DECISION DOCUMENT

450 Union Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224219
October 2020

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

DECLARATION STATEMENT - DECISION DOCUMENT

450 Union Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224219
October 2020

Statement of Purpose and Basis

This document presents the remedy for the 450 Union Street 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 (the Department) for the 450 Union Street site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. Remedial Design

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

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

- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Cover System

A site cover currently exists in areas not occupied by buildings and will be maintained to allow for restricted residential, commercial or industrial use of the site. Any site redevelopment will maintain the existing site cover. The site cover may include paved surface parking areas, sidewalks or soil where the upper two feet of exposed surface soil meets the applicable soil cleanup objectives SCOs for restricted residential, commercial or industrial use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6NYCRR part 375-6.7(d).

3. Coal Tar Recovery

Installation and operation of coal tar recovery wells along the eastern edge of the site bordering the Gowanus Canal to remove potentially mobile coal tar from the subsurface. The design calls for 2 extraction wells: the existing well screened to a depth of 52 feet, and a new well to be installed at a maximum depth of 65 feet below ground surface (bgs). These recovery wells will be spaced approximately 35 to 40 feet apart, adjacent to the bulkhead.

Coal tar will be collected periodically from each well; however, if wells are determined by the Department to accumulate large quantities of coal tar over extended time periods, they will be converted to automated collection.

4. Institutional Control

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

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

5. 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 above.
- Engineering Controls: The cover system, DNAPL recovery system discussed above and the bulkhead wall/contaminant barrier installed as an IRM.

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;
- a provision for demolition of on-site Buildings if and when they become unsafe or inactive or vacant;
- descriptions of the provisions of the environmental easement including any land use and/or 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 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 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:
   - a schedule of monitoring and frequency of submittals to the Department;
   - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
   - procedures for operating and maintaining the remedy;
   - compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
   - maintaining site access controls and Department notification; and
   - providing the Department access to the site and O&M records.

Declaration

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

October 23, 2020

Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

450 Union Street
Brooklyn, Kings County
Site No. C224219
October 2020

SECTION 1: SUMMARY AND PURPOSE

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

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant.

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

SECTION 2: CITIZEN PARTICIPATION

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

DECInfo Locator - Web Application
https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C224219

Carroll Gardens Branch Library
396 Clinton Street
Brooklyn, NY 11231
Phone: 718-596-6972

Brooklyn Community Board 6
250 Baltic Street

Brooklyn, NY 11201
Phone: (718) 643-3027

Receive Site Citizen Participation Information By Email

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

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The site is approximately 0.65 acres in size and is located in an urban area at 450 Union Street in the Gowanus neighborhood of Brooklyn, New York. The site is bounded by Union Street to the north, the Gowanus Canal to the east, a parking lot followed by President Street to the south, and Bond Street to the west.

Site Features: The site is currently improved with a one-story building and two storage sheds. The exterior portion of the property contains an enclosed area for social events, a parking lot and driveway, and storage areas. A bulkhead which will separate the property from the Gowanus Canal is currently under construction.

Current Zoning and Land Use: The site is zoned M2-1 (manufacturing/industrial) and is currently used as a private event space, an art gallery, and an outdoor restaurant.

Past Use of the Site: The site was historically occupied by a coal and wood yard (1886-1928); a granite works (1915); a die casting/electroplating facility (1922); a garage (1918-1930); a fuel company, garage and office (1931); and a foundry (1930-2007).

Geology and Hydrogeology: The site sits at an elevation of approximately 10 feet above mean sea level and slopes down to the east towards the Gowanus Canal. The subsurface strata at the site is comprised of historic urban fill consisting of sand with varying amounts of gravel, silt, brick, coal, wood and concrete fragments. The historic fill layer extends to a depth of about 15 feet below grade surface and is underlain by clay and silt. The groundwater interface is at depths between 7 and 11 feet below grade surface. Groundwater beneath the site flows southeast toward the Gowanus Canal, which adjoins the site to the east.

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(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, the Department has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

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

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor
- indoor air

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

6.1.2: RI Results

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

benzo(a)pyrene	naphthalene
fluoranthene	lead
chrysene	benzo(k)fluoranthene
indeno(1,2,3-CD)pyrene	coal tar

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.

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

Soil and UST removal

The following tasks were completed under an approved IRM Work Plan dated February 16, 2017:

1. Geophysical subsurface survey and waste characterization soil sampling within the underground storage tank (UST) and hazardous lead hotspot areas for disposal purposes;

2. Excavation to approximately 5 feet and off-site disposal of soil containing characteristic hazardous concentrations of lead;

3. Advancement of four test pits in the vicinity of the UST to identify its size, orientation, and distance from the adjacent building;

4. Removal, decommissioning, and off-site disposal of one 550-gallon UST;

5. Localized excavations into the existing site cover for installation of awning footings, planter beds, and tree pits and off-site disposal of excavated material;

6. Implementation of a community air monitoring program and site-specific health and safety plan during ground-intrusive work;

7. Collection and analysis of confirmation soil samples following the hazardous lead soil and UST excavations and documentation soil samples following the awning footing, planter bed, and tree pit excavations.

8. Restoration of the site cover with concrete, asphalt, and landscaped surfaces underlain by a high-visibility demarcation barrier.

These activities were documented in a Construction Completion Report that was approved by the NYSDEC in April 2020.

Bulkhead/Containment Barrier

The following Tasks are scheduled to be completed in October 2020 under an approved Interim Remedial Work Plan dated January 21, 2020.

1. Installation of a new, sealed, steel bulkhead/containment barrier to serve as a subsurface containment/cut-off wall for coal tar DNAPL migration;

2. Excavation and off-site disposal of excess soil/fill generated during construction of the new bulkhead/containment barrier.

3. Documentation of soil sampling and analysis, collected from the base and (where available) sidewalls of bulkhead/containment barrier excavations, to document residual soil/fill exceeding 6 NYCRR Part 375 Restricted Residential SCOs;

4. Backfill above the high-level relieving platform to the original grade using certified-clean fill meeting the lower of Restricted Residential or Protection of Groundwater SCOs, or with virgin, native crushed stone, in accordance with DER-10;

5. Restoration of the site cover consisting of asphalt, concrete pavement, and/or a minimum 2-foot-thick clean soil cover meeting the lower of Restricted Residential and Protection of Groundwater SCOs above a demarcation barrier;

6. Survey of excavations and the top of the site cover by a New York State Professional Land Surveyor; and

7. Development and execution of a Construction Health and Safety Plan (CHASP) and a Community Air Monitoring Plan (CAMP) for the protection of on-site workers and the nearby community during remediation and construction activities.

This work will be documented in the Final Engineering Report.

6.3: Summary of Environmental Assessment

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

Nature and Extent of Contamination:

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides. Groundwater was analyzed for emerging contaminants. Soil vapor was analyzed for VOCs. Based upon investigations conducted to date, the primary contaminants of concern are coal tar, SVOCs and lead in soil and groundwater.

Soil - The following SVOCs were found at concentrations exceeding their respective restricted residential use soil cleanup objectives (RRSCOs): naphthalene at concentrations up to 4,300 parts per million (ppm) as compared to the RRSCO of 100 ppm; benzo(a)pyrene at concentrations up to 95 ppm (RRSCO is 1 ppm); fluoranthene at concentrations up to 220 ppm (RRSCO is 100 ppm); benzo(k)fluoranthene, at concentrations up to 78 ppm (RRSCO is 3.9 ppm); chrysene at concentrations up to 97 ppm (RRSCO is 3.9 ppm) and ideno(1,2,3-cd)pyrene, at concentrations up 38 ppm (RRSCO of 0.5 ppm. For metals, lead was detected at a maximum concentration of 1,300 ppm (RRSCO is 400 ppm). Some soil samples contained lead at levels exceeding the hazardous waste threshold of 5 ppm by the toxicity characteristic leaching procedure (TCLP). No VOCs, pesticides or PCBs were detected at concentrations exceeding the RRSCOs. Data does not indicate any off-site impacts in soil related to this site.

Groundwater - Coal tar impacts, evidenced by dense, non-aqueous phase liquid (DNAPL), staining, coal tar-like odors, and field instrument readings above background levels were encountered at depths ranging from 23 to 54 feet below grade along the eastern perimeter of the site along the Gowanus Canal. Bail-down tests performed on the wells containing DNAPL indicated that up to 10 feet of DNAPL is present. The coal tar-related SVOC naphthalene was detected at concentrations of up to 70 parts per billion (ppb), which exceeds the ambient water quality standard (AWQS) of 10 ppb. Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS) were detected in groundwater at concentrations up to 80.5 parts per trillion (ppt) for

PFOA and 25.2 ppt for PFOS. In the absence of groundwater standards for PFOA and PFOS these numbers are compared to the NYSDEC drinking water maximum contaminant levels of 10 ppt for both PFOA and PFOS. No VOCs, pesticides, or PCBs were found at concentrations exceeding the AWQS. Data does not indicate any off-site impacts in groundwater related to this site.

Sub-Slab Vapor, Soil Vapor and Indoor Air - In sub-slab vapor samples, total detected VOC concentrations were found up to 1,579 micrograms per cubic meter (ug/m3) (of which ethyl acetate is at 1,340 ug/m3). In soil vapor, total VOCs were found at a maximum concentration of 2,841 ug/m3 (of which toluene is at 2,490 ug/m3), and in indoor air total VOCs were found at a maximum concentration of 482 ug/m3 (of which ethanol is at 464 ug/m3). Concentrations of contaminants of concern did not exceed applicable air guidelines in indoor air and no further actions were needed to address soil vapor intrusion based on the sub-slab and indoor air sampling results. Data does not indicate any off-site impacts in soil vapor related to this site.

6.4: Summary of Human Exposure Pathways

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

People will not come into contact with contaminated soil or groundwater since the site is covered with buildings and pavement. Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a different source 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. Environmental sampling indicates that soil vapor intrusion is not a concern for the current onsite building; any new construction onsite will be evaluated for the potential for indoor air impacts via the soil vapor intrusion pathway. Environmental sampling indicates that soil vapor intrusion is not a concern for offsite 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.

RAOs for Environmental Protection

- 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.

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 use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the Cover System and Coal Tar (DNAPL) Recovery 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 will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Cover System

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3. Coal Tar Recovery

Installation and operation of coal tar recovery wells along the eastern edge of the site bordering the Gowanus Canal to remove potentially mobile coal tar from the subsurface. The design calls for 2 extraction wells: the existing well screened to a depth of 52 feet, and a new well to be installed at a maximum depth of 65 feet below ground surface (bgs). These recovery wells will be spaced approximately 35 to 40 feet apart, adjacent to the bulkhead.

Coal tar will be collected periodically from each well; however, if wells are determined by the Department to accumulate large quantities of coal tar over extended time periods, they will be converted to automated collection.

4. Institutional Control

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

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for restricted residential use, commercial use or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOHMH; and
- require compliance with the Department approved Site Management Plan.

5. 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 above.
- Engineering Controls: The cover system, DNAPL recovery system discussed above and the bulkhead wall/contaminant barrier installed as an IRM.

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;
- a provision for demolition of on-site Buildings if and when they become unsafe or inactive or vacant;
- descriptions of the provisions of the environmental easement including any land use and/or 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 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 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:
   - a schedule of monitoring and frequency of submittals to the Department;
   - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
   - procedures for operating and maintaining the remedy;
   - compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
   - maintaining site access controls and Department notification; and
   - providing the Department access to the site and O&M records.

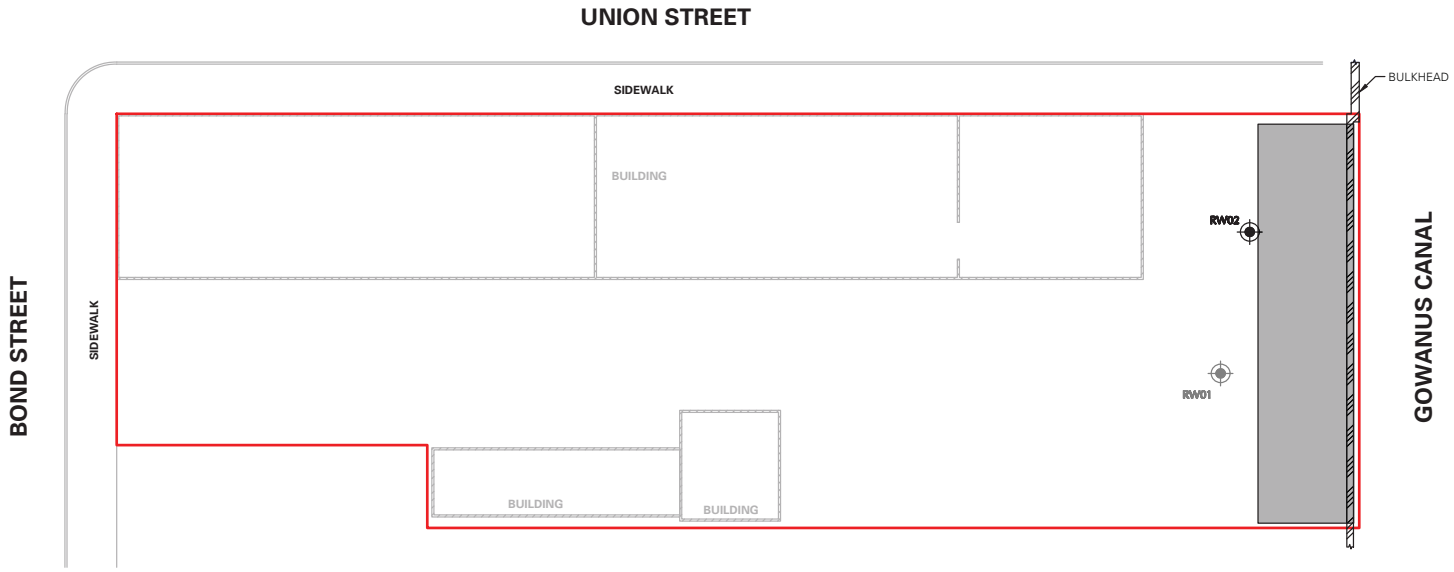
LEGEND:

APPROXIMATE BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY

GENERAL NOTES:

1. BASE MAP IS TAKEN FROM UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5 MINUTE TOPOGRAPHIC MAPS FOR THE BROOKLYN, 1980 AND JERSEY CITY, 1982 QUADRANGLES.

	Project	Figure Title	Figure No.
	450 UNION STREET BLOCK No. 438, LOT No. 7 BROOKLYN NEW YORK	SITE LOCATION MAP	1



LEGEND:

- APPROXIMATE BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY
- APPROXIMATE AREA OF CONCRETE HIGH-LEVEL RELIEVING PLATFORM
- RW01 APPROXIMATE LOCATION OF EXISTING RECOVERY WELL
- RW02 APPROXIMATE LOCATION OF PROPOSED NEW RECOVERY WELL

GENERAL NOTES:

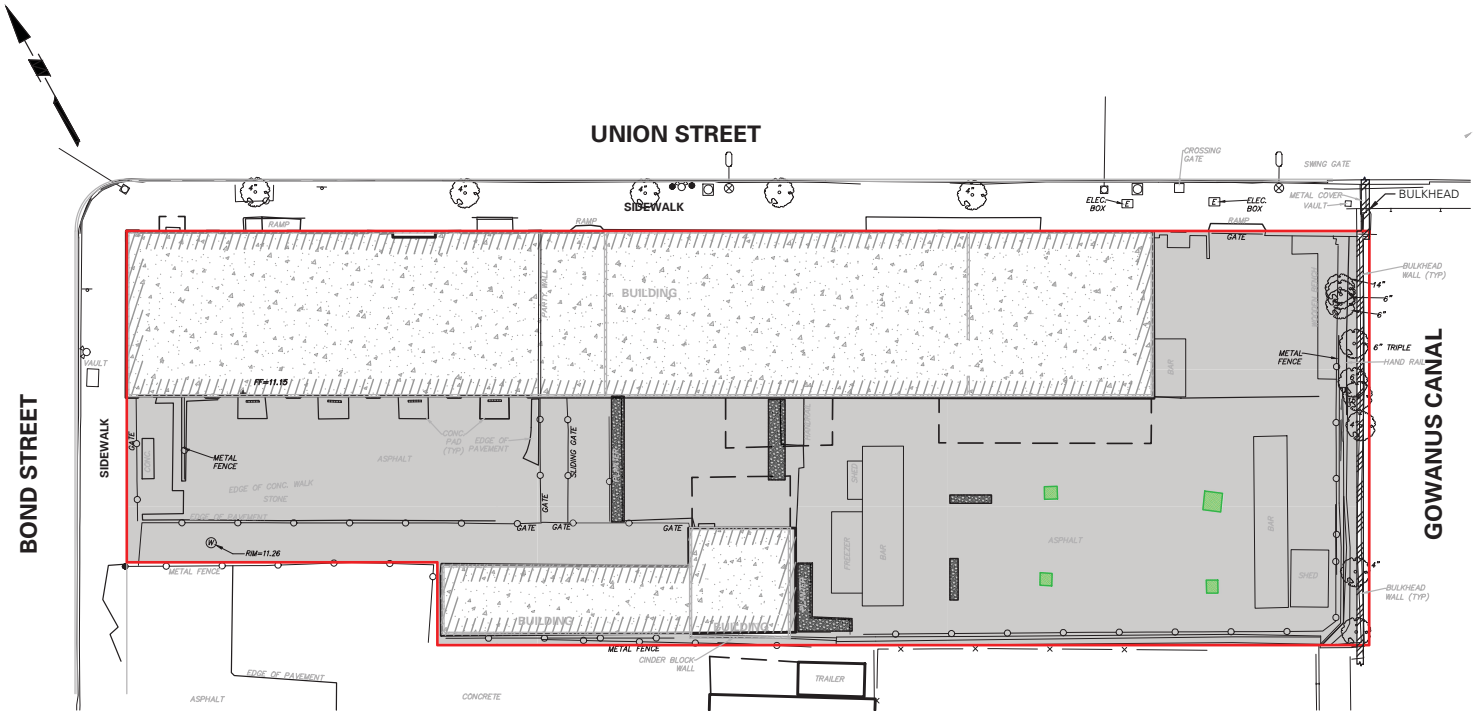
1. BASE MAP IS REFERENCED FROM BOUNDARY AND TOPOGRAPHIC SURVEY, PREPARED BY LANGAN ENGINEERING, SURVEYING, LANDSCAPE ARCHITECTURE AND GEOLOGY, D.P.C., DATED JUNE 13, 2016.
2. ALL LOCATIONS ARE APPROXIMATE.

30 0 15 30
SCALE IN FEET

Project
450 UNION STREET
BLOCK No. 438, LOT No. 7
BROOKLYN
KINGS NEW YORK

Figure Title
ALTERNATIVE II TRACK 4 RECOVERY PLAN

Figure No.
2

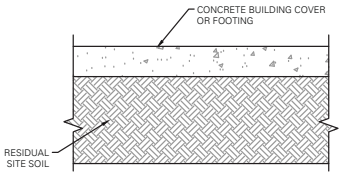


LEGEND:

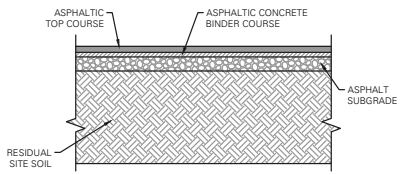
- APPROXIMATE BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY
- CONCRETE COVER - TYPE 1 (DETAIL 1)
- ASPHALT COVER - TYPE 2 (DETAIL 2)
- 2-FOOT-THICK STONE COVER - TYPE 3 (DETAIL 3)
- 2-FOOT-THICK CLEAN SOIL COVER - TYPE 4 (DETAIL 4)

GENERAL NOTES:

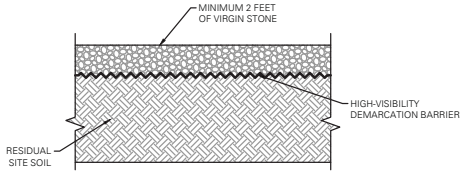
1. BASE MAP IS TAKEN FROM SURVEY SITE SURVEY, PREPARED BY BORO LAND SURVEYING, P.C., DATED MARCH 25, 2011.
2. THE SITE COVER TYPES WILL RESTORED FOR THEIR RESPECTIVE AREAS.
3. THE LOCATIONS OF EACH COVER TYPE SHOWN ARE APPROXIMATE AND MAY DIFFER IN LOCATION AND QUANTITY.



DETAIL 1: COVER TYPE 1 - TYPICAL CONCRETE COVER FOR BUILDING AND FOOTINGS
(NOT TO SCALE)

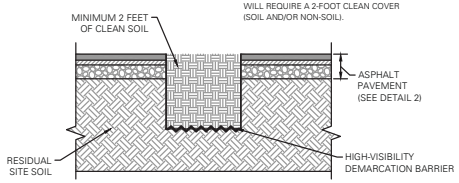


DETAIL 2: COVER TYPE 2 - TYPICAL ASPHALT COVER
(NOT TO SCALE)



DETAIL 3: COVER TYPE 3 - TYPICAL CLEAN STONE COVER
(NOT TO SCALE)

NOTE: DETAIL 4 ILLUSTRATES TYPICAL COVER CONSTRUCTION FOR LANDSCAPED AREAS. HOWEVER, ANY OTHER LOCATIONS THAT WILL NOT BE RESTORED WITH A SURFACE STRUCTURE WILL REQUIRE A 2-FOOT CLEAN COVER (SOIL AND/OR NON-SOIL).



DETAIL 4: COVER TYPE 4 - TYPICAL CLEAN SOIL COVER
(NOT TO SCALE)

30 0 15 30
SCALE IN FEET

	Project: 450 UNION STREET BLOCK No. 438, LOT No. 7 BROOKLYN KINGS NEW YORK	Figure Title: SITE COVER SYSTEM	Figure No.: 3