NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau B
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September 9, 2021

Mr. Emzon Shung
Red Hook Developers Holdings, LLC
1400 Broadway, Floor 15
New York, NY 10018-5300

Re: Red Hook Smith Street
Site ID No. C224163
Brooklyn, Kings County
Remedial Action Work Plan & Decision Document

Dear Mr. Emzon Shung:

The New York State Department of Environmental Conservation (Department) and the New York State Department of Health (NYSDOH) have reviewed the Remedial Action Work Plan (RAWP) for the Red Hook Smith Street site dated September 7, 2021 and prepared by Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. on behalf of the Red Hook Development Holding, LLC. The RAWP is hereby approved. Please ensure that a copy of the approved RAWP is placed in the document repository(ies). The draft plan should be removed.

Attached is a copy of the Department's Decision Document for the site. The remedy is to be implemented in accordance with this Decision Document. Please ensure that a copy of the Decision Document is placed in the document repository(ies).

Please contact the Department's Project Manager, Charles Post, at (518) 402-9793 or charles.post@dec.ny.gov at your earliest convenience to discuss next steps. Please recall the Department requires seven days notice prior to the start of field work.

Sincerely,

Gerard Burke
Director
Remedial Bureau B
Division of Environmental Remediation

Enclosure

ec *w/attachments*:

Michael Ryan, DER Division Director
Gerard Burke, DER Bureau B Director
Sarah Quandt, DER Bureau B Section Chief
Jane O'Connell, DER Regional Remediation Engineer (Region 2)
Charles Post, DER Bureau B Project Manager
Patrick Foster, Acting Regional Director and Regional Attorney (Region 2)
Cristine Vooris, NYSDOH Bureau Director
Scarlett McLaughlin, NYSDOH Section Chief
Stephanie Selmer, NYSDOH Project Manager
Emzon Shung
Jason Hayes, Langan
Michael Bogin, Sive, Paget & Riesel, P.C.
Matt Gokey, matthew.gokey@tax.ny.gov

DECISION DOCUMENT

Red Hook Smith Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224163
August 2021

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

DECLARATION STATEMENT - DECISION DOCUMENT

Red Hook Smith Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224163
August 2021

Statement of Purpose and Basis

This document presents the remedy for the Red Hook Smith 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 Red Hook Smith 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. Excavation

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

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil containing total SVOCs exceeding 500 ppm;
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

All soils in the upper foot which exceed the commercial SCOs will be excavated and transported off-site for disposal. Approximately 4,300 cubic yards of contaminated soil will be removed from the site.

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

3. Backfill

On-site soil which does not exceed the above excavation criteria may be used below the cover system described in remedy element 4 to backfill the excavation to the extent that a sufficient volume of on-site soil is available.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil from beneath the water table and to complete the remaining backfilling of the excavation.

4. Cover System

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

5. Coal Tar Recovery

Installation and operation of coal tar recovery wells along the Gowanus Canal to remove potentially mobile coal tar from the subsurface. The number, depth, type and spacing of the recovery wells will be determined during the design phase of the remedy. 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.

6. Sealed-Seam Sheet Pile Cutoff Wall

A subsurface vertical containment wall will be installed along the north and west sides of the site. The wall will be constructed of steel sheet pile with sealable joints and keyed into the low-permeability till unit found between 10 and 14 feet below the ground surface. The design depth of the containment wall is 17 feet below the existing grade. This wall will be tied into the existing steel sheet pile bulkhead located along the east and south sides of the site along the Gowanus Canal as part of the interim remedial measure (IRM) discussed in Section 6.2. Once completed, the vertical containment wall will fully enclose the site perimeter.

7. Institutional Control

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

- require the remedial party or site owner to complete and submit to the 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 commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH; and
- require compliance with the Department approved Site Management Plan.

8. Site Management Plan

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

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

  - Institutional Controls: The Environmental Easement discussed in Paragraph 7 above.
  - Engineering Controls: The cover system discussed in Paragraph 4 above, the coal tar recovery in Paragraph 5, and the sealed-seam sheet pile cutoff wall discussed in Paragraph 6 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 future 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 Paragraph 4 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
- 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 coal tar recovery to assess the performance and effectiveness of the remedy;
- schedule of monitoring and frequency of submittals to the Department; and
- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

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:
- a Coal Tar Recovery Plan which details the methods and frequency of recovering coal tar from the wells along the cutoff wall;
- 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.

September 9, 2021

Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

Red Hook Smith Street
Brooklyn, Kings County
Site No. C224163
August 2021

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 repository:

DECInfo Locator – Web Application
https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C224163

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

Brooklyn Public Library

10 Grand Army Plaza
Brooklyn, NY 11238
Phone: (718) 230-2100

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 1.96-acre site is located in an urban area of Brooklyn. The site is bounded by Smith Street to the west, the Gowanus Canal to the east and south, and an industrial property to the north.

Site Features: Two tax parcels comprise the site: Block 493, Lot 1 and Block 495, Lot 1. The site includes approximately 750-linear feet of waterfront along the Gowanus Canal at the mouth of the Gowanus Bay. The site was formerly developed with a one-story warehouse that was demolished in 2018, leaving the site vacant with asphalt and concrete surfaces.

Current Zoning and Land Use(s): The site is zoned M-3, heavy manufacturing which also allows certain retail and commercial uses.

Past Use of the Site: Barrett Manufacturing occupied Block 493 (northern area of the site) circa 1900 to 1940 and utilized nine coal tar storage tanks as part of their production of coal tar and roofing material. The facility also extended to the west of the site (hydraulically up-gradient). After Barrett Manufacturing sold the property in the 1950s, two gasoline underground storage tanks (USTs) were installed on the property. Various manufacturing and storage companies occupied Block 495 (southern part of the site) including: an ice company in the early 1900s; a dock and seaboard storage company from approximately 1930 to 1950; and a cargo line and storage company from the late 1960s to the 1990s.

Site Geology and Hydrogeology: Site topography is relatively flat, gently sloping downward to the east-southeast towards the Gowanus Canal. The site is underlain by historic urban fill that extends to approximately 12 feet below grade surface (bgs). The historic fill generally consisted of sand, silt, clay, gravel, cobbles, with wood and brick fragments, cinder, and ash. A native clay lens containing some organic material was identified at varying depths (12 to 14 feet bgs). Native fine sand and silt were identified beneath the clay to a depth of 50-feet bgs. Bedrock was not encountered during this investigation. The depth to groundwater is approximately five feet below the ground surface and flows to the east-southeast towards the Gowanus Canal.

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 commercial use (which allows for industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

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

SECTION 5: ENFORCEMENT STATUS

The Applicant 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.

The off-site contamination is located in the Gowanus Canal, which is being remediated by responsible parties with oversight by the United State Environmental Protection Agency (EPA) as part of the Gowanus Canal Superfund site. Therefore, enforcement actions are not 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. 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:

coal tar
coal tar pitch volatiles
creosote
benzene
toluene
xylene (mixed)
naphthalene
lead
tetrachloroethene (PCE)

The contaminant(s) 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.

The following IRMs has been completed at this site based on conditions observed during the RI.

Bulkhead Cutoff Wall along the Gowanus Canal

An IRM is currently being constructed to address potential future migration of coal tar and other site-related contaminants of concern into the Gowanus Canal via cutoff and containment. The Department-approved IRM includes:

- The installation of a new, sealed-seam, steel sheet pile cutoff wall along the site's entire waterfront along the Gowanus Canal (approximately 750 linear feet). The cutoff wall is being driven down to approximately 66 feet below ground surface;
- Excavation and off-site disposal of soil generated during construction of the new, sealed-seam, steel sheet pile cutoff wall; and
- Backfilling excavated areas, as necessary, to site grade using clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d).

The IRM will be completed and 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 samples were also analyzed for per- and polyfluoroalkyl substances (PFAS). Soil vapor was analyzed for VOCs. The primary contaminants of concern are coal tar in soil and floating on the groundwater, SVOCs (total) and naphthalene in soil and naphthalene in groundwater.

Soil:
The primary soil contamination concern is the presence of coal tar and tar-like material across the site and to a maximum depth of 48 feet below ground surface (bgs). Grossly-impacted soils were observed in a soil boring, in both historic fill from 10-12 feet bgs and native material from 30 to 48 feet bgs, as well as a monitoring well boring from 6 to 27 feet bgs. In addition to the coal tar, SVOCs were detected to a depth of 5 to 6 feet bgs at levels exceeding commercial use soil cleanup objectives (CSCOs) and/or protection of groundwater soil cleanup objectives (PGWSCOs), where applicable, including: total SVOCs up to 18,518 parts per million (ppm), naphthalene up to 7,500 ppm (CSCO 500 ppm and PGWSCO 12 ppm), benzo(a)anthracene up to 31 ppb (CSCO 5.6 ppm), benzo(a)pyrene up to 74 ppm (CSCO 1 ppm), benzo(b)fluoranthene up to 71 ppm (CSCO 5.6 ppm and PGWSCO 1.7 ppm), and indeno(1,2,3-cd)pyrene up to 32 ppm (CSCO 5.6 ppm and PGWSCO 8.2 ppm).

One VOC, 1,2,4-trimethylbenzene, was detected in two locations at 210 ppm and 270 ppm, above its CSCO of 190 ppm.

Metals were detected at levels exceeding CSCOs to a depth of 6 feet bgs as follows: lead up to 15,000 ppm (CSCO 1,000 ppm) and copper up to 2,600 ppm (CSCO 270 ppm).

No PCBs or pesticides were detected in soil above CSCOs.

Site-related soil impacts may be migrating off-site.

Groundwater:
Coal tar was encountered beginning near the ground surface and extending well into groundwater, located at approximately 5 feet bgs, to a maximum depth of 47 feet bgs. VOCs detected above Class GA Ambient Water Quality Standard (AWQS) include: benzene up to 550 parts per billion (ppb) (AWQS is 1 ppb), ethylbenzene up to 1,400 ppb (AWQS is 5 ppb), toluene up to 1,500 ppb (AWQS is 5 ppb), total xylene up to 3,200 ppb (AWQS is 5 ppb), and 1,2,4-trimentylbenzene up to 41 ppb (AWQS 5 ppb)..

The following SVOCs were detected above AWQS: naphthalene up to 13,000 ppb (AWQS is 10 ppb), phenol up to 200 ppb (AWQS is 1 ppb), acenaphthene up to 500 ppb (AWQS is 20 ppb), 2,4-dimethylphenol up to 1,100 ppb (AWQS is 50 ppb), anthracene up to 82 ppb (AWQS is 50 ppb), benzo(b)fluoranthene up to 0.3 ppb (AWQS is 0.002 ppb), benzo(k)fluoranthene up to 0.17 ppb (AWQS is 0.002 ppb), bis(2-ethylhexyl)phthalate up to 7.2 ppb (AWQS is 5 ppb), chrysene up to 0.28 ppb (AWQS is 0.002 ppb), fluorene up to 260 ppb (AWQS is 50 ppb), indeno(1,2,3-cd) up to 0.17 ppb (AWQS is 0.002 ppb), and phenanthrene up to 190 ppb (AWQS is 50 ppb).

For PFAS, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were reported at concentrations up to 126 parts per trillion (ppt) and 41.4 ppt, respectively, exceeding the Maximum Contaminant Level (MCL) (drinking water standard) of 10 ppt each in groundwater. There are no public water supply wells within a half a mile and there is a municipal prohibition for use of groundwater at the site.

PCBs, metals, and pesticides were not detected above AWQS in site groundwater.

Site-related groundwater impacts may be migrating off-site.

Soil Vapor:
Fifteen soil vapor samples were collected from approximately two feet bgs and analyzed for VOCs. Results detected benzene, toluene, ethylbenzene and xylene (BTEX) a across the site up to 1,304 micrograms per cubic meter ($\mu g/m^3$). The chlorinated VOC tetrachloroethene (PCE) was also detected up to 59.2 $\mu g/m^3$ but is not thought to be site related since PCE was not detected above standards in soil or groundwater at the site.

The data do 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.*

Direct contact with contaminated soil is unlikely because the site is completely fenced, which restricts public access, and is covered by concrete. 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 inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern because there are no buildings on-site, however the potential for indoor air impacts via the soil vapor intrusion pathway exists for any future occupied buildings. Sampling indicates soil vapor intrusion is not a concern for off-site structures.

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.

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 Track 4: Restricted use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the Excavation, Coal Tar Recovery, Sealed-Seam Cutoff Wall, and Cover System 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. Excavation

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

- grossly contaminated soil, to 1 foot below the observed groundwater table (between 4 and 6 feet below ground surface), as defined in 6 NYCRR Part 375-1.2(u);
- soil containing total SVOCs exceeding 500 ppm;
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

All soils in the upper foot which exceed the commercial SCOs will be excavated and transported off-site for disposal. Approximately 4,300 cubic yards of contaminated soil will be removed from the site.

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

3. Backfill

On-site soil which does not exceed the above excavation criteria may be used below the cover system described in remedy element 4 to backfill the excavation to the extent that a sufficient volume of on-site soil is available.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil from beneath the water table and to complete the remaining backfilling of the excavation.

4. Cover System

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

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6. Sealed-Seam Sheet Pile Cutoff Wall

A subsurface vertical containment wall will be installed along the north and west sides of the site. The wall will be constructed of steel sheet pile with sealable joints and keyed into the low-permeability till unit found between 10 and 14 feet below the ground surface. The design depth of the containment wall is 17 feet below the existing grade. This wall will be tied into the existing steel sheet pile bulkhead located along the east and south sides of the site along the Gowanus Canal as part of the interim remedial measure (IRM) discussed in Section 6.2. Once completed, the vertical containment wall will fully enclose the site perimeter.

7. Institutional Control

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

- require the remedial party or site owner to complete and submit to the 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 commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH; and
- require compliance with the Department approved Site Management Plan.

8. Site Management Plan

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

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

   – Institutional Controls: The Environmental Easement discussed in Paragraph 7 above.
   – Engineering Controls: The cover system discussed in Paragraph 4 above, the coal tar recovery in Paragraph 5, and the sealed-seam sheet pile cutoff wall discussed in Paragraph 6 above.

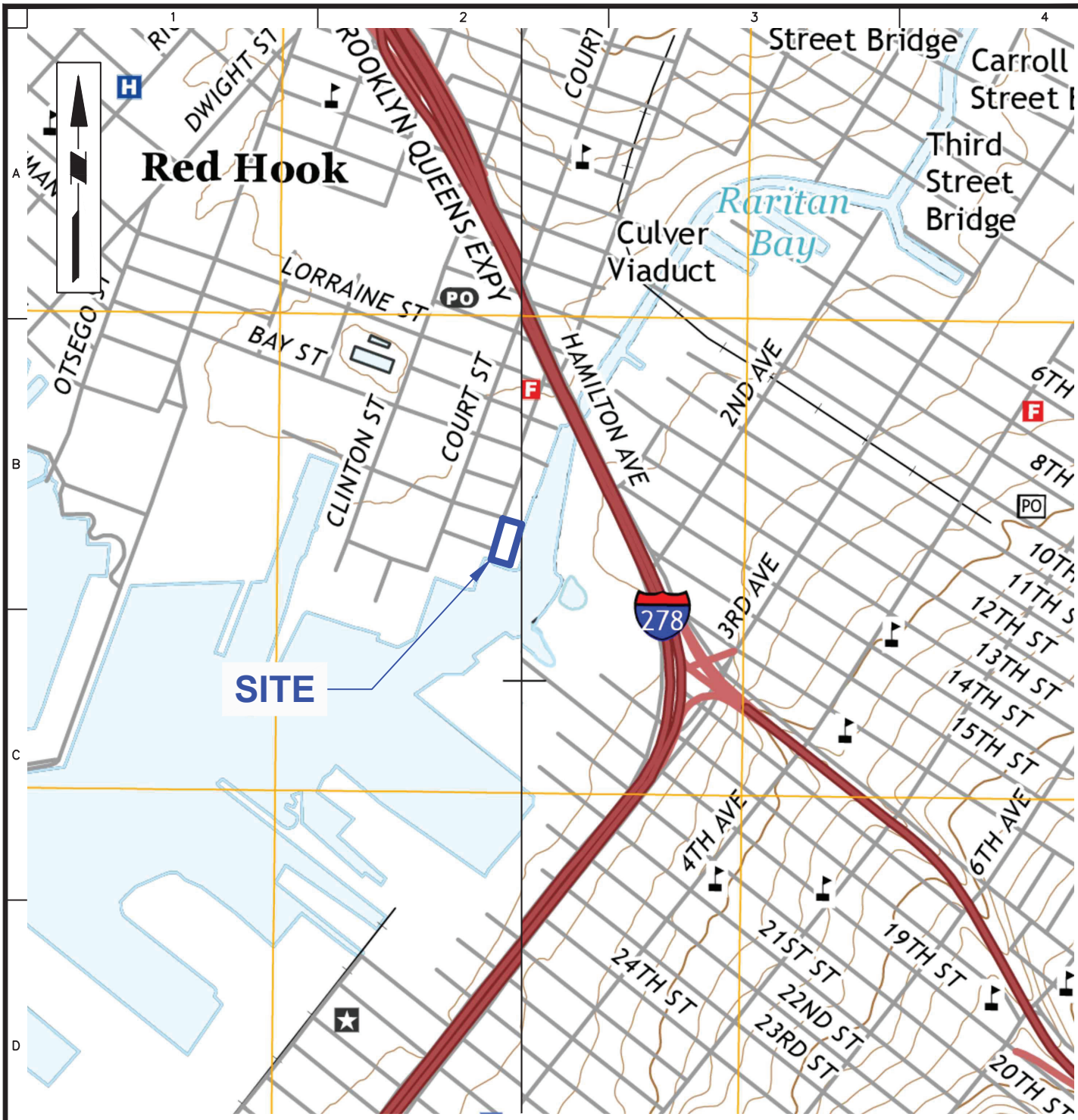
This plan includes, but may not be limited to:

- 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 future 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 Paragraph 4 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
- 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 coal tar recovery to assess the performance and effectiveness of the remedy;
   - schedule of monitoring and frequency of submittals to the Department; and
   - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

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:
   - a Coal Tar Recovery Plan which details the methods and frequency of recovering coal tar from the wells along the cutoff wall;
   - 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.



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NOTES:
1. BASEMAP REFERENCED FROM UNITED STATED GEOLOGICAL SURVEY 7.5-MINUTE SERIES JERSEY CITY AND BROOKLYN QUADRANGLES, DATED NOVEMBER 2016.
2. SITE BOUNDARY IS APPROXIMATE.

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

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Project
627-661 SMITH STREET
BLOCK No. 493, LOT No. 1
BLOCK No. 495, LOT No. 1
KINGS COUNTY NEW YORK

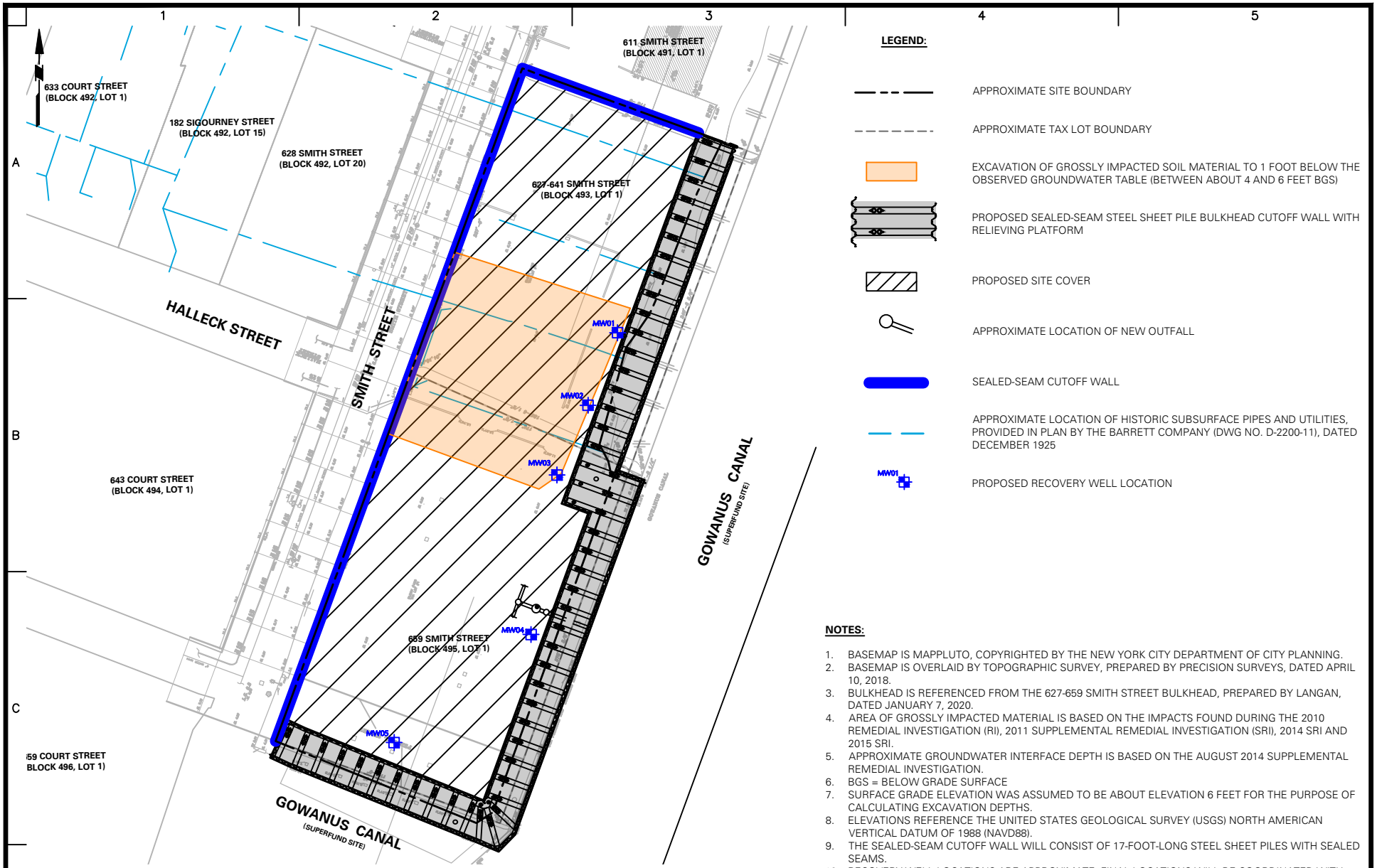
Figure Title
SITE LOCATION PLAN

Project No.	170063001
Date	10/19/2018
Drawn By	NEK
Checked By	ELS

Figure No. 1

Sheet 1 of 11

Filename: \\Langan.com\data\NYC\data0\170063001\Cadd Data - 170063001\Dwg\2018 - RAWP\Figure 1 - Site Location Map.dwg Date: 12/4/2018 Time: 19:13 User: nkung Style Table: Langan.stb Layout: ANSIA-BP



NOTES:

1. BASEMAP IS MAPPLUTO, COPYRIGHTED BY THE NEW YORK CITY DEPARTMENT OF CITY PLANNING.
2. BASEMAP IS OVERLAID BY TOPOGRAPHIC SURVEY, PREPARED BY PRECISION SURVEYS, DATED APRIL 10, 2018.
3. BULKHEAD IS REFERENCED FROM THE 627-659 SMITH STREET BULKHEAD, PREPARED BY LANGAN, DATED JANUARY 7, 2020.
4. AREA OF GROSSLY IMPACTED MATERIAL IS BASED ON THE IMPACTS FOUND DURING THE 2010 REMEDIAL INVESTIGATION (RI), 2011 SUPPLEMENTAL REMEDIAL INVESTIGATION (SRI), 2014 SRI AND 2015 SRI.
5. APPROXIMATE GROUNDWATER INTERFACE DEPTH IS BASED ON THE AUGUST 2014 SUPPLEMENTAL REMEDIAL INVESTIGATION.
6. BGS = BELOW GRADE SURFACE
7. SURFACE GRADE ELEVATION WAS ASSUMED TO BE ABOUT ELEVATION 6 FEET FOR THE PURPOSE OF CALCULATING EXCAVATION DEPTHS.
8. ELEVATIONS REFERENCE THE UNITED STATES GEOLOGICAL SURVEY (USGS) NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
9. THE SEALED-SEAM CUTOFF WALL WILL CONSIST OF 17-FOOT-LONG STEEL SHEET PILES WITH SEALED SEAMS.
10. RECOVERY WELL LOCATIONS ARE APPROXIMATE. FINAL LOCATIONS WILL BE COORDINATED WITH NYSDEC PRIOR TO INSTALLATION.

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Project

627-661 SMITH STREET

BLOCK No. 493, LOT No. 1
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KINGS COUNTY NEW YORK

Figure Title

ALTERNATIVE III - TRACK 4 CLEANUP SOURCE REMOVAL, SEALED-SEAM CUTOFF WALL, AND SITE COVER

Project No.	170063001
Date	07/26/2021
Drawn By	JC
Checked By	ELS

Figure No. 2

Sheet 2 of 2

Filename: \\Langan.com\data\NYC\data0\170063001\Cadd Data - 170063001\Dwg\2021 - DD Figures (DEC Request)\Figure 2 - Alternative III - Track 4 Cleanup.dwg Date: 8/3/2021 Time: 17:25 User: nkung Style Table: Langan.stb Layout: ANSIA-BL