

DECISION DOCUMENT

CE - E. 11th Street MGP - OU-3
Brownfield Cleanup Program
New York, New York County
Site No. C231105
March 2026



**Department of
Environmental
Conservation**

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 CE - E. 11th Street MGP - OU-3 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 CE - E. 11th Street MGP - OU-3 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;
- 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 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. 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. Excavation of site soils will be performed to a depth of 5 feet below grade in the southern-central portion of the site to facilitate the in-situ solidification (ISS) treatment described in Remedy Element 4.

Approximately 7,060 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, 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.

Backfill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site.

3. 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 its 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.

4. In-Situ Solidification

In-situ solidification (ISS) will be implemented in the southern-central portion of the site to remediate coal tar. The treatment zone will extend from the top of the groundwater table (approximately 5 feet below grade) to approximately 25 feet below grade. 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 1.0×10^{-6} cm/sec or less and would also result in an unconfined compressive strength of 50 psi or higher. The solidified mass will then be covered with a cover system as described in element 3 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.

5. Containment Wall

Installation of approximately 75 linear feet of sealed containment wall to a maximum depth of 30 feet to contain any remaining coal tar contamination and to further ensure against recontamination from off-site sources. The wall will be in two sections, one in the southwestern corner of the site and the other in the southeastern corner and along the southern portion of the eastern edge of the site. The wall will be constructed downgradient of the known contamination sources and will be made of either sealed steel sheeting, overlapping grout columns, or other material as deemed acceptable by NYSDEC.

6. Engineering and Institutional Controls

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.

7. 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 6

above.

- Engineering Controls: The Cover System discussed in Remedy Element 3, the ISS mass discussed in Remedy Element 4, the containment walls discussed in Remedy Element 5, and any sub-slab depressurization system/vapor mitigation system if needed on-site.

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 use restrictions;
 - a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
 - 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 3 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.

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.

March 13, 2026

Date



Scott Deyette, Director
Remedial Bureau B

DECISION DOCUMENT

CE - E. 11th Street MGP - OU-3
New York, New York County
Site No. C231105
February 2026

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=C231105>

New York Public Library - Tompkins Square Branch
331 East 10th Street
New York, NY 10009
Phone: 212-228-4747

Manhattan Community Board 3

59 E 4th St
New York, NY 10003
Phone: 212-533-5300

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 1.4-acre site is located in an urban area on the lower east side of the Borough of Manhattan in New York City. The site is bounded by East 13th Street to the north, East 12th Street to the south, Avenue D to the East, and a residential property to the west (3 Haven Plaza).

Site Features:

The main features of the site include the following: a two-story building which formerly housed the Church of St. Emeric; a two-story building which formerly housed the Escuela Hispana Montessori Head Start School (formerly Saint Emeric's School); a vacant Quonset-hut style storage building and the church/school parking lot and sidewalks.

Current Zoning and Land Use:

New York City Planning Commission designates the properties as R7-2: Moderate to High-Density Residential District, which includes land uses designated as multilevel elevator residential buildings, transportation and utility use, and public facilities and institutions. The site is currently vacant.

Past Uses of the Site:

The East 11th Street Works began operations sometime between 1859 and 1868 and was shut down in approximately 1933. During its operational period, the manufactured gas plant (MGP) consisted of 17 gas holders ranging in capacity from approximately 50,000 cubic feet (cu ft.) to 5,000,000 cu ft. Several of the gas holders were converted from gas storage to liquid storage of naphtha, tar or gas oil. The original gas holders built in the late 1800s were most likely constructed with below grade bottoms. Many of these were replaced by large gas holders built on grade, with storage capacities greater than 1,000,000 cu ft. of gas. Other production and storage facilities that were present at the former MGP included retorts, fuel/gas oil tanks, tar separators, purifying houses, condensers and scrubbers.

Site Geology and Hydrogeology

Overburden materials at the site comprise three primary stratigraphic units: a Fill Unit, a Sand-Silt

Unit, and a Silty-Clay Unit. The Fill Unit is the uppermost unit encountered and is the present-day surface of the site. The Fill Unit consists of typical urban debris, including reworked gravel, sand and clay, as well as various types of anthropogenic material such as, but not limited to, concrete, brick, ash, cinder and glass. The Fill Unit is underlain by the Sand-Silt Unit, which is underlain by the Silty-Clay Unit. Beneath the overburden lies gneiss bedrock, which is located at least 90 feet below ground surface (ft bgs). The Fill Unit and the Sand-Silt Unit form a shallow unconfined aquifer (or water table aquifer) and the Silty-Clay Unit appears to be semi-confining to groundwater. Shallow groundwater, found at approximately 10 ft bgs, flows generally eastward toward the East River.

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, alternatives that restrict 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 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 Applicants under the Brownfield Cleanup Agreement are Volunteers. The Applicants do not have an obligation to address off-site contamination. However, NYSDEC, in consultation with NYSDOH, has determined that this site poses a significant threat to public health or the environment; accordingly, enforcement actions are necessary.

NYSDEC will seek to identify any parties (other than the Volunteer) known or suspected to be responsible for contamination at or emanating from the site, referred to as Potentially Responsible Parties (PRPs). NYSDEC will bring an enforcement action against the PRPs. If an enforcement action cannot be brought or does not result in the initiation of a remedial program by any PRPs, NYSDEC will evaluate the off-site contamination for action under the State Superfund. The PRPs are subject to legal actions by the State for recovery of all response costs the State incurs or has incurred.

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:

- air
- 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 contaminants of concern identified at this site is/are:

benzo(a)pyrene

benzene

benzo(a)anthracene
ethylbenzene
benzo(b)fluoranthene
mercury
coal tar

toluene
xylene (mixed)
lead
indeno(1,2,3-cd)pyrene

The contaminants of concern exceed the applicable SCGs for:

- groundwater
- soil

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.

There were no IRMs performed at this site during the RI.

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.

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), cyanide and pesticides. Groundwater was also tested for per- and polyfluoroalkyl substances (PFAS), 1,4 dioxane. Indoor air and soil vapor samples were collected and analyzed for VOCs. Based upon investigations conducted to date, the primary contaminants of concern for the site are coal tar, petroleum VOCs, SVOCs, and lead.

Soil: Sample results were compared against the restricted residential SCOs (RRSCO), and to the protection of groundwater SCOs (PGSCO) for those contaminants found in groundwater above applicable standards. Petroleum-related VOCs were detected across the site including maximum concentrations of benzene at 9.1 parts per million (ppm) compared to the PGSCO of 0.06 ppm, ethylbenzene at 14 ppm (PGSCO 1 ppm), toluene at 6.4 ppm (PGSCO 0.7 ppm), and xylene at 34 ppm (PGSCO 1.2 ppm). SVOCs were detected across the site including maximum concentrations of benzo(a)anthracene at 12 ppm (RRSCO 1.4 ppm), benzo(a)pyrene at 10.5 ppm (RRSCO 1 ppm), benzo(b)fluoranthene at 6.4 ppm (RRSCO 1.4 ppm), and indeno(1,2,3-cd)pyrene at 5.11 ppm (RRSCO 1.4 ppm). Metals were detected in 61 subsurface soil samples at concentrations exceeding the RRSCOs, this includes maximum concentrations of lead at 972 ppm (RRSCO 400 ppm) and mercury at 2.91 ppm (RRSCO 0.30 ppm). There were no detections of pesticides, or PCBs above RRSCOs. Coal tar was found in the soil in discrete locations on the southern edge of the site from 10 ft bgs to 25 ft bgs.

Data indicates that there are off-site impacts in soil related to the site.

Groundwater: VOCs were found in groundwater at the site exceeding the NYS Ambient Water Quality Standards and Guidance Values (AWQSGVs) including maximum concentrations of benzene at 1,600 parts per billion (ppb) (AWQSGV 1 ppb), ethylbenzene at 120 ppb (AWQSGV 5 ppb), toluene at 29.9 ppb (AWQSGV 5 ppb), and xylene at 116 ppb (AWQSGV 5 ppb). SVOCs were detected groundwater exceeding the AWQSGV including maximum concentrations of benzo(a)pyrene at 1.37 ppb (AWQSGV 0.002 ppb) and benzo(b)fluoranthene at 0.653 ppb (AWQSGV 0.002 ppb). Metals were detected above the AWQS in each of the ten groundwater samples collected at the site, however they were naturally occurring metals expected to be found in the groundwater in this area, including iron and sodium, and are not site-specific contaminants of concern. PFAS were compared to the screening levels found in the June 2021 Guidance for Sampling and Analysis of PFAS. Perfluorooctanoic acid (PFOA) was detected in one of the three groundwater samples exceeding the AWQSGV of 6.7 parts per trillion (ppt) at a maximum concentration of 15.2 ppt. Perfluorooctanesulfonic acid (PFOS) was detected in all three groundwater samples at concentrations exceeding the AWQSGV of 2.7 ppt at a maximum concentration of 25.4 ppt. The levels are consistent across the site and are not considered site-specific contaminants of concern. Neither pesticides nor PCBs were detected in any of the groundwater samples collected at the Site.

Data indicates that there are off-site impacts in groundwater related to the site.

Soil Vapor, Sub-Slab Soil Vapor, and Indoor Air: VOCs were detected in soil vapor samples including maximum concentrations of 1,1,1-trichloroethane at 14 micrograms per cubic meter (ug/m³), tetrachloroethene at 9.7 ug/m³, benzene at 23 ug/m³, ethylbenzene at 11 ug/m³, xylene at 25 ug/m³, toluene at 18 ug/m³, and naphthalene at 48 ug/m³. VOCs were detected in sub-slab samples including maximum concentrations of 1,1,1-trichloroethane at 1.4 micrograms per cubic meter (ug/m³), tetrachloroethene at 6.9 ug/m³, benzene at 140 ug/m³, ethylbenzene at 65 ug/m³, xylene at 92 ug/m³, toluene at 150 ug/m³, and naphthalene at 110 ug/m³. Indoor air had maximum concentrations of chloroform at 6.5 ug/m³, 1,1,1-trichloroethane at 5.2 ug/m³, tetrachloroethene at 6.6 ug/m³, trichloroethene at 1.1 ug/m³, and vinyl chloride at 0.77 ug/m³. Sub-slab/soil vapor and indoor air sampling results were evaluated in reference to NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion (October 2006, with updates).

Data indicates that there are 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*.

Since the site is vacant, fenced and covered by asphalt, concrete, or building foundations, 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 spaced 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 the site is vacant, the inhalation of site-related contaminants 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. Environmental sampling indicated soil vapor intrusion from site-related contamination is also a potential concern for off-site structures.

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 4: Restricted Residential use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the ISS and Barrier Wall 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 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. 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. Excavation of site soils will be performed to a depth of 5 feet below grade in the southern-central portion of the site to facilitate the in-situ solidification (ISS) treatment described in Remedy Element 4.

Approximately 7,060 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.

Backfill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site.

3. 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 its 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.

4. In-Situ Solidification

In-situ solidification (ISS) will be implemented in the southern-central portion of the site to remediate coal tar. The treatment zone will extend from the top of the groundwater table (approximately 5 feet below grade) to approximately 25 feet below grade. 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 1.0×10^{-6} cm/sec or less and would also result in an unconfined compressive strength of 50 psi or higher. The solidified mass will then be covered with a cover system as described in element 3 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.

5. Containment Wall

Installation of approximately 75 linear feet of sealed containment wall to a maximum depth of 30 feet to contain any remaining coal tar contamination and to further ensure against recontamination from off-site sources. The wall will be in two sections, one in the southwestern corner of the site and the other in the southeastern corner and along the southern portion of the eastern edge of the

site. The wall will be constructed downgradient of the known contamination sources and will be made of either sealed steel sheeting, overlapping grout columns, or other material as deemed acceptable by NYSDEC.

6. Engineering and Institutional Controls

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.

7. 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 6 above.
 - Engineering Controls: The Cover System discussed in Remedy Element 3, the ISS mass discussed in Remedy Element 4, the containment walls discussed in Remedy Element 5, and any sub-slab depressurization system/vapor mitigation system if needed on-site.

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 use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- 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 3 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.

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LEGEND

-  SITE BOUNDARY
-  PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: NEW YORK CITY
3. AERIAL IMAGERY SOURCE: NEARMAP, 5 SEPTEMBER 2023



HALEY ALDRICH 181 AVENUE D
NEW YORK, NEW YORK

SITE PLAN

JANUARY 2025

FIGURE 1

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LEGEND

-  SITE BOUNDARY
-  PARCEL BOUNDARY
-  APPROXIMATE LOCATION OF PHYSICAL BARRIER WALL
-  APPROXIMATE LOCATION OF STEAM EASEMENT
-  5 FT BGS EXCAVATION/IN SITU STABILIZATION AREA (5-25 FT BGS)
-  2 FT BGS EXCAVATION
-  CONCEPTUAL SUB-SLAB HORIZONTAL PIPING NETWORK (PASSIVE)
-  RISER EXTENDING FROM SUB-SLAB TO BUILDING ROOF
-  POTENTIAL SUB-SLAB VAPOR MONITORING POINT

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: NEW YORK CITY
3. AERIAL IMAGERY SOURCE: NEARMAP, 5 SEPTEMBER 2023
4. LOCATIONS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON LOCATION OF STEAM EASEMENT



HALEY ALDRICH 181 AVENUE D
NEW YORK, NEW YORK

**ALTERNATIVE I - PREFERRED
REMEDY COMPONENTS PLAN**

MARCH 2025

FIGURE 2