RECORD OF DECISION

K - Fulton Works
Operable Unit Number 01: Plant Site and Near Off-site
Brooklyn, Kings County
Site No. 224051
July 2015

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

DECLARATION STATEMENT - RECORD OF DECISION

K - Fulton Works
Operable Unit Number: 01
Brooklyn, Kings County
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Statement of Purpose and Basis

This document presents the remedy for Operable Unit Number: 01: Plant Site and Near Off-site of the K - Fulton Works site, a Class 2 inactive hazardous waste disposal 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, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for Operable Unit Number: 01 of the K - Fulton Works site and the public's input to the proposed remedy presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

The elements of the selected remedy are as follows:

Due to the presence of active commercial buildings and the Thomas Greene Park on the site, the planned remediation of the Gowanus Canal by the USEPA, and with only limited potential for public health exposures on the parcels to be addressed, the proposed remedy identifies both near term and future actions. Both near term and future actions will require voluntary agreements between the Volunteer and respective property owners for site access and any other pertinent provisions to enable the installation and maintenance of cover systems, management of residual contamination, excavation, inspections, sampling, and/or any other requisite activities.

The near-term actions are intended to address the environmental impact of the discharge of contaminants to the Gowanus Canal to allow the ongoing USEPA project to proceed and avoid re-contamination of remediated sediments, and to address a current potential exposure to utility workers, in addition to collecting mobile tar in the subsurface and overall management of the site. It should be noted that the coal tar present at depths greater than 25 feet under Parcel VIII is not directly addressed by this remedy, but will be addressed as OU2 of the Fulton site. Shallow tar impacts near the walls of the canal will be dealt with by the USEPA remedy pursuant to their September 2013 ROD. The basis for this approach is discussed in more detail in Exhibit D. Accordingly, the remedial elements are described below as near-term and long-term actions, to

be implemented in distinct stages as access becomes available.

Near-Term Actions

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; and
•Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Containment:

A subsurface barrier wall will be installed along the east bank of the Gowanus Canal to prevent the migration of coal tar to the canal from Parcels I, II, III, IV, VI and VII. The wall will be constructed from the north end of the canal to approximately Sackett Street, and will extend to a sufficient depth, currently estimated to be 50 feet, to prevent further movement of coal tar into the canal. Short sections of wing walls leading inland from the canal bank may be necessary to prevent contaminant migration from moving around the ends of the wall. In addition to providing a barrier to contaminant migration, the barrier wall will be designed with sufficient strength to ensure bank stability during the upcoming dredging of the canal. The barrier wall will also include measures such as the sealing of utility penetrations of the wall to prevent tar migration along utilities, such as storm sewers or other piping which cannot be abandoned, to eliminate provide these penetrations as a pathway for tar migration into the canal. The final wall depth and configuration, including the need for hydraulic relief and associated treatment, will be determined during the design of this project. This portion of the remedial work will be designed and constructed as a first priority to minimize any delay in the implementation of the USEPA dredging project.

3. Coal Tar Recovery:

A series of coal tar recovery wells, or other system of collection, will be constructed behind the

barrier wall to collect coal tar that accumulates behind the wall. These wells will be designed with sumps to accumulate coal tar passively, without continuous pumping. 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 can be converted to automated collection.

Coal tar collection wells will also be constructed in upland areas where mobile coal tar is identified by the Department in the subsurface. Initially, the construction of these collection wells will be focused on the area near the intersection of Nevins and DeGraw Streets. These wells will be installed in public rights of way to the extent possible and will be constructed with sumps to allow passive accumulation of coal tar for periodic collection. All collected tar will be sent off-site for treatment and/or disposal.

4. Utility Corridors:

The potential for coal tar migration into utility corridors within the area at the intersection of Nevins and DeGraw Streets will be assessed during the remedial design. Based on the results of this evaluation, a remedial action plan will be developed to address identified impacts to shallow utility corridors (i.e., water and gas mains or other subsurface infrastructure). Coal tar impacts to the deeper sewer lines in this area will be addressed during any future major sewer modification work.

5. Cover System:

A site cover currently exists and will be maintained to allow for restricted residential use (which includes active recreational use) of Parcel II (Thomas Greene Park), and commercial/industrial use of the remainder of the site and Parcel VI. Any site redevelopment will maintain or re-establish a site cover, which may consist either of the structures such as the buildings, pavement, and sidewalks comprising the site development.

Where a soil cover is required on Parcel II it will include a minimum of two feet of soil meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. Where a soil cover is required on the rest of the site (Parcels I, III and IV) and Parcel VI, it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

6. Institutional Controls:

Imposition of institutional controls in the form of environmental easements, subject to agreements with property owners, for the controlled properties, consisting of Parcels I, II, III, and IV, that:

- 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 Parcel II for restricted residential, commercial and industrial uses as defined by Part 375-1.8(g), and the remaining parcels that comprise the site for commercial and 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 NYC DOH;
- require compliance with the Department-approved Site Management Plan.

7. Site Management Plan

A Site Management Plan, subject to agreements with property owners of Parcels I, II, III, IV, VI, and VII, 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 are effective:

Institutional Controls:

- The environmental easements discussed in Paragraph 6 above;

Engineering Controls:

- The barrier wall discussed in paragraph 2 above;
- The coal tar recovery system discussed in paragraph 3 above;
- The cover system discussed in paragraph 5 above; and
- The solidified soils discussed in paragraph 8 below.

An Interim Site Management Plan (ISMP) will be required to manage site activities until the final SMP is approved. The ISMP and SMP include, but may not be limited to:

- an Excavation Plan which details the provisions for management of limited excavations in areas of remaining contamination;
- a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated. Based on the investigation results and the Department's determination of the scope of the remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for each parcel, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment. This includes Parcels I, II, III, IV a, VI and VII;
- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site or for any buildings where the current use changes, including provisions for implementing actions recommended to address exposures related to soil vapor intrusion;

- 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 for site-related contamination and also for natural attenuation indicators to provide an understanding of the biological activity breaking down the contamination and to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department;
- monitoring for vapor intrusion for any buildings developed on the site or for any buildings where the current use changes, 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 the coal tar recovery system;
- 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.

Future Actions:

8A. Excavation/Stabilization of MGP Structures and Source Material

Excavation of MGP structures, including gas holder foundations and tanks, and immediately adjacent source areas and grossly contaminated soil, as defined in 6NYCRR Part 375-1.2(u), from Parcels I, II, III and IV will be required when each parcel becomes accessible. The excavated material will be transported off-site for treatment and/or disposal. It is estimated that approximately 30,000 cubic yards (cy) of contaminated soil/debris would be removed from the site once all areas are addressed. The excavation areas on these parcels, based on currently available information, are estimated to be:
Parcel I - 50 ft. x 50 ft. x 10 ft. deep – approximately 925 cy;
Parcel II - 250 ft. x 100 ft. x 20 ft. deep – approximately 18,500 cy;
Parcels III and IV are expected to be a contiguous excavation measuring approximately 200 ft. x 75 ft. x 20 ft. deep – approximately 11,000 cy.

Excavation support, such as driven steel sheets or solidified soil walls, will be required in most cases to allow the above excavation (or any additional excavation identified in 8B) to proceed. In cases where mobile NAPL is known or suspected to exist immediately outside the areas to be excavated, the excavation support will be designed to be left in place as a coal tar migration barrier to prevent mobile NAPL from re-contaminating the remediated areas.

8B. Additional Source Removal Evaluation Areas:

The need for additional soil removal will be evaluated beyond the immediate limits of the MGP structure areas identified above. Pre-design investigations (PDIs) will be conducted on Parcels I, II, III, IV,VI and VII to determine the extent of contamination outside the limits of the MGP structure excavations for those areas that exhibited source material at elevations above the meadow mat soil layer that is present approximately 20 feet below ground surface (bgs). In the event that proposed redevelopment requires excavation to depths beyond 20 feet, the PDIs will be progressed to the appropriate depth(s). This soil will either be excavated and transported off-site for treatment and/or disposal, or may alternatively be treated by in-situ solidification/solidification (ISS). The estimated volume of these areas will be determined by the PDIs.

8C. Utility corridors: In other areas where subsurface disturbances for repairs or redevelopment may occur where levels contaminants in soil exceed CP-51 criteria (total PAHs greater than 500 ppm) due to MGP-related impacts, the soil will be excavated to the depth required for the subsurface repair, maintenance or redevelopment. This soil will be excavated and transported off site for treatment and/or disposal. On-site soils which do not exceed SCOs for restricted residential use of Parcel II and commercial use of the remaining parcels comprising the site may be used to backfill the excavation to the extent that it can be reused on site, below the cover system described in paragraph 5.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in as needed to complete the backfilling of the excavation and establish the designed grades at the site. The site will be re-graded to accommodate installation of a cover system as described in paragraph 5.

8D. In-situ solidification (ISS): As an alternative to excavation, in those areas where potentially mobile coal tar is present in the subsurface above the elevation of the meadow mat (approximately 20 ft. below ground surface), ISS may be implemented in lieu of excavation to immobilize contamination that remains below excavated areas. ISS may also be used to provide containment surrounding excavation areas as discussed above.

ISS is a process that binds 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 resulting solid matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

In any areas subject to ISS, a four-foot soil cover will be established between the solidified waste and the finished ground surface. The function of this cover will also be to provide sufficient thermal protection of the solidified mass from seasonal freeze/thaw cycles, and to protect the ISS mass from deep root penetration.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

July 31, 2015

Date

Robert W. Schick, P.E., Director
Division of Environmental Remediation

RECORD OF DECISION

K - Fulton Works
Brooklyn, Kings County
Site No. 224051
July 2015

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 hazardous wastes 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 hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. The remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This Record of Decision (ROD) identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for selecting the remedy.

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:

Brooklyn Community Board
Attn: Craig Hammerman
250 Baltic St.
Brooklyn, NY 12201
Phone: (718) 643 3027

A public meeting was also conducted. At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) were presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period was held, during which verbal or written comments were accepted on the proposed remedy.

Comments on the remedy received during the comment period are summarized and addressed in

the responsiveness summary section of the ROD.

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, Voluntary 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 Fulton Municipal Works MGP is located in the Gowanus neighborhood in South Brooklyn to the east of the Gowanus Canal. The site occupies five properties (designated Parcels I through V) located between Douglass and Sackett Streets and between the Gowanus Canal and Fourth Ave. These five properties comprise approximately 6.5 acres. The remedial investigation identified three additional parcels (designated Parcels VI through VIII) affected by contamination from the Fulton MGP. Parcels VI and VII abut the eastern bank of the Gowanus Canal and Parcel VIII lies on the canal's west bank.

Current Zoning and Land Use:
The area is zoned for industrial use, specifically light manufacturing (M2-1 and M1-2). Parcel I is currently in use as a film studio. Parcel II is occupied by the Thomas Greene Park. Parcel III is currently used as a text book warehouse with offices on the upper of two stories, Parcel IV is occupied as a roll-off container and truck repair facility, and Parcel V, which formerly housed the NY Daily News automotive garage, is currently used as a rock climbing gym. The site is surrounded by mixed use parcels, including commercial, industrial, and multi-family residential properties.

Site Features:
The site is comprised of commercial and industrial properties, as well as a city park containing a playground, basketball and handball courts and a swimming pool, in an urban area. Site topography is nearly flat, with a gradual downslope westward toward the Gowanus Canal.

Past Use of the Site:
The site was operated as a manufactured gas plant (MGP) by Brooklyn Union Gas Co. from approximately 1879 to 1929. The operation of the MGP led to contamination of subsurface soil and groundwater by coal tar, a byproduct of the gas manufacturing process. The specific MGP operations and structures located on the individual parcels are as follows:

Parcel I: production facilities including an oil/naptha collection tank, generator/retort house, condenser/blower house, coal shed, engine house, gasoline house and generators.

Parcel II: the southern portion of the parcel contained production facilities including 3 oil tanks, 1 relief holder/hydrogen tank and 6 gas oil naptha tanks. During World War I a US government toluol plant was located on the northern part of the parcel.

Parcel III: production facilities including a gas holder, purifying house, oxidizing sheds, coal bin, shaving scrubbers, tower scrubbers for the toluol plant, meter house, governor's house and offices.

Parcel IV: production facilities including a gas holder and coal shed.

Parcel V: facilities included a gas holder (storage only), water tank, engines/blowers and coal shed.

The site has been divided into two operable units.

An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

Operable Unit 1 includes the footprint of the former MGP operation, and the neighboring off-site properties east of the Gowanus Canal, where coal tar has spread in the subsurface. This includes Parcels I through VII. MGP source areas have been identified on Parcels I through IV; tar from these source areas has migrated westward beneath Parcels VI and VII. Parcel V, although included in the definition of Operable Unit 1, appears to be uncontaminated.

Operable Unit 2 includes the more distant off-site areas to the west, where coal tar has spread beneath the Gowanus Canal and a short distance beyond.

Site Geology/Hydrogeology:
The site is underlain by urban fill ranging from 10 to 20 feet in thickness, which overlies a discontinuous peat and silt layer approximately 4 feet thick. Beneath the peat are glacial outwash deposits consisting predominantly of sand, with lesser amounts of silt and clay. Bedrock is approximately 150 feet below the ground surface. Groundwater is encountered at depths of 8 to 14 feet across the site, and flows westward toward the Gowanus Canal.

Operable Unit (OU) Number 01 is the subject of this document.

A Record of Decision will be issued for OU 02 in the future.

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 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 included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

Keyspan dba National Grid

National Grid

The Department and Keyspan Energy Delivery, New York and Keyspan Energy Delivery, Long Island, corporate predecessors to National Grid, entered into a Consent Order on August 10, 2007 (Index No. A2-0552-0606). The Order obligates the responsible parties to implement a full remedial program for this and 11 other former MGP sites. On-site and off-site contamination unrelated to the former MGP activities identified during the environmental investigations are being addressed separately by the NYSDEC.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,

- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- air
- 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. The tables found in Exhibit A list the applicable SCGs in the footnotes. 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 hazardous waste 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 in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified for this Operable Unit at this site is/are:

coal tar
benzene, toluene, ethylbenzene and xylenes (BTEX)
polycyclic aromatic hydrocarbons (PAHS), total

As illustrated in Exhibit A, 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 Record of Decision.

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.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU 01.

The Remedial Investigation identified the presence of coal tar in subsurface soils beneath four of the five Parcels comprising the original MGP site (I, II, III and IV) and three off-site Parcels (VI, VII and VIII). Contamination beneath these parcels is generally inaccessible due to the distance below ground surface and presence of buildings, pavement and other infrastructure. To date, contamination has not been found at shallow depths, where human exposures would be likely. Future subsurface excavation work, however, could bring workers into direct contact with the contamination in the area adjacent to the intersection of Nevins and DeGraw Streets, where the Remedial Investigation identified coal tar at depths as shallow as 10 feet.

When the MGP was operating, coal tar was released directly into the Gowanus Canal by discharge pipes, and into the subsurface by leaking plant structures (primarily subsurface gas holders and storage tanks). The tar then spread through the subsurface soil. Beneath portions of the site, a discontinuous clay and peat layer commonly referred to as the meadow mat, which was deposited on the tidal flat adjacent to the Gowanus Creek, lies approximately 20 feet below the ground surface. The relatively low permeability of the meadow mat caused the coal tar that leaked from the plant structures to pool and spread laterally on top of it. Much of the coal tar on the site is found in the soil on top of the mat. In areas where the meadow mat is absent, coal tar has migrated deeper, moving both laterally and vertically for considerable distances. Close to the former plant structures coal tar is found at depths ranging from 8 feet to more than 100 feet below ground surface, and is generally found at greater depths with increasing distance from the structures.

