DECISION DOCUMENT

12074 Flatlands Avenue p/o Lot 1
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224353
May 2024

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 12074 Flatlands Avenue p/o Lot 1 site, a 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 12074 Flatlands Avenue p/o Lot 1 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

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

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);

- 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

- Excavation and removal of any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination.

Excavation and off-site disposal of all on-site soils which exceed unrestricted SCOs as defined by 6 NYCRR Part 375-6.8. If a Track 1 cleanup is achieved, a Cover System will not be a required element of the remedy.

Approximately 64,000 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.

3. Backfill

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. Groundwater Extraction & Treatment

Groundwater extraction and treatment as needed will be implemented to treat VOCs and SVOCs in groundwater and to facilitate remedial excavation below the water table. The groundwater extraction system will be designed and installed so that the capture zone is sufficient to dewater the site to allow removal of all soil contaminants above UUSCOs and address VOCs in on-site groundwater. The extraction system will create a depression of the water table so that contaminated groundwater is directed toward the extraction points within the plume area. The extracted groundwater will be treated if needed using granular activated carbon and discharged to the New York City sewer system.

Monitoring will be required downgradient of the treatment zone. Pre- and post-dewatering monitoring will be conducted for VOCs at two monitoring wells downgradient of the treatment zone.

If the remedial action objectives (RAOs) for groundwater are not achieved, an in-situ remedy, such as using activated carbon, oxygen release compound (ORC), or other in-situ technology, will be implemented at the site to achieve the groundwater RAOs.

5. Vapor Intrusion Evaluation

As part of the Track 1 remedy, a soil vapor intrusion evaluation will be completed. The evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

6. Local Institutional Controls

If no Environmental Easement (EE) or Site Management Plan (SMP) is needed to achieve soil, groundwater, or soil vapor RAOs, then the following local use restriction will be relied upon to

prevent ingestion of groundwater: Article 141 of the NYCDOHMH code which prohibits potable use of groundwater without prior approval.

Contingent Track 1

The intent of the remedy is to achieve Track 1 unrestricted use; therefore, no environmental easement or site management plan is anticipated.

If the soil vapor intrusion (SVI) evaluation is not completed prior to completion of the Final Engineering Report, then a Site Management Plan (SMP) and Environmental Easement (EE) will be required to address the SVI evaluation and implement actions as needed. If a mitigation or monitoring action is needed, a Track 1 cleanup can only be achieved if the mitigation system or other required action is no longer needed within 5 years of the date of the Certificate of Completion.

In the event that Track 1 unrestricted use is not achieved, the following contingent remedial elements will be required, and the remedy will achieve a Track 2 restricted residential cleanup. Elements of the Track 2 restricted residential cleanup will include establishment of an SMP and recording of an EE.

Engineering and Institutional Controls

Imposition of an institutional control in the form of an EE and a SMP, as described below, will be required. The remedy will achieve a Track 2 restricted residential cleanup at a minimum.

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 NYSDEC 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 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 NYCDOHMH;
- require compliance with the NYSDEC 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 Paragraph 7 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 groundwater uses 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;
- 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 groundwater to assess the performance and effectiveness of the remedy;
- A schedule of monitoring and frequency of submittals to the Department; and
- 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.

May 2, 2024
Date

R. Scott Deyette
Scott Deyette, Director
Remedial Bureau B

DECISION DOCUMENT

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Brooklyn, Kings County
Site No. C224353
May 2024

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=C224353

Brooklyn Public Library Spring Creek Branch
12143 Flatlands Avenue
Brooklyn, NY 11207
Phone: (718) 257-6571

Brooklyn Community Board 5
127 Pennsylvania Avenue, 2nd Floor
Brooklyn, NY 11207
Phone: (718) 819-5487

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

Site Location: The 2.084-acre site is located at 12074 Flatlands Avenue, Brooklyn, Kings County, NY 11207 and is identified as Block 4434, portion of Lot 1. The site is in a mixed-use commercial and residential neighborhood. To the north of the site is Flatlands Avenue followed by an automobile dismantling company and used automobile parts business, medical offices, and the Oasis Hotel. A recycled concrete aggregate covered lot and twelve-story multi-family residential apartment building are located east of the site on Block 4434 Lot 10. A twelve-story multi-family residential apartment building is located south of the building. The Brooklyn campus of the Christian Cultural Center (CCC) Church facility and associated asphalt-paved parking lot are located west of the site.

Site Features: The site is currently developed as a dirt parking lot, which is only used for excess parking for the CCC. The site is not located in a flood zone.

Current Zoning and Land Use: The site is located in an R5 residential district but is undergoing a Uniform Land Use Review Procedure rezoning process. The zoning designation allows for residential use of the site. The subject property is currently developed as a parking lot. The surrounding properties include residential buildings, an automobile dismantling company, a used auto parts business, medical offices, and a hotel. The closest rail line is a subway line, which is located approximately 0.53 miles from the site.

Past Use of the Site: The site originally consisted of wetlands. In the early 1900s, the site was filled in with ash and waste from a municipal solid waste incinerator. In 1908, what is now known as Flatlands Avenue was identified as Fairfield Avenue. The site was mostly vacant. A one-story shed and one-story wagon house were located within the central portion of the site. Maps from 1928 depict the two one-story structures from earlier maps as vacant sheds. In 1950, the two structures were no longer present. An adjacent lot was used as an automobile parts facility. In 1967, the northern portion of the site was used as an automobile junkyard. The northeastern portion of the site contained a one-story office building. Maps from 1969 through 1983 depict a similar configuration to the 1967 maps. The one-story building was no longer present in maps from 1986.

Between 1987 and 2001, the site was depicted in a similar configuration to 1986 maps. In maps from 2002 and 2007, the northern portion of the property was no longer used as an automobile junkyard.

Site Geology and Hydrogeology: The site slopes from south to north with elevations ranging from 12.5 to 24.45 North American Vertical Datum of 1988 (NAVD88). The subsurface stratigraphy at the Site consists of historic fill, generally consisting of brown, gray, or black fine to coarse sand with varying proportions of fine to coarse gravel, silt, clay, ash, and miscellaneous debris including brick, concrete, asphalt, wood, slag, and glass, to depths ranging from approximately 8.5 to at least 26 feet below grade. The fill is underlain by a native brown to dark brown or dark grey sand unit with varying proportions of gravel, silt and clay that extended to the termination depths of all borings, which ranged from 20 to 77 feet below grade. Groundwater is between elevation 2.01 to elevation 3.5 feet NAVD88 (between 10.48 and 19.73 feet below ground surface). Based on area topography, observed water level measurements, and the proximity of the site to Fresh Creek, groundwater flow is to the south toward Fresh Creek and Jamaica Bay which is located approximately 0.22 miles from the site within the Fresh Creek Nature Preserve.

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 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

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 is/are:

benzo(a)anthracene
benzo(a)pyrene
benzo(b)fluoranthene
benzo(k)fluoranthene
chrysene
lead
copper
barium
arsenic
naphthalene
1,4-dioxane
tetrachloroethene (PCE)

vinyl chloride	cis-1,2-dichloroethene
1,2,4-trimethylbenzene	1,2-dichlorobenzene
benzene	toluene
total xylene	naphthalene
indeno(1,2,3-cd)pyrene	dibenz(a,h)anthracene
polychlorinated biphenyls	perfluorooctanesulfonic acid (PFOS)

The contaminant(s) 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.

Nature and Extent of Contamination:

A site-wide investigation was conducted to delineate contamination in soil, groundwater, and soil vapor. Soil and groundwater samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), pesticides, the emerging contaminants per-and polyfluoroalkyl substances (PFAS), and 1,4 dioxane. Soil vapor was analyzed for VOCs. Based on investigations conducted to date, the primary contaminants of concern at the site are VOCs, SVOCs, PCBs and metals in soil; VOCs, SVOCs and metals in groundwater; and VOCs in soil vapor. Results are summarized below.

Soil:

Soil data were compared to Unrestricted Use Soil Cleanup Objectives (UUSCO) and the Protection of Groundwater Soil Cleanup Objectives (PGWSCO), as applicable.VOCs detected in the subsurface exceeding their respective UUSCOs and PGWSCOs include 1,2,4-trimethylbenzene up to 18 parts per million (ppm) (UUSCOs is 3.6 ppm), 1,2-dichlorobenzene up to 2.1 ppm (UUSCO is 1.1 ppm), benzene up to 1 ppm (UUSCO is 0.06), toluene up to 1.4 ppm (UUSCOS is 0.7 ppm), total xylene up to 7.1 ppm (UUSCO is 0.26 ppm) and naphthalene up to 130 ppm

(PGWSCO is 12 ppm). SVOCs detected in the subsurface exceeding their respective UUSCO and PGWSCO include benzo(a)anthracene up to 41 ppm (PGWSCO is 1 ppm), benzo(a)pyrene up to 40 ppm (PGWSCO is 22 ppm), benzo(b)fluoranthene up to 46 ppm (PGWSCO is 1.7 ppm), benzo(k)fluoranthene up to 16 ppm (PGWSCO is 1.7 ppm), chrysene up to 37 ppm (PGWSCO is 1 ppm), indeno(1,2,3-cd)pyrene up to 24 ppm (PGWSCO is 8.2 ppm), dibenz(a,h)anthracene up to 5.2 ppm (UUSCO is 0.33). Total PCBs was detected in sub-surface at 21.9 ppm (UUSCO is 0.1 ppm and PGWSCO is 3.2ppm). Several metals exceeded their respective UUSCOs and PGWSCOs, including barium up to 834 ppm (PGWSCO is 820 ppm), lead up to 4,100 ppm (UUSCO is 450 ppm), copper up to 3,730 pm (UUSCO is 50 ppm), arsenic up to 36 ppm (UUSCO 13 ppm). The emerging contaminant perfluorooctanesulfonic acid (PFOS) was detected at up to 0.0176 ppm (unrestricted soil guidance value is 0.00088 ppm and protection of groundwater soil guidance value is 0.0037 ppm).

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

Groundwater:

Groundwater data was compared to Ambient Water Quality Standards and Guidance Values (AWQSGVs). VOCs detected include 1,4-dioxane up to 10.4 parts per billion (ppb) (AWQSGV is 0.35 ppb), naphthalene up to 110 ppb (AWQSGV is 10 ppb), and tert-butyl methyl ether at 19.9 ppb (AWQS is 10 ppb). SVOCs detected above their AWQSGVs include benzo(a)anthracene up to 0.17 ppb (AWQSGV of 0.002 ppb), benzo(a)pyrene up to 0.13 ppb (AWQSGV is ND), benzo(b)fluoranthene up to 0.11 (AWQSGV is 0.002), chrysene up to 0.18 ppb (AWQSGV is 0.002 ppb), indeno (1,2,3, -cd) pyrene up to 0.07 ppb (AWQSGV is 0.002 ppb). Total PCBs were detected up to 0.341 ppb (AWQSGV is 0.09 ppb) and barium was detected up to 1,080 ppb (AWQSGV is 1,000 ppb). Perfluorooctanoic acid (PFOA) was detected at a maximum concentration of 0.183 ppb (AWQSGV is 0.0067 ppb), and PFOS was detected at a maximum concentration of 0.153 ppb (AWQSGV is 0.0027 ppb). 1,4-dioxane was also detected at a maximum concentration of 10.4 ppb, exceeding the Maximum Contaminant Level (drinking water standard) of 1 ppb in groundwater.

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

Soil Vapor:

Petroleum-related VOCs were detected in all soil vapor samples ranging from 12.18 microgram per cubic meter (µg/m3) to 1,124 µg/m3. Chlorinated VOCs were reported in all of the soil vapor samples with tetrachloroethene (PCE) ranging from 177 µg/m3 to 340 µg/m3, vinyl chloride ranging from 6.26 µg/m3 from 21.9 µg/m3 and cis-1,2 dichloroethane from 7.69 µg/m3 from 12.2 µg/m3.

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.*

The site is secured with a fence and people will not come in 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. As 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 inhalation of site contaminants due to soil vapor intrusion for any future on-site development. In addition, sampling indicates soil vapor intrusion from site contaminants 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 Contingent Track 1 remedy.

The selected remedy is referred to as the Soil Excavation, Backfill and Groundwater Extraction and Treatment remedy.

The elements of the selected remedy, as shown in Figure 2, 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

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

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- 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
- Excavation and removal of any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination.

Excavation and off-site disposal of all on-site soils which exceed unrestricted SCOs as defined by 6 NYCRR Part 375-6.8. If a Track 1 cleanup is achieved, a Cover System will not be a required element of the remedy.

Approximately 64,000 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.

3. Backfill

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. Groundwater Extraction & Treatment

Groundwater extraction and treatment as needed will be implemented to treat VOCs and SVOCs in groundwater and to facilitate remedial excavation below the water table. The groundwater extraction system will be designed and installed so that the capture zone is sufficient to dewater the site to allow removal of all soil contaminants above UUSCOs and address VOCs in on-site groundwater. The extraction system will create a depression of the water table so that contaminated groundwater is directed toward the extraction points within the plume area. The extracted groundwater will be treated if needed using granular activated carbon and discharged to the New York City sewer system.

Monitoring will be required downgradient of the treatment zone. Pre- and post-dewatering monitoring will be conducted for VOCs at two monitoring wells downgradient of the treatment zone.

If the remedial action objectives (RAOs) for groundwater are not achieved, an in-situ remedy, such as using activated carbon, oxygen release compound (ORC), or other in-situ technology, will be implemented at the site to achieve the groundwater RAOs.

5. Vapor Intrusion Evaluation

As part of the Track 1 remedy, a soil vapor intrusion evaluation will be completed. The evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

6. Local Institutional Controls

If no Environmental Easement (EE) or Site Management Plan (SMP) is needed to achieve soil, groundwater, or soil vapor RAOs, then the following local use restriction will be relied upon to prevent ingestion of groundwater: Article 141 of the NYCDOHMH code which prohibits potable use of groundwater without prior approval.

Contingent Track 1

The intent of the remedy is to achieve Track 1 unrestricted use; therefore, no environmental easement or site management plan is anticipated.

If the soil vapor intrusion (SVI) evaluation is not completed prior to completion of the Final Engineering Report, then a Site Management Plan (SMP) and Environmental Easement (EE) will be required to address the SVI evaluation and implement actions as needed. If a mitigation or monitoring action is needed, a Track 1 cleanup can only be achieved if the mitigation system or other required action is no longer needed within 5 years of the date of the Certificate of Completion.

In the event that Track 1 unrestricted use is not achieved, the following contingent remedial elements will be required, and the remedy will achieve a Track 2 restricted residential cleanup. Elements of the Track 2 restricted residential cleanup will include establishment of an SMP and recording of an EE.

Engineering and Institutional Controls

Imposition of an institutional control in the form of an EE and a SMP, as described below, will be required. The remedy will achieve a Track 2 restricted residential cleanup at a minimum.

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 NYSDEC 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 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 NYCDOHMH;
- require compliance with the NYSDEC 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:

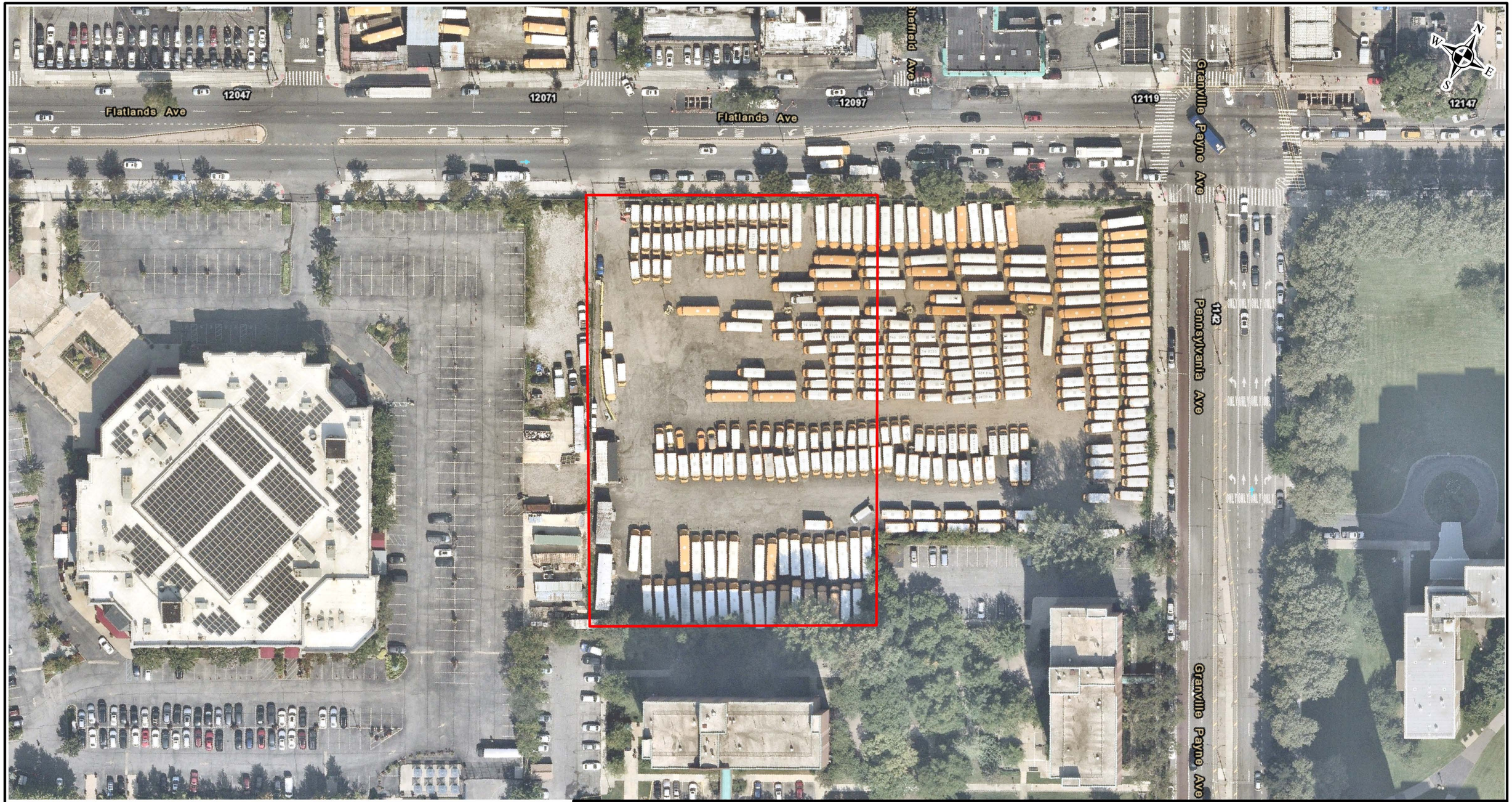
- Institutional Controls: The Environmental Easement discussed in Paragraph 7 above.

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



Legend

Site Boundary

80 0 80

SCALE IN FEET

References:
1. Aerial imagery provided by Nearmap Ltd., c diected 09/05/2023.

LANGAN

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Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project

12074 FLATLANDS AVENUE

BLOCK No. 4434, LOT No. 1

BROOKLYN

KINGS COUNTY NEW YORK

Drawing Title

SITE LOCATION

Project No.	100688801
Date	09/27/2023
Scale	1"=80'
Drawn By	PDT
Figure	1

Path: W:\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\APRX\100688801\100688801.aprx

Legend

- Site Boundary
- Remedial Excavation to 8 feet bgs
- Remedial Excavation to 15 feet bgs
- Remedial Excavation to 20 feet bgs
- Remedial Excavation to 22 feet bgs
- Remedial Excavation to approximately 22 feet bgs for the removal of SVOCs and metals hotspot
- Remedial Excavation to approximately 23 feet bgs for the removal of SVOCs and metals hotspot
- Remedial Excavation to approximately 23 feet bgs for the removal of SVOCs, pesticides, PCBs, and metals hotspot
- 2023 RI Soil Boring Location
- 2018 Phase II Soil Boring Location

LSB-29
LSB-28
LSB-30
LSB-11
LSB-14
LSB-32
LSB-31
LSB-33
LSB-34
LSB-35
LSB-36
LSB-10
LSB-13
LSB-37
LSB-39
LSB-38
LSB-12
LSB-41
LSB-40
LSB-42

N
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E
S

50 0 50
SCALE IN FEET

Notes:
1. Aerial imagery provided by Nearmap Ltd., collected 3/19/2023.
2. 2018 Phase II EI Sample and Test Pit locations obtained from the Phase II EI Report conducted by Langan Engineering, Environmental, Survey, Landscape Architecture, and Geology, D.P.C dated 5/30/2018.
3. Sample locations for the RI were collected using GPS location techniques.

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NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project
12074 FLATLANDS AVENUE
BLOCK No. 4434, LOT No. 1
BROOKLYN
KINGS COUNTY NEW YORK

Drawing Title
ALTERNATIVE I - TRACK 1 CLEANUP

Project No.	100688801
Date	6/22/2023
Scale	1 " = 50 '
Drawn By	IHB

Figure 8

Path: \\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2023-11 Phase 1B Update\Figure 8 - Alternative I Track 1 Cleanup.mxd