DECISION DOCUMENT

37 Otsego Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224300
February 2024

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

DECLARATION STATEMENT - DECISION DOCUMENT

37 Otsego Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224300
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Statement of Purpose and Basis

This document presents the remedy for the 37 Otsego Street 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 37 Otsego Street 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), SiteWiseTM (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 building as well as slabs will be demolished and materials which cannot be beneficially reused on site will be taken off-site for proper disposal in order to implement the remedy.

All soils in the upper two feet which exceed the restricted-residential soil cleanup objectives (SCOs) will be excavated and transported off-site for disposal. Approximately 7,500 cubic yards of contaminated soil will be removed from the site. If found on the site, any underground storage tanks (USTs), fuel dispensers, underground piping or other structures will be excavated and properly disposed off-site.

Collection and analysis of documentation samples at the remedial excavation depth.

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.

Excavation of site soils to a depth of six feet below grade in the portion of the site subject to the in-situ solidification (ISS) treatment described in remedy element 5. Approximately 3,500 cubic yards of soil will be excavated to facilitate ISS implementation. All soils excavated as part of the ISS which exceed either RRSCOs or protection of groundwater SCOs for contaminants present in groundwater will be disposed at a permitted off-site facility.

3. Backfill

On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used to backfill the excavation or re-grade the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site.

4. Cover System

A site cover will be required in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs), to allow for future restricted residential use of the site. Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

Where the soil cover is required over the ISS treatment area, it will consist of a minimum of four feet of soil to ensure the underlying monolith remains below the frost line and protected from the freeze-thaw cycle. Consistent with the remainder of the site cover, the upper two feet will meet the SCOs for restricted residential use. 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.

5. In-Situ Solidification

In-situ solidification (ISS) will be implemented in the western portion of the site in an approximately 25,000 square foot area, to treat petroleum related volatile organic compounds (VOCs). The treatment zone will extend from 6 feet below ground surface (bgs) to approximately 28 feet bgs. An approximately 6-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 agents (typically Portland cement) or other binding agents using an excavator or augers. The soil and binding agents are mixed to produce a solidified mass resulting in a low permeability monolith. The solidified mass

will then be covered with a cover system as described in remedial element item 4 above 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. Prior to implementation of ISS treatment, a treatability study will be conducted to determine appropriate ISS design mix necessary to achieve ISS performance criteria.

6. Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan will be required.

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

7. Site Management Plan

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

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

- Institutional Controls: The Environmental Easement discussed in remedial element 6 above.
- Engineering Controls: The cover system discussed in remedial element 4 and the ISS discussed in remedial 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/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 in remedial element 4 above will be placed in any areas where the ISS monolith is present or in areas where the upper two feet of exposed surface soil exceed the applicable SCOs;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and NYSDEC notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to NYSDEC; and
- 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, if needed, to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
- maintaining site access controls and NYSDEC notification; and
- providing the NYSDEC 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.

February 14, 2024
Date

Scott Deyette, Director
Remedial Bureau B

DECISION DOCUMENT

37 Otsego Street
Brooklyn, Kings County
Site No. C224300
February 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=C224300

Brooklyn Community Board 6
250 Baltic Street
Brooklyn, NY 11201
Phone: (718) 643 3027

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 37 Otsego Street site is a 2.3-acre parcel located in the Red Hook neighborhood of Brooklyn. The site is bordered by Lorraine Street to the north, Columbia Street to the east, Creamer Street to the south and Otsego Street to the west. The greater surrounding area is mixed use industrial and residential, with some commercial uses.

Site Features: The site is currently improved with a large one-story brick and stucco building which occupies the eastern two thirds of the site and an asphalt parking lot which occupies the western one third of the site. The building is currently vacant.

Current Zoning and Land Use: The site is zoned R-6 (residential) with a C1-3 (commercial) overlay. The site was most recently used for retail commercial purposes.

Past Use of the Site: Prior to 1900, the site was undeveloped and surrounded by industrial development. As of 1904, the western portion of the site was occupied by "Philip H. Gill & Sons Machinists." Additional historic uses of the site from this time period include a machine shop, iron works, metal forging, and printing facility. The machine shop had the same footprint as the current parking lot. More recently, the northwest corner of the site may have been used as a gasoline service station and records show underground storage tanks (USTs) were historically present on the eastern portion of the Property. A spill (1509420) was reported in 2015. Under a Corrective Action Plan with NYSDEC's Spill program, remedial actions including ISCO (in-situ chemical oxidation) and hot spot excavation were implemented in the western portion of the site during 2017 and 2019, respectively.

Site Geology and Hydrogeology: Site soils encountered to approximately 15 feet below ground surface (bgs) generally consist of sandy fill materials including brick, concrete, glass, micaceous schist, plastic, coal slag, wood, and rock fragments. The site is relatively flat. Groundwater was encountered at depths ranging from 8 to 9 feet bgs. Groundwater flows to the southwest, towards the Erie Basin, located approximately 1,500 feet southwest of the site.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

NYSDEC may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives that restrict the use of the site to restricted-residential as described in Part 375-1.8(g) were evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicant under the Brownfield Cleanup Agreement is a Volunteer. The Applicant does not have an obligation to address off-site contamination. However, NYSDEC has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

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

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

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

6.1.2: RI Results

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

naphthalene	1,2,4-trimethylbenzene
benzo(a)anthracene	arsenic
benzo(b)fluoranthene	copper
benzo(a)pyrene	barium
chrysene	lead
indeno(1,2,3-cd)pyrene	mercury
benzene	tetrachloroethene (PCE)
ethylbenzene	trichloroethene (TCE)
xylenes	

The contaminants of concern exceed the applicable SCGs for:

- soil
- groundwater

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 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. Based upon the investigations conducted to date, the primary contaminants of concern for the site are petroleum related VOCs, SVOCs and metals in soil, and petroleum related VOCs in groundwater.

Soil - Soils samples were collected from subsurface soils throughout the site. Soil data for VOCs were compared to Restricted Residential Use Soil Cleanup Objectives (RRSCOs) and Protection of Groundwater Soil Cleanup Objectives (PGSCOs), as applicable. Petroleum-related VOCs were encountered in subsurface soil samples above PGSCOs on the western portion of the site at depths ranging from 8 to 18 feet bgs. Benzene (maximum concentration 0.93 parts per million (ppm), PGSCO is 0.06 ppm), 1,2,4-trimethylbenzene (maximum concentration 6 ppm, PGSCO is 3.6 ppm), ethylbenzene (maximum concentration 4.4 ppm, PGSCO is 1 ppm) and xylenes (maximum concentration 2.3 ppm, PGSCO is 1.6 pm) exceeded PGWSCOs but did not exceed RRSCOs. Naphthalene exceeded PGSCOs in six samples and RRSCOs in one sample (maximum concentration 230 ppm, RRSCO is 100 ppm, PGSCO is 12 ppm). Soils impacted by petroleum-related VOCs in subsurface soil also exhibited odors and staining.

Several SVOCs exceeded RRSCOs in site soil samples with the highest concentrations encountered from 7 to 9 feet bgs. These SVOCs include: benzo(a)anthracene at concentrations up to 18 ppm (RRSCO is 1 ppm), benzo(b)fluoranthene at concentrations up to 18 ppm (RRSCO is 1 ppm), benzo(a)pyrene at concentrations up to 16 ppm (RRSCO is 1 ppm), chrysene at concentrations up to 16 ppm (RRSCO is 3.9 ppm), and indeno(1,2,3-cd)pyrene at concentrations up to 9.4 ppm (RRSCO is 0.5 ppm).

Several metals also exceeded RRSCOs in site soil samples. These metals include arsenic at concentrations up to 155 ppm (RRSCO is 16 ppm), barium at concentrations up to 662 ppm (RRSCO is 400 ppm), copper at concentrations up to 974 ppm (RRSCO is 270 ppm), lead at concentrations up to 4,090 ppm (RRSCO is 400 ppm) and mercury at concentrations up to 43.3 ppm (RRSCO is 0.81 ppm).

PCBs, pesticides, and 1,4-dioxane were not detected in site soils above RRSCOs. The emerging contaminants perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were detected in site soils at concentrations of 0.895 ppb and 0.913 ppb respectively. The restricted residential guidance values for PFOA and PFOS are 33 and 44 parts per billion (ppb) respectively and the protection of groundwater guidance values for PFOA and PFOS are 0.8 ppb and 1.0 ppb respectively.

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

Groundwater - Several petroleum related VOCs were detected in groundwater over their respective ambient water quality standards and guidance values (AWQSGVs). These include 1,2,4-trimethylbenzene at concentrations up to 47 ppb (AWQSGV is 5 ppb), 1,2,4,5-trimethylbenzene at concentration up to 15 ppb (AWQSGV is 5 ppb), benzene at concentrations up to 22 ppb (AWQSGV is 1 ppb), ethylbenzene at concentrations up to 170 ppb (AWQSGV is 5 ppb), isopropylebenzene at concentrations up to 46 ppb (AWQSGV is 5 ppb), naphthalene at concentrations up to 3,600 ppb (AWQSGV is 10 ppb) and n-propylbenzene at concentrations up to 45 ppb (AWQSGV is 5 ppb).

SVOCs were detected in groundwater samples collected from the site at concentrations exceeding AWQSGVs including acenaphthene at 140 ppb (AWQSGV is 20 ppb), benzo(a)anthracene at 0.13 ppb (AWQSGV is 0.002 ppb), benzo(a)pyrene at 0.1 ppb (AWQS is 0.002 ppb), benzo(b)fluoranthene at 0.13 ppb (AWQSGV is 0.002 ppb), benzo(k)fluoranthene at 0.05 ppb (AWQSGV is 0.002 ppb), chrysene at 0.29 ppb (AWQSGV is 0.002 ppb) and indeno(1,2,3-cd)pyrene at 0.09 ppb (AWQSGV is 0.002 ppb). The presence of SVOCs in groundwater is likely due to entrained sediments in groundwater samples from the historic fill present on-site and not an on-site source of SVOCs to groundwater.

Metals were detected in filtered groundwater samples collected from the site at concentrations exceeding AWQSGVs including iron at concentrations up to 19,200 ppb (AWQSGV is 300 ppb), magnesium at concentrations up to 93,700 ppb (AWQSGV is 35,000 ppb), manganese at concentrations up to 1,938 ppb (AWQSGV is 300 ppb), nickel at concentrations up to 132 ppb (AWQSGV is 100 ppb), and sodium at concentrations up to 777,000 ppb (AWQSGV is 20,000 ppb). The presence of metals in groundwater is likely due to naturally occurring minerals or road salt applications.

No PCBs, pesticides and herbicides were detected in groundwater samples above AWQSGVs. 1,4-dioxane was not detected in groundwater samples collected from the site.

Perfluorooctanesulfonic acid (PFOS) was detected at concentrations up to 26.4 ppt (parts per trillion) which exceeds its AWQSGV guidance value of 2.7 ppt. Perfluorooctanoic Acid (PFOA) was detected at concentrations up to 147 ppt which also exceeds its AWQSGV guidance value of 6.7 ppt. PFOA and PFOS were found in most wells and the distribution of PFOA and PFOAS concentrations in groundwater are not indicative of an on-site source.

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

Soil Vapor - Several petroleum-related VOCs were detected in soil vapor samples including benzene (maximum concentration 7.12 micrograms per cubic meter, or ug/m3), ethylbenzene (maximum concentration of 13.7 ug/m3) and toluene (maximum concentration of 57.7 ug/m3). Chlorinated VOCs were also detected in soil vapor samples including tetrachloroethylene (PCE) at concentrations up to 8.14 ug/m3 and trichloroethylene (TCE) at concentrations up to 8.65 ug/m3.

6.4: Summary of Human Exposure Pathways

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

The site is fenced and covered by asphalt or building foundation and people will not come in contact with site-related soil and groundwater contamination unless they dig below the surface. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. The site is vacant, therefore the inhalation of site related contaminants due to soil vapor intrusion does not represent a current concern. The potential exists for the inhalation of site related contaminants due to soil vapor intrusion for any future on-site redevelopment and occupancy. Current environmental sampling indicates soil vapor intrusion is not a concern for off-site buildings.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 4: Restricted use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the Excavation, In-Situ- Solidification (ISS), and Site Cover remedy.

The elements of the selected remedy, as shown in Figure 2 through 4 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), SiteWiseTM (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 building as well as slabs will be demolished and materials which cannot be beneficially reused on site will be taken off-site for proper disposal in order to implement the remedy.

All soils in the upper two feet which exceed the restricted-residential soil cleanup objectives (SCOs) will be excavated and transported off-site for disposal. Approximately 7,500 cubic yards of contaminated soil will be removed from the site. If found on the site, any underground storage tanks (USTs), fuel dispensers, underground piping or other structures will be excavated and properly disposed off-site.

Collection and analysis of documentation samples at the remedial excavation depth.

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.

Excavation of site soils to a depth of six feet below grade in the portion of the site subject to the in-situ solidification (ISS) treatment described in remedy element 5. Approximately 3,500 cubic

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

3. Backfill

On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used to backfill the excavation or re-grade the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site.

4. Cover System

A site cover will be required in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs), to allow for future restricted residential use of the site. Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

Where the soil cover is required over the ISS treatment area, it will consist of a minimum of four feet of soil to ensure the underlying monolith remains below the frost line and protected from the freeze-thaw cycle. Consistent with the remainder of the site cover, the upper two feet will meet the SCOs for restricted residential use. 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.

5. In-Situ Solidification

In-situ solidification (ISS) will be implemented in the western portion of the site in an approximately 25,000 square foot area, to treat petroleum related volatile organic compounds (VOCs). The treatment zone will extend from 6 feet below ground surface (bgs) to approximately 28 feet bgs. An approximately 6-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 agents (typically Portland cement) or other binding agents using an excavator or augers. The soil and binding agents are mixed to produce a solidified mass resulting in a low permeability monolith. The solidified mass will then be covered with a cover system as described in remedial element item 4 above 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. Prior to implementation of ISS treatment, a treatability study will be conducted to determine appropriate ISS design mix necessary to achieve ISS performance criteria.

6. Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan will be required.

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

7. Site Management Plan

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

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

- Institutional Controls: The Environmental Easement discussed in remedial element 6 above.
- Engineering Controls: The cover system discussed in remedial element 4 and the ISS discussed in remedial element 5,

This plan includes, but may not be limited to:

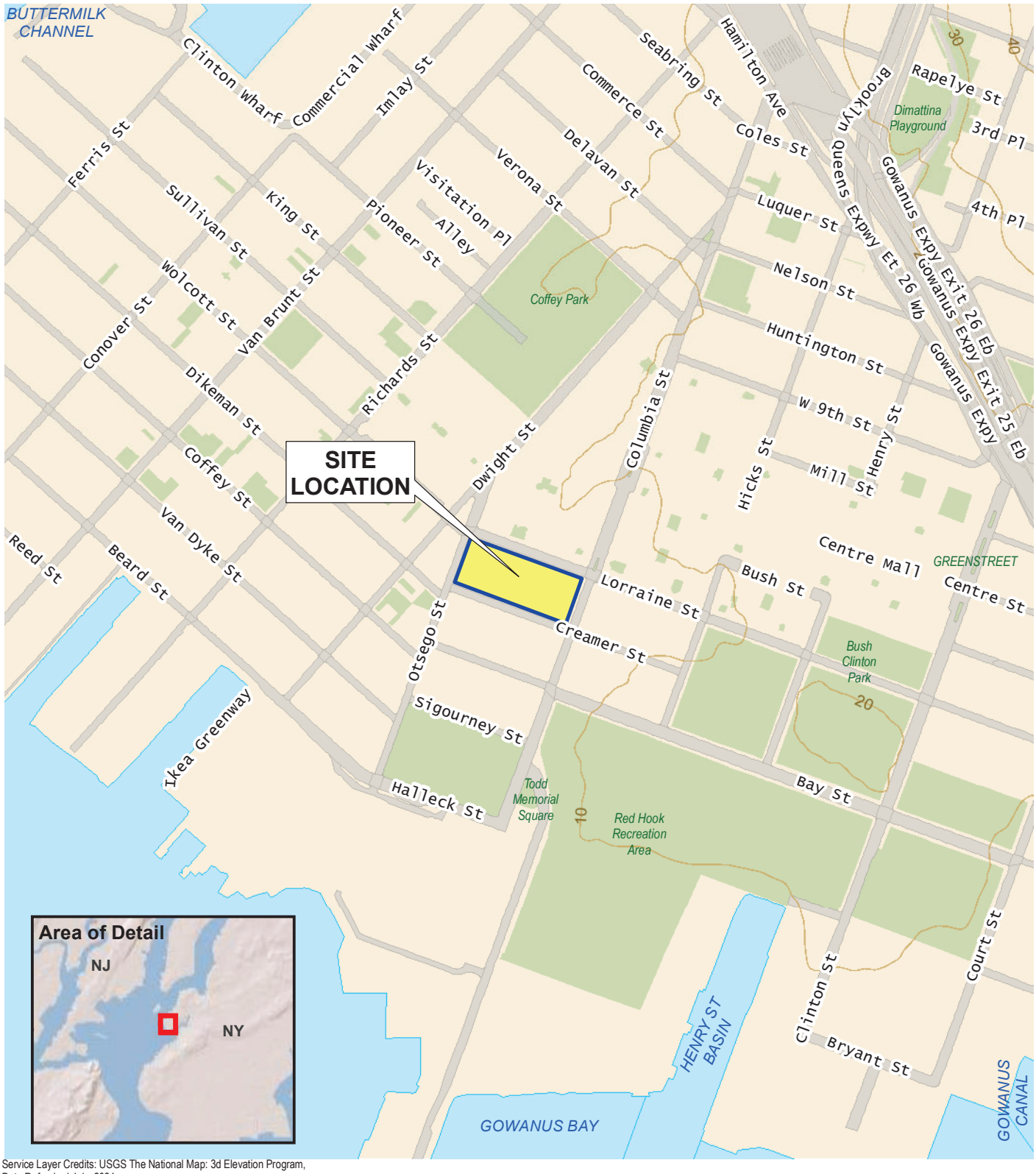
- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination.
- descriptions of the provisions of the environmental easement including any land use and/or groundwater use restrictions;
- a provision for evaluation of the potential for soil 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 in remedial element 4 above will be placed in

any areas where the ISS monolith is present or in areas where the upper two feet of exposed surface soil exceed the applicable SCOs;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and NYSDEC notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to NYSDEC; and
- 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, if needed, to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
- maintaining site access controls and NYSDEC notification; and
- providing the NYSDEC access to the site and O&M records.



Service Layer Credits: USGS The National Map: 3d Elevation Program, Data Refreshed July, 2021

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440 Park Avenue South, New York, NY 10016

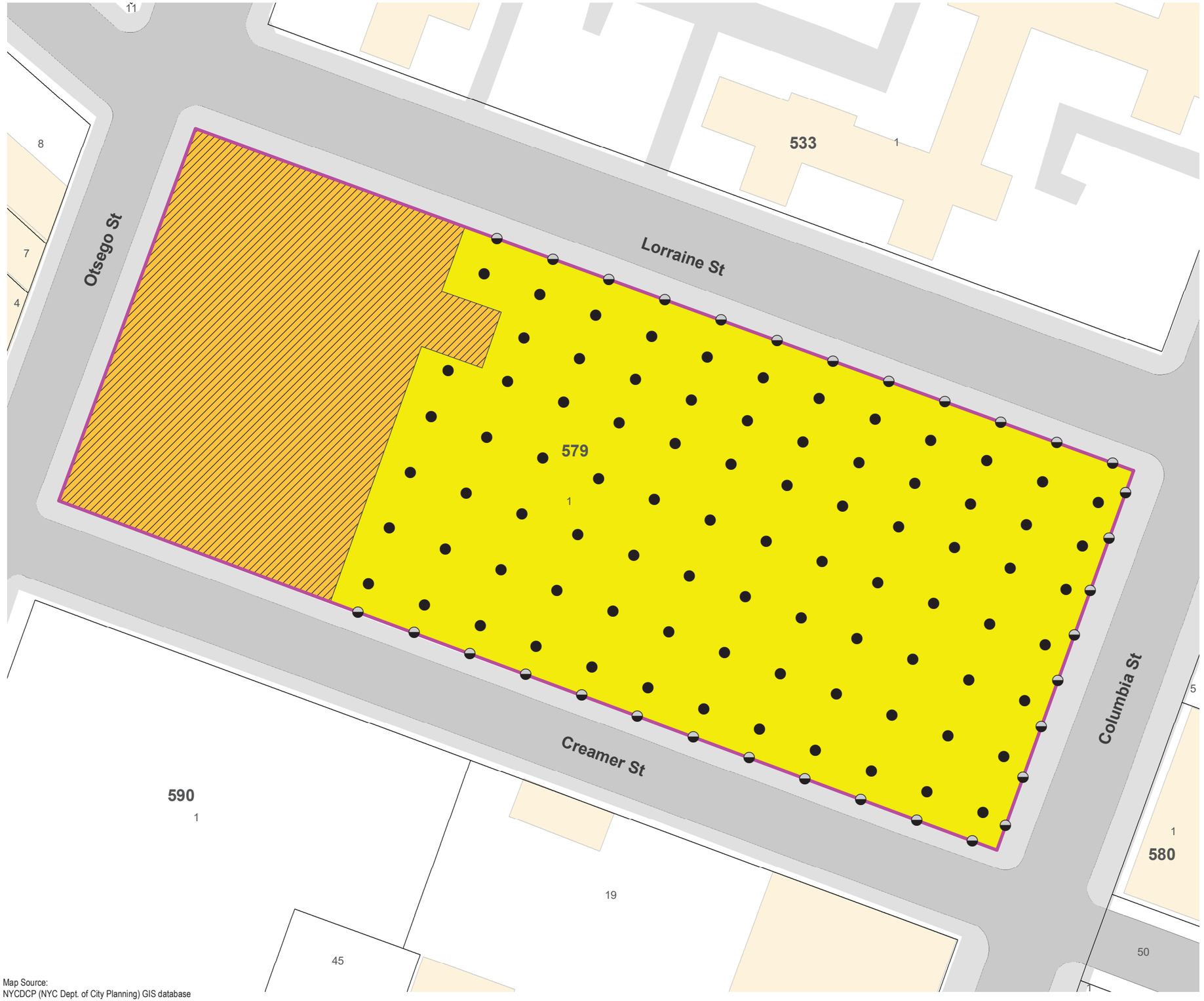
37 Otsego Street
Brooklyn, New York

BCP SITE LOCATION

DATE
5/18/2023

PROJECT NO.
230011

FIGURE
1



LEGEND

- BCP PROJECT SITE BOUNDARY
- 1 — LOT BOUNDARY AND TAX LOT NUMBER
- 579 — BLOCK NUMBER
- APPROXIMATE EXTENT OF IN-SITU SOLIDIFICATION (ISS) AREA
- REMEDIAL EXCAVATION TO APPROXIMATELY 2 FEET BELOW GRADE TO ACHIEVE A TRACK 4 CLEANUP
- REMEDIAL EXCAVATION TO 6 FEET BELOW GRADE FOR THE BENCH CUT REQUIRED AS PART OF THE IN-SITU SOLIDIFICATION (ISS) TREATMENT
- PROPOSED BOTTOM ENDPOINT SAMPLE LOCATION
- PROPOSED SIDEWALL ENDPOINT SAMPLE LOCATION

Note:
No excavation bottom or sidewall samples will be required in the ISS Treatment Area.

0 25 50 100
SCALE IN FEET

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

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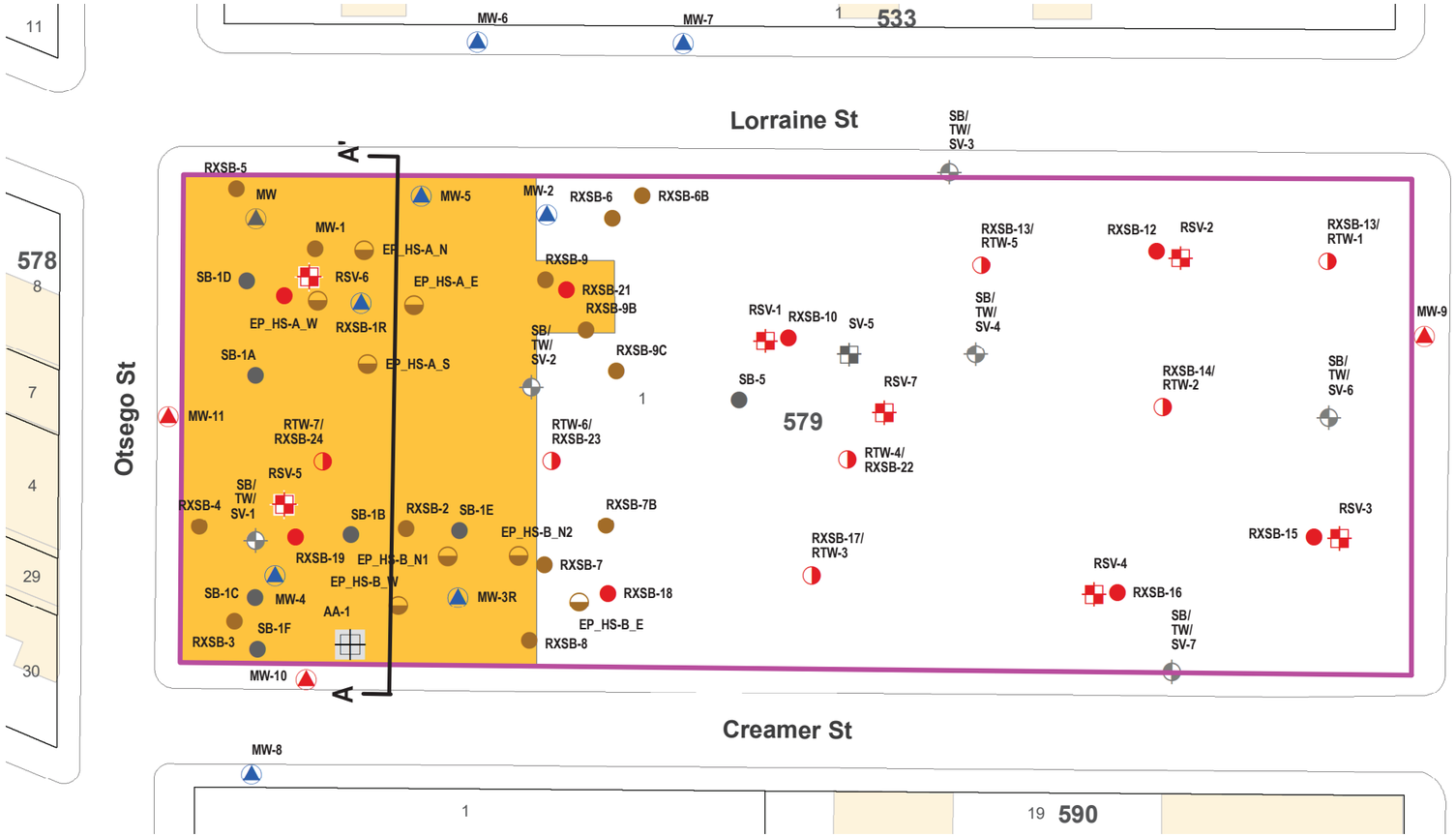
REMEDIAL EXCAVATION EXTENT AND ENDPOINT SAMPLING PLAN

DATE
5/30/2023

PROJECT NO.
230011

FIGURE
2

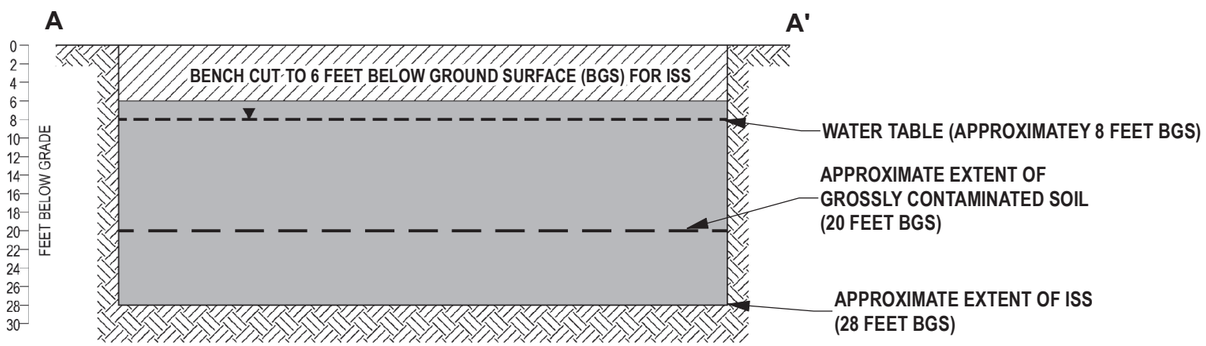


LEGEND

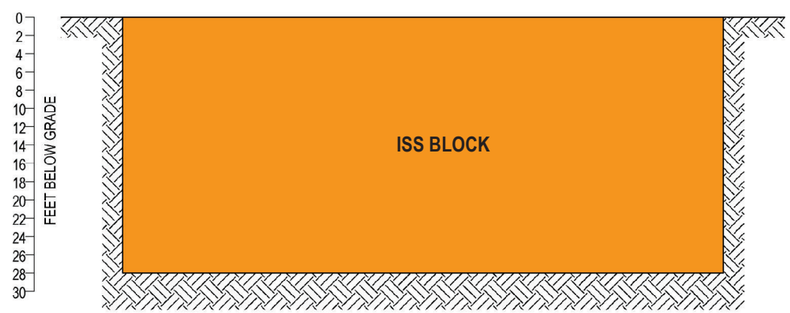
- BCP PROJECT SITE BOUNDARY
- 579 BLOCK NUMBER
- 1 LOT BOUNDARY AND TAX LOT NUMBER
- MONITORING WELL (AKRF)
- SOIL BORING (AKRF)
- SOIL BORING/TEMPORARY WELL/SOIL VAPOR POINT (AKRF)
- AMBIENT AIR (AKRF)
- SOIL VAPOR POINT (AKRF)
- MONITORING WELL (ROUX)
- SOIL BORING (ROUX)
- ENDPOINT SAMPLE (ROUX)
- SOIL BORING (ROUX)
- SOIL BORING/TEMPORARY WELL (ROUX)
- MONITORING WELL (ROUX)
- SOIL VAPOR POINT (ROUX)
- APPROXIMATE EXTENT OF IN-SITU SOLIDIFICATION (ISS) AREA

0 30 60 120

SCALE IN FEET



Cross Section Detail prior to ISS A-A'
not to scale



Cross Section Detail After ISS A-A'
not to scale

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

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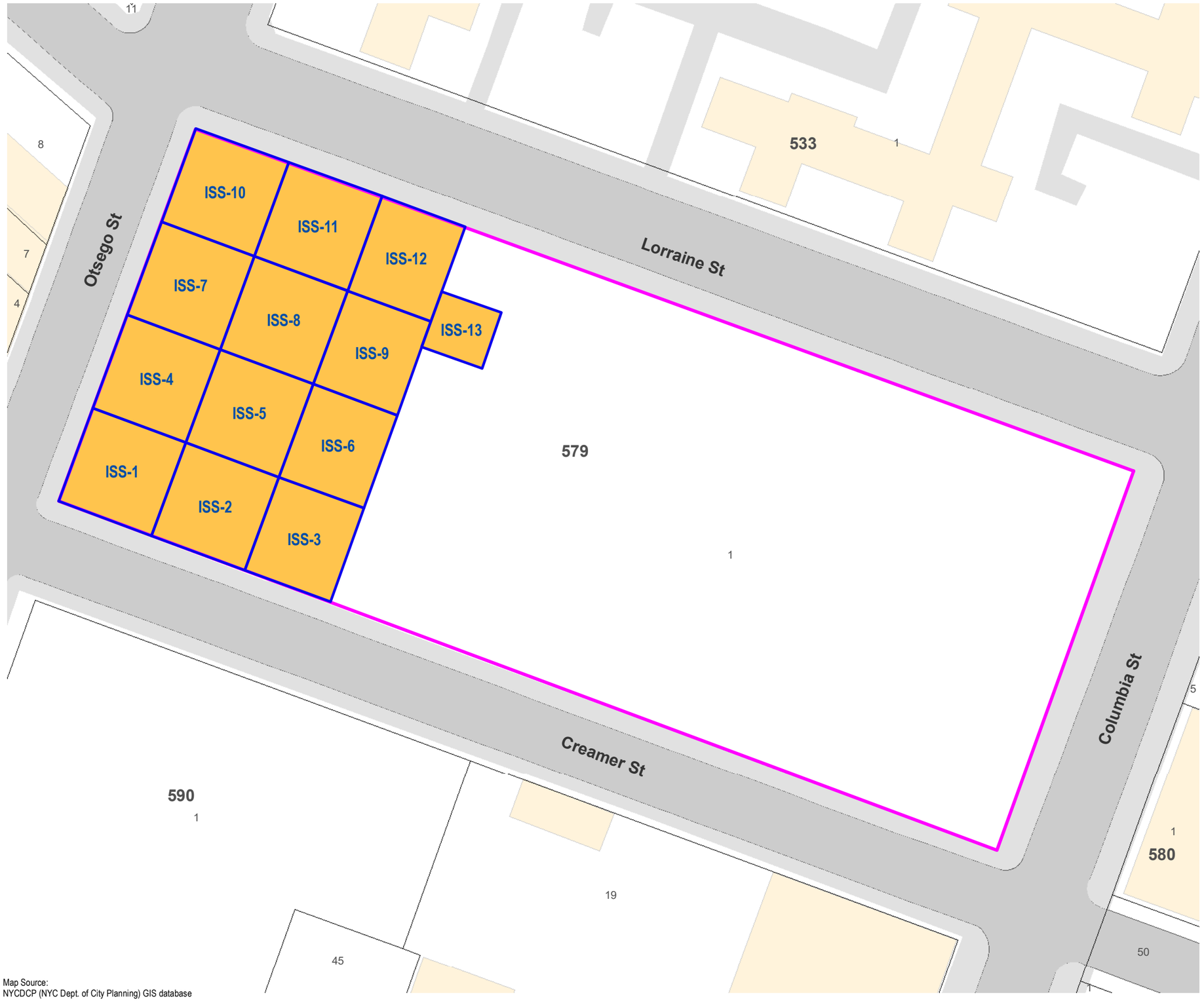
PROPOSED IN-SITU SOLIDIFICATION PLAN

DATE
5/30/2023

PROJECT NO.
230011

FIGURE
3



LEGEND

- BCP PROJECT SITE BOUNDARY
- 1 — LOT BOUNDARY AND TAX LOT NUMBER
- 579 — BLOCK NUMBER
- APPROXIMATE EXTENT OF IN-SITU SOLIDIFICATION (ISS) AREA
- EXISTING BUILDING
- ISS GRID

0 25 50 100

SCALE IN FEET

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

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ISS GRID MAP

DATE
8/25/2023

PROJECT NO.
230011

FIGURE
4