Contaminants of concern in the tar include polycyclic aromatic hydrocarbons (PAHs) and the volatile organic compounds benzene, toluene, ethylbenzene and xylene (BTEX). In addition to the high levels of soil contamination, BTEX and PAH compounds have been found in groundwater at levels which greatly exceed SCGs. Benzene was found at levels as high as 5,200 parts per billion (ppb), compared to the groundwater quality standard of 1 ppm. Ethyl benzene was found as high as 6,300 ppb, toluene as high as 2,200 ppb and total xylenes as high as 5,700 ppb; all compared to their individual groundwater quality standard of 5 ppb. Approximately one-quarter of groundwater samples also contained methyl tert-butyl ether (MTBE), a former gasoline additive, indicating that petroleum releases unrelated to the MGP have contributed to groundwater contamination.

Contamination in the form of separate phase tar and associated dissolved groundwater contaminants has migrated off-site. In off-site areas where tar is present, groundwater exceeds standards for VOCs and PAHs. Coal tar has migrated through the subsurface into and beneath the canal. Sediment contamination in the canal and in the canal banks beyond the source sites is being addressed by the United States Environmental Protection Agency (USEPA) under the Federal Superfund Program.

Soil vapor samples were collected from five parcels, along with indoor air samples from the three site parcels with occupied structures. Soil vapor beneath all five parcels contained MGP-related BTEX compounds, as well as non-MGP related compounds such as tetrachloroethene, trichloroethene, dichlorobenzene, and ethanol. Samples of indoor air collected from Parcel 3 contained levels of non-MGP chlorinated solvents exceeding NYSDOH guidelines for mitigation. Levels of BTEX and non-MGP contaminants (e.g., ethanol and n-decane) in the indoor air of Parcel 5 exceeded the concentrations normally seen in indoor air. However, these levels were significantly higher than corresponding sub-slab vapor samples, indicating that an indoor source may be responsible.

The Responsible Party, in accordance with the Order on Consent, is not responsible for remediation of non-MGP related contamination. The owners of affected properties have been notified where mitigation or monitoring of impacts to indoor air is required.

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 pavement, concrete or structures. However, people who dig below the surface may come into contact with contaminated subsurface soil or groundwater. People are not drinking contaminated groundwater because the area is served by public water. Volatile organic compounds may move into the soil vapor (air spaces within the soil) which in turn may move into overlying buildings and affect 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 for soil vapor intrusion to occur should be evaluated should the site be redeveloped or new construction occurs. Additionally, people using the canal for recreational purposes such as swimming or boating may come into direct contact with harmful biological organisms or site related contaminants in the surface water or sediments. Fish and shellfish in the canal are likely to contain the same contaminants that are present in the surface water and shallow sediments; therefore people should follow the New York State consumption guidelines for the Upper Bay of New York harbor and the canal.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to

pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent migration of contaminants that would result in recontamination of the sediments in the Gowanus Canal following the USEPA remediation

SECTION 7: SUMMARY OF THE SELECTED REMEDY

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the feasibility study (FS) report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation,

maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's remedy is set forth at Exhibit D.

The selected remedy is referred to as the Containment, Coal Tar Recovery, and Excavation/Solidification remedy.

The estimated present worth cost to implement the remedy is $54,525,000. The cost to construct the remedy is estimated to be $48,825,000 and the estimated average annual cost is $331,000.

The elements of the selected remedy are as follows:

Due to the presence of active commercial buildings and the Thomas Greene Park on the site, the planned remediation of the Gowanus Canal by the USEPA, and with only limited potential for public health exposures on the parcels to be addressed, the proposed remedy identifies both near term and future actions. Both near term and future actions will require voluntary agreements between the Volunteer and respective property owners for site access and any other pertinent provisions to enable the installation and maintenance of cover systems, management of residual contamination, excavation, inspections, sampling, and/or any other requisite activities.

The near-term actions are intended to address the environmental impact of the discharge of contaminants to the Gowanus Canal to allow the ongoing USEPA project to proceed and avoid re-contamination of remediated sediments, and to address a current potential exposure to utility workers, in addition to collecting mobile tar in the subsurface and overall management of the site. It should be noted that the coal tar present at depths greater than 25 feet under Parcel VIII is not directly addressed by this remedy, but will be addressed as OU2 of the Fulton site. Shallow tar impacts near the walls of the canal will be dealt with by the USEPA remedy pursuant to their September 2013 ROD. The basis for this approach is discussed in more detail in Exhibit D. Accordingly, the remedial elements are described below as near-term and long-term actions, to be implemented in distinct stages as access becomes available.

Near-Term Actions

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; and
•Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Containment:

A subsurface barrier wall will be installed along the east bank of the Gowanus Canal to prevent the migration of coal tar to the canal from Parcels I, II, III, IV, VI and VII. The wall will be constructed from the north end of the canal to approximately Sackett Street, and will extend to a sufficient depth, currently estimated to be 50 feet, to prevent further movement of coal tar into the canal. Short sections of wing walls leading inland from the canal bank may be necessary to prevent contaminant migration from moving around the ends of the wall. In addition to providing a barrier to contaminant migration, the barrier wall will be designed with sufficient strength to ensure bank stability during the upcoming dredging of the canal. The barrier wall will also include measures such as the sealing of utility penetrations of the wall to prevent tar migration along utilities, such as storm sewers or other piping which cannot be abandoned, to eliminate provide these penetrations as a pathway for tar migration into the canal. The final wall depth and configuration, including the need for hydraulic relief and associated treatment, will be determined during the design of this project. This portion of the remedial work will be designed and constructed as a first priority to minimize any delay in the implementation of the USEPA dredging project.

3. Coal Tar Recovery:

A series of coal tar recovery wells, or other system of collection, will be constructed behind the barrier wall to collect coal tar that accumulates behind the wall. These wells will be designed with sumps to accumulate coal tar passively, without continuous pumping. 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 can be converted to automated collection.

Coal tar collection wells will also be constructed in upland areas where mobile coal tar is identified by the Department in the subsurface. Initially, the construction of these collection wells will be focused on the area near the intersection of Nevins and DeGraw Streets. These wells will be installed in public rights of way to the extent possible and will be constructed with sumps to allow passive accumulation of coal tar for periodic collection. All collected tar will be sent off-site for treatment and/or disposal.

4. Utility Corridors:

The potential for coal tar migration into utility corridors within the area at the intersection of Nevins and DeGraw Streets will be assessed during the remedial design. Based on the results of this evaluation, a remedial action plan will be developed to address identified impacts to shallow utility corridors (i.e., water and gas mains or other subsurface infrastructure). Coal tar impacts to the deeper sewer lines in this area will be addressed during any future major sewer modification work.

5. Cover System:

A site cover currently exists and will be maintained to allow for restricted residential use (which includes active recreational use) of Parcel II (Thomas Greene Park), and commercial/industrial use of the remainder of the site and Parcel VI. Any site redevelopment will maintain or re-establish a site cover, which may consist either of the structures such as the buildings, pavement, and sidewalks comprising the site development.

Where a soil cover is required on Parcel II it will include a minimum of two feet of soil meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. Where a soil cover is required on the rest of the site (Parcels I, III and IV) and Parcel VI, it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

6. Institutional Controls:

Imposition of institutional controls in the form of environmental easements, subject to agreements with property owners, for the controlled properties, consisting of Parcels I, II, III, and IV, that:

- 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 Parcel II for restricted residential, commercial and industrial uses as defined by Part 375-1.8(g), and the remaining parcels that comprise the site for commercial and 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 NYC DOH;
- require compliance with the Department-approved Site Management Plan.

7. Site Management Plan

A Site Management Plan, subject to agreements with property owners of Parcels I, II, III, IV, VI, and VII, 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 are effective:

Institutional Controls:
- The environmental easements discussed in Paragraph 6 above;

Engineering Controls:
- The barrier wall discussed in paragraph 2 above;
- The coal tar recovery system discussed in paragraph 3 above;
- The cover system discussed in paragraph 5 above; and
- The solidified soils discussed in paragraph 8 below.

An Interim Site Management Plan (ISMP) will be required to manage site activities until the final SMP is approved. The ISMP and SMP include, but may not be limited to:

- an Excavation Plan which details the provisions for management of limited excavations in areas of remaining contamination;
- a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated. Based on the investigation results and the Department's determination of the scope of the remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for each parcel, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment. This includes Parcels I, II, III, IV a, VI and VII;
- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site or for any buildings where the current use changes, including provisions for implementing actions recommended to address exposures related to soil vapor intrusion;
- 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 for site-related contamination and also for natural attenuation indicators to provide an understanding of the biological activity breaking down the contamination and to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department;
- monitoring for vapor intrusion for any buildings developed on the site or for any buildings where the current use changes, 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 the coal tar recovery system;

- 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.

Future Actions:

8A. Excavation/Stabilization of MGP Structures and Source Material

Excavation of MGP structures, including gas holder foundations and tanks, and immediately adjacent source areas and grossly contaminated soil, as defined in 6NYCRR Part 375-1.2(u), from Parcels I, II, III and IV will be required when each parcel becomes accessible. The excavated material will be transported off-site for treatment and/or disposal. It is estimated that approximately 30,000 cubic yards (cy) of contaminated soil/debris would be removed from the site once all areas are addressed. The excavation areas on these parcels, based on currently available information, are estimated to be:
Parcel I - 50 ft. x 50 ft. x 10 ft. deep – approximately 925 cy;
Parcel II - 250 ft. x 100 ft. x 20 ft. deep – approximately 18,500 cy;
Parcels III and IV are expected to be a contiguous excavation measuring approximately 200 ft. x 75 ft. x 20 ft. deep – approximately 11,000 cy.

Excavation support, such as driven steel sheets or solidified soil walls, will be required in most cases to allow the above excavation (or any additional excavation identified in 8B) to proceed. In cases where mobile NAPL is known or suspected to exist immediately outside the areas to be excavated, the excavation support will be designed to be left in place as a coal tar migration barrier to prevent mobile NAPL from re-contaminating the remediated areas.

8B. Additional Source Removal Evaluation Areas:

The need for additional soil removal will be evaluated beyond the immediate limits of the MGP structure areas identified above. Pre-design investigations (PDIs) will be conducted on Parcels I, II, III, IV,VI and VII to determine the extent of contamination outside the limits of the MGP structure excavations for those areas that exhibited source material at elevations above the meadow mat soil layer that is present approximately 20 feet below ground surface (bgs). In the event that proposed redevelopment requires excavation to depths beyond 20 feet, the PDIs will be progressed to the appropriate depth(s). This soil will either be excavated and transported off-site for treatment and/or disposal, or may alternatively be treated by in-situ solidification/solidification (ISS). The estimated volume of these areas will be determined by the PDIs.

8C. Utility corridors: In other areas where subsurface disturbances for repairs or redevelopment may occur where levels contaminants in soil exceed CP-51 criteria (total PAHs greater than 500 ppm) due to MGP-related impacts, the soil will be excavated to the depth required for the subsurface repair, maintenance or redevelopment. This soil will be excavated and transported off site for treatment and/or disposal. On-site soils which do not exceed SCOs for restricted residential use of Parcel II and commercial use of the remaining parcels comprising the site may be used to backfill the excavation to the extent that it can be reused on site, below the cover system described in paragraph 5.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in as needed to complete the backfilling of the excavation and establish the designed grades at the site. The site will be re-graded to accommodate installation of a cover system as described in paragraph 5.

8D. In-situ solidification (ISS): As an alternative to excavation, in those areas where potentially mobile coal tar is present in the subsurface above the elevation of the meadow mat (approximately 20 ft. below ground surface), ISS may be implemented in lieu of excavation to immobilize contamination that remains below excavated areas. ISS may also be used to provide containment surrounding excavation areas as discussed above.

ISS is a process that binds 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 resulting solid matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

In any areas subject to ISS, a four-foot soil cover will be established between the solidified waste and the finished ground surface. The function of this cover will also be to provide sufficient thermal protection of the solidified mass from seasonal freeze/thaw cycles, and to protect the ISS mass from deep root penetration.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into three categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use.

Waste/Source Areas

As described in the RI report, waste/source materials were identified at the site and are impacting soil, and groundwater.

Wastes are defined in 6 NYCRR Part 375-1.2(aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375(au). Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Wastes and source areas were identified at the site include, coal tar.

Coal tar waste in the form of dense non-aqueous phase liquid (DNAPL) was identified within and adjacent to subsurface structures related to the operation of the MGP, such as gas holders and tar wells, on Parcels I, II, III and IV. These structures appear to be the principal sources of contamination on the site. The distribution of tar throughout the site is the result of releases from these subsurface structures and associated piping, followed by lateral and vertical migration through the subsurface soil. This release and migration has occurred over a period of many decades, and has resulted in a complex distribution of contamination throughout the area.

DNAPL coal tar has migrated away from these structures in the subsurface predominantly westward, toward the Gowanus Canal, where coal tar impacts were identified beneath off-site Parcels VI and VII. Shallow tar impacts extend to the bank of the Gowanus Canal, and a greater proportion of deeper tar impacts have migrated beneath it. In addition, coal tar contamination is expected to be present in the subsurface under the public streets near the intersection of DeGraw and Nevins Streets. Coal tar contaminated soil was identified at depths ranging from approximately eight feet to 128 feet below the ground surface, within an area bounded by Union Street to the south, the Bond Street to the west, Butler Street to the north and Third Avenue to the east.

Visible coal tar contamination was observed as follows, on a parcel by parcel basis:

Parcel I: Intervals of coal tar coating were observed between depths of 15 to 45 feet below ground surface (bgs). Coal tar saturation was observed between 42 and 46 feet bgs and lenses of tar were observed at 65 feet bgs. Lesser impacts consisting of disconnected coal tar blebs were observed between 5 and 10 feet bgs.

Parcel II: Intervals of coal tar coating were observed between 10 and 65 feet bgs. Coal tar saturated intervals were observed between depths of 10 to 100 feet bgs. Lesser impacts consisting of coal tar blebs and sheens were observed between depths ranging from 15 to 105 feet bgs.

Parcel III: Within the gas holder on the parcel, intervals of tar saturation were observed between depths of 5 feet and the bottom of the holder at a depth of 18 feet. Outside the holder, intervals of visible coal tar contamination consisting of tar globs and coatings were observed between depths of 10 to 48 feet bgs. Lesser impacts consisting of coal tar blebs and sheens were observed between 7 and 27 feet bgs.

Parcel IV: Inside the gas holder on the parcel, coal tar coating was observed between 13 and 15 feet bgs. Coal tar saturated lenses were observed between 14 and 19 feet bgs. Outside of the holder, lesser impacts consisting of coal tar blebs and sheens were observed between 15 and 19 feet bgs.

Parcel V: No MGP-related impacts other than mild odors were observed in subsurface soils.

Parcel VI: Intervals of coal tar coating were observed between depths of 10 to 128 feet bgs. Intervals of coal tar saturation were observed at depths between 13 and 112 feet bgs. Lesser impacts consisting of coal tar blebs and sheens were observed between 6 and 112 feet bgs.

Parcel VII: Intervals of coal tar coating were observed at depths of 20 to 30 feet bgs. Intervals of coal tar saturation were observed between 25 to 30 feet bgs. Lesser impacts consisting of coal tar sheens were observed between 63 and 67 feet bgs.

