

DECISION DOCUMENT

1885 Atlantic Avenue Redevelopment
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224347
September 2023



**Department of
Environmental
Conservation**

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

DECLARATION STATEMENT - DECISION DOCUMENT

1885 Atlantic Avenue Redevelopment
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224347
September 2023

Statement of Purpose and Basis

This document presents the remedy for the 1885 Atlantic Avenue Redevelopment 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 (the Department) for the 1885 Atlantic Avenue Redevelopment site and the public's input to the proposed remedy presented by the Department.

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;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and

- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, 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 Department 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

Excavation and off-site disposal of all on-site soils which exceed restricted-residential SCOs, as defined by 6 NYCRR Part 375-6.8, in the upper 4 feet throughout the site and to 7 feet below ground surface (bgs) at a hotspot in the northeastern portion of the site. Approximately 1,400 cubic yards of material will be removed from the site. If found on the site, any underground storage tanks (USTs), fuel dispensers, underground piping or other structures will be excavated and properly disposed off-site.

Collection and analysis of confirmation and documentation samples at the remedial excavation depths will be used to verify that SCOs for the site have been achieved. If confirmation/documentation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify the Department, submit the sample results and, in consultation with the Department, 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

On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used to backfill the excavation or re-grade the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site.

4. Soil Vapor Extraction (SVE)

Soil vapor extraction (SVE) will be implemented in the northeastern portion of the site to remove volatile organic compounds (VOCs) from the subsurface. VOCs will be physically removed from the soil by applying a vacuum to wells that have been installed into the vadose zone (the area below the ground but above the water table). The vacuum draws air through the soil matrix which carries the VOCs from the soil to the SVE well. The air extracted from the SVE wells is then treated as necessary prior to being discharged to the atmosphere. SVE wells will be installed into the vadose zone and screened from 15 feet below the ground surface to a depth of approximately 60 feet (the approximate depth of the water table).

5. In Situ Chemical Oxidation (ISCO)

In-situ chemical oxidation (ISCO) will be implemented to treat VOCs in groundwater. A chemical oxidant will be injected into the subsurface to destroy contaminants in groundwater throughout the site using six temporary injection points. The oxidant will be applied via temporary injection wells screened from 60 to 63 feet below the ground surface. Monitoring will be required within and downgradient of the treatment zone to ensure the remedy is effective.

6. Vapor Mitigation

Any on-site buildings will be required to have a Sub-Slab Depressurization System (SSDS), or other acceptable measures, to mitigate the migration of vapors into the building from the subsurface.

7. 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 Department 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 Department approved Site Management Plan.

8. 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 remedial element 7 above.
 - Engineering Controls: The Soil Vapor Extraction system discussed in remedial element 4 above and Sub Slab Depressurization System (SSDS) discussed in remedial element 6 above.

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/or groundwater use restrictions;
 - provisions for the management and inspection of the identified engineering controls;
 - maintaining site access controls and Department 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 soil, groundwater, and soil vapor, to assess the performance and effectiveness of the remedy; and
 - a schedule of monitoring and frequency of submittals to the Department.
 - c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, 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

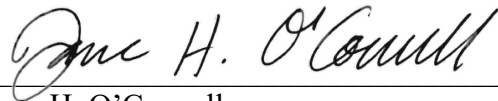
- providing the data for any necessary permit or permit equivalent reporting; and providing the Department access to the site and O&M records.

Declaration

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

September 14, 2023

Date



Jane H. O'Connell
Regional Remedial Engineer, Region 2

DECISION DOCUMENT

1885 Atlantic Avenue Redevelopment
Brooklyn, Kings County
Site No. C224347
September 2023

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), 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.

The Department 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

The Department 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 the Department 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=C224347>

Brooklyn Community Board 3
1360 Fulton Street, 2nd Floor
Brooklyn, NY 11216
Phone: (718) 622-6601

Brooklyn Public Library - Brownsville Branch
61 Glenmore Ave. at Watkins St.
Brooklyn, NY 11212
Phone: (718) 498-9721

Receive Site Citizen Participation Information By Email

Please note that the Department'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

Site Location: The 0.21-acre site is located in the Stuyvesant Heights neighborhood of Brooklyn, NY. The site is located on the north side of Atlantic Avenue between Ralph Avenue and Columbus Place. The site is comprised of a single lot identified as Block 1714 Lot 30 on the New York City Tax Map. The site is bounded by a parking lot to the north, Ralph Avenue followed by mixed-use commercial and residential buildings to the east, Atlantic Avenue and the Long Island Railroad tracks to the south, and a commercial building occupied by McDonald restaurant to the west.

Site Features: The site was occupied by an active retail petroleum station and was improved with two low-rise buildings utilized for storage and as the Speedway kiosk building. Both structures were demolished in 2022 and all known USTs, associated piping, and accessories were removed during Interim Remedial Measure (IRM) activities conducted from June 2022 to August 2022.

Current Zoning and Land Use: The site is located within a residential and manufacturing zoning district (M1-1 and R7D) and special mixed-use MX-10 zoning area with Mandatory Inclusionary Housing (MIH). The surrounding properties are currently used for commercial, residential, and warehousing/manufacturing purposes. The nearest residential building is to the west side of the site, across Ralph Avenue.

Past Land Use: The site was a woodworking shop before 1932, an auto repair shop and a garage from 1932 to the 1950s, a metal product manufacturing facility from the 1950s to the 1960s, and a retail petroleum station and an auto wrecking facility from the 1960s to 2022.

Site Geology and Hydrogeology: The site is underlain by a layer of fill material consisting of light to dark brown, fine to medium sand with varying amounts of silt, clay, and gravel with brick, concrete, slag/ash, glass, ceramic, and asphalt fragments. Fill extends to variable depths between 5 and 15 feet below ground surface (ft bgs). Brown to orange fine to medium sand with varying amounts of silt, gravel, and intermittent clay lenses underly the fill layer and extend to at

least 35 ft bgs. Groundwater was encountered at depths ranging from approximately 60 to 63 ft bgs and flows from northeast to southwest.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department 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, alternatives (or an alternative) that restrict(s) 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) were/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(s) does/do not have an obligation to address off-site contamination. However, the Department 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

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. The Department 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 is/are:

- | | |
|------------------------|-------------------------|
| 1,2,4-trimethylbenzene | tetrachloroethene (PCE) |
| ethylbenzene | benzene |
| toluene | isopropylbenzene |
| xylene (mixed) | 1,3,5-trimethylbenzene |
| benzo(b)fluoranthene | n-propylbenzene |
| indeno(1,2,3-cd)pyrene | sec-butylbenzene |
| lead | naphthalene |

The contaminants of concern exceed the applicable SCGs for:

- soil
- groundwater

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 IRM(s) has/have been completed at this site based on conditions observed during the RI.

Interim Remedial Measure

Site Demolition and UST Removal

During the IRM the following structures associated with the former gas station were removed for off-site disposal:

- Former storage building and gas station kiosk
- Former service station pump island with two dispensers;
- Concrete pads within IRM area;
- Five 4000-gallon gasoline underground storage tanks (USTs);
- One 550-gallon wastewater UST and associated product piping between the former tank field and the pump island; and
- Approximately 200 cubic yards of petroleum impacted soil.

Approximately 210 cubic yards of clean fill ($\frac{3}{4}$ -inch stone) was imported to backfill the excavation area. The IRM is documented in a January 2023 Construction Completion Report which has been approved by the Department.

