DECISION DOCUMENT

2 Ingraham Street
Brownfield Cleanup Program
East Williamsburg, Kings County
Site No. C224036
June 2022

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

DECLARATION STATEMENT - DECISION DOCUMENT

2 Ingraham Street
Brownfield Cleanup Program
East Williamsburg, Kings County
Site No. C224036
June 2022

Statement of Purpose and Basis

This document presents the remedy for 2 Ingraham Street, 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 2 Ingraham 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:

The site remedy will be comprised of two cleanup tracks: a Track 2 cleanup for restricted residential use will be implemented on the eastern portion of the site, while a Track 4 cleanup for restricted residential use will be implemented on the western portion of the site. 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. Excavation

Pre-excavation of site soils to a depth of five feet below grade in the portion of the site subject to the in-situ solidification (ISS) treatment described in remedy element 3. Approximately 1,200 cubic yards of soil will be excavated. All soils which exceed either restricted residential or protection of groundwater soil cleanup objectives (SCOs) for contaminants present in groundwater will be disposed of off-site at a permitted facility.

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

3. In-situ solidification

In-situ solidification (ISS) will be implemented in the former metal plating drain area located in the northwestern portion of the site, as indicated on Figure 2. The treatment zone will extend from approximately 5 feet below grade to approximately 25 feet below grade in areas where elevated metals are present below the water table. 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 agents (typically Portland cement) or other binding agents using excavators. The soil and binding agents are mixed to produce a solidified mass resulting in a low permeability monolith. ISS will be subject to performance standards to ensure homogeneity of the solidified monolith. The solidified mass will then be covered with a cover system as described in remedy element 5 to prevent direct exposure to the solidified mass. The resulting solid matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

Groundwater Monitoring will be required down-gradient of the ISS treatment area. Monitoring will be conducted for contaminants of concern.

4. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the site. On-site soil, including pre-excavation soil, which does not exceed the restricted residential or protection of groundwater soil cleanup objectives SCOs for any constituent may be used to

backfill the excavation or to establish the designed grades at the site below the cover system described in remedy element 5.

5. Cover System

A site cover currently exists over the western portion of the site and will be maintained to allow for restricted residential use of the site. Any site redevelopment will maintain the existing site cover over the western portion of the site. 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 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).

The site cover currently existing in the ISS treatment areas will be replaced following implementation of ISS treatment. Where the soil cover is required over the ISS treatment area, it will consist of a minimum of five feet of soil meeting the SCOs for restricted residential use, placed over a demarcation layer.

6. 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, commercial or industrial uses 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 NYCDOH; and
- require compliance with the Department approved Site Management Plan.

7. Site Management Plan

A Site Management Plan is required, which includes the following:

a) An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in remedy element 6 above.

Engineering Controls: The Cover System discussed in remedy element 5 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 use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in remedy element 5 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:

- 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 developed 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, inspection, and reporting of any mechanical or physical components of the active vapor mitigation systems, if any. 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.

June 29, 2022

Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

2 Ingraham Street
East Williamsburg, Kings County
Site No. C224036
June 2022

SECTION 1: SUMMARY AND PURPOSE

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

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance, based on the reasonably anticipated use of the property.

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

SECTION 2: CITIZEN PARTICIPATION

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

DECInfo Locator - Web Application
https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C224036

Brooklyn Public Library, Central Branch
10 Grand Army Plaza
Brooklyn, NY 11238
Phone: 718-230-2100

Brooklyn Community Board 1
435 Graham Avenue
Brooklyn, NY 11211
Phone: 718-389-0009

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 located at 2 Ingraham Street in the East Williamsburg section of Brooklyn, NY, and is identified as Block 3084 and Lot 1 on the New York City Tax Map. The site is a rectangular parcel of about 1.8 acres in size and is located on the city block bordered by Ingraham Street to the north, Morgan Avenue to the east, Harrison Place to the south, and Bogart Street to the west. The site is approximately 0.2 miles to the southwest of the English Kills.

Site Features: The site previously contained a one-story warehouse building which covered the entire site. The warehouse building was demolished between September 2019 and April 2021. The site is currently undergoing redevelopment consisting of a seven-story storage building and a parking lot. The new building slabs and pavement cover are in place.

Current Zoning and Land Use: The current zoning of the property is M1-2 (light manufacturing). The surrounding land use is mainly manufacturing (M-1 and M-2) with residential (R-6) farther east and west of the site. The businesses in the immediate area include warehouses, auto scrap yards, masonry materials sales, waste management and trucking. The neighborhood surrounding the site includes some residential units interspersed with commercial properties. A New York City Transit Authority subway line is located beneath Harrison Place, and there are rail yards nearby which are connected to the Long Island Railroad Bushwick Branch.

Past Use of the Site: Prior to 1946 the site was used as an orphanage. The site was occupied by an umbrella manufacturing plant starting in 1948 and a metal plating company between 1946 and the early 1990's. After the 1990's, the site has been used as a warehouse without major changes. The former site structure was unoccupied since April 2016 until it was demolished.

Site Geology and Hydrogeology: The site is underlain by 0 to 16 feet of urban fill. The fill consists predominantly of brown to gray to black, fine- to coarse-grained sand with varying amounts of silt, clay, gravel, and anthropogenic and pyrogenic material including coal, brick, concrete, wood, glass, metal, plastic, ceramic, and ash. Native soils beneath the fill layer consist of reddish-brown to brown to gray, fine- to coarse-grained sand with varying amounts of silt, clay, gravel, and

cobbles.

The depth to groundwater is approximately 15 feet below grade. The regional groundwater flow direction is roughly south to north, towards the English Kills.

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) 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 Volunteer does not have an obligation to address off-site contamination. The Department has determined that this site poses a significant threat to human health and the environment and there are off-site impacts that require remedial activities; accordingly, enforcement actions are necessary.

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

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

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

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI

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

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor
- indoor air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. 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:

chromium	trichloroethene (TCE)
mercury	cis-1,2-dichloroethene
nickel	tetrachloroethene (PCE)
lead	benzo(a)pyrene

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 IRMs have been completed at this site based on conditions observed during the RI.

Building Demolition and Soil Excavation in the Eastern Portion of the Site

IRM activities completed include demolition of the existing building and concrete building slab removal, collection of soils samples, collection of soil vapor samples, installation of support -of-excavation systems, installation of a vapor barrier beneath the new building, and excavation to a depth of approximately 13 to 15.6 feet to achieve Track 2 Restricted Residential Use soil cleanup objectives (SCOs) in the eastern portion of the site. Approximately 24,405 tons of contaminated material (impacted building slabs and soil) was removed from the site and disposed of at a permitted facility. Confirmation samples collected from the eastern portion of the site met Restricted Residential SCOs. Excavated areas of the site were backfilled with on-site soil which does not exceed the Restricted Residential or Protection of Groundwater SCOs and clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d).

The IRM will be documented in the Final Engineering Report.

Soil Excavation and Site Cover in the Western Portion of the Site

IRM activities completed include excavation and off-site disposal of soils in source areas to a depth of approximately 8 below ground surface to achieve a Track 4 remediation intended for restricted residential use, installation of a site cover (asphalt-paved parking lot) over the western portion of the site, installation of monitoring wells, and collection of groundwater samples. The site cover installed over the ISS treatment areas will be replaced following implementation of remedy, as described in remedy element 5. Approximately 7,736 tons of contaminated soil was disposed of at a permitted facility. Excavated areas of the site were backfilled with on-site soil which does not exceed the Restricted Residential or Protection of Groundwater SCOs and clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d).

The IRM 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.

Soil and groundwater samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), pesticides, per- and polyfluoroalkyl substances (PFAS), and 1,4-dioxane. Soil vapor samples were analyzed for VOCs. The primary contaminants of concern at the site include SVOCs and metals in soil, VOCs and metals in groundwater, and VOCs in soil vapor.

Soil: Analytical results from soil sampling revealed several metals and SVOCs (polycyclic aromatic hydrocarbon, or PAHs) above applicable soil cleanup objectives (SCOs). No VOCs were detected above applicable SCOs. The PAHs, lead and some mercury contamination in site soils is likely related to the presence of historic fill. The presence of mercury, hexavalent chromium, trivalent chromium, and nickel in subsurface soils is likely related to historical use of the site for metal plating. Maximum detections in comparison to applicable protection of groundwater or restricted residential use soil cleanup objectives (PGSCO/RRSCO) are as follows: lead at 1,960 parts per million (ppm) compared to the RRSCO of 400 ppm, hexavalent chromium at 291 ppm (PGSCO of 19 ppm), trivalent chromium at 1,400 ppm (RRSCO of 180 ppm), mercury at 4,940 ppm (PGSCO of 0.73 ppm, RRSCO of 0.81 ppm), nickel at 2,020 ppm (PGSCO of 130 ppm), and several PAHs including benzo(a)pyrene at 3.9 ppm (RRSCO of 1 ppm). A previous investigation found mercury, nickel and lead (up to 18.2 ppm, 433 ppm, and 106 ppm respectively) off-site at soil borings SSB7N and SB8 to the northwest of the site.

Near surface soils which exceeded RRSCOs for PAHs and metals were addressed by an Interim Remedial Measure through excavation and a site cover.

PFAS were detected in soil samples with both perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) detected below the current guidance values for unrestricted use of 0.66 parts per billion (ppb) and 0.88 ppb, respectively. 1,4-Dioxane was not detected in soil samples.

Additional sampling is needed to define the extent of off-site impacts in soils related to this site. This work will be performed as part of a separate off-site investigation program.

Groundwater: Groundwater sampling found metals and VOCs contamination above Class GA Ambient Water Quality Standards (AWQS). Some metals were found at relatively low levels in groundwater and are likely related to the presence of historic fill. Maximum detections are as follows: tetrachloroethene (PCE) at 13 ppb (AWQS is 5 ppb), trichloroethene (TCE) at 200 ppb (AWQS is 5 ppb), cis-1,2-dichloroethylene at 11 ppb (AWQS is 5 ppb), total chromium (dissolved) at 136,000 ppb (AWQS is 50 ppb), hexavalent chromium (dissolved) at 143,000 (AWQS is 50 ppb), mercury (dissolved) at 1.19 ppb (AWQS is 0.7 ppb), and nickel (dissolved) at 213,000 ppb (AWQS is 100 ppb). TCE up to 170 ppb was detected off-site in cross-gradient groundwater monitoring well MW-6 to the east of the site. Also, a previous investigation revealed total chromium (dissolved), nickel (dissolved), and lead (up to 78,700 ppb, 11,420 ppb, and 802 ppb, respectively) off-site in downgradient groundwater monitoring well MW-8 to the northwest of the site.

PFOA and PFOS were detected at concentrations of up to 68 and 145 parts per trillion (ppt), respectively, exceeding the Maximum Contaminant Level (drinking water standard) of 10 ppt for

each. Based on the soil data, there is no apparent on-site source for PFAS in site groundwater. 1,4-Dioxane was reported at concentrations up to 2.39 ppb (MCL of 1 ppb). Based on the soil data, there is no apparent on-site source for 1,4-dioxane in site groundwater.

Additional sampling is needed to determine if there is any off-site impacts in groundwater related to this site. This work will be performed as part of a separate off-site investigation program.

Soil Vapor Intrusion: Analytical data collected during previous environmental investigations (2014-2017) included the collection of concurrent sub-slab/indoor air samples that were analyzed for VOCs using Method TO-15. Slightly elevated levels of chlorinated VOCs were detected in sub-slab soil vapor.

Chlorinated VOCs were detected at lower levels than previous investigations in sub-slab soil vapor samples during the remedial investigation (2019). Indoor air samples were not collected during this investigation. The maximum concentrations of PCE, TCE, carbon tetrachloride, and 1,1,1-TCA in sub-slab soil vapor were detected in the mid-portion of the site at the respective concentrations of 1.75 ug/m3, 0.962 ug/m3, 5.85 ug/m3, and 9.82 ug/m3.

Due to VOC contamination in groundwater, additional sampling is needed to determine if there are any off-site impacts in soil vapor. This work will be performed as part of a separate off-site investigation program.

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.*

Direct contact with contaminants in the soil is unlikely because 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. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site buildings or occupancy. Environmental sampling indicates soil vapor intrusion from site contaminants or an off-site source may be 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 Multiple Cleanup Tracks with Site Cover and In-situ Solidification remedy.

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

The site remedy will be comprised of two cleanup tracks: a Track 2 cleanup for restricted residential use will be implemented on the eastern portion of the site, while a Track 4 cleanup for restricted residential use will be implemented on the western portion of the site. 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. Excavation

Pre-excavation of site soils to a depth of five feet below grade in the portion of the site subject to the in-situ solidification (ISS) treatment described in remedy element 3. Approximately 1,200 cubic yards of soil will be excavated. All soils which exceed either restricted residential or protection of groundwater soil cleanup objectives (SCOs) for contaminants present in groundwater will be disposed of off-site at a permitted facility.

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

3. In-situ solidification

In-situ solidification (ISS) will be implemented in the former metal plating drain area located in the northwestern portion of the site, as indicated on Figure 2. The treatment zone will extend from approximately 5 feet below grade to approximately 25 feet below grade in areas where elevated metals are present below the water table. 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 agents (typically Portland cement) or other binding agents using excavators. The soil and binding agents are mixed to produce a solidified mass resulting in a low permeability monolith. ISS will be subject to performance standards to ensure homogeneity of the solidified monolith. The solidified mass will then be covered with a cover system as described in remedy element 5 to prevent direct exposure to the solidified mass. The resulting solid matrix reduces or eliminates

mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

Groundwater Monitoring will be required down-gradient of the ISS treatment area. Monitoring will be conducted for contaminants of concern.

4. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the site. On-site soil, including pre-excavation soil, which does not exceed the restricted residential or protection of groundwater soil cleanup objectives SCOs for any constituent may be used to backfill the excavation or to establish the designed grades at the site below the cover system described in remedy element 5.

5. Cover System

A site cover currently exists over the western portion of the site and will be maintained to allow for restricted residential use of the site. Any site redevelopment will maintain the existing site cover over the western portion of the site. 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 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).

The site cover currently existing in the ISS treatment areas will be replaced following implementation of ISS treatment. Where the soil cover is required over the ISS treatment area, it will consist of a minimum of five feet of soil meeting the SCOs for restricted residential use, placed over a demarcation layer.

6. 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, commercial or industrial uses 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 NYCDOH; and
- require compliance with the Department approved Site Management Plan.

7. Site Management Plan

A Site Management Plan is required, which includes the following:

a) An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in remedy element 6 above.

Engineering Controls: The Cover System discussed in remedy element 5 above.

This plan includes, but may not be limited to:

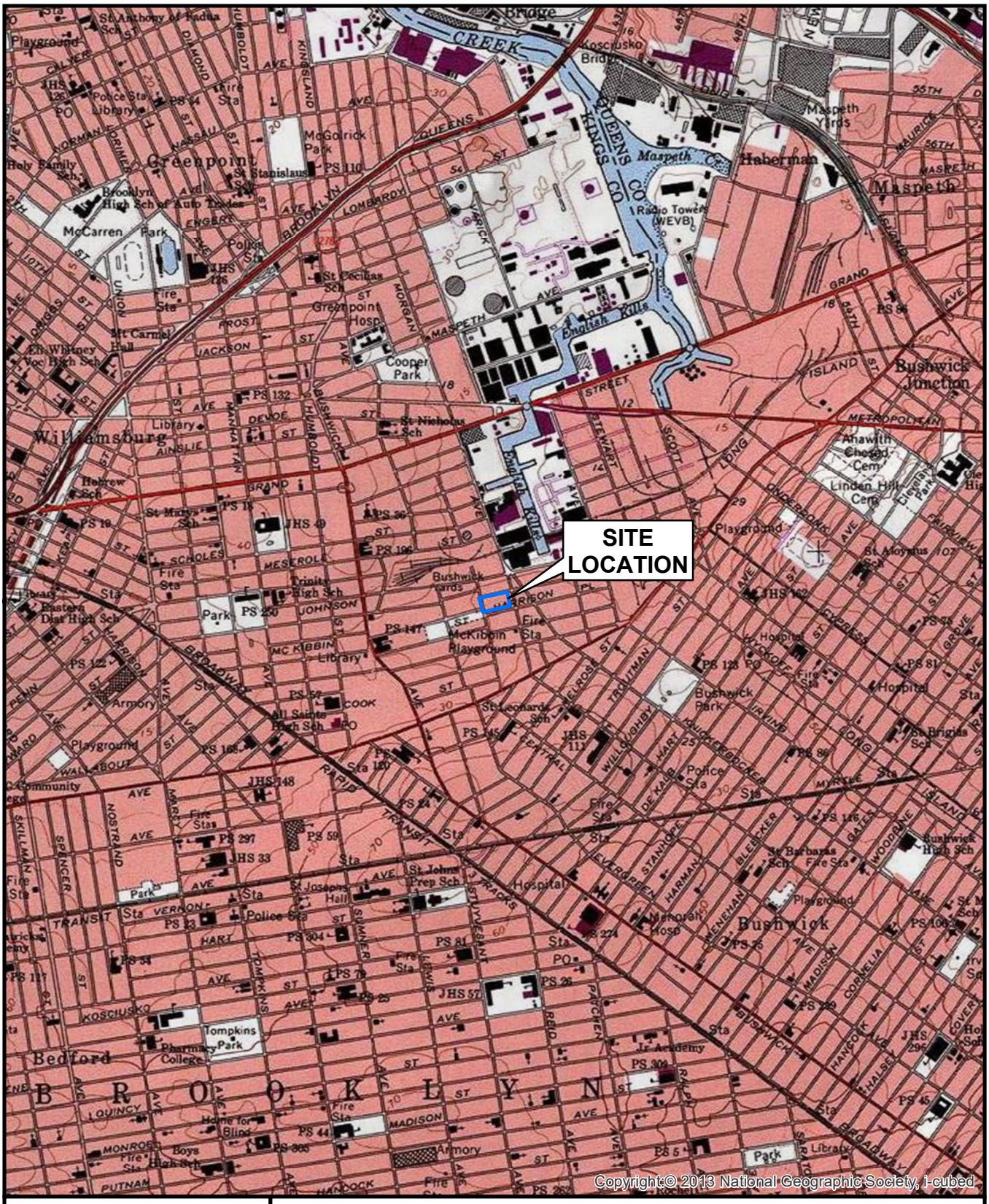
- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in remedy element 5 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:

- 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 developed 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, inspection, and reporting of any mechanical or physical components of the active vapor mitigation systems, if any. 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.



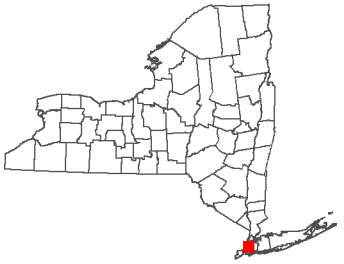


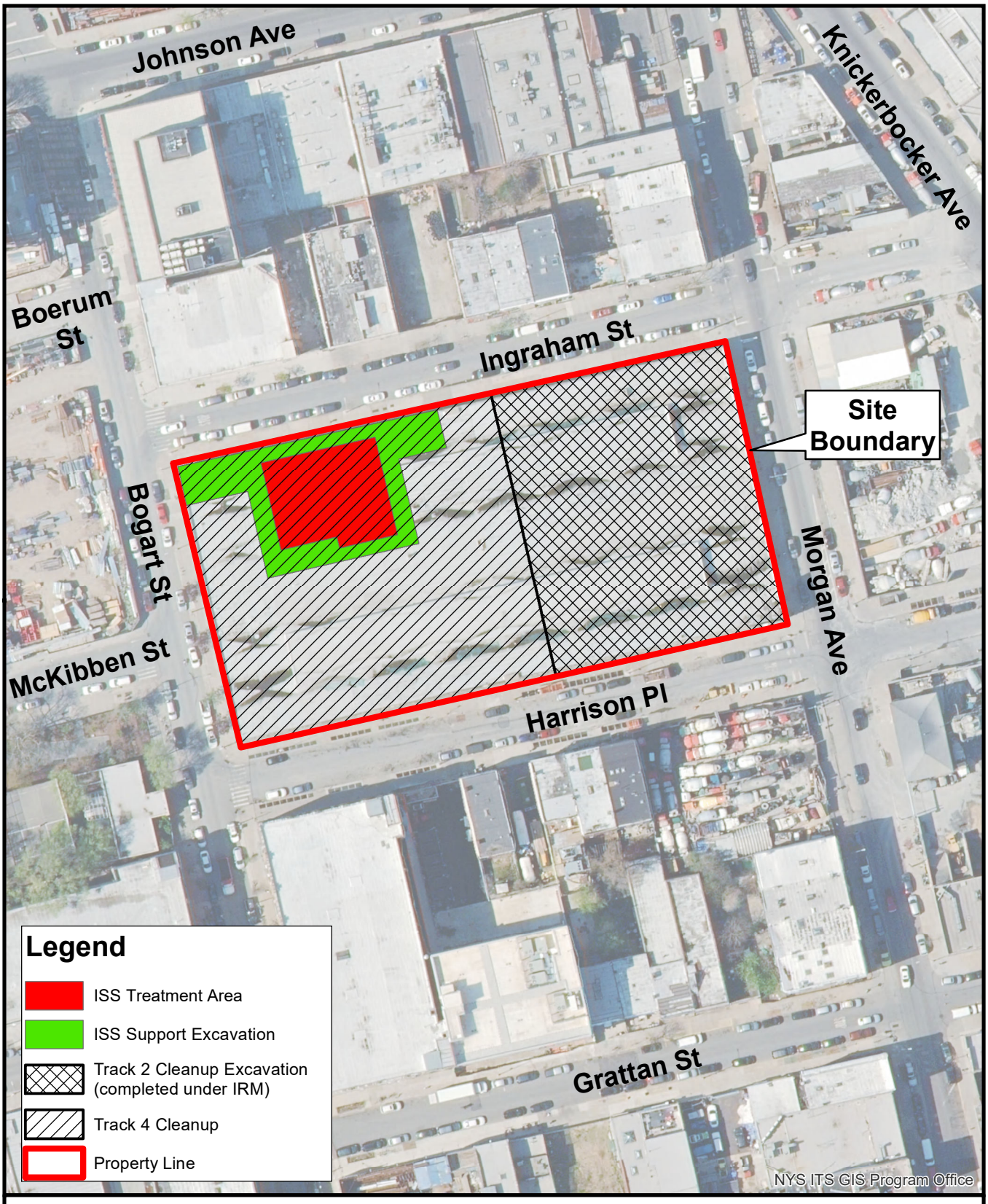
Figure 1

Site Location Map

2 Ingraham Street
East Williamsburg, Kings County
Site No. C224036

N
W E
S

0 1,000 2,000
Feet



N
W E
S

0 50 100
Feet

Figure 2

Selected Remedy Elements

2 Ingraham Street
East Williamsburg, Kings County
Site No. C224036

NEW YORK STATE OF OPPORTUNITY
Department of Environmental Conservation