The principal contaminants present in the tar are the VOCs benzene, toluene, ethylbenzene and xylene (BTEX) and polycyclic aromatic hydrocarbons (PAHs).

The waste/source areas identified will be addressed in the remedy selection process.

Groundwater

In groundwater, VOCs, PAHs, pesticides and metals were detected above applicable standards throughout all of the parcels where coal tar waste was found. This contaminated groundwater migrates slowly toward the Gowanus Canal and discharges into the canal.

Coal tar and associated BTEX and PAHs are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process. The extent of groundwater impacts are shown in Figure 4.

Table 1 - Groundwater

Constituents	Concentration Range (ppb)[a]		SCG[b] (ppb)	Frequency Exceeding SCG
	Minimum	Maximum		
VOCs				
Acetone	21	465	50*	1 of 62
Benzene	0.31	5200	1	28 of 62
Chlorobenzene	5.5	5.5	5	1 of 62
Chloroethane	32	32	5	1 of 62
Chloroform	0.2	44	7	4 of 62
cis-1,2-Dichloroethene	0.36	17	5	4 of 62
Ethylbenzene	0.55	6300	5	21 of 62
Isopropyl benzene	0.13	170	5	6 of 20

Constituents	Concentration Range (ppb)[a]		SCG[b] (ppb)	Frequency Exceeding SCG
	Minimum	Maximum		
Methyl tert-butyl ether (MTBE)	0.25	350	10*	14 of 53
Methylene chloride	0.31	10	5	3 of 62
Styrene	880	880	5	1 of 62
Tetrachloroethene (PCE)	0.24	26	5	3 of 62
Toluene	0.47	2200	5	8 of 62
Trichloroethene (TCE)	0.17	14	5	2 of 62
Trichlorofluoromethane (Freon 11)	3.3	8.7	5	1 of 20
o-Xylene	0.32	2000	5	6 of 20
m/p-Xylene	0.61	3900	5	7 of 20
Total Xylene	5.1	5700	5	13 of 42
Vinyl chloride	1.1	71	2	5 of 62
SVOCs				
Acenaphthene	0.18	550	20*	22 of 62
Benzo(a)anthracene	0.027	0.84	0.002*	6 of 62
Benzo(b)fluoranthene	0.03	0.53	0.002*	6 of 62
Benzo(k)fluoranthene	0.026	0.2	0.002*	4 of 62
Benzo(a)pyrene	0.026	0.5	ND	5 of 62
Biphenyl (1,1-Biphenyl)	0.012	80	5	7 of 20
Bis(2-ethylhexyl)phthalate	0.59	77	5	1 of 62
Chrysene	0.041	0.65	0.002*	7 of 62
Fluorene	0.092	91	50*	4 of 62
Indeno(1,2,3-cd)pyrene	0.022	1.1	0.002*	5 of 62
2-Methylphenol (o-Cresol)	0.35	17	1	2 of 62
4-Methylphenol (p-Cresol)	0.41	30	1	2 of 56
Naphthalene	0.16	14000	10*	19 of 62
Phenanthrene	0.13	120	50*	10 of 62
Phenol	0.24	25	1	5 of 62

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.

b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Subsurface Soil

Soil contamination was assessed both by visual observation and chemical analysis. All soil samples recovered were closely inspected for the presence of visible tar, as summarized above. In addition, 98 subsurface soil samples were collected from depths of 1-140 feet for laboratory testing.

The analytical results and sample locations are summarized in Figure 5.The results indicate that soils at the site exceed the unrestricted, restricted residential and commercial SCGs for volatile and semi-volatile organics and metals.

The primary subsurface soil contaminants are polycyclic aromatic hydrocarbons (PAHs) contained in the coal tar which has migrated through the subsurface from the former MGP structures, as noted on Figure 5. These are considered to be the primary contaminants of concern that will drive the remediation of subsurface soil to be addressed in the remedy selection process.

Subsurface soil contamination on Parcels I, II, III, IV, VI and VII will be addressed in the remedy selection process. Parcel V is excluded because no significant MGP contamination was found during the Remedial Investigation

Subsurface soil data is summarized below in separate tables on a parcel by parcel basis.

Table 2A – Parcel I Subsurface Soil

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
VOCs						
Benzene	0.0015	68	0.06	11 of 32	44	1 of 32
Ethylbenzene	0.00087	370	1	9 of 32	390	0 of 32
m/p-Xylene	0.0026	0.42	0.26	1 of 10	500	0 of 10
Total Xylene	0.0036	82	0.26	8 of 22	500	0 of 22
Acetone	0.046	0.076	0.05	2 of 32	500	0 of 32
cis-1,2-Dichloroethene	0.016	1.9	0.25	2 of 32	500	0 of 32
trans-1,2-Dichloroethene	0.28	0.28	0.19	1 of 32	500	0 of 32
Trichloroethene (TCE)	0.0009	13	0.47	2 of 32	200	0 of 32
SVOCs						
Acenaphthene	0.034	330	20	7 of 32	500	0 of 32
Anthracene	0.044	170	100	1 of 32	500	0 of 32
Benzo(a)anthracene	0.036	150	1	14 of 32	5.6	11 of 32
Benzo(b)fluoranthene	0.034	88	1	15 of 32	5.6	10 of 32
Benzo(k)fluoranthene	0.038	32	0.8	11 of 32	56	0 of 32
Benzo(a)pyrene	0.05	130	1	14 of 32	1	14 of 32
Chrysene	0.038	150	1	15 of 32	56	1 of 32
Dibenz(a,h)anthracene	0.022	6.7	0.33	7 of 32	0.56	5 of 32
Fluoranthene	0.077	270	100	1 of 32	500	0 of 32
Fluorene	0.025	210	30	6 of 32	500	0 of 32
Indeno(1,2,3-cd)pyrene	0.051	48	0.5	14 of 32	5.6	6 of 32
Naphthalene	0.061	1600	12	6 of 32	500	2 of 32
Phenanthrene	0.1	650	100	6 of 32	500	1 of 32
Pyrene	0.11	340	100	1 of 32	500	0 of 32
Dibenzofuran	0.024	7.7	7	1 of 32	350	0 of 32
Pesticides						
4,4'-DDT (p,p'-DDT)	0.018	0.034	0.0033	3 of 18	47	0 of 18
4,4'-DDE (p,p'-DDE)	0.004	0.01	0.0033	3 of 18	62	0 of 18
4,4-DDD (p,p-DDD)	0.012	0.027	0.0033	2 of 18	92	0 of 18
Dieldrin	0.011	0.011	0.005	1 of 18	1.4	0 of 18

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
Endrin	0.0056	0.045	0.014	2 of 18	89	0 of 18
Inorganics						
Arsenic	1.1	80.8	13	2 of 22	16	2 of 22
Copper	6.6	85.2	50	4 of 22	270	0 of 22
Lead	2.6	613	63	5 of 22	1000	0 of 22
Mercury	0.018	3	0.18	5 of 22	2.8	1 of 22
Nickel	8.2	73.7	30	3 of 22	310	0 of 22
Selenium	1.7	6.8	3.9	1 of 22	1500	0 of 22
Zinc	13.7	327	109	5 of 22	10000	0 of 22

Notes:

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential Use.

d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use.

Table 2B – Parcel 2 Subsurface Soil

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Residential SCG[c] (ppm)	Frequency Exceeding Restricted Residential SCG	Commercial SCG[d] (ppm)	Frequency Exceeding Commercial SCG
	Min	Max						
VOCs								
Benzene	0.00082	750	0.06	16 of 56	4.8	11 of 56	44	9 of 56
Toluene	0.00095	1300	0.7	10 of 56	100	7 of 56	500	7 of 56
Ethylbenzene	0.00092	1400	1	16 of 56	41	12 of 56	390	12 of 56
o-Xylene	0.011	260	0.26	1 of 9	100	1 of 9	500	1 of 9
m/p-Xylene	0.016	560	0.26	1 of 9	100	1 of 9	500	1 of 9
Total Xylene	0.0034	1500	0.26	15 of 47	100	9 of 47	500	9 of 47
Acetone	0.006	0.14	0.05	1 of 56	100	0 of 56	500	0 of 56
SVOCs								
Acenaphthene	0.057	1900	20	18 of 56	100	12 of 56	500	12 of 56
Acenaphthylene	0.034	2900	100	8 of 56	100	8 of 56	500	8 of 56
Anthracene	0.067	1000	100	11 of 56	100	11 of 56	500	11 of 56
Benzo(a)anthracene	0.082	690	1	34 of 56	1	34 of 56	5.6	34 of 56
Benzo(b)fluoranthene	0.045	400	1	33 of 56	1	33 of 56	5.6	33 of 56
Benzo(k)fluoranthene	0.045	140	0.8	24 of 56	3.9	13 of 56	56	13 of 56
Benzo(g,h,i)perylene	0.027	380	100	1 of 56	100	1 of 56	500	1 of 56
Benzo(a)pyrene	0.054	620	1	35 of 56	1	35 of 56	1	35 of 56
Chrysene	0.083	610	1	33 of 56	3.9	27 of 56	56	27 of 56
Dibenz(a,h)anthracene	0.04	17	0.33	17 of 56	0.33	17 of 56	0.56	17 of 56
Fluoranthene	0.11	1300	100	11 of 56	100	11 of 56	500	11 of 56
Fluorene	0.04	1400	30	17 of 56	100	11 of 56	500	11 of 56
Indeno(1,2,3-cd)pyrene	0.025	340	0.5	28 of 56	0.5	28 of 56	5.6	28 of 56
Naphthalene	0.08	16000	12	20 of 56	100	16 of 56	500	16 of 56
Phenanthrene	0.081	4100	100	17 of 56	100	17 of 56	500	17 of 56
Pyrene	0.16	2000	100	12 of 56	100	12 of 56	500	12 of 56
Dibenzofuran	0.032	74	7	3 of 56	59	1 of 56	350	1 of 56
Pesticides								
4,4'-DDT (p,p'-DDT)	0.014	0.014	0.0033	1 of 32	7.9	0 of 32	47	0 of 32
4,4'-DDE (p,p'-DDE)	0.006	0.017	0.0033	2 of 32	8.9	0 of 32	62	0 of 32

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Residential SCG[c] (ppm)	Frequency Exceeding Restricted Residential SCG	Commercial SCG[d] (ppm)	Frequency Exceeding Commercial SCG
	Min	Max						
4,4-DDD (p,p-DDD)	0.015	0.015	0.0033	1 of 32	13	0 of 32	92	0 of 32
Dieldrin	0.0066	0.014	0.005	2 of 32	0.2	0 of 32	1.4	0 of 32
Inorganics								
Arsenic	0.56	33	13	6 of 56	16	5 of 56	16	5 of 56
Barium	12.8	1190	350	5 of 56	400	4 of 56	400	4 of 56
Copper	4.7	381	50	13 of 56	270	1 of 56	270	1 of 56
Lead	1.9	4630	63	23 of 56	400	14 of 56	1000	14 of 56
Mercury	0.022	57.6	0.18	23 of 56	0.81	14 of 56	2.8	14 of 56
Nickel	6.7	102	30	5 of 56	310	0 of 56	310	0 of 56
Selenium	0.53	6.5	3.9	1 of 56	180	0 of 56	1500	0 of 56
Zinc	9.8	828	109	21 of 56	10000	0 of 56	10000	0 of 56

Notes:
a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential Use.
d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use.

Table 2C – Parcel III Subsurface Soil

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
VOCs						
Benzene	0.0022	1700	0.06	8 of 12	44	2 of 12
Toluene	0.00052	2500	0.7	6 of 12	500	1 of 12
Ethylbenzene	0.0021	310	1	7 of 12	390	0 of 12
Total Xylene	0.0037	2200	0.26	7 of 12	500	1 of 12
Acetone	0.0033	0.52	0.05	1 of 12	500	0 of 12
cis-1,2-Dichloroethene	0.01	1.2	0.25	3 of 12	500	0 of 12
Methylene chloride	0.0017	0.3	0.05	4 of 12	500	0 of 12
Trichloroethene (TCE)	0.0084	9.2	0.47	4 of 12	200	0 of 12
Vinyl chloride	0.1	1	0.02	4 of 12	13	0 of 12
SVOCs						
Acenaphthene	0.026	170	20	4 of 12	500	0 of 12
Acenaphthylene	0.095	1700	100	3 of 12	500	2 of 12
Anthracene	0.022	700	100	3 of 12	500	1 of 12
Benzo(a)anthracene	0.018	360	1	9 of 12	5.6	7 of 12
Benzo(b)fluoranthene	0.53	190	1	9 of 12	5.6	7 of 12
Benzo(k)fluoranthene	0.18	14	0.8	5 of 12	56	0 of 12
Benzo(a)pyrene	0.01	290	1	9 of 12	1	9 of 12

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
Chrysene	0.34	310	1	9 of 12	56	3 of 12
Dibenz(a,h)anthracene	4	17	0.33	5 of 12	0.56	5 of 12
Fluoranthene	0.032	860	100	3 of 12	500	1 of 12
Fluorene	1.1	920	30	4 of 12	500	1 of 12
Indeno(1,2,3-cd)pyrene	0.68	99	0.5	8 of 12	5.6	6 of 12
Naphthalene	0.039	9000	12	7 of 12	500	4 of 12
Phenanthrene	0.08	2600	100	5 of 12	500	2 of 12
Pyrene	0.058	1400	100	3 of 12	500	2 of 12
Dibenzofuran	1.8	98	7	4 of 12	350	0 of 12
Pesticides						
4,4'-DDT (p,p'-DDT)	0.0035	0.079	0.0033	4 of 4	47	0 of 4
Dieldrin	0.0056	0.0056	0.005	1 of 4	1.4	0 of 4
Inorganics						
Arsenic	2.1	20.8	13	1 of 12	16	1 of 12
Cadmium	0.65	20.4	2.5	2 of 12	9.3	1 of 12
Copper	6.7	415	50	7 of 12	270	2 of 12
Lead	1.9	980	63	7 of 12	1000	0 of 12
Mercury	0.08	0.5	0.18	5 of 12	2.8	0 of 12
Nickel	13	98.5	30	4 of 12	310	0 of 12
Silver	0.13	10.1	2	2 of 12	1500	0 of 12
Zinc	10.9	504	109	5 of 12	10000	0 of 12

Notes:

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential Use.

d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use.

Table 2D – Parcel IV Subsurface Soil

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
SVOCs						
Benzo(a)anthracene	3.1	19	1	2 of 3	5.6	1 of 3
Benzo(b)fluoranthene	3.3	18	1	2 of 3	5.6	1 of 3
Benzo(k)fluoranthene	1.4	8.3	0.8	2 of 3	56	0 of 3
Benzo(a)pyrene	3.5	17	1	2 of 3	1	2 of 3
Chrysene	3.6	21	1	2 of 3	56	0 of 3
Dibenz(a,h)anthracene	1.1	5	0.33	2 of 3	0.56	2 of 3
Indeno(1,2,3-cd)pyrene	3.6	14	0.5	2 of 3	5.6	1 of 3
Pesticides						
4,4'-DDE (p,p'-DDE)	0.0056	0.0056	0.0033	1 of 1	62	0 of 1
Dieldrin	0.017	0.017	0.005	1 of 1	1.4	0 of 1
Inorganics						

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
Barium	17.6	763	350	1 of 3	400	1 of 3
Cadmium	10.1	10.1	2.5	1 of 3	9.3	1 of 3
Copper	8.4	16400	50	1 of 3	270	1 of 3
Lead	1.2	1500	63	2 of 3	1000	1 of 3
Mercury	0.38	1.2	0.18	2 of 3	2.8	0 of 3
Nickel	10.7	54.5	30	2 of 3	310	0 of 3
Silver	2.8	2.8	2	1 of 3	1500	0 of 3
Zinc	12.5	9660	109	1 of 3	10000	0 of 3

Notes:

Notes:

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential Use.

d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use.

Table 2E – Parcel V Subsurface Soil

Constituents	Concentration Range (ppm)a		Unrestricted SCGb (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCGc (ppm)	Frequency Exceeding Commercial SCG
	Min	Max				
VOCs						
Benzene	0.0015	1.1	0.06	1 of 12	44	0 of 12
Toluene	1.4	1.4	0.7	1 of 12	500	0 of 12
Ethylbenzene	0.0013	1.3	1	1 of 12	390	0 of 12
Total Xylene	0.0007	1.4	0.26	1 of 12	500	0 of 12
Acetone	0.053	0.079	0.05	3 of 12	500	0 of 12
SVOCs						
Benzo(a)anthracene	0.05	17	1	1 of 12	5.6	1 of 12
Benzo(b)fluoranthene	0.079	21	1	1 of 12	5.6	1 of 12
Benzo(k)fluoranthene	0.083	9.7	0.8	1 of 12	56	0 of 12
Benzo(a)pyrene	0.055	18	1	1 of 12	1	1 of 12
Chrysene	0.052	21	1	1 of 12	56	0 of 12
Dibenz(a,h)anthracene	0.027	2.4	0.33	1 of 12	0.56	1 of 12
Indeno(1,2,3-cd)pyrene	0.1	11	0.5	2 of 12	5.6	1 of 12
Inorganics						
Arsenic	1.8	25.3	13	1 of 12	16	1 of 12
Copper	12	131	50	1 of 12	270	0 of 12
Lead	3.8	1790	63	8 of 12	1000	1 of 12
Mercury	0.013	7	0.18	4 of 12	2.8	1 of 12
Zinc	27.2	345	109	3 of 12	10000	0 of 12

Notes:

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential Use.

d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use.

Table 2F – Parcel VI Subsurface Soil

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Min	Max				
VOCs						
Benzene	0.0014	230	0.06	3 of 10	44	1 of 10
Toluene	0.00055	72	0.7	1 of 10	500	0 of 10
Ethylbenzene	0.055	790	1	2 of 10	390	1 of 10
o-Xylene	0.0044	21	0.26	1 of 7	500	0 of 7
m/p-Xylene	0.006	3.2	0.26	1 of 7	500	0 of 7

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Min	Max				
Total Xylene	840	840	0.26	1 of 3	500	1 of 3
Acetone	0.0082	0.08	0.05	1 of 10	500	0 of 10
cis-1,2-Dichloroethene	0.26	0.26	0.25	1 of 10	500	0 of 10
trans-1,2-Dichloroethene	1.3	1.3	0.19	1 of 10	500	0 of 10
Trichloroethene (TCE)	0.67	0.67	0.47	1 of 10	200	0 of 10
SVOCs						
Acenaphthene	0.057	290	20	2 of 10	500	0 of 10
Acenaphthylene	0.26	1900	100	1 of 10	500	1 of 10
Anthracene	0.092	980	100	1 of 10	500	1 of 10
Benzo(a)anthracene	0.19	570	1	4 of 10	5.6	2 of 10
Benzo(b)fluoranthene	0.17	250	1	4 of 10	5.6	2 of 10
Benzo(k)fluoranthene	0.13	110	0.8	4 of 10	56	1 of 10
Benzo(g,h,i)perylene	0.093	550	100	1 of 10	500	1 of 10
Benzo(a)pyrene	0.17	430	1	4 of 10	1	4 of 10
Chrysene	0.19	560	1	4 of 10	56	1 of 10
Dibenz(a,h)anthracene	0.029	1.1	0.33	1 of 10	0.56	1 of 10
Fluoranthene	0.32	1000	100	1 of 10	500	1 of 10
Fluorene	0.057	1100	30	2 of 10	500	1 of 10
Indeno(1,2,3-cd)pyrene	0.085	480	0.5	3 of 10	5.6	1 of 10
Naphthalene	0.074	8400	12	2 of 10	500	1 of 10
Phenanthrene	0.069	3600	100	2 of 10	500	1 of 10
Pyrene	0.37	1500	100	1 of 10	500	1 of 10
Dibenzofuran	0.042	110	7	1 of 10	350	0 of 10
Pesticides						
4,4'-DDT (p,p'-DDT)	0.0042	0.011	0.0033	2 of 8	47	0 of 8
4,4'-DDE (p,p'-DDE)	0.0098	0.0098	0.0033	1 of 8	62	0 of 8
4,4-DDD (p,p-DDD)	0.017	0.017	0.0033	1 of 8	92	0 of 8
Dieldrin	0.0084	0.0084	0.005	1 of 8	1.4	0 of 8
Inorganics						
Arsenic	61	61	13	1 of 3	16	1 of 3
Lead	184	184	63	1 of 3	1000	0 of 3
Mercury	0.0049	0.31	0.18	1 of 3	2.8	0 of 3

Notes:

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential Use.

d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use.

Table 2G – Parcel VII Subsurface Soil

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
VOCs						
Ethylbenzene	0.0014	21	1	1 of 6	390	0 of 6
Total Xylene	18	18	0.26	1 of 6	500	0 of 6
SVOCs						
Benzo(a)anthracene	0.49	27	1	1 of 6	5.6	1 of 6
Benzo(b)fluoranthene	0.47	11	1	1 of 6	5.6	1 of 6
Benzo(k)fluoranthene	0.19	5	0.8	1 of 6	56	0 of 6
Benzo(a)pyrene	0.38	19	1	1 of 6	1	1 of 6
Chrysene	0.56	27	1	1 of 6	56	0 of 6
Fluorene	0.41	50	30	1 of 6	500	0 of 6
Indeno(1,2,3-cd)pyrene	1.5	14	0.5	2 of 6	5.6	1 of 6
Naphthalene	0.42	230	12	1 of 6	500	0 of 6
Phenanthrene	0.94	170	100	1 of 6	500	0 of 6
Inorganics						
Arsenic	2.9	41.7	13	1 of 6	16	1 of 6
Copper	5.8	101	50	1 of 6	270	0 of 6
Lead	4.7	403	63	1 of 6	1000	0 of 6
Mercury	0.0067	0.24	0.18	1 of 6	2.8	0 of 6
Nickel	7.1	41.7	30	1 of 6	310	0 of 6

Notes:
a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential Use.
d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use.

Table 2H – Parcel VIII Subsurface Soil

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
VOCs						
Benzene	0.0012	880	0.06	16 of 84	44	5 of 84
Toluene	0.00096	1600	0.7	16 of 84	500	6 of 84
Ethylbenzene	0.00011	1300	1	6 of 84	390	2 of 84
Total Xylene	0.00084	1500	0.26	16 of 84	500	4 of 84
Acetone	0.0034	0.24	0.05	9 of 84	500	0 of 84

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
Methyl ethyl ketone (2-Butanone)	0.024	7.4	0.12	1 of 84	500	0 of 84
Methylene chloride	0.011	11	0.05	2 of 84	500	0 of 84
SVOCs						
Acenaphthene	0.024	2000	20	13 of 84	500	4 of 84
Acenaphthylene	0.021	2000	100	6 of 84	500	3 of 84
Anthracene	0.016	1200	100	7 of 84	500	4 of 84
Benzo(a)anthracene	0.012	840	1	26 of 84	5.6	17 of 84
Benzo(b)fluoranthene	0.038	500	1	27 of 84	5.6	14 of 84
Benzo(k)fluoranthene	0.036	150	0.8	15 of 84	56	3 of 84
Benzo(g,h,i)perylene	0.13	370	100	3 of 84	500	0 of 84
Benzo(a)pyrene	0.04	750	1	29 of 84	1	29 of 84
Chrysene	0.022	730	1	27 of 84	56	9 of 84
Dibenz(a,h)anthracene	0.065	270	0.33	14 of 84	0.56	12 of 84
Fluoranthene	0.039	1400	100	8 of 84	500	5 of 84
Fluorene	0.019	1500	30	9 of 84	500	5 of 84
Indeno(1,2,3-cd)pyrene	0.11	330	0.5	25 of 84	5.6	9 of 84
Naphthalene	0.024	17000	12	15 of 84	500	8 of 84
Phenanthrene	0.051	4700	100	11 of 84	500	6 of 84
Pyrene	0.022	2300	100	10 of 84	500	5 of 84
Dibenzofuran	0.044	120	7	3 of 84	350	0 of 84
Pesticides						
4,4'-DDT (p,p'-DDT)	0.003	0.0083	0.0033	3 of 22	47	0 of 22
4,4'-DDE (p,p'-DDE)	0.017	0.017	0.0033	1 of 22	62	0 of 22
4,4-DDD (p,p-DDD)	0.004	0.049	0.0033	5 of 22	92	0 of 22
Dieldrin	0.012	0.012	0.005	1 of 22	1.4	0 of 22
Inorganics						
Arsenic	0.45	19.9	13	2 of 84	16	2 of 84
Barium	8.4	376	350	1 of 84	400	0 of 84
Copper	5.2	83.7	50	2 of 84	270	0 of 84
Lead	1.1	651	63	16 of 84	1000	0 of 84
Mercury	0.005	2.3	0.18	7 of 57	2.8	0 of 57
Nickel	7.2	68.7	30	12 of 84	310	0 of 84
Zinc	9.8	300	109	6 of 84	10000	0 of 84

Notes:

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential Use.

d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use.

Table 2I – Public Streets Subsurface Soil

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
VOCs						
Benzene	300	300	0.06	1 of 2	44	1 of 2
Toluene	890	890	0.7	1 of 2	500	1 of 2
Ethylbenzene	1000	1000	1	1 of 2	390	1 of 2
Total Xylene	1100	1100	0.26	1 of 2	500	1 of 2
SVOCs						
Acenaphthene	240	240	20	1 of 2	500	0 of 2
Acenaphthylene	0.13	2200	100	1 of 2	500	1 of 2
Anthracene	0.17	1100	100	1 of 2	500	1 of 2
Benzo(a)anthracene	0.095	570	1	1 of 2	5.6	1 of 2
Benzo(b)fluoranthene	0.055	330	1	1 of 2	5.6	1 of 2
Benzo(k)fluoranthene	150	150	0.8	1 of 2	56	1 of 2
Benzo(g,h,i)perylene	110	110	100	1 of 2	500	0 of 2
Benzo(a)pyrene	0.074	470	1	1 of 2	1	1 of 2
Chrysene	0.093	600	1	1 of 2	56	1 of 2
Fluoranthene	0.19	1200	100	1 of 2	500	1 of 2
Fluorene	0.14	1300	30	1 of 2	500	1 of 2
Indeno(1,2,3-cd)pyrene	780	780	0.5	1 of 2	5.6	1 of 2
Naphthalene	0.081	7900	12	1 of 2	500	1 of 2
Phenanthrene	0.59	3500	100	1 of 2	500	1 of 2
Pyrene	0.31	1500	100	1 of 2	500	1 of 2
Dibenzofuran	140	140	7	1 of 2	350	0 of 2

Notes:
a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use.

Surface Soil

Twelve surface soil samples were collected from a depth of 0-2 inches to assess potential for direct human exposure. Since most of the site is paved, sample collection was focused on the few areas where surface soil was exposed. Samples were collected on Parcels I, II, IV and VI and from tree wells on the Sackett and DeGraw Street right of ways.

Analyses of the surface soil samples showed exceedances of unrestricted use SCOs for PAHs, metals and pesticides. One sample exceeded Commercial SCOs for PAHs. Pesticides are unrelated to MGP activities. The observed concentrations of metals and PAHs represent typical urban fill concentrations and are not related to the operation of the MGP.

Table 3 – Surface Soil

Constituents	Concentration Range (ppm)[a]		Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
	Minimum	Maximum				
SVOCs						
Benz[a]anthracene	0.33	11	1	3 of 12	5.6	1 of 12
Benzo[a]pyrene	0.41	8.8	1	3 of 12	1	3 of 12
Benzo[b]fluoranthene	0.65	12	1	6 of 12	5.6	1 of 12
Benzo[k]fluoranthene	0.23	4.8	0.8	3 of 12	56	0
Chrysene	0.42	11	1	5 of 12	56	0
Dibenz[a,h]anthracene	0.092	1.4	0.33	1 of 12	0.56	1 of 12
Indeno[1,2,3-cd]pyrene	0.34	6.8	0.5	8 of 12	5.6	1 of 12
4-Methylphenol (p-Cresol)	0.06	0.67	0.33	1 of 12	500	0
Pesticides						
Aldrin	0.0079	0.0079	0.005	1 of 12	0.68	0
4,4-DDD	0.0059	0.042	0.0033	6 of 12	92	0
4,4'-DDE	0.0039	0.021	0.0033	5 of 12	62	0
4,4'-DDT	0.013	0.081	0.0033	10 of 12	47	0
Dieldrin	0.0054	0.0082	0.005	1 of 12	1.4	0
Inorganics						
Cadmium	0.62	4.3	2.5	1 of 12	9.3	0
Copper	35	198	50	9 of 12	270	0
Lead	44.1	333	63	11 of 12	1000	0
Mercury	0.066	0.68	0.18	7 of 12	2.8	0
Nickel	12.2	36.5	30	1 of 12	310	0
Zinc	111	567	109	12 of 12	10000	0

Notes:
a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use.

Soil Vapor

Soil vapor, indoor air and ambient (outdoor) air were sampled. Soil vapor was sampled on Parcels I through V. Indoor air was sampled in occupied buildings on Parcels I, III and V. Ambient air was sampled on Parcels I, III, IV and V. The sampling showed the presence of MGP- related compounds in soil vapor. Concentrations of MGP-related compounds in indoor air were below the 90th percentile of USEPA BASE Study. The analytical results are presented in Tables 4 A-C.