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

Soil - Soil data for VOCs were compared to Restricted Residential Use Soil Cleanup Objectives (RRSCOs) and Protection of Groundwater Soil Cleanup Objectives (PGSCOs). The following VOCs exceeded both RRSCOs and PGSCOs in site soils: 1,2,4-trimethylbenzene at concentrations up to 300 parts per million, or ppm (RRSCO is 52 ppm, PGSCO is 3.6 ppm), 1,3,5-trimethylbenzene at concentrations up to 110 ppm (RRSCO is 52 ppm, PGSCO is 8.4 ppm), benzene at a concentrations up to 62 ppm (RRSCO is 4.8 ppm, PGSCO is 0.06 ppm), ethylbenzene at a concentrations up to 130 ppm (RRSCO is 41 ppm, PGSCO is 1 ppm), toluene at concentrations up to 370 ppm (RRSCO is 100 ppm, PGSCO is 0.7 ppm), and total xylenes at concentration up to 640 ppm (RRSCO is 100 ppm, PGSCO is 1.6 ppm). Elevated levels of VOCs in site soils extend from the site surface to at least 50 feet bgs.

Two SVOCs and one metal exceeded RRSCOs in site soil samples collected from 0 to 0.5 ft bgs: benzo(b)fluoranthene at a concentration of 1.24 ppm (RRSCO is 1 ppm), indeno(1,2,3-cd)pyrene at a concentration of 0.68 ppm (RRSCO is 0.5 ppm), and lead at a concentration of 480 ppm (RRSCO is 400 ppm).

PCBs, pesticides and 1,4-dioxane were not detected in site soils above RRSCOs and per- and polyfluoroalkyl substances (PFAS) were not detected in site soils above restricted-residential guidance values.

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

Groundwater - The chlorinated VOC tetrachloroethylene (PCE) was detected in one monitoring well at a concentration of 18 parts per billion (ppb), exceeding the ambient water quality standards and guidance values (AWQS) for PCE of 5 ppb. Petroleum related VOCs were also detected in groundwater including 1,2,4-trimethylbenzene at maximum concentration 41.4 ppb (AWQS is 5 ppb), benzene at maximum concentration 569 ppb (AWQS is 1 ppb), toluene at maximum concentration 20.5 ppb (AWQS is 5 ppb), and total xylenes at maximum concentration 98.1 ppb (AWQS is 5 ppb). Additionally, several VOCs were detected above the AWQS in only one well including 1,3,5-trimethylbenzene at 16 ppb, sec-butylbenzene at 16.8 ppb, ethylbenzene at 32 ppb, isopropylbenzene at 5.6 ppb and n-propylbenzene at 9.5 ppb.

Two SVOCs were detected in groundwater samples collected from the site at concentrations exceeding AWQS including bis(2-ethylhexyl)phthalate at 6.1 ppb (AWQS is 5 ppb) and diethyl phthalate at 448 ppb (AWQS is 50 ppb). SVOCs exceeding AWQS in groundwater are likely the result of entrained sediments in groundwater samples. The metal manganese was detected in groundwater samples collected from the site at concentrations up to 1,640 ppb (AWQS is 300 ppb). Manganese is a naturally occurring element and is not considered to be a site-specific contaminant.

No PCBs were detected in groundwater samples above AWQS. 1,4-dioxane was not detected in groundwater samples collected from the site.

Perfluorooctanesulfonic Acid (PFOS) was detected in one well at 90 parts per trillion, or ppt, exceeding the AWQS of 2.7 ppt. Perfluorooctanoic Acid (PFOA) was detected at concentrations exceeding the AWQS of 6.7 ppt in three wells at maximum concentration of 330 ppt. No source of PFOA and PFOS was encountered in site soils.

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

Soil Vapor - Several petroleum-related VOCs were detected at elevated concentrations in soil vapor samples including benzene (maximum concentration 1,190,000 micrograms per cubic meter, or ug/m³) and toluene (maximum concentration of 240,000 ug/m³). Total benzene, toluene, ethylbenzene, and total xylene (BTEX) concentrations ranged from non-detect to a maximum of 1,430,000 ug/m³.

Several other VOCs were also detected in multiple soil vapor samples including 1,3-butadiene (maximum concentration 2,460 ug/m³), 2,2,4-trimethylpentane (maximum concentration 4,260,000 ug/m³), 2-butanone (maximum concentration 1,100 ug/m³), cyclohexane (maximum concentration 606,000 ug/m³), heptane (maximum concentration 672,000 ug/m³), and n-hexane (maximum concentration 7,190,000 ug/m³).

Total VOC concentrations in soil vapor ranged from 1,348.13 ug/m³ to 10,846,000 ug/m³. Elevated levels of petroleum related VOCs in soil vapor were detected at depths of up to 45 below grade.

Data does not indicate any off-site impacts in 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*.

People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. The site is currently vacant and fenced, therefore people are not expected to come into contact with any site related soil 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. The inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern as the site is vacant. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development. Furthermore, environmental sampling indicates soil vapor intrusion 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

- 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 2: Restricted use with generic soil cleanup objectives remedy.

The selected remedy is referred to as the Excavation, Soil and Groundwater Source Remediation, and Sub-Slab Depressurization System (SSDS) remedy.

The elements of the selected remedy, as shown in Figure 2 through 5 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;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, 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 Department 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

Excavation and off-site disposal of all on-site soils which exceed restricted-residential SCOs, as defined by 6 NYCRR Part 375-6.8, in the upper 4 feet throughout the site and to 7 feet below ground surface (bgs) at a hotspot in the northeastern portion of the site. Approximately 1,400 cubic yards of material will be removed from the site. If found on the site, any underground storage tanks (USTs), fuel dispensers, underground piping or other structures will be excavated and properly disposed off-site.

Collection and analysis of confirmation and documentation samples at the remedial excavation depths will be used to verify that SCOs for the site have been achieved. If confirmation/documentation sampling indicates that SCOs were not achieved at the stated

remedial depth, the Applicant must notify the Department, submit the sample results and, in consultation with the Department, 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

On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used to backfill the excavation or re-grade the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site.

4. Soil Vapor Extraction (SVE)

Soil vapor extraction (SVE) will be implemented in the northeastern portion of the site to remove volatile organic compounds (VOCs) from the subsurface. VOCs will be physically removed from the soil by applying a vacuum to wells that have been installed into the vadose zone (the area below the ground but above the water table). The vacuum draws air through the soil matrix which carries the VOCs from the soil to the SVE well. The air extracted from the SVE wells is then treated as necessary prior to being discharged to the atmosphere. SVE wells will be installed into the vadose zone and screened from 15 feet below the ground surface to a depth of approximately 60 feet (the approximate depth of the water table).

5. In Situ Chemical Oxidation (ISCO)

In-situ chemical oxidation (ISCO) will be implemented to treat VOCs in groundwater. A chemical oxidant will be injected into the subsurface to destroy contaminants in groundwater throughout the site using six temporary injection points. The oxidant will be applied via temporary injection wells screened from 60 to 63 feet below the ground surface. Monitoring will be required within and downgradient of the treatment zone to ensure the remedy is effective.

6. Vapor Mitigation

Any on-site buildings will be required to have a Sub-Slab Depressurization System (SSDS), or other acceptable measures, to mitigate the migration of vapors into the building from the subsurface.

7. 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 Department 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 Department approved Site Management Plan.

8. 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 remedial element 7 above.
 - Engineering Controls: The Soil Vapor Extraction system discussed in remedial element 4 above and Sub Slab Depressurization System (SSDS) discussed in remedial element 6 above.

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/or groundwater use restrictions;
 - provisions for the management and inspection of the identified engineering controls;
 - maintaining site access controls and Department 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 soil, groundwater, and soil vapor, to assess the performance and effectiveness of the remedy; and
 - a schedule of monitoring and frequency of submittals to the Department.
 - c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance,



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; and
- providing the Department access to the site and O&M records.

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LEGEND

-  COMMUTER RAIL LINE BLOCK 1714
-  SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: KINGS COUNTY
3. AERIAL IMAGERY SOURCE: NEARMAP, 12 AUGUST 2021



**HALEY
ALDRICH**

1885 ATLANTIC AVENUE REDEVELOPMENT SITE
1885 ATLANTIC AVENUE
BROOKLYN, NY

Site Location Map

SEPTEMBER 2022

FIGURE 1

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LEGEND

- EXCAVATION TO 4 FEET BGS
- EXCAVATION TO 7 FEET BGS
- PARCEL BOUNDARY
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BGS = BELOW GRADE SURFACE
3. ASSESSOR PARCEL DATA SOURCE: NYC DEPARTMENT OF CITY PLANNING
4. AERIAL IMAGERY SOURCE: NEARMAP, 19 JULY 2022



1885 ATLANTIC AVENUE REDEVELOPMENT SITE
1885 ATLANTIC AVENUE
BROOKLYN, NY

ALTERNATIVE II EXCAVATION PLAN

AUGUST 2023

FIGURE 2

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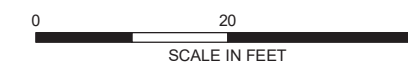


LEGEND

- EXCAVATION TO 4 FEET BGS
- EXCAVATION TO 7 FEET BGS
- PARCEL BOUNDARY
- SITE BOUNDARY
- SVE LOCATION SCREENED FROM 20-30 FT BGS AND 40-50 FT BGS (2 CO-LOCATED VAPOR EXTRACTION WELLS)
- SVE LOCATION SCREENED FROM 30-40 FT BGS AND 50-60 FT BGS (2 CO-LOCATED VAPOR EXTRACTION WELLS)
- SVE MONITORING LOCATION (4 CO-LOCATED MONITORING POINTS)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BGS = BELOW GRADE SURFACE
3. ASSESSOR PARCEL DATA SOURCE: NYC DEPARTMENT OF CITY PLANNING
4. AERIAL IMAGERY SOURCE: NEARMAP, 19 JULY 2022



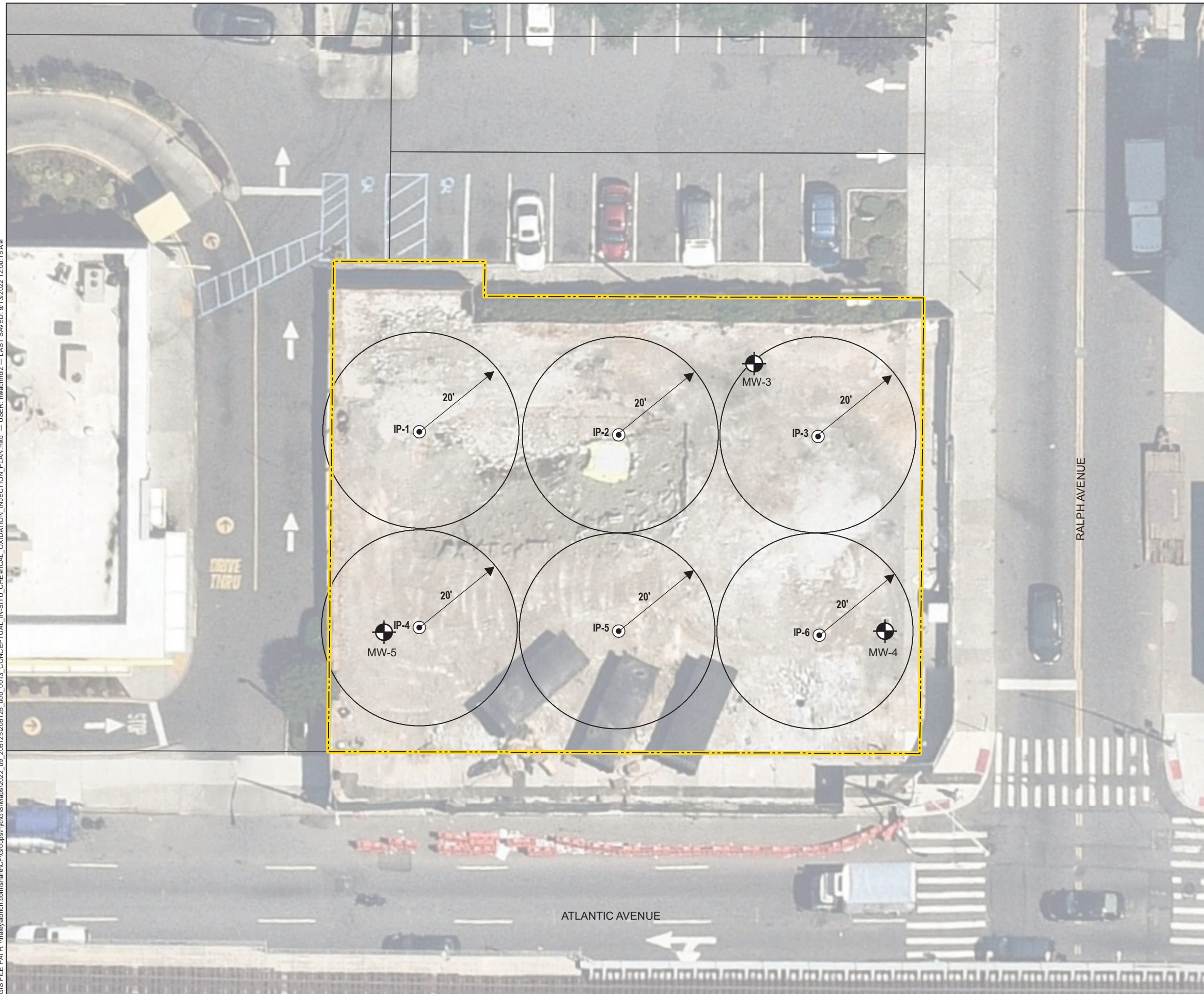
HALEY ALDRICH 1885 ATLANTIC AVENUE REDEVELOPMENT SITE
1885 ATLANTIC AVENUE
BROOKLYN, NY

ALTERNATIVE II SOIL VAPOR EXTRACTION SYSTEM PLAN






AUGUST 2023

FIGURE 3

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LEGEND

-  ISCO INJECTION POINT
-  RADIUS OF INFLUENCE
-  PARCEL BOUNDARY
-  SITE BOUNDARY
-  GROUNDWATER MONITORING WELL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: NYC DEPARTMENT OF CITY PLANNING
3. AERIAL IMAGERY SOURCE: NEARMAP, 19 JULY 2022



HALEY ALDRICH 1885 ATLANTIC AVENUE REDEVELOPMENT SITE
1885 ATLANTIC AVENUE
BROOKLYN, NY

**CONCEPTUAL IN-SITU CHEMICAL
OXIDATION INJECTION PLAN**

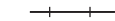




AUGUST 2023

FIGURE 4

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LEGEND

-  COMMUTER RAIL LINE BLOCK 1714
-  SITE BOUNDARY
-  SUB-SLAB HORIZONTAL PIPING NETWORK
-  RISER EXTENDING FROM SUB-SLAB TO THE BUILDING ROOF
-  SUB-SLAB VAPOR MONITORING POINT

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: KINGS COUNTY
3. AERIAL IMAGERY SOURCE: NEARMAP, 12 AUGUST 2021
4. SOURCE MAP: MECHANICAL CELLAR FLOOR PLAN BY J FRANKL C MALLEA ASSOCIATES DATED 3/3/2022



1885 ATLANTIC AVENUE REDEVELOPMENT SITE
1885 ATLANTIC AVENUE
BROOKLYN, NY

CONCEPTUAL ACTIVE SSDS LAYOUT PLAN

AUGUST 2023

FIGURE 5