil to ensure the underlying monolith remains below the frost line and protected from the freeze-thaw cycle. A building and its foundation are considered suitable cover to protect the ISS monolith. Where a building and it's foundation are considered part of the site cover, the ISS design should include considerations for drainage between the ISS and building foundation and the potential need to design the ISS for a higher strength. If the ISS monolith extends beyond the building footprint, the design shall include a soil cover consisting of a minimum of four feet of soil for that portion. Consistent with the remainder of the site cover, the upper two feet will meet the SCOs for restricted residential use outside the ISS monolith area. For areas where solidified material underlies the cover, the solidified material itself will serve as the demarcation layer due to the nature of the material.

5. In-Situ Solidification or Stabilization

In-situ solidification (ISS) or in-situ geochemical stabilization (ISGS) will be implemented in two areas on the northwestern and western portions of the site to address coal tar non-aqueous phase liquid (NAPL) located near a previously installed bulkhead, as indicated on Figure 2. The determination of ISS or ISGS as the selected remedial element will be determined during the design.

The treatment zone will extend from the top of the groundwater table to approximately -23 feet NAVD88, this elevation corresponds to a depth of -2 feet below the Gowanus Canal cap base elevation (CBE). An approximately 4-foot soil cut will need to be excavated in this area to contain the ISS spoils and increased soil volume created by the soil mixing.

ISS is a process that binds the soil particles in place creating a low permeability mass. The contaminated soil will be mixed in place together with solidifying reagents or other binding reagents using an excavator or augers. Often Portland cement is used as the primary binder, although less carbon-intensive amendments will be considered. The soil and binding reagents are mixed to produce a solidified mass resulting in a low permeability monolith. Prior to the full implementation of this technology, bench-scale laboratory testing and on-site pilot scale studies will be conducted to more clearly define design parameters, amendment types and dosages. Bench test will consist of collecting soil from source area and mixing with a variety of amendments and doses in a controlled atmosphere followed by testing resulting hydraulic conductivity and unconfined-compressive strength. Pilot tests will then be conducted using successful amendment mixes from the bench test prior to full scale design.

Typical design requirements are that solidified mass would produce a hydraulic conductivity (K) of 1.0 X 10^{-6}cm/sec or less and would also result in an unconfined compressive strength of 50 psi, or higher pending future uses that may include construction above the solidified mass. The solidified mass will then be covered with a cover system as described in Remedy Element 4 to prevent direct exposure to the solidified mass. The resulting solid matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

In-situ Geochemical Stabilization is a process that uses a stabilizing reagent which chemically changes contamination to make it less soluble, and permanganate to oxidize and break down contaminants within the soil mass. The contaminated soil will be mixed in place with stabilizing reagents using direct-push injections. This treatment changes the contamination from a soluble form to a stable, insoluble compound to reduce or eliminate the matrix as a source of groundwater contamination. The stabilized soil will then be covered with a cover system as described in Remedy Element 4 to prevent direct exposure.

6. Groundwater Treatment

In-situ chemical oxidation (ISCO) will be implemented to treat petroleum-impacted saturated soils and groundwater. A chemical oxidant will be injected into the subsurface via injection wells

to destroy the contaminants in an approximately 57,000 square foot area located in the northwestern, central and northeastern portions of the site where petroleum-related compounds were elevated in the groundwater. The method and depth of injection will be determined during the remedial design.

7. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system, or other acceptable measures, to mitigate the migration of vapors into the building from the subsurface.

8. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOHMH; and
- require compliance with the NYSDEC approved Site Management Plan.

9. Site Management Plan

A Site Management Plan is required, which includes the following:
a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

- Institutional Controls: The Environmental Easement discussed in Remedy Element 8 above.
- Engineering Controls: The site cover system discussed in Remedy Element 4 and the vapor mitigation system discussed in Remedy Element 7.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use and groundwater water use restrictions;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Remedy Element 5 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and NYSDEC notification; and

- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater and soil vapor to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the NYSDEC;
- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

- procedures for operating and maintaining the remedy;
- compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting,
- maintaining site access controls and NYSDEC notification; and
- providing the NYSDEC access to the site and O&M records.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration NYSDEC guidance, as appropriate. The remedy is protective of public health and the environment.

June 25, 2025
Date

R. Scott Deyette
Scott Deyette, Director
Remedial Bureau B

DECISION DOCUMENT

175-225 3rd Street
Brooklyn, Kings County
Site No. C224209
June 2025

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance, based on the reasonably anticipated use of the property.

NYSDEC has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

NYSDEC seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by NYSDEC in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repositories:

DECInfo Locator - Web Application
https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C224209

Park Slope Library
431 6th Avenue at 9th Street
Brooklyn, NY 11213
Phone: 718-832-1853

Brooklyn Community Board #6
250 Baltic Street
Brooklyn, NY 11201
Phone: (718) 643-3027

Receive Site Citizen Participation Information By Email

Please note that NYSDEC's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The site is approximately 3.2 acres and is designated as Block 972, Lot 58 (formerly Lots 1, 43, and 58) located at 225 3rd Street in the Gowanus neighborhood of Brooklyn, New York. The site is bounded to the north by a closed section of 2nd Street, to the east by 3rd Avenue, to the south by 3rd Street, and to the west by the Gowanus Canal.

Site Features: The rectangular-shaped site was most recently occupied by a Verizon service center. The site is currently fenced on all the landward sides. The westernmost part of the site is generally capped with a gravel cover and does not contain structures or foundations. The middle portion of the site contains an approximate 8,300-square-foot single-story brick building and asphalt paved parking areas. The easternmost lot contains asphalt-paved parking areas and an approximate 7,100-square-foot, single-story, prefabricated building with sheet metal walls. All buildings are currently vacant.

Current Zoning and Land Use: The site is currently zoned M1-4/R7-2 (manufacturing/residential) on the western portion of the property, and M1-4/R7X (manufacturing/residential) on the eastern portion of the property. Properties surrounding the site are occupied by commercial and industrial uses.

Past Use of the Site: Historical use of the site includes a coal and stone yard with wagon painting (1886 to 1904), blacksmith (1904), a transit facility with iron coal conveyor transecting the site from east to west (1915 to 1938), an automobile wrecking facility (1934 to 1950), a filling station with gasoline tanks (1950 to 1977), and automobile repair facilities with hydraulic lifts, drums, and waste oil storage (1950 to present).

Site Geology and Hydrogeology: The site sits at an average elevation of approximately 10 feet above mean sea level (MSL, NAVD88), ranging from an elevation of 17 feet MSL in the southeast to 9.4 feet MSL in the southwest. The topography of the site is generally level, and slopes gently toward the southwest. The subsurface consists of historic urban fill characterized

by brown silty sand with gravel, concrete, wood, brick, stone and debris extending to varying depths of 8 to 15.25 feet below grade. The fill material is underlain by either an organic layer consisting of soft silt and clay or by a fine- to coarse-grained sand layer with varying amounts of silt and gravel. Groundwater is present beneath the site at 3.5 to 8.75 feet below surface grade or elevation 1.83 feet MSL at low tide to elevation 8.54 feet MSL at high tide. Groundwater flow is to the west toward the Gowanus Canal.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

NYSDEC may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, an alternative that restricts the use of the site to restricted-residential use (which allows for commercial use and industrial use) as described in Part 375-1.8(g) was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicant under the Brownfield Cleanup Agreement is a Volunteer. The Applicant does not have an obligation to address off-site contamination. However, NYSDEC has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected

in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor
- indoor air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. NYSDEC has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site are:

ethylbenzene	chrysene
n-propylbenzene	naphthalene
toluene	arsenic
xylene (mixed)	lead
acenaphthene	mercury
benzo(a)anthracene	1,2,4-trimethylbenzene
benzo(k)fluoranthene	trichloroethene (TCE)
benzo(a)pyrene	tetrachloroethene (PCE)

The contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Decision Document.

The following IRMs have been completed at this site based on conditions observed during the RI.

Installation of Bulkhead

The IRM was completed to support shoreline stabilization activities and prevent contaminant migration along the site's Gowanus Canal frontage. The existing concrete seawall and associated structures were demolished as needed to install a sheet pile cutoff wall. Soils were excavated and transported for off-site disposal to facilitate the installation of the cutoff wall and upland components (i.e., sheet pile deadman and tie rods). A sealed-seam, sheet pile cutoff wall outboard of the existing bulkhead was installed to stabilize the shoreline and prevent contaminant migration. Endpoint soil samples were collected and analyzed from the base of the excavation area. A two-foot-thick gravel cover was placed above a demarcation layer. One collection well was also installed on the landward side of the bulkhead to collect any dense nonaqueous phase liquids that may be behind the wall. A Construction Completion Report (CCR) was prepared to document construction of the steel sheet pile cutoff wall.

The IRM commenced in June 2020 and is documented in the approved June 2021 CCR.

Soil Vapor Intrusion Mitigation

A sub-slab depressurization system (SSDS) was installed to mitigate the migration of vapors into the office space of the on-site building in the center of the site from the subsurface. The SSDS consists of:

- Installation of two depressurization pits excavated to approximately two to three feet bgs;
- A 4-inch diameter depressurization point was installed within each depressurization pit beneath the concrete slab;
- Restoration of the building floor slab with concrete on top of crushed stone;
- Vertical header pipes that discharge vapors above the building roof line with vents located a minimum of 10 feet from any intake points; and
- Six sub-slab soil vacuum monitoring points installed within the floor slab of the building to monitor and evaluate the effectiveness of the system.
- Indoor air samples collected after system startup indicated concentrations of contaminants had decreased.

The IRM commenced in December 2020 and is documented in the approved October 2021 IRM CCR.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

Nature and Extent of Contamination:

Soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals and polychlorinated biphenyls (PCBs). Soil and groundwater samples were analyzed for VOCs, SVOCs, metals, PCBs, per- and polyfluoroalkyl substances (PFAS), and 1,4-dioxane. Soil vapor, sub-slab and indoor air samples were analyzed for VOCs. Based upon investigations conducted to date, the primary contaminants of concern for the site include SVOCs and metals in soils, VOCs and SVOCs in groundwater and VOCs in soil vapor.

Soil: Soil data were compared to Protection of Groundwater Soil Cleanup Objectives (PGWSCO), and Restricted Residential Soil Cleanup Objectives (RRSCO). VOCs, SVOCs, and petroleum impacts are present primarily on the western portion of the site from depths of 2 to 10 feet below surface grade. VOCs detected in the soil exceeding applicable SCOs include maximum concentrations of 1,2,4-trimethylbenzene at 96 parts per million, or ppm (PGWSCO is 3.6 ppm, RRSCO is 52 ppm), ethylbenzene at 160 ppm (PGWSCO is 1 ppm, RRSCO of 41 ppm), and xylenes at 120 ppm (PGWSCO is 1.6 ppm, RRSCO is 100 ppm). SVOCs that exceed the applicable SCOs include maximum concentrations of acenaphthene at 1,530 ppm (PGWSCO is 98 ppm, RRSCO of 100 ppm); benzo(a)anthracene at 274 ppm (PGWSCO and RRSCO is 1 ppm); benzo(a)pyrene at 153 ppm (PGWSCO is 22 ppm, RRSCO is 1 ppm); chrysene at 352 ppm (PGWSCO is 1 ppm, RRSCO is 3.9 ppm); and naphthalene at 14,700 ppm (PGWSCO is 12 ppm, RRSCO is 100 ppm). Metals were detected in soil including maximum concentrations of arsenic at 81.7 ppm (PGSCO and RRSCO is 16 ppm); lead at 7,190 ppm (PGWSCO is 450 ppm, RRSCO is 400 ppm); and mercury at 26.4 ppm (PGWSCO is 0.73, RRSCO is 0.81 ppm). Two samples exceeded the RCRA hazardous waste regulatory limit for lead, as determined by Toxic Characteristic Leachate Procedure (TCLP) analysis. Two TCLP samples had concentrations of 7.57 ppm and 25.7 ppm compared to the RCRA standard of 5 ppm. PCBs were not detected above RRSCOs. During the investigation, neither PFAS nor pesticides were sampled.

Data does not indicate any off-site impacts to soil related to this site.

Groundwater: The primary contaminants of concern in groundwater are VOCs and SVOCs. VOCs in groundwater that exceed the Ambient Water Quality Standards and Guidance Values (AWQSGVs) include maximum concentrations of 1,2,4-trimethylbenzene at 71 parts per billion (ppb); ethylbenzene at 770 ppb; n-propylbenzene at 26 ppb; toluene at 190 ppb; and total xylenes at 630 ppb (all of which have a AWQSGV of 5 ppb); and benzene at 24 ppb (AWQSGV is 1 ppb). SVOCs in groundwater that exceed the AWQSGVs include maximum concentrations of benzo(a)anthracene at 0.49 ppb; benzo(a)pyrene at 1.03 ppb; benzo(k)fluoranthene at 0.32 ppb; and chrysene at 0.38 ppb (all of which have AWQSGV of 0.002 ppb); and naphthalene at 7,070

ppb (AWQSGV is 10 ppb). PFOA and PFOS were reported at concentrations of up to 167 and 30.9 parts per trillion (ppt), respectively, compared to the groundwater guidance values of 6.7 ppt for PFOA and 2.7 ppt for PFOS. PCBs were not detected above AWQSGV.

Data does not indicate any off-site impacts to groundwater related to this site.

Soil vapor: Petroleum-related VOCs and chlorinated VOCs concentrations were detected within soil vapor, sub-slab soil vapor and indoor air throughout the Site. PCE was detected in soil vapor samples at concentrations up to 19 ug/m3, in sub-slab soil vapor samples up to 510 ug/m3, and in indoor air samples up to 108 ug/m3, respectively. TCE was detected in soil vapor samples at concentrations up to 300 ug/m3, in sub-slab soil vapor samples up to 199 ug/m3, and in indoor air samples up to 7.2 ug/m3, respectively. Heptane was detected in soil vapor samples at concentrations up to 18 ug/m3, in sub-slab soil vapor samples up to 248 ug/m3, and in indoor air samples up to 451 ug/m3, respectively.

Data does not indicate any off-site impacts to soil vapor related to this site.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

Since the site is fenced and covered by asphalt or concrete, people will not come into contact with site-related soil and groundwater contamination unless they dig below the surface. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because there are no occupied on-site buildings, inhalation of site contaminants in indoor air due to soil vapor intrusion does not represent a current concern. However, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development. In addition, sampling indicates soil vapor intrusion from site contamination is not a concern for off-site buildings.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 4: Restricted Residential use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the Soil Excavation, Cover System, In-Situ Solidification, Vapor Mitigation remedy.

The elements of the selected remedy, as shown in Figure 2, Figure 3, and Figure 4 are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the

design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise^{TM} (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

2. Excavation

The existing on-site buildings will be demolished and materials which cannot be beneficially reused on site will be taken off-site for proper disposal in order to implement the remedy.

Excavation and off-site disposal of contaminant source areas, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil exceeding the 6 NYCRR Part 371 hazardous criteria for lead;
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

All soils in the upper two feet which exceed the restricted residential soil cleanup objectives (SCOs) will be excavated and transported off-site for disposal. In addition, excavation and removal of petroleum contaminated soil exceeding applicable PGWSCOs will be extended to the groundwater table (approximately 3.5 to 8.75 feet below grade). Excavation of soil to a depth of 4 feet below grade in the portion of the site subject to the in-situ solidification (ISS) treatment described in Remedy Element 5.

Approximately 27,866 cubic yards of contaminated soil will be removed from the site. Collection and analysis of confirmation samples at the remedial excavation depth will be used to verify that SCOs for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify NYSDEC, submit the sample results and, in consultation with NYSDEC, determine if further remedial excavation is necessary. Further excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, and regulations and facility-specific permits.

3. Backfill

Backfill meeting the requirements of 6 NYCRR Part 375-6.7(d)(1) will be brought in to replace the excavated soil and establish the designed grades at the site. Approximately 27,866 cubic yards of clean fill will be imported for this purpose.

4. Cover System

A site cover will be required in areas where the upper two feet of exposed surface soil will exceed the applicable SCOs, to allow for future restricted residential use of the site. Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the

tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

Where the soil cover is required over the ISS treatment area, it will consist of a minimum of four feet of soil to ensure the underlying monolith remains below the frost line and protected from the freeze-thaw cycle. A building and its foundation are considered suitable cover to protect the ISS monolith. Where a building and it's foundation are considered part of the site cover, the ISS design should include considerations for drainage between the ISS and building foundation and the potential need to design the ISS for a higher strength. If the ISS monolith extends beyond the building footprint, the design shall include a soil cover consisting of a minimum of four feet of soil for that portion. Consistent with the remainder of the site cover, the upper two feet will meet the SCOs for restricted residential use outside the ISS monolith area. For areas where solidified material underlies the cover, the solidified material itself will serve as the demarcation layer due to the nature of the material.

5. In-Situ Solidification or Stabilization

In-situ solidification (ISS) or in-situ geochemical stabilization (ISGS) will be implemented in two areas on the northwestern and western portions of the site to address coal tar non-aqueous phase liquid (NAPL) located near a previously installed bulkhead, as indicated on Figure 2. The determination of ISS or ISGS as the selected remedial element will be determined during the design.

The treatment zone will extend from the top of the groundwater table to approximately -23 feet NAVD88, this elevation corresponds to a depth of -2 feet below the Gowanus Canal cap base elevation (CBE). An approximately 4-foot soil cut will need to be excavated in this area to contain the ISS spoils and increased soil volume created by the soil mixing.

ISS is a process that binds the soil particles in place creating a low permeability mass. The contaminated soil will be mixed in place together with solidifying reagents or other binding reagents using an excavator or augers. Often Portland cement is used as the primary binder, although less carbon-intensive amendments will be considered. The soil and binding reagents are mixed to produce a solidified mass resulting in a low permeability monolith. Prior to the full implementation of this technology, bench-scale laboratory testing and on-site pilot scale studies will be conducted to more clearly define design parameters, amendment types and dosages. Bench test will consist of collecting soil from source area and mixing with a variety of amendments and doses in a controlled atmosphere followed by testing resulting hydraulic conductivity and unconfined-compressive strength. Pilot tests will then be conducted using successful amendment mixes from the bench test prior to full scale design.

Typical design requirements are that solidified mass would produce a hydraulic conductivity (K) of 1.0 X 10^{-6}cm/sec or less and would also result in an unconfined compressive strength of 50 psi, or higher pending future uses that may include construction above the solidified mass. The solidified mass will then be covered with a cover system as described in Remedy Element 4 to prevent direct exposure to the solidified mass. The resulting solid matrix reduces or eliminates

mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

In-situ Geochemical Stabilization is a process that uses a stabilizing reagent which chemically changes contamination to make it less soluble, and permanganate to oxidize and break down contaminants within the soil mass. The contaminated soil will be mixed in place with stabilizing reagents using direct-push injections. This treatment changes the contamination from a soluble form to a stable, insoluble compound to reduce or eliminate the matrix as a source of groundwater contamination. The stabilized soil will then be covered with a cover system as described in Remedy Element 4 to prevent direct exposure.

6. Groundwater Treatment

In-situ chemical oxidation (ISCO) will be implemented to treat petroleum-impacted saturated soils and groundwater. A chemical oxidant will be injected into the subsurface via injection wells to destroy the contaminants in an approximately 57,000 square foot area located in the northwestern, central and northeastern portions of the site where petroleum-related compounds were elevated in the groundwater. The method and depth of injection will be determined during the remedial design.

7. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system, or other acceptable measures, to mitigate the migration of vapors into the building from the subsurface.

8. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOHMH; and
- require compliance with the NYSDEC approved Site Management Plan.

9. Site Management Plan

A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

- Institutional Controls: The Environmental Easement discussed in Remedy Element 8

above.

- Engineering Controls: The site cover system discussed in Remedy Element 4 and the vapor mitigation system discussed in Remedy Element 7.

This plan includes, but may not be limited to:

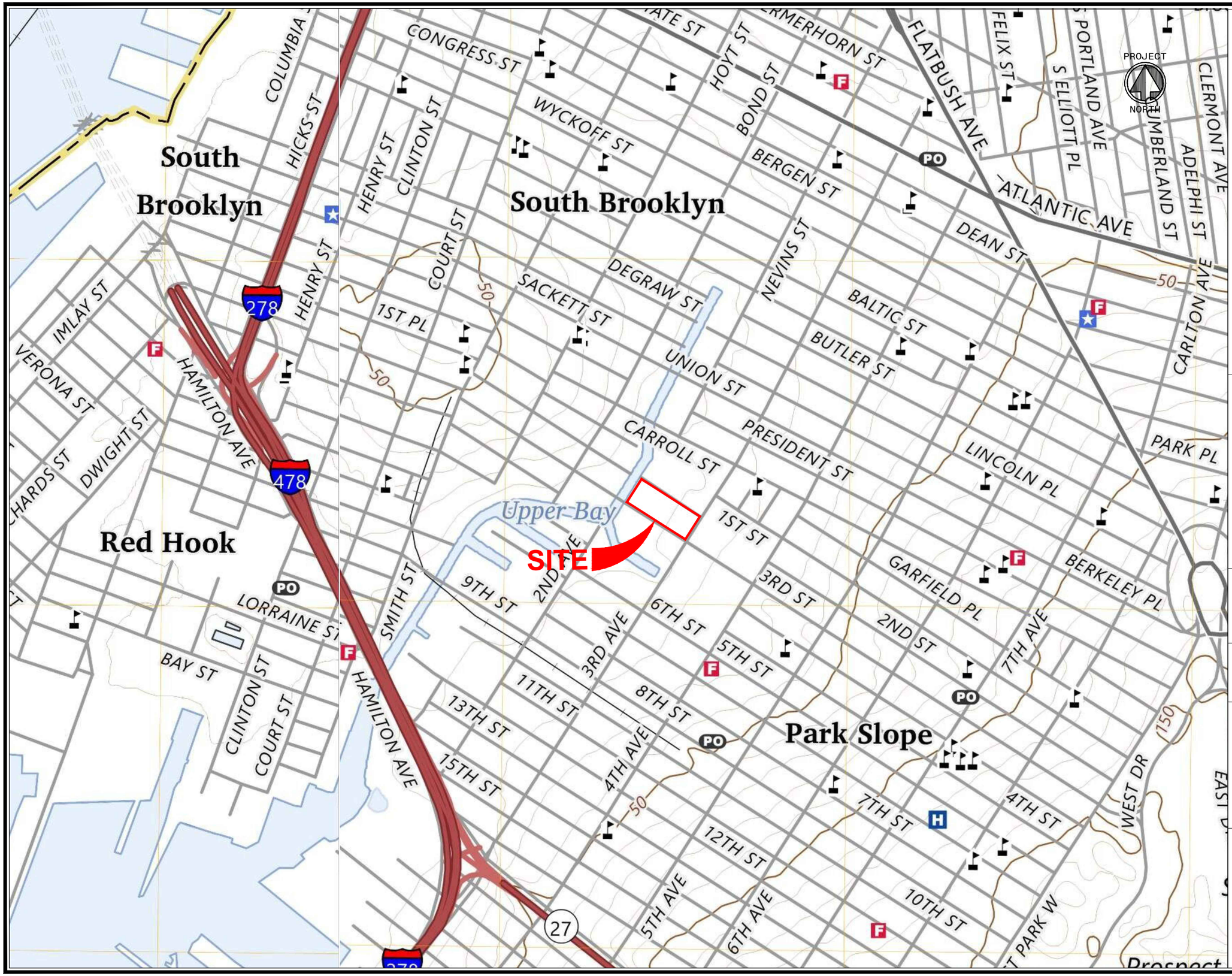
- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use and groundwater water use restrictions;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Remedy Element 5 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and NYSDEC notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater and soil vapor to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the NYSDEC;
- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

- procedures for operating and maintaining the remedy;
- compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting,
- maintaining site access controls and NYSDEC notification; and
- providing the NYSDEC access to the site and O&M records.



NOTES:

FIGURE 1:
SITE LOCATION

175-225 3rd Street
Brooklyn, New York

Figure No: 01

PROJECT NO.	17831-01
DESIGNED BY:	AB
DRAWN BY:	AB
CHECKED BY:	DF
DATE:	11/21/2024
SCALE:	N.T.S.

REVISIONS

IMPACT ENVIRONMENTAL CLOSURES, INC.

170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
TEL (631) 269-8800
FAX (631) 269-1599

LEGEND:

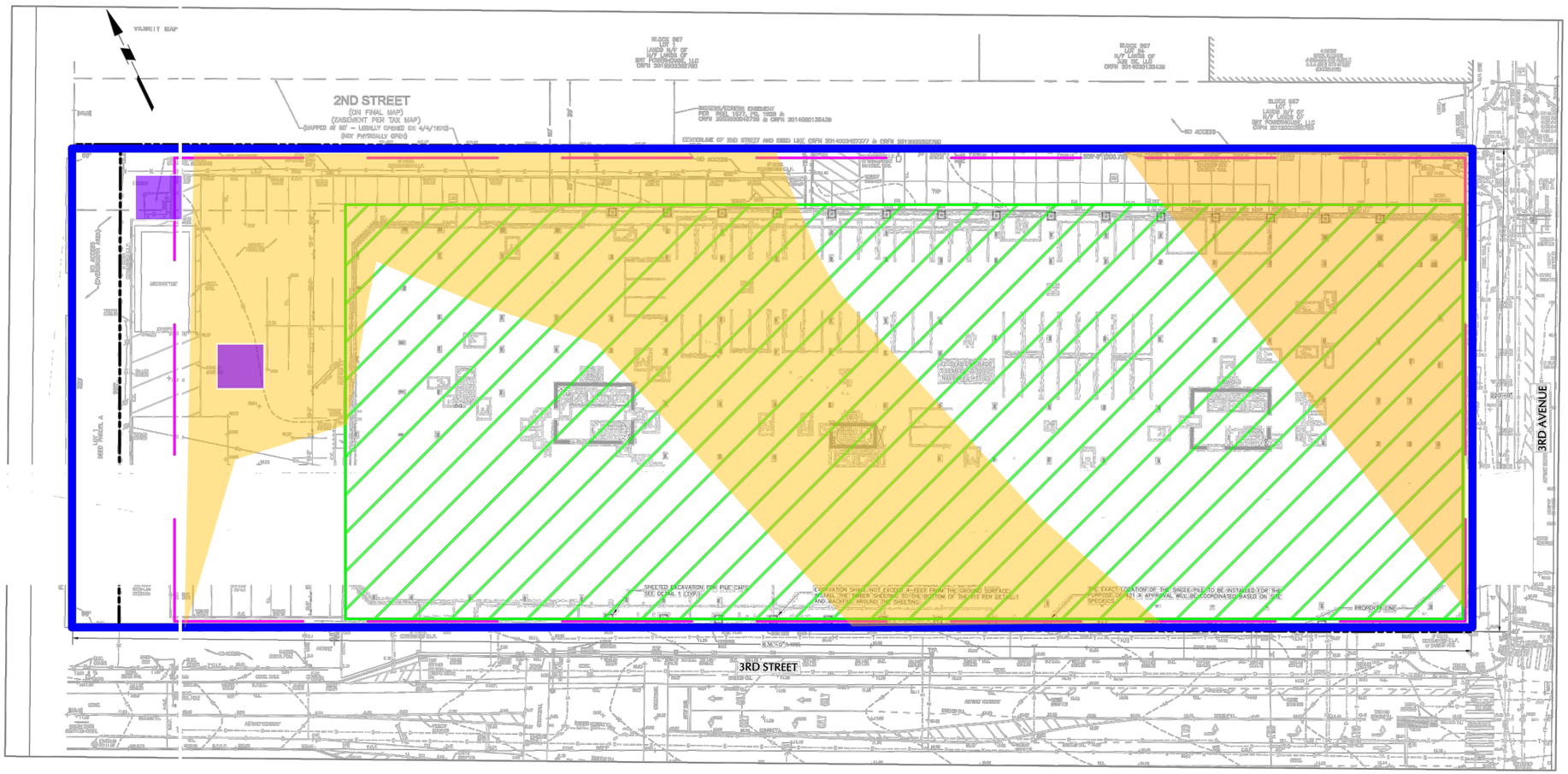
SITE BOUNDARY

APPROXIMATE EXTENT OF REMEDIAL EXCAVATION (SEE NOTE 4)

APPROXIMATE EXTENT OF SOIL VAPOR INTRUSION MITIGATION (SEE NOTE 5)

COAL TAR TREATMENT AREAS TO BE TREATED WITH ISS AND/OR ISGS

PETROLEUM IMPACTED AREA TO BE TREATED WITH ISCO



NOTES:

1. BASE MAP ADAPTED FROM 18 FEBRUARY 2022 DRAFT GENERAL EXCAVATION PLAN, DETAILS AND NOTES BY BJARKE INGELS GROUP.
2. ELEVATIONS ARE IN FEET AND REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. BGS = BELOW GRADE SURFACE
4. SPECIFIC TRACK 4 EXCAVATION AND IN-SITU TREATMENT AREAS WILL BE SUBMITTED TO NYSDEC AND WILL BE SUBJECT TO NYSDEC APPROVAL. TRACK 4 EXCAVATION AREAS WILL TARGET THE FOLLOWING SOIL TYPES:
   - SOIL IN THE UPPER TWO FEET OF MATERIAL THAT EXCEEDS THE RURR SCOS
   - SOIL ABOVE THE GROUNDWATER TABLE THAT EXCEEDS THE PG SCOS, AS DEFINED BY 6NYCRR PART 375-6.8 FOR THOSE CONTAMINANTS FOUND IN SITE GROUNDWATER ABOVE SGVS. SOIL BELOW THE GROUNDWATER TABLE THAT EXCEED THE PG SCOS, AS DEFINED BY 6 NYCRR PART 375-6.8 FOR THOSE CONTAMINANTS FOUND IN SITE GROUNDWATER ABOVE SGVS WILL BE TREATED VIA SHORT-TERM IN-SITU SOIL AND GROUNDWATER TREATMENT TECHNOLOGY IN-SITU CHEMICAL OXIDATION [ISCO] OR ENHANCED BIOREMEDIATION VIA INJECTION AND/OR MIXING DURING EXCAVATION)
   - SOIL THAT EXCEEDS THE 6 NYCRR PART 371 HAZARDOUS CRITERIA FOR LEAD
5. THE SOIL VAPOR INTRUSION MITIGATION SYSTEM DESIGN WILL BE PROVIDED TO NYSDEC AND
6. NYSDOH FOR REVIEW AND APPROVAL.

0' 60' 120'

ALTERNATIVE II - TRACK 4 REMEDY

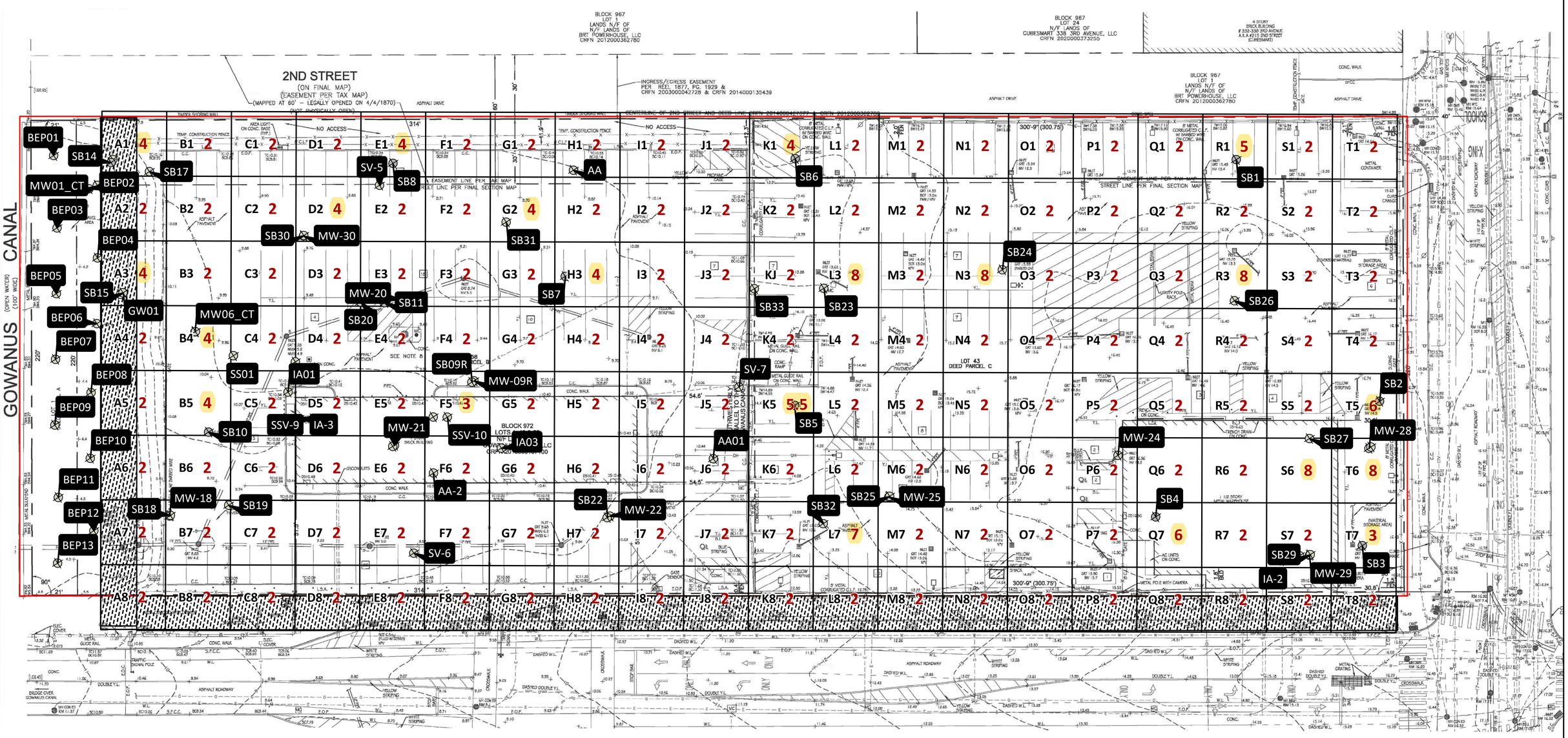
175-225 3rd Street
Brooklyn, New York

PROJECT NO.	17831-01
DESIGNED BY:	AB
DRAWN BY:	AB
CHECKED BY:	DF
DATE:	11/21/2024
SCALE:	1" = 60'

REVISIONS

Figure 2

IMPACT ENVIRONMENTAL ENGINEERING AND GEOLOGY PLLC
170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
TEL (631) 269-8800
FAX (631) 269-1599



IMPACT ENVIRONMENTAL
170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
TEL (631) 269-8800
FAX (631) 269-1599

0 12.5 25 50 75 Feet

NORTH

Prepared By: DF Reviewed By: GMC

Legend

RI Borings — Endpoints Grids — Non-Excavated Area — Property Boundary

* Number Values in RED denote expected excavation depth based on Track 4 Excavation
Number Values highlighted in yellow indicated deeper excavation due to lower interval of PGW SCO Exceedance or Groundwater Table.

DRAFT PROPOSED REMEDIAL EXCAVATION MAP

BCP C224209 - 175 Third Street, Brooklyn, NY

FIGURE 3

Notes:

*Boundary modifications based on field survey
*Minimal aerial imagery shift is attributed to projection changes and image processing.

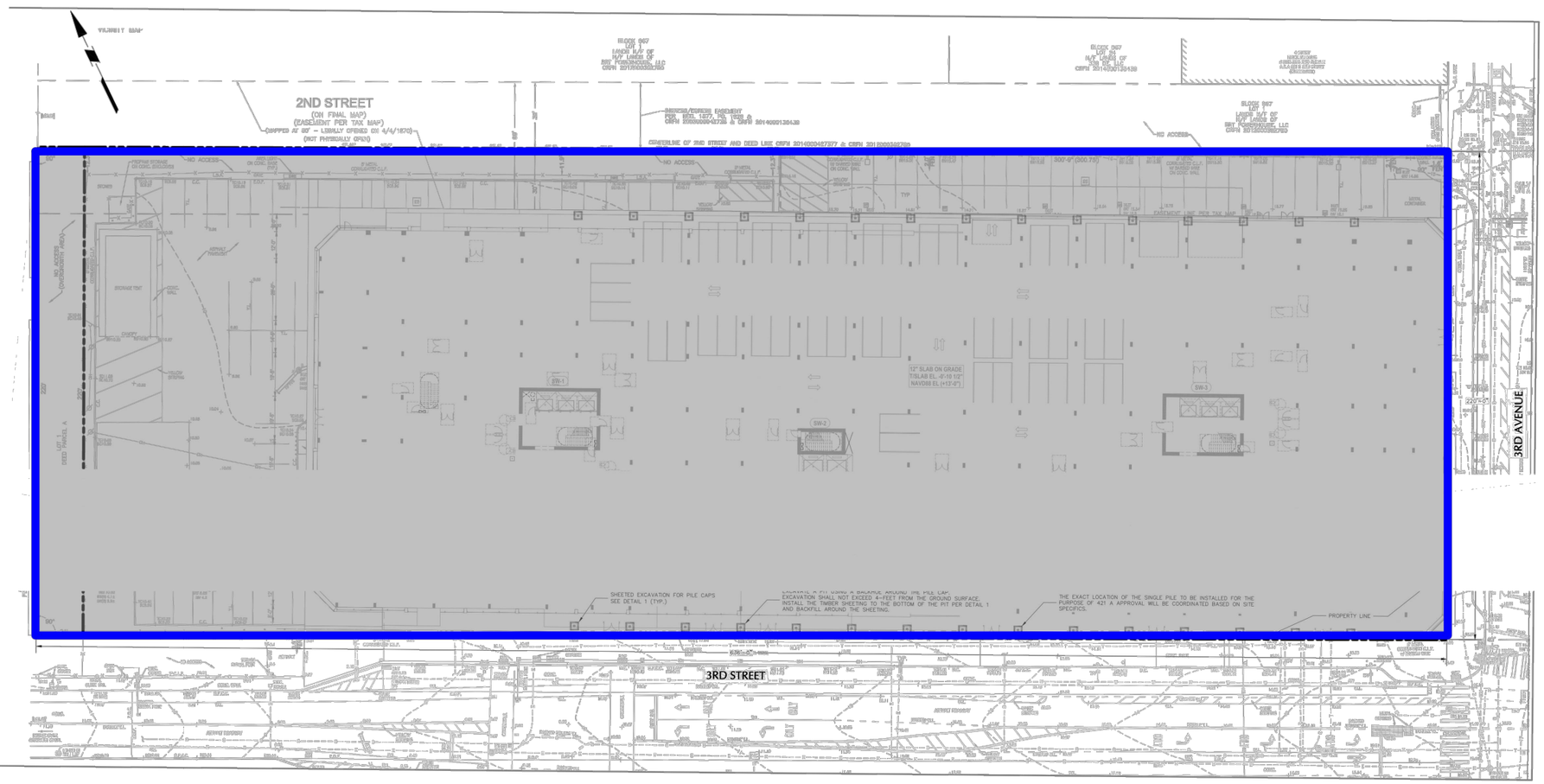
LEGEND:

SITE BOUNDARY

APPROXIMATE EXTENT OF COMPOSITE COVER SYSTEM

NOTES:

1. BASE MAP ADAPTED FROM 18 FEBRUARY 2022 DRAFT GENERAL EXCAVATION PLAN, DETAILS AND NOTES BY BJARKE INGELS GROUP.
2. ELEVATIONS ARE IN FEET AND REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).



0' 60' 120'

FIGURE 4

COMPOSITE COVER PLAN

175-225 3rd Street
Brooklyn, New York

PROJECT NO.	17831-01
DESIGNED BY:	AB
DRAWN BY:	AB
CHECKED BY:	DF
DATE:	11/21/2024
SCALE:	1" = 60'

REVISIONS

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