Table 4A – Soil Vapor

Constituents	Concentration Range (ug/m3)	
	Minimum	Maximum
VOCs		
Benzene	0.38	200
Toluene	0.686	73
Ethylbenzene	0.56	12
m,p-Xylene	0.535	21
o-Xylene	0.49	14
p-Xylene	1.5	33
Acetaldehyde	6.5	40
Acetone	4.09	410
Acrolein (propenal)	0.67	10
Bromodichloromethane	0.27	1.6
Bromoform	0.29	2
Bromomethane	0.057	0.074
1,3-Butadiene	0.42	5.2
Butane	0.7	520
2-Butanone (Methyl ethyl ketone)	1.75	79
t-Butyl alcohol (Tertiary Butyl Alcohol)	0.18	26
Carbon disulfide	1.2	21
Carbon tetrachloride	0.16	22
Chloroethane	0.11	0.65
Chloroform	0.2	130
Chloromethane	0.69	3.7
2-Chlorotoluene	1.3	1.3
Cryofluorane (Freon-114)	0.11	0.12
Cyclohexane	0.54	2000
n-Decane	1.3	410
Dibromochloromethane	0.41	1.3
1,3-Dichlorobenzene	0.19	10
1,4-Dichlorobenzene	0.21	22
Dichlorodifluoromethane	1	36
1,1-Dichloroethane	0.8	1.2
1,2-Dichloroethane	0.13	5.1
cis-1,2-Dichloroethene	0.71	1700
trans-1,2-Dichloroethene	1.2	1.3
1,1-Dichloroethene	0.078	0.078
1,2-Dichloropropane	0.15	0.15
1,4-Dioxane	0.64	0.64
n-Dodecane	3.3	150
Ethanol	2.2	130
p-Ethyltoluene	1.1	11
n-Heptane	0.46	320
n-Hexane	0.59	1300

Constituents	Concentration Range (ug/m3)	
	Minimum	Maximum
2-Hexanone	0.65	10
Indane	1.2	7.1
Indene	2.1	9.8
Methyl tert-butyl ether	0.62	23
4-Methyl-2-pentanone	0.29	30
Methylene chloride	1	3.5
1-Methylnaphthalene	18	19
2-Methylnaphthalene	8.9	71
Naphthalene	1.3	100
Nonane	0.58	43
n-Octane	0.33	54
Pentane	0.731	1200
2-Propanol (Isopropyl Alcohol)	0.8	23
Styrene	0.47	20
1,1,2,2-Tetrachloroethane	1.3	5.8
Tetrachloroethene	0.69	5500
1,2,4,5-Tetramethylbenzene	2.3	25
Thiophene	0.64	2
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.32	2
1,1,1-Trichloroethane	0.094	14
Trichloroethene	0.27	180000
Trichlorofluoromethane	0.53	78
1,2,3-Trimethylbenzene	2.2	130
1,2,4-Trimethylbenzene	0.4	26
1,3,5-Trimethylbenzene	0.86	18
2,2,4-Trimethylpentane	0.49	1200
n-Undecane	1	360

Notes:
Minimum is the minimum detected value
VOCs - volatile organic compounds
ug/m3-microgram per cubic meter

Table 4B – Indoor Air

Constituents	Concentration Range (ug/m3)		EPA BASE Indoor Air Concentrations 90th Percentile	Frequency Exceeding EPA BASE Indoor Air Concentrations 90th Percentile
	Minimum	Maximum		
VOCs				
Toluene	3	610	43	4 of 8
Ethylbenzene	0.93	34	5.7	4 of 8
o-Xylene	0.83	12	7.9	1 of 8

Constituents	Concentration Range (ug/m3)		EPA BASE Indoor Air Concentrations 90th Percentile	Frequency Exceeding EPA BASE Indoor Air Concentrations 90th Percentile
	Minimum	Maximum		
Acetone	13	240	98.9	2 of 8
2-Butanone (Methyl ethyl ketone)	2.1	14	12	1 of 8
n-Decane	1.1	39	17.5	3 of 8
1,4-Dichlorobenzene	0.3	30	5.5	3 of 8
1,2-Dichloroethane	0.084	20	0.9	4 of 8
cis-1,2-Dichloroethene	1.9	5.5	1.9	2 of 8
Ethanol	3.2	360	210	3 of 8
p-Ethyltoluene	0.43	4.7	3.6	1 of 8
Methylene chloride	1.4	30	10	2 of 8
Styrene	0.11	4.9	1.9	2 of 8
Trichloroethene (TCE)	0.29	40	4.2	3 of 8
1,3,5-Trimethylbenzene	0.23	5.3	3.7	1 of 8

Notes:
ug/m3 - micrograms per cubic meter
VOCs - volatile organic compounds
NE - not established
U.S. Environmental Protection Agency (EPA) Building Assessment and Survey Evaluation (BASE) Reference1 Source: New York State Department of Health (DOH), October 2006. Summary of Indoor and Outdoor Levels of Volatile Organic Compounds from selected public and commercial office buildings reported in various locations within office settings in New York State, 1994-1996.

Table 4C – Outdoor Air

Constituents	Concentration Range (ug/m3)		USEPA BASE Outdoor Air Concentrations	Frequency Exceeding USEPA BASE Outdoor Air Concentrations
	Minimum	Maximum		
VOCs				
Methylene chloride	2.2	26	6.1	2

Notes:
ug/m3 - micrograms per cubic meter
VOCs - volatile organic compounds
NE - not established

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Common Elements

All of the active remedies discussed below include measures to prevent subsurface migration of coal tar from source areas at the Fulton Works site into the Gowanus Canal. Migration of tar toward the canal and the presence of tar-contaminated sediments at the bottom of the canal was documented during the RI. USEPA is currently designing a remedy for dredging contaminated sediments in the canal, and has stated that those dredging efforts will begin at the head of the canal, adjacent to the Fulton site.

A subsurface barrier to tar migration located along the eastern bank of the canal is included as a common element to protect the canal from recontamination once the USEPA dredging project is complete. This barrier will take the form of a subsurface wall of sufficient depth to prevent further migration of tar at depths where it could further contaminate canal sediments.

In addition, many of the existing bulkheads in this area are in poor condition and pose a threat of collapse if the USEPA dredging remedy were to proceed at this time. Consequently, the barrier wall will serve two purposes: to stop further migration of coal tar into the sediments at the bottom of the canal, and also to support the bank of the canal and adjacent buildings from collapse as dredging deepens the canal. A sealed, reinforced steel sheet pile wall is the baseline technology identified which can serve both of these purposes.

The design of the wall includes:

- a cutoff wall approximately 50 feet deep installed on the east bank of the Gowanus Canal to prevent the migration of MGP contamination from the site to the canal. The construction of “wing walls”, hydraulic relief structures, and/or groundwater treatment zones will be determined during the design phase.
- coal tar recovery wells installed (or an alternative means of tar collection) behind the cutoff wall where mobile source material is present to remove coal tar DNAPL and prevent migrating tar from building up behind the wall.
- Measures such as sealing all penetrations of the wall to prevent tar migration along utilities such as storm sewers or other piping which cannot be abandoned, which could provide a pathway for migration into the canal.

Alternatives 2 – 4 outlined below present different degrees of source area remediation. The alternatives vary widely in the length of time required, the degree of short-term impacts, the reliance on institutional controls, and overall cost.

Alternative 2: Restoration to Pre-Disposal or Unrestricted Conditions

Full Excavation

In addition to the Common Elements noted above, the Full Excavation alternative requires removal and off-site disposal of NAPL-impacted soil and all soil that exceeds the SCOs for unrestricted use from all areas of the site, as well as the street rights of way to which coal tar has migrated in the subsurface. Given the presence of coal tar at depths greater than 100 feet, the water table at an approximate depth of 10 feet and the densely populated urban nature of the site, this alternative will be subject to the limitations of excavation technology applicable to this area. Natural attenuation of groundwater would reduce dissolved contaminant concentrations over a period of several years following completion of the excavation.

Capital Cost $609,248,000

Alternative 3: Excavation of Former MGP Subsurface Structures and Immediately Adjacent Coal Tar Contaminated Soils and Containment and Coal Tar Recovery

In addition to the Common Elements noted above, Alternative 3 would call for excavation of MGP source areas currently located beneath parcels I, II, III, IV and VI. Because all of these parcels currently host active land uses, remediation would proceed on a parcel by parcel basis, as each parcel becomes vacant or otherwise becomes available for remediation. Such opportunities for remediation would include redevelopment proposals, extensive reconstruction of city sewer infrastructure, or rehabilitation/reconstruction of the Thomas Greene Park.

Once a parcel becomes available for remediation, the following actions would be implemented:

- Excavation of the MGP structure areas, including gas holder foundations and tanks, and immediately adjacent source areas and grossly contaminated soil, as defined in 6NYCRR Part 375-1.2(u), from Parcels I, II, III and IV. Grossly contaminated soils would be excavated from the portions of off-site Parcel VI, where tar has migrated from the original MGP operations areas.
- Additional excavation work required to facilitate redevelopment would be included in the removal program, with requirements for proper handling and disposal of the excavated material.
- Excavation support systems such as sheet piling, installed to facilitate deep excavations, would be left in place as necessary to minimize recontamination by tar migrating from adjacent unremediated areas. Coal tar impacts to the deeper sewer lines in this area will be addressed during major sewer modification work.
- Natural attenuation of groundwater would reduce dissolved contaminant concentrations over a period of several years following completion of the excavation and solidification. However, due to the extensive presence of tar throughout the area, it is unlikely that groundwater contamination will be eliminated.

Environmental Easements will be required in the near term for Parcels I, II, III and IV, which make up the footprint of the former MGP. Interim Site Management Plans will be required for all on-site and off-site properties except Parcel V, subject to agreements with the property owners.

Present Worth: $35,501,000
Capital Cost:.....$29,801,000

Annual Costs:.....$331,000

Alternative 4: Excavation of Former MGP Subsurface Structures and Remediation of MGP Source Material to a Minimum Depth of 20 feet and Containment and Coal Tar Recovery

This alternative builds on Alternative 3 by providing for additional remediation of deeper soils. It includes the Common Elements noted above, and provides for a parcel by parcel remedial approach which would be triggered by the same events listed for Alternative 3.

Once a parcel becomes available for remediation, the following actions would be implemented:

- Excavation of MGP structures, including gas holder foundations and tanks, and immediately adjacent source areas and grossly contaminated soil, as defined in 6NYCRR Part 375-1.2(u), from Parcels I, II, III and IV.
- For Parcels I, II, III, IV, VI and VII, a pre-design investigation would be conducted to determine the extent of MGP source material to depths of at least 20 feet. This material will be either excavated and replaced with clean backfill meeting the appropriate Part 375 SCOs, or solidified in place using an in-situ solidification (ISS) process. ISS is a process that binds the soil particles in place creating a low permeability mass. The contaminated soil is mixed in place with solidifying agents (typically Portland cement) or other binding agents using an excavator or augers. The mixture produces a solidified low permeability monolith. The solidified mass will then be covered with a cover system to prevent direct exposure and to protect the solidified material from weathering due to freeze/thaw cycles. The process reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination. The solidified mass, however, can still be removed as necessary to support future site redevelopment.
- Excavation support systems such as sheet piling or soil-concrete walls that are installed to facilitate deep excavations, would be left in place as necessary to minimize recontamination by tar migrating from adjacent unremediated areas.
- Coal tar impacts to the deeper sewer lines in this area would be addressed during major sewer modification work.
- Natural attenuation of groundwater would reduce dissolved contaminant concentrations over a period of several years following completion of the excavation and solidification. However, due to the extensive presence of tar at depth beneath the area, it is unlikely that groundwater contamination will be eliminated.
- Environmental Easements will be required in the near term for Parcels I, II, III and IV, which make up the footprint of the former MGP. Interim Site Management Plans will be required for all on-site and off-site properties except Parcel V, subject to agreements with the property owners.

Present Worth: $54,525,000
Capital Cost:.....$48,825,000
Annual Costs:.....$331,000

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1) No Action	0	0	0
2) Restoration to Pre-Disposal or Unrestricted Conditions	609,248,000	0	0
3) Excavation of Former MGP Subsurface Structures and Immediately Adjacent Coal Tar Contaminated Soils and Containment and Coal Tar Recovery	29,801,000	331,000	35,501,000
4) Excavation of Former MGP Subsurface Structures and Remediation of MGP Source Material to a depth of 20 feet and Containment and Coal Tar Recovery	48,825,000	331,000	54,525,000

Exhibit D

SUMMARY OF THE SELECTED REMEDY

The Department has selected Alternative 4: Barrier Wall with Coal Tar Extraction, Excavation of Former MGP Subsurface Structures, and Remediation of MGP Source Material to a minimum depth of 20 feet as the remedy for this site. The elements of this remedy are described in Section 7 and the selected remedy is depicted in Figure 5.

Basis for Selection

The selected remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Alternative 1 (No Action) does not provide any protection to public health and the environment and will not be evaluated further. Alternative 2, by removing soil contaminated above the unrestricted soil cleanup objectives, to the limits of construction technology applicable to this area, meets this threshold criterion. Alternatives 3 and 4 protect the environment in the short term by the construction of the barrier wall to prevent further contamination of the canal, by addressing potential utility worker exposures in the short term, and by maintaining the existing protections for general public exposures through institutional controls. As the parcels become available for remediation in the longer term, Alternative 3 partially addresses contaminated soil and the sources of groundwater contamination. Those soils most likely to be encountered during future excavation work would be removed and replaced with clean backfill. The selected remedy, Alternative 4, would satisfy this criterion to a greater degree by removing or stabilizing/solidifying more of the contaminated subsurface soils. By removing or stabilizing all MGP contamination to a depth of at least 20 feet, Alternative 4 would achieve an enhanced level of overall protection.

Alternatives 2, 3 and 4 rely on natural attenuation of groundwater contamination over time, in conjunction with eventually reducing the source of contaminants as remedial actions remove and/or treat additional areas of contamination, to protect the groundwater resource. Under favorable conditions, all of the identified MGP contaminants can be digested and destroyed by soil bacteria once they are dissolved in groundwater. However, it is likely that at least some MGP source areas will remain at unreachable subsurface depths for the foreseeable future, and this undissolved material would not be broken down by soil bacteria. Thus, it is likely that significant levels of groundwater contamination will remain beneath the area indefinitely. To achieve human health protection, in addition to the local groundwater use restrictions that are already in place, institutional controls will also be required to prevent human contact with this groundwater. Under Alternatives 2, 3, and 4, tar discharges to the Gowanus Canal will be eliminated, and a substantial reduction in dissolved groundwater contaminant concentrations discharged to the canal will be achieved. Under current conditions, dissolved contaminants are rapidly degraded once they reach the canal, and reach concentration levels below human and ecological screening thresholds. Alternatives 2, 3, and 4, combined with increasing oxygen levels in the canal resulting from operation of the newly rehabilitated flushing tunnel, will reduce contaminant levels even further.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

Alternatives 2, 3, and 4 would comply with SCGs to the extent practicable. Alternative 2 would meet unrestricted use soil cleanup objectives while Alternatives 3 and 4 would meet commercial use soil cleanup objectives by removing soils which exceed those objectives. Alternative 3 would remove less of this soil, but would isolate it from human and environmental exposure with a surface cover consisting of clean soil, buildings, or pavement. Alternative 4 would remove/solidify more contaminated soil than Alternative 3 and thus provide a deeper layer of clean or solidified soil, but would still rely to some extent on a surface cover to prevent exposure.

Alternatives 3 and 4 would allow source material to remain at depth below the site, and this source material would continue to contaminate groundwater which comes into contact with these source materials. Alternative 4 removes or solidifies a greater volume of source material, more effectively addressing the sources of groundwater contamination. Human exposure to the contaminated groundwater would be prevented through institutional controls.

Because Alternatives 2, 3 and 4 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Alternatives 2, 3, and 4 all include construction of a subsurface barrier wall along the east bank of the Gowanus Canal to prevent further migration of coal tar from the site into the sediments at the bottom of the canal. This is a well-established technology for controlling contaminant migration, and is considered highly effective and reliable over the long term. A similar barrier wall system was installed along the banks of the Hudson River in Newburgh in 2010. It has proven highly effective: over 5,000 gallons of coal tar DNAPL has been collected behind the wall, and no evidence of discharge to the river or to remediated river sediments has been seen. Along the Gowanus Canal, a similar wall has already been pilot tested at the Citizen's MGP site farther to the south, and is slated for installation in 2016. National Grid's design team conducted the pilot test and is familiar with the challenges posed by design and construction of this structure.

Behind this barrier wall, long-term effectiveness is best accomplished by those alternatives involving excavation and removal of the contaminated soils. Alternative 2 calls for complete excavation of soil contamination. Alternatives 3 and 4 both call for excavation of all MGP structures, but Alternative 4 calls for more extensive excavation of source material outside of those structures.

The greatest degree of long-term effectiveness would be achieved by Alternative 2 since contaminated material would be removed from the site to the limits of excavation technology. However, contaminated material would remain at depths unreachable by existing excavation technology, which would still remain beneath the canal and

at depth on the west side of the canal. Alternatives 3 and 4 would remove all MGP structures and associated source material to a depth of 20 feet, but some contaminated material would remain at depths below 20 feet on site, beneath the canal and at depth on the west side of the canal. Alternative 4 would remediate more source material than Alternative 3, either through excavation or stabilization. In-situ stabilization (ISS) is considered highly effective over the long-term, since it binds the contaminants tightly into a solidified cement mass which is highly resistant to dissolution by groundwater. ISS has been successfully applied to MGP-contaminated soils at numerous locations throughout New York State.

Alternatives 3 and 4 would both provide additional containment around areas of the future excavated material, since they call for leaving excavation supports such as sheet piling in place when excavation is complete. This would help prevent recontamination of remediated areas by coal tar, which could otherwise move back into the remediated areas

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

The most important concern with contaminant mobility is the ongoing migration of coal tar from on-site source areas toward the Gowanus Canal, and into the sediments at the bottom of the canal. Alternatives 2, 3, and 4 all call for construction of a barrier wall along the bank of the canal and collection of coal tar behind the wall to eliminate this off-site migration and future impacts to canal sediments. To ensure that the mobility of tar is minimized before USEPA performs the remedial dredging of the canal, it is essential that the design and implementation of this portion of the overall remedy be conducted in a timely manner.

Alternatives 3 and 4 offer an additional degree of mobility reduction within the site itself in the future, by calling for excavation support sheeting to be left in place following remediation. This sheeting would serve as an additional barrier to migration of contaminants within the site. The in-situ solidification of soils allowed under Alternative 4 would further limit the mobility of contaminants in the solidified soil mass.

Reducing the volume of contaminated material is best achieved by excavation and removal, as discussed in item 3 above. Alternatives 2, 3 and 4 offer varying degrees of volume reduction. Alternative 2 offers the greatest degree of volume reduction, Alternative 3 offers the least, and Alternative 4 offers significantly more than Alternative 3.

Toxicity reduction is best achieved by physical removal as well, so Alternative 2 ranks best by removing the maximum amount of material. Alternative 4 allows for a different approach to toxicity reduction, by allowing some of the contaminated soil to be solidified in place. Solidification greatly reduces the toxicity of the treated soil, but actually results in a slight increase in volume. This volume increase would be inconsequential, however, since the solidified mass would be created at depth below the ground surface, and would simply result in a smaller volume of backfill required to restore the remediated areas to existing grades.

Natural attenuation would, in time, reduce the toxicity and mobility of contamination in the groundwater since the dissolved contaminants break down naturally in the environment, but achievement of groundwater quality standards is unlikely.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

The barrier wall and tar collection system included in the common remedy elements will involve construction in a relatively narrow space along the eastern bank of the Gowanus Canal. Noise and vibration impacts during this construction work are a significant concern. On Parcel 1 in particular, the presence of an active movie production studio a few feet from the barrier wall alignment will pose significant engineering challenges. Suspension of production activities, or relocation of the studio operation, may be required during the barrier wall installation.

Since Alternatives 2, 3 and 4, include excavation of MGP structures and source material, the short term impacts for all alternatives are similar. However, the severity of these impacts varies significantly. Alternative 2 would require an extremely large scale excavation to extraordinary depths, and would generate a much greater disruption to current property use and a greater amount of truck traffic, construction noise, and other impacts in the surrounding community. The duration of construction would be far longer than for Alternatives 3 and 4. Alternative 2 would require large scale disruption of current businesses and land use, whereas Alternative 3 and 4 are specifically designed to allow implementation on a parcel-by-parcel basis as each property becomes available.

Alternatives 3 and 4 would result in lower levels of truck traffic, since the volume of material excavated and transported off site would be less than the amount required by Alternative 2. Noise impacts would be generated by excavation work and by sheet pile driving for excavation support under all alternatives, but would be considerably less intense and shorter in duration for Alternatives 3 and 4 than for Alternative 2. Truck traffic to transport coal tar collected from recovery wells will occur under Alternatives 3 and 4, but the number of truck trips required to move the recovered tar is very small compared to the number of truck trips required to transport the far larger volumes of excavated soil.

Alternatives 3 and 4 will result in truck traffic as a result of the transportation of contaminated soil off-site and clean fill to the site, but the number of truck trips is less than the number required for the full excavation alternative. Minimizing truck traffic is consistent with the green remediation principles outlined in DER-31. If ISS techniques are employed under Alternative 4, this would require importing loads of cement, but the associated truck traffic would generally be smaller than the amount of truck traffic required for full excavation, off-site disposal, and importation of clean backfill.

6. Implementability. The technical and administrative feasibility of implementing each alternative is evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

The barrier wall and tar collection system included in the common remedial elements will require close coordination with the USEPA program to dredge contaminated sediments from the canal. The current presence of occupied buildings on Parcels 1 and 6 requires that the wall be constructed by working from large, heavy barges in the canal. The current accumulation of contaminated sediment in the canal does not provide sufficient water depth to position a work barge in this area. As a result, building the wall from the canal could require preliminary dredging in this area, which would complicate the logistics of the USEPA effort and could delay its full implementation.

The Parcel 1 and 6 buildings also constrain the location of the tar recovery wells to be built behind the wall, since very little room is available between the barrier wall and the wall of the existing buildings. Construction

and operation of these wells can be accomplished with the buildings in place, but would be significantly easier if the buildings were to be removed prior to construction.

Alternatives 2 through 4 all include excavation, which is a relatively routine activity that can be accomplished with existing construction techniques. However, Alternative 2 would require an extremely deep excavation, and correspondingly extreme measures for excavation support and dewatering would be required. It is likely that the deepest contamination, far below the ground surface, could not be reached with existing technologies. It would not be feasible to implement Alternative 2 in the manner planned or even to fully excavate to the depths necessary without severely damaging area infrastructure and buildings given the magnitude of such a removal. Alternatives 3 and 4 include coal tar recovery, which is already under way at one other MGP site on the Gowanus Canal and can be readily implemented here. The ISS treatment of soils allowed under Alternative 4 has been successfully implemented at several other MGP sites in New York and elsewhere and is readily implementable.

Administratively, implementation of Alternatives 3 and 4 will be somewhat difficult because they involve excavation or treatment of soil beneath occupied structures, city streets, and a city park. However the administrative feasibility is enhanced by performing this excavation when the parcels become available for redevelopment or other improvements. Alternative 2, which would require those parcels to be immediately excavated, would be extremely difficult to implement administratively due to the need to obtain access or ownership of all of the affected parcels.

Parcel 1 also contains subsurface MGP structures in close proximity to the alignment of the barrier wall, just inside the western wall of the current studio building. Heavily contaminated soil may be present beneath both parcels 1 and 6. The barrier wall can be constructed under current conditions, but it may prove more efficient to remove the buildings prior to construction of the wall. Such a removal would significantly accelerate the construction of the wall and the removal of source areas throughout Parcels 1 and 6.

Alternatives 3 and 4 call for institutional controls to control future excavation work on the site, and would include controls to prevent the use of groundwater without appropriate treatment. Similar controls have been implemented at numerous other sites statewide.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

The costs of the alternatives vary significantly. Because of the great depths to which tar has migrated in the subsurface, and the need to remove several city blocks full of buildings and infrastructure, the estimated cost for Alternative 2 is extraordinarily high, given the minimal increase in the protection of public health and the environment it represents. Alternative 3 has a moderate to high cost but does not remove the MGP source material outside the immediate vicinity of the MGP structures. Alternative 4 is less costly than Alternative 2 and more costly than Alternatives 3. Alternative 3 best addresses the RAOs of the alternatives and is cost-effective.

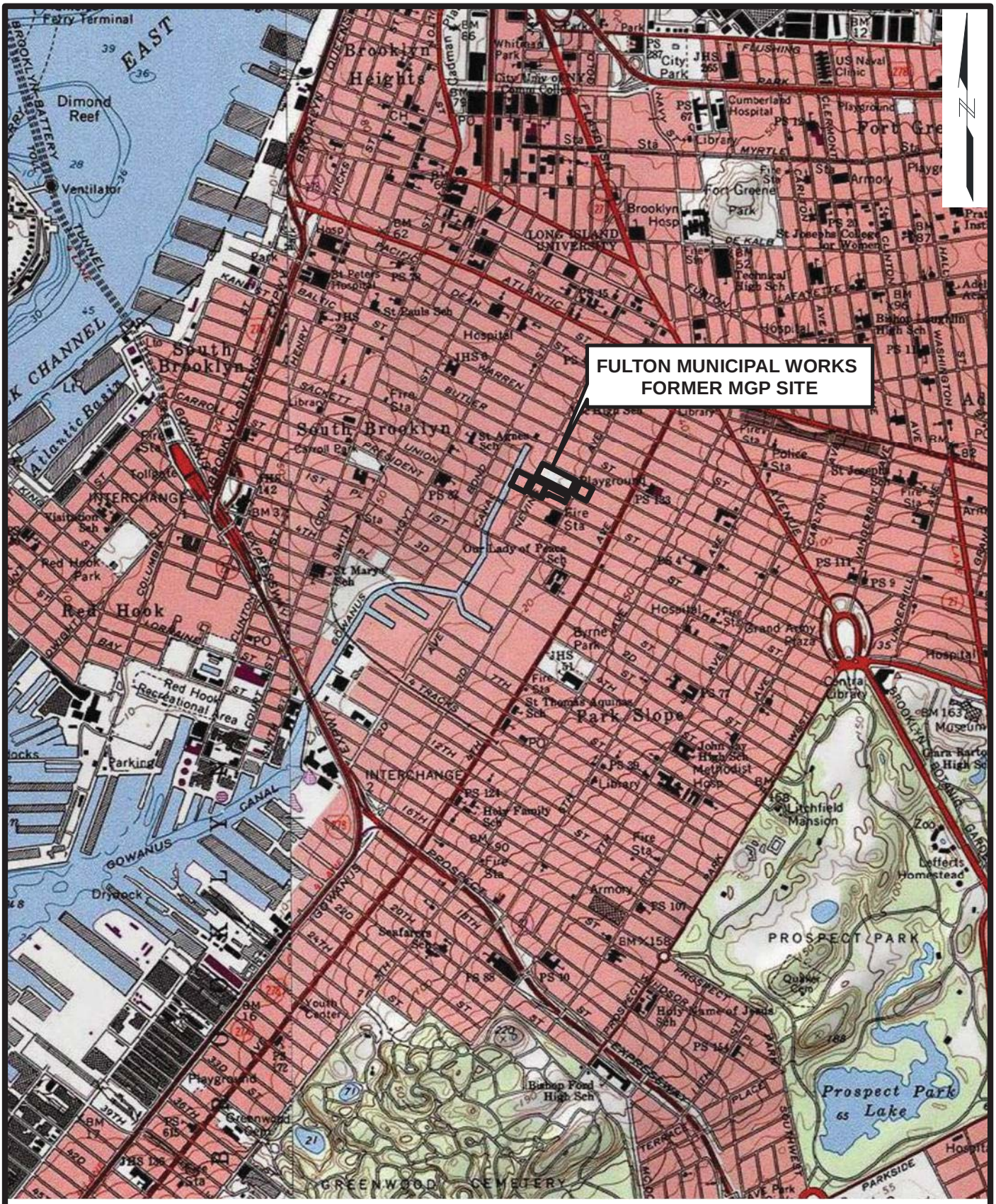
8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

Alternative 2 would require no further restrictions on land use if it could be fully implemented. However, significant restrictions on land use already exist in this highly urbanized area, in the form of zoning restrictions and restrictions on groundwater use. Although Alternatives 3 and 4 would be less desirable because some contaminated soil and NAPL would remain untreated, exposure to the material remaining at depth would be controlled under the provisions of the environmental easement and Site Management Plan, which would be compatible with the current restricted residential, recreational, commercial and industrial land uses.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP were evaluated. A responsiveness summary was prepared that describes public comments received and the manner in which the Department addressed the concerns raised.

Alternative 4 was selected because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.



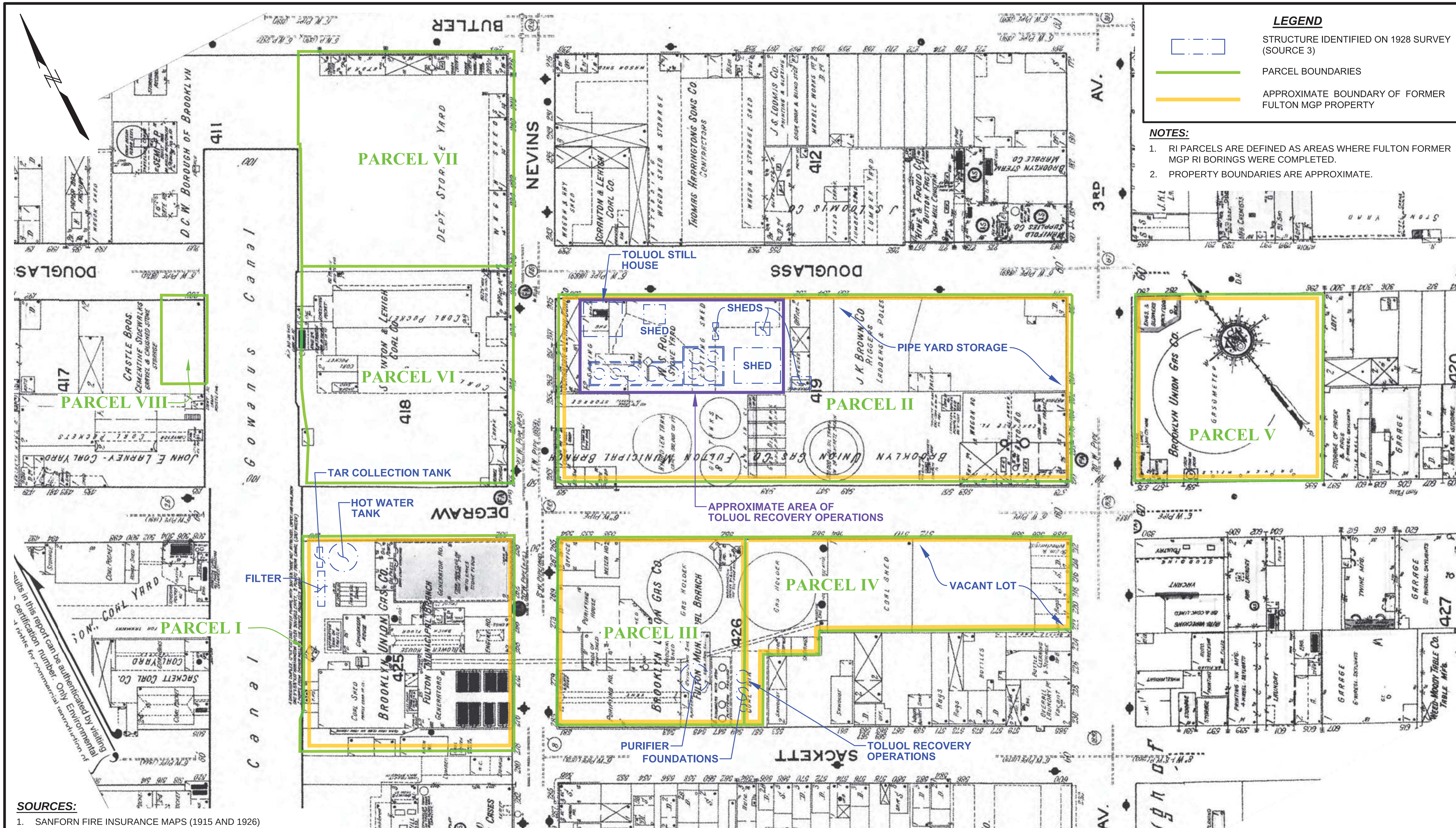
SOURCE:
USGS TOPOGRAPHIC MAP, ACCESSED
VIA WWW.ARCGISONLINE.COM

0 2,000 4,000
SCALE, FEET

Fulton Municipal Works Former MGP Site
Brooklyn, New York
Site No. 224051

FIGURE 1:
SITE LOCATION MAP

J:\Projects\National_Grid\Fulton\FS\PRAP\Site Location.mxd



NOTES:

1. RI PARCELS ARE DEFINED AS AREAS WHERE FULTON FORMER MGP RI BORINGS WERE COMPLETED.
2. PROPERTY BOUNDARIES ARE APPROXIMATE.

SOURCES:

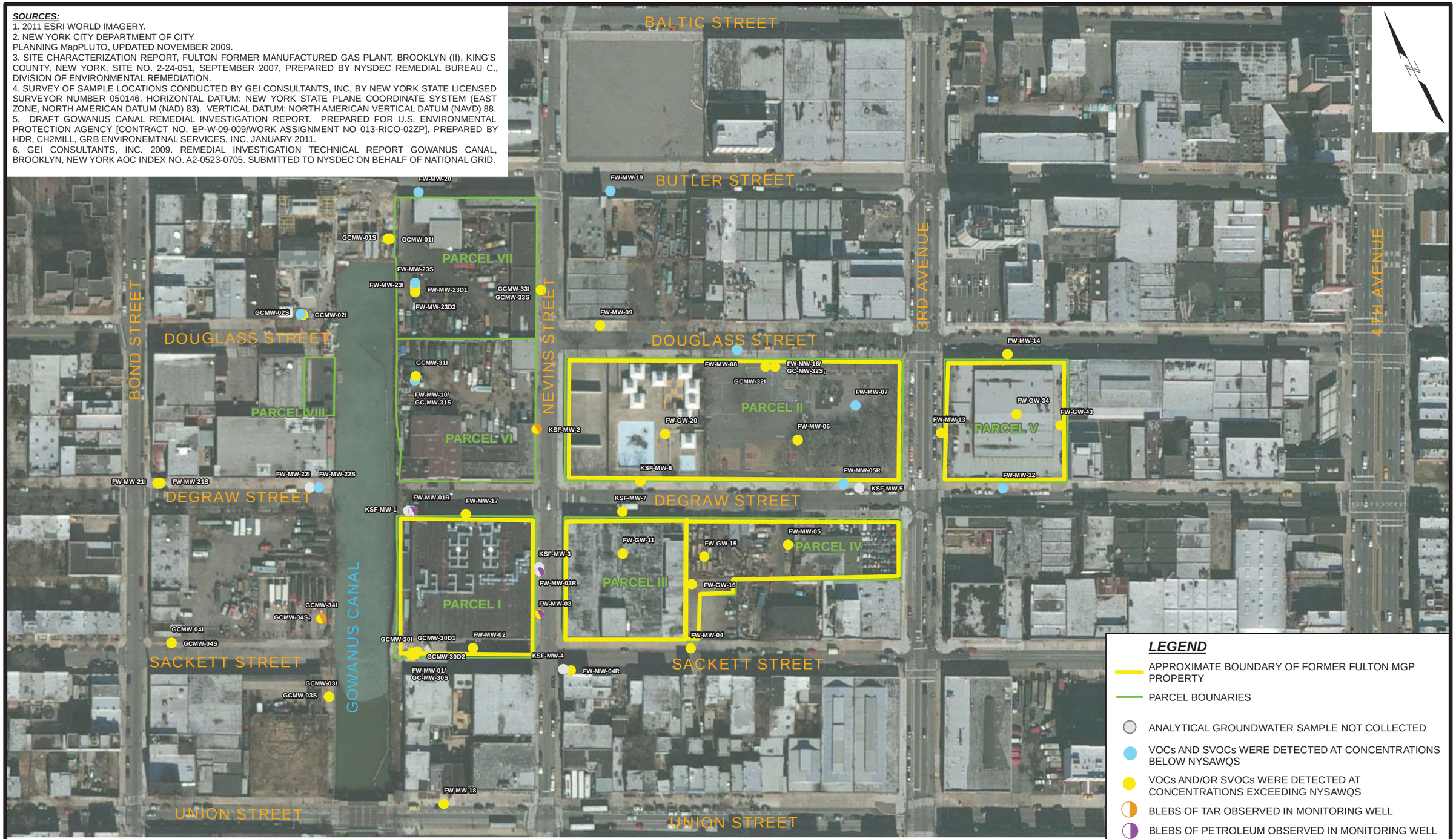
1. SANFORN FIRE INSURANCE MAPS (1915 AND 1926)
2. NEW YORK CITY OPEN ACCESSIBLE SPACE INFORMATION SYSTEM (http://www.oasisnyc.net), ACCESSED JANUARY 2008.
3. SURVEY OF FULTON GAS WORKS, PREPARED BY JOHNSON AND HIGGINS, N.Y., SCALE: 1" = 50', DATE: MARCH 13, 1928.
4. BIRD'S EYE VIEW PHOTOGRAPH DOUGLASS STREET STORE YARD (19806), THE BROOKLYN UNION GAS CO., DATED MARCH 13, 1928.
5. PROPERTY DEED INFORMATION FOR 270 NEVINS STREET, 537 SACKETT STREET, 225 NEVINS STREET, 560 DEGRAW STREET, AND 191 3RD AVENUE.

Fulton Municipal Works Former MGP Site Brooklyn, New York Site No. 224051	FIGURE 2: FULTON MUNICIPAL WORKS FORMER MGP SITE FOOTPRINT SUMMARY

I:\Project\National Grid\Fulton\Feasibility Study\2014-12\Fulton-Former MGP Footprint-PRAP.dwg

SOURCES:

1. 2011 ESRI WORLD IMAGERY.
2. NEW YORK CITY DEPARTMENT OF CITY PLANNING MapPLUTO, UPDATED NOVEMBER 2009.
3. SITE CHARACTERIZATION REPORT, FULTON FORMER MANUFACTURED GAS PLANT, BROOKLYN (II), KING'S COUNTY, NEW YORK, SITE NO. 2-24-051, SEPTEMBER 2007, PREPARED BY NYSDEC REMEDIAL BUREAU C., DIVISION OF ENVIRONMENTAL REMEDIATION.
4. SURVEY OF SAMPLE LOCATIONS CONDUCTED BY GEI CONSULTANTS, INC, BY NEW YORK STATE LICENSED SURVEYOR NUMBER 050146. HORIZONTAL DATUM: NEW YORK STATE PLANE COORDINATE SYSTEM (EAST ZONE, NORTH AMERICAN DATUM (NAD) 83). VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM (NAVD) 88.
5. DRAFT GOWANUS CANAL REMEDIAL INVESTIGATION REPORT. PREPARED FOR U.S. ENVIRONMENTAL PROTECTION AGENCY [CONTRACT NO. EP-W-09-009/WORK ASSIGNMENT NO 013-RICO-02ZP], PREPARED BY HDR, CH2MILL, GRB ENVIRONEMTNAL SERVICES, INC. JANUARY 2011.
6. GEI CONSULTANTS, INC. 2009. REMEDIAL INVESTIGATION TECHNICAL REPORT GOWANUS CANAL, BROOKLYN, NEW YORK AOC INDEX NO. A2-0523-0705. SUBMITTED TO NYSDEC ON BEHALF OF NATIONAL GRID.



LEGEND

- APPROXIMATE BOUNDARY OF FORMER FULTON MGP PROPERTY
- PARCEL BOUNARIES
- ANALYTICAL GROUNDWATER SAMPLE NOT COLLECTED
- VOCs AND SVOCs WERE DETECTED AT CONCENTRATIONS BELOW NYSAWQS
- VOCs AND/OR SVOCs WERE DETECTED AT CONCENTRATIONS EXCEEDING NYSAWQS
- BLEBS OF TAR OBSERVED IN MONITORING WELL
- BLEBS OF PETROLEUM OBSERVED IN MONITORING WELL

NOTE:

1 - FW-MW-16 samples collected on 6/12/2008 and 9/15/2009 do not have VOCs/SVOCs detected at concentrations exceeding NYSAWQS criteria. The GC-MW-32S sample collected on 7/20/2010 has SVOCs detected at concentrations exceeding the NYSAWQS.
2 - Tar blebs were observed in GCMW-34I and not in GCMW-34S.
3 - Tar blebs were observed at KSF-MW-6 and KSF-MW-7 during the 2007 sampling event. However tar blebs were not observed during the 2009 and 2010 events.

0 150 300

SCALE, FEET

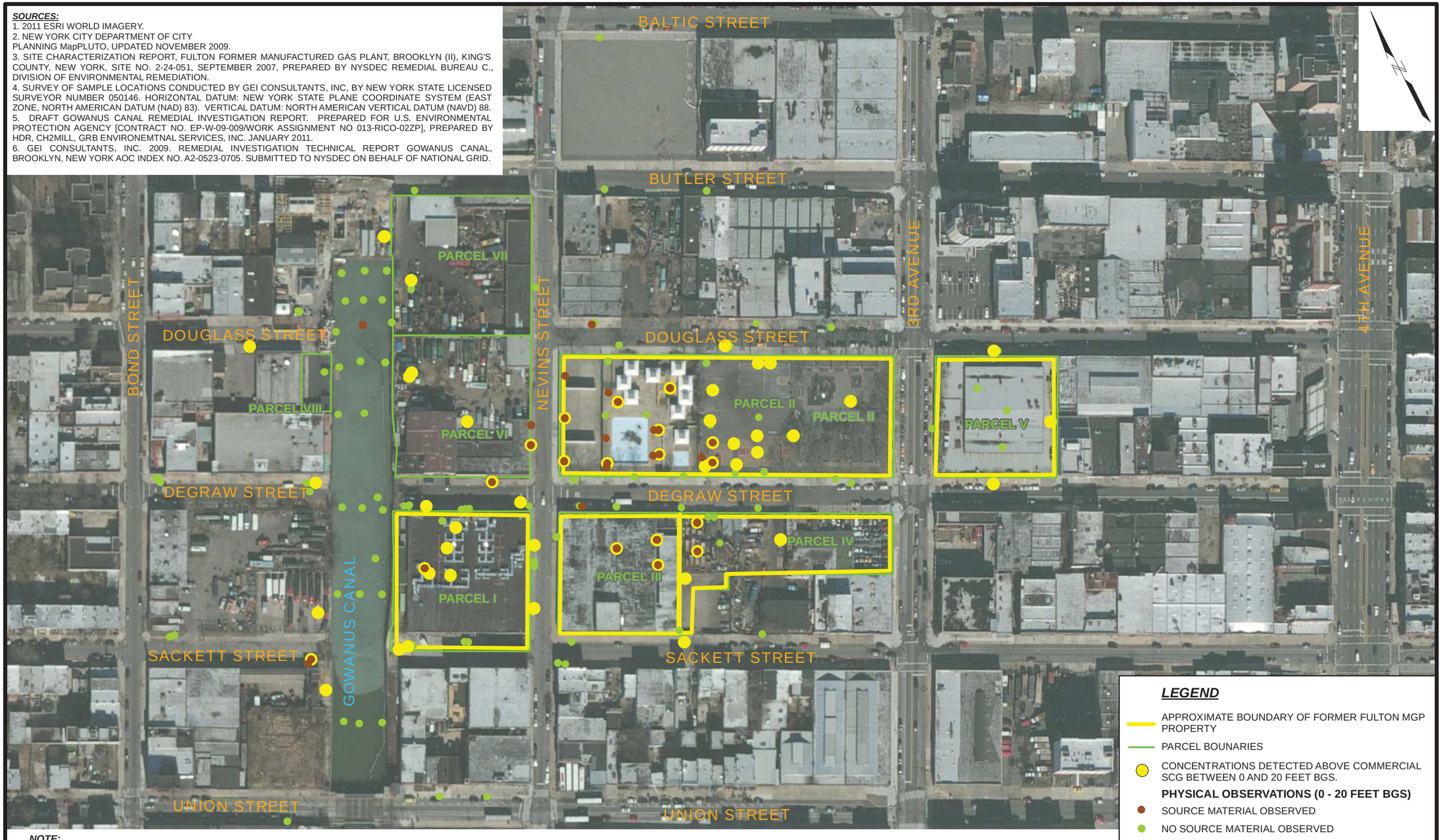
Fulton Municipal Works Former MGP Site
Brooklyn, New York
Site No. 224051

FIGURE 3:
SUMMARY OF GROUNDWATER CONDITIONS

J:\Projects\National_Grid\Fulton\FS\PRAP\GW_PRAP_Response.mxd

SOURCES:

1. 2011 ESRI WORLD IMAGERY.
2. NEW YORK CITY DEPARTMENT OF CITY PLANNING MapPLUTO, UPDATED NOVEMBER 2009.
3. SITE CHARACTERIZATION REPORT, FULTON FORMER MANUFACTURED GAS PLANT, BROOKLYN (II), KING'S COUNTY, NEW YORK, SITE NO. 2-24-051, SEPTEMBER 2007, PREPARED BY NYSDEC REMEDIAL BUREAU C., DIVISION OF ENVIRONMENTAL REMEDIATION.
4. SURVEY OF SAMPLE LOCATIONS CONDUCTED BY GEI CONSULTANTS, INC, BY NEW YORK STATE LICENSED SURVEYOR NUMBER 050146. HORIZONTAL DATUM: NEW YORK STATE PLANE COORDINATE SYSTEM (EAST ZONE, NORTH AMERICAN DATUM (NAD) 83). VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM (NAVD) 88.
5. DRAFT GOWANUS CANAL REMEDIAL INVESTIGATION REPORT. PREPARED FOR U.S. ENVIRONMENTAL PROTECTION AGENCY [CONTRACT NO. EP-W-09-009/WORK ASSIGNMENT NO 013-RICO-02ZP], PREPARED BY HDR, CH2MILL, GRB ENVIRONEMTNAL SERVICES, INC. JANUARY 2011.
6. GEI CONSULTANTS, INC. 2009. REMEDIAL INVESTIGATION TECHNICAL REPORT GOWANUS CANAL, BROOKLYN, NEW YORK AOC INDEX NO. A2-0523-0705. SUBMITTED TO NYSDEC ON BEHALF OF NATIONAL GRID.



LEGEND

- APPROXIMATE BOUNDARY OF FORMER FULTON MGP PROPERTY
- PARCEL BOUNARIES
- CONCENTRATIONS DETECTED ABOVE COMMERCIAL SCG BETWEEN 0 AND 20 FEET BGS.

PHYSICAL OBSERVATIONS (0 - 20 FEET BGS)

- SOURCE MATERIAL OBSERVED
- NO SOURCE MATERIAL OBSERVED

NOTE:

1. SOURCE MATERIAL IS DEFINED AS SOILS THAT CONTAIN TAR COATINGS, LENSES, AND SATURATION.
2. COMMERCIAL SCG - PART 375-6.8(B), RESTRICTED USE SOIL CLEANUP OBJECTIVES FOR THE PROTECTION OF PUBLIC HEALTH FOR COMMERCIAL USE.

0 150 300

SCALE, FEET

Fulton Municipal Works Former MGP Site
Brooklyn, New York
Site No. 224051

FIGURE 4:
SUMMARY OF
SUBSURFACE SOIL
(0 - 20 FEET BGS)

J:\Projects\National_Grid\Fulton\FS\PRAP\Summary_Subsurface_Soil.mxd

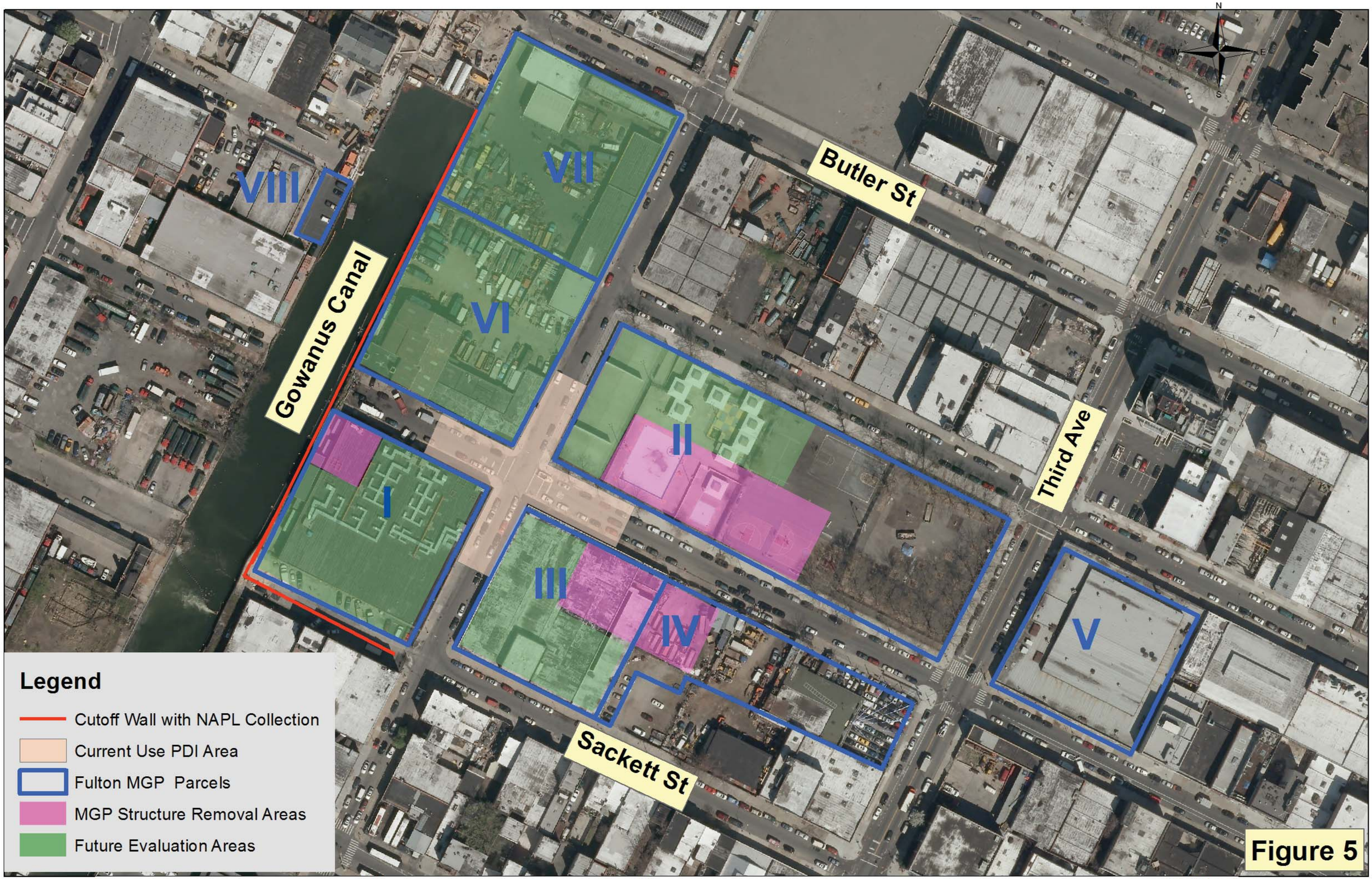

N
W
E
S
Butler St
Third Ave
Gowanus Canal
Sackett St
VIII
VII
VI
II
I
III
IV
V
Legend
Cutoff Wall with NAPL Collection
Current Use PDI Area
Fulton MGP Parcels
MGP Structure Removal Areas
Future Evaluation Areas
0
340
680
1,360 Feet

Figure 5

APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

K-Fulton Works
Operable Unit No.1: Plant Site and Near Off-site
Brooklyn, Kings County, New York
Site No. 224051

The Proposed Remedial Action Plan (PRAP) for the K-Fulton Works site was prepared by the New York State Department of Environmental Conservation (DEC) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on April 3, 2015. The PRAP outlined the remedial measure proposed for the contaminated soil and groundwater at the K-Fulton Works site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on April 16, 2015 which included a presentation of the remedial investigation as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period was to have ended on May 3, 2015, however it was extended to June 2, 2015, at the request of the public. The Gowanus Canal Community Advisory Group (CAG) NYS Senator Velmanette Montgomery, U.S. Congresswoman Nydia Velazquez, NYS Assemblywoman JoAnne Simon and NYC Councilman Brad Lander submitted letters requesting a 90 day extension of the Public Comment Period. As noted above a thirty day extension was granted based on the limitation for comment period extensions of thirty days set forth at 6 NYCRR Part 375-1.10(g). These letters and DEC response are included in the Administrative Record.

This responsiveness summary responds to all questions and comments raised at the public meeting or in writing during the public comment period. The following are the comments received, with the Department's responses:

National Grid submitted a letter dated May 1, 2015, which included the following comments:

COMMENT 1: National Grid wishes to clarify the regulatory status of the Site, as the PRAP identifies the Site as a "State Superfund Project." While National Grid understands that DEC's regulatory authority for inactive hazardous waste sites is derived from the Inactive Hazardous Waste Disposal Site Law (ECL, § 27-1301 et seq.), commonly referred to as the State Superfund Law, the Site itself is not actually a Listed Site on the Inactive Hazardous Waste Site Registry. National Grid believes the Site's classification as a Non-Registry Site should be made clear in the ROD.

RESPONSE 1: Agreed. The title page of the PRAP and ROD typically reflect the program under which the site is administered. Although the regulatory authority under which the PRAP and ROD are issued is the Inactive Hazardous Waste Disposal Site Law (ECL, § 27-1301 et seq.) commonly referred to as the State Superfund Law, the K-Fulton Works is not listed on the Registry of Inactive Hazardous Waste Disposal Sites. The reference to SSF has been dropped and this explanation

provided in the ROD.

COMMENT 2: The PRAP contains several references both to contaminants unrelated to MGP operations, as well as to other parties that may be responsible for the contamination on OU1. For example, Section 3 references the U.S. government's toluol plant formerly located on Parcels II and III. Section 6.3 discusses the presence of MTBE in approximately 25% of the groundwater samples, indicating petroleum contamination unrelated to the MGP, and chlorinated solvents in soil vapor samples also unrelated to the former MGP. Given this documented evidence of other sources and parties at OU 1, the discussion of Potentially Responsible Parties in Section 5 should be expanded to include, at a minimum, a statement that contaminants unrelated to the MGP have been found at the Site, for which National Grid is not responsible, and that additional PRPs may be identified in the future.

RESPONSE 2: The nature and extent of the MGP contamination exceeds any other potential source of contamination identified at, or in the vicinity of, the site. Soil grossly contaminated with coal tar is widespread, both laterally and with depth in the upland areas as well as in and beneath the canal. The period of operation of the toluol plant appears to have been very short, compared to the decades-long period when the MGP operated, and no distinctive suite of contaminants associated with this plant have been identified. In addition, although the MTBE detected in groundwater samples most likely originated from post-MGP gasoline contamination, no gasoline source areas were identified during the RI. Currently no other Responsible Parties have been identified. The Enforcement Status detailed in Section 5 is accurate.

COMMENT 3: National Grid requests that the possibility for a wing wall on Sackett Street be addressed more clearly. Page 10 of the PRAP notes that short sections of wing walls (implying at both ends of the wall) may be required, depending on evaluation conducted during the design phase. Page 19 of the Exhibits, however, notes that a wing wall will be required on the southern end at Sackett Street, and such a wing is shown extending to Nevins Street on the remedial design figure. National Grid's understanding is that a wing wall on the northern end is not required and requests that the language on Page 10 referenced above be clarified.

With respect to the southern end, National Grid believes, as indicated in the Feasibility Study (FS), that further evaluation is needed to determine whether a wing wall of any length is necessary along Sackett Street. Installation of a wing wall along Sackett Street could result in unacceptable groundwater flow conditions and possible groundwater mounding behind the wall. An evaluation of the potential impact of a Sackett Street wing wall on groundwater hydraulics and quality is part of the Pre-Design Investigation (PDI) work scope that National Grid will be completing for the Fulton Site; the Record of Decision should clarify that the need for a wing wall along Sackett Street will depend on the outcome of that work.

RESPONSE 3: Page 10 of the PRAP correctly states that the need for wing walls (and their extent) will be determined in the design phase. No change to that statement is warranted. Page 19 of the Exhibits has been changed to state that construction of wing walls may be required and that a determination will be made during the design phase relative to their need and extent. Hydraulic relief structures with associated groundwater treatment zones may also be substituted for wing walls, depending on the degree of tar and dissolved contaminant migration forecast by groundwater

modeling during the design phase of the project.

COMMENT 4: Contrary to the FS, Page 21 of the PRAP Exhibits indicates that Parcel VII will be subject to future PDI work. Since MGP impacts were not detected on Parcel VII until approximately thirty five (35) feet below ground, the PRAP and ROD should be clarified to explain that PDI work will not be required for Parcel VII unless there is a redevelopment of this property in the future that requires excavation of materials at depths greater than 35 feet below ground surface (bgs).

RESPONSE 4: In view of the potential that a CSO storage tank extending deeper than 35 feet may be constructed on Parcel VII, PDI work on that Parcel will be required. Therefore the ROD Exhibits are correct and will remain unchanged. Section 8B of the ROD now includes a provision that PDI work will be conducted on Parcel VII in the event that construction of any nature deeper than 20 feet bgs is proposed on the parcel.

COMMENT 5: On Page 11, Bullet #5 of the PRAP describes the future cover system for the park, including fill requirements. National Grid proposes moving this requirement from the "Near-Term Actions" section to the "Future Actions" section to avoid any confusion regarding when this remedial component is triggered.

RESPONSE 5: The requirement to maintain the existing site cover on all parcels is triggered immediately, as reflected in the placement of this element. No change will be made.

COMMENT 6: Contrary to the FS, the PRAP applies Restricted Residential standards to Parcel II instead of the Commercial standards that are applied to all of the other Fulton parcels and which can be applied to parks. Since either standard could be applied to Parcel II, the PRAP and ROD should clarify that the remediation of Parcel II will still be based on removal of source material and not based on individual constituent concentrations in the Restricted Residential standards. Application of the Restricted Residential standards will provide for a 2-foot soil cover instead of a one-foot soil cover (for Commercial standards) in the remediation areas and this soil cover will meet the Restricted Residential standards rather than the Commercial standards.

RESPONSE 6: Restricted Residential SCOs, which allow for active recreational use, are applicable to Parcel II since the current and reasonably anticipated use as a park, includes active recreational activities. The remedy specifies that excavation and/or solidification on all properties is based on the presence of MGP source material, and not on individual SCOs. The SCOs are applied to the cover system component of the remedy and to backfill imported to the site.

COMMENT 7: National Grid has noted an inconsistency between the FS and PRAP documents as they relate to the potential reuse of site soils (specifically, between Section 8 of the FS and Section 7(8C) of the PRAP). Both documents use the CP-51 criteria (total PAHs greater than 500 ppm) as the determining factor for acceptable soil quality. Soils in excess of 500 ppm total PAH are to be removed from the site and soils with 500 ppm or less total PAH may remain in-situ. The FS further notes that soils exceeding the Commercial Use SCOs for PAHs, but meeting the CP-51 criteria may remain on site with an appropriate cap.

In contrast, the PRAP notes that soil exceeding the CP-51 criteria should be removed and may be

replaced with on-site soils which do not exceed SCOs for Restricted Residential use for Parcel II or Commercial Use for the remaining parcels. The intermediate use of soil meeting the CP-51 criteria but above the SCOs noted is not considered in the PRAP. The PRAP limits the reuse of soils meeting the CP-51 criteria, yet allows them to remain on- site (with a cap) if they are not excavated. As such, National Grid believes that soil meeting the CP- 51 criteria should be acceptable for reuse on site with an appropriate cap. This approach is consistent with the Fulton FS and other DEC-approved MGP remedies.

RESPONSE 7: Remedial element 8C pertains to the utility corridors, where the likelihood of contact with deep soils is greater than for the remaining parcels comprising the site remedy. For this reason, the CP-51 criterion of 500 ppm total PAHs is applied as the threshold for excavation in these areas.

COMMENT 8: NYC Councilmember Stephen Levin submitted a letter on May 29, 2015 requesting a 60 day extension of the Public Comment Period in order to consider other elements like the Superfund designation of the Gowanus Canal and the NYC Long Term Control Plan.

RESPONSE 8: As noted in the introduction, the request for an extension of the public comment period is limited by regulation to 30 days as per 6 NYCRR Part 375-1.10(g). With regard to the Superfund designation of the Gowanus Canal, the near term actions specified in the Fulton PRAP, and now the ROD, are protective of the USEPA Gowanus Canal remedy, in that the remedy provides for containment of upland MGP–related coal tar by means of the barrier wall on the eastern canal bank. Timely completion of this barrier wall is critical to the initiation of USEPA's canal remediation project, which would be further delayed by an extension of the requested magnitude.

With regard to the NYC Long Term Control Plan, the Fulton remedy does not address nor will it have any direct bearing on the siting or sizing of CSO control measures. MGP-impacted soils are present in the subsurface at both of the proposed locations for subsurface CSO tank(s). Such soils will require removal and off-site treatment prior to the construction of the tank(s), with National Grid responsible for any additional excavation and disposal costs. The Department urges interested parties to provide input to the Long Term Control Plan process, relative to the need for, siting and/or sizing of any CSO tank(s).

The City of New York Law Department submitted a letter on June 1, 2015 which included the following comments:

COMMENT 9: There is no basis for NYSDEC to omit Parcel VII from the "Future Actions" discussion in the PRAP regarding additional MGP investigation and remediation.

RESPONSE 9: Agreed. The ROD states that the limits of the Pre-Design Investigation (PDI) will extend to Parcel VII and address specific redevelopment plans.

COMMENT 10: The PRAP should be amended to state clearly that National Grid is responsible for investigation and removal of all MGP contamination necessary to facilitate future development, including construction of CSO tanks at the Parcels I through VII, to require coordination of the remediation with tank construction.

RESPONSE 10: See Response 9.

COMMENT 11: The PRAP does not adequately address the potential environmental and public health impