DECISION DOCUMENT

39-04 Northern Boulevard
Brownfield Cleanup Program
Long Island City, Queens County
Site No. C241265
December 2024

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

DECLARATION STATEMENT - DECISION DOCUMENT

39-04 Northern Boulevard
Brownfield Cleanup Program
Long Island City, Queens County
Site No. C241265
December 2024

Statement of Purpose and Basis

This document presents the remedy for the 39-04 Northern Boulevard 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 39-04 Northern Boulevard 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(TM) (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

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

2. Excavation

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

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

- soil exceeding the 6 NYCRR Part 371 hazardous criteria for lead;
- any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination.
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Track 2 Area of the Site:

Excavation and off-site disposal of all on-site soils which exceed Commercial SCOs, as defined by 6 NYCRR Part 375-6.8 in the upper 15 feet in the southern and eastern portion of the site. If a track 2 cleanup is achieved, a Cover System will not be a required element of the remedy in that area.

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 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.

Track 4 Area of the Site:
All soils in the upper one foot which exceed the Commercial SCOs in the northern and western portion of the site will be excavated and transported off-site for disposal.

In total, approximately 15,000 cubic yards of contaminated soil will be removed from the site. 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.

In-Situ Solidification Area:
Excavation of site soils to a depth of 4 feet below grade in the portion of the site where in-situ solidification (ISS) treatment described in remedy element 5. Approximately 10,930 cubic yards of soil will be excavated to facilitate ISS implementation. All soils which exceed either Commercial SCOs or protection of groundwater SCOs for contaminants present in groundwater will be disposed of off-site at a permitted facility.

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

3. Cover System:
A site cover will be required in track 4 areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs), to allow for future Commercial use of the site. Where a soil cover is to be used it will be a minimum of one foot 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.

If a Track 2 commercial cleanup is achieved, a Cover System will not be a required element of the remedy in that area.

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 one foot will meet the SCOs for Commercial 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. Vapor Mitigation

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

5. In-Situ soil Solidification

In-situ solidification (ISS) will be implemented as indicated on Figure 2. The treatment zone will extend from 4 feet below grade surface, or ft bgs, to approximately 34 ft bgs. A 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 testing 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.

6. Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy in one area of the site will achieve a Track 2 Commercial cleanup at a minimum and will achieve a Track 4 Commercial cleanup at a minimum in the remaining area and will include imposition of a site cover as a contingency if soil greater than 2 feet but less than 15 feet deep does not meet the commercial SCOs.

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 Commercial 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 site cover discussed in Remedy Element 3, the sub-slab depressurization system discussed in Remedy Element 4, and the in-situ soil solidification discussed in Remedy Element 5.

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 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 one foot 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:
- 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.
- monitoring of groundwater to assess the performance and effectiveness of the remedy

c) an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system(s). The plan includes, but is not limited to:
- procedures for operating and maintaining the system(s); and
- compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting.

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.

December 2, 2024
Date

R. Scott Deyette
Scott Deyette, Director
Remedial Bureau B

DECISION DOCUMENT

39-04 Northern Boulevard
Long Island City, Queens County
Site No. C241265
December 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=C241265

Queens Public Library - Long Island City
37-44 21 Street
Long Island City, NY 11101
Phone: (718) 752-3700

Queens Community Board 2

Attn: Morry Galonoy
43-22 50th Street, Room 2B
Woodside, NY 11377
Phone: (718) 533-8777

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 39-04 Northern Boulevard site is a 3.185-acre site located in urban Long Island City, New York. The Site is identified as Tax Block 183, Lots 9 and 12 in Queens County. The site is bound by Northern Boulevard to the north, 39th Street to the west, Long Island Railroad tracks and Amtrak Sunnyside Rail Yards to the south, and a commercial building to the east.

Site Features:

The site is an irregularly shaped parcel that contains both a vacant gas service station, and an active automobile dealership and maintenance facility. Structures associated with the former occupant, Speedway gasoline station, are still present. This includes the former main convenience store, dispenser canopy, detached eastern car wash, and detached western storage building. Buildings associated with the automotive dealership and servicing area are also present and in use. The remainder of the site is paved and utilized for parking.

Current Zoning and Land Use:

The Site is currently active, with the former gas service station vacant. It is zoned for commercial/industrial use. The current use for the surrounding parcels includes: a condominium and commercial properties across Northern Boulevard to the north, a self storage facility to the east, and an automotive part manufacturer across 39th Street to the west.

Past Use of the Site:

The site was initially developed as a gasoline station between 1915 and 1936. An automobile sales and service operation was also present by 1936. Between 1936 and 1947, a garage and two stores were added to the site. The current dealership buildings were constructed between 1966

and 1970. By 1970, a new service station building is also present and 40 gasoline tanks were noted in the central portion of the site, including gas racks. An additional commercial building on the east side of the property is present in the late 1970s. Fueling operations at the site ceased in October 2018 and that portion has since been vacant.

Site Geology and Hydrogeology:

The site is underlain with a mixture of historic fill consisting of sand, silt, concrete, brick, glass, and large cobbles or boulders. The historic fill layer extends to an average depth of 15 to 20 feet below grade across the western portion of the site, and 3 feet below grade within the eastern portion. Beneath the historic fill, the subsurface is predominantly comprised of fine to medium sands with gravel. Bedrock was not encountered.

Groundwater at the site is approximately 17 to 20 feet below grade and is estimated to flow to the west southwest.

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 (or an alternative) that restrict(s) the use of the site to commercial use (which allows for 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(s) under the Brownfield Cleanup Agreement is a/are Volunteer(s). The Applicant(s) does/do 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:

1,2,4-trimethylbenzene
xylene (mixed)
ethylbenzene
n-propylbenzene
benzo(a)anthracene
benzo(a)pyrene
benzo(b)fluoranthene
benzo(k)fluoranthene
dibenz[a,h]anthracene
indeno(1,2,3-cd)pyrene
lead
isopropylbenzene
methylene chloride
1,1,1-Trichloroethane(TCA)

tetrachloroethene (PCE)
perfluorooctanoic acid
perfluorooctane sulfonic acid
trichloroethene (TCE)

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

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

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

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:

Soil VOCs were found in concentrations exceeding applicable Commercial Use Soil Cleanup Objectives (CSCO), including maximum concentrations of 1,2,4 trimethylbenzene at 960 parts per million, or ppm (CSCO is 190 ppm) and total xylenes at 680 ppm (CSCO is 500 ppm). VOCs in exceedance of Protection of Groundwater SCOs (PGWSCO) include 1,2,4 trimethylbenzene at 960 ppm (PGWSCO is 3.6 ppm), 1,3,5 trimethylbenzene at 190 ppm (PGWSCO is 8.4 ppm), ethylbenzene at 350 ppm (PGWSCO is 1 ppm), n-butylbenzene at 36 ppm (PGWSCO is 12ppm), n-propylbenzene at 130 ppm (PGWSCO is 3.9 ppm), and total xylenes at 680 ppm (PGWSCO is 1.6 ppm). Most exceedances were found from 12 ft bgs to 29 ft bgs in the western portion of the site. SVOCs include maximum concentrations of benzo(a)anthracene at 32 ppm (CSCO of 5.6 ppm, PGWSCO of 1 ppm), benzo(a)pyrene at 29 ppm (CSCO of 1 ppm, PGWSCO of 22 ppm), benzo(b)fluoranthene at 30 ppm (CSCO is 5.6 ppm, PGWSCO of 1.7 ppm), dibenz(a,h)anthracene at 3.8 ppm (CSCO of 0.56 ppm, PGWSCO of 1000 ppm), and indeno(1,2,3-cd)pyrene at 13 ppm (CSCO of 5.6 ppm. PGWSCO of 8.2 ppm). Metals were detected at concentrations above the CSCOs including lead at 3460 ppm (CSCO is 1000 ppm). Metals and SVOCs were detected in the eastern portion of the site at depths ranging from 1ft bgs to 14ft bgs. Detections of PFAS hat exceed the applicable SCOs for this site include PFOS (max of 3.64 ppt, PGWSCO of 1.0 ppt). Pesticides detected in exceedance of PGWSCOs include Aldrin (max of 1.97 ppm, PGWSCO of 0.19 ppm) and Dieldrin (max of 15.4 ppm, PGWSCO of 0.1 ppm). There were no detections of PCbs in exceedance of PGWSCOs for this site.

Groundwater - Petroleum-related VOCs, SVOCs, and pesticides were detected in groundwater at levels above the NYSDEC Ambient Water Quality Standards and Guidance Values (AWQSGVs). The highest number of VOC exceedances include 1,2,4,5-tetramethylbenzene (max of 170 parts per billion, or ppb, AWQSGV is 5 ppb), ethylbenzene (max of 1600 ppb, AWQSGV is 5 ppb), isopropylbenzene (max of 180 ppb, AWQS is 5 ppb), naphthalene (max of 590 ppb, AWQS is 10 ppb), n-propylbenzene (max of 520 ppb AWQS is 5 ppb), toluene, (max of 38 ppb, AWQS is 5 ppb), and total xylenes (max of 3500 ppb, AWQS is 5 ppb). SVOCs detected in groundwater include benzo[a]anthracene (max of 0.03 ppb, AWQS is 0.002 ppb), chrysene, Indeno[1,2,3-cd] pyrene and benzo[k]fluoranthene. Most exceedances were detected in the western portion of the site, around the gasoline filling station and abandoned USTs. Emerging contaminants were detected in groundwater above AWQSGVs, including PFOS (max of 0.164 ppb, AWQSGV is 0.0027 ppb), and PFOA (max of 0.0962 ppb, AWQSGV is 0.0067 ppb). Total metals detected in groundwater include: iron (max of 18,000 ppb, AWQSGV of 300 ppb), magnesium (max of 35,100 ppb, AWQSGV of 35,000 ppb), manganese (max of 1496 ppb, AWQSGV of 300 ppb), selenium (max of 32.6 ppb, AWQSGV of 10 ppb) and sodium (max of 169,000 ppb, AWQSGV of 20,000 ppb). One pesticide was detected: dieldrin (max of 0.078 ppb, AWQSGV of 0.004 ppb). PCBs were not detected in any groundwater samples.

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

- Soil Vapor Chlorinated VOCs were detected, including trichloroethene (TCE) in 7 vapor samples (max of 465 ppb at SV-404-5) in the eastern portion of the site, 1,1-dichloroethene (DCE) in 2 samples (max of 13.2 ppb at SV-4040-6), methylene chloride in 3 samples (max of 6.64 ppb at SV-4040-6), tetrachloroethylene (PCE) in 19 soil samples (max of 599 ppb at SV-4040-10), and 1,1,1-trichloroethane (TCA) in 7 samples (max of 181 ppb at SV-4040-7).

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 who dig below the ground surface may come into contact with contaminants in the subsurface soil. 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 into the indoor air of buildings, is referred to as soil vapor intrusion. Exposure to site contaminants through soil vapor intrusion is not a current concern because the site is vacant. However, the potential exists for people to inhale site contaminants in indoor air due to soil vapor intrusion in any future on-site development and occupancy. Environmental sampling indicates soil vapor intrusion off-site from site contaminants is not a concern.

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.
- Prevent the discharge of contaminants to surface water.
- 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.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

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 Multiple Cleanup Tracks remedy.

The selected remedy is referred to as the Track 2/Track 4 Split Track Remedy 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(TM) (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

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

remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

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

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

- soil exceeding the 6 NYCRR Part 371 hazardous criteria for lead;
- any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination.
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Track 2 Area of the Site:
Excavation and off-site disposal of all on-site soils which exceed Commercial SCOs, as defined by 6 NYCRR Part 375-6.8 in the upper 15 feet in the southern and eastern portion of the site. If a track 2 cleanup is achieved, a Cover System will not be a required element of the remedy in that area.

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 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.

Track 4 Area of the Site:
All soils in the upper one foot which exceed the Commercial SCOs in the northern and western portion of the site will be excavated and transported off-site for disposal.

In total, approximately 15,000 cubic yards of contaminated soil will be removed from the site. 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.

In-Situ Solidification Area:
Excavation of site soils to a depth of 4 feet below grade in the portion of the site where in-situ solidification (ISS) treatment described in remedy element 5. Approximately 10,930 cubic yards

of soil will be excavated to facilitate ISS implementation. All soils which exceed either Commercial SCOs or protection of groundwater SCOs for contaminants present in groundwater will be disposed of off-site at a permitted facility.

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

3. Cover System:
A site cover will be required in track 4 areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs), to allow for future Commercial use of the site. Where a soil cover is to be used it will be a minimum of one foot 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.

If a Track 2 commercial cleanup is achieved, a Cover System will not be a required element of the remedy in that area.

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 one foot will meet the SCOs for Commercial 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. Vapor Mitigation
Any on-site buildings will be required to have a sub-slab depressurization system, or other acceptable measures, to mitigate the migration of vapors into the building from soil.

5. In-Situ soil Solidification
In-situ solidification (ISS) will be implemented as indicated on Figure 2. The treatment zone will extend from 4 feet below grade surface, or ft bgs, to approximately 34 ft bgs. A 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.

6. Engineering and Institutional Controls
Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy in one area of the site will achieve a Track 2 Commercial cleanup at a minimum and will achieve a Track 4 Commercial cleanup at a minimum in the remaining area and will include imposition of a site cover as a contingency if soil greater than 2 feet but less than 15 feet deep does not meet the commercial SCOs.

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 Commercial 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 site cover discussed in Remedy Element 3, the sub-slab depressurization system discussed in Remedy Element 4, and the in-situ soil solidification discussed in Remedy Element 5.

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 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 one foot 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:

- 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.
- monitoring of groundwater to assess the performance and effectiveness of the remedy

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

- procedures for operating and maintaining the system(s); and
- compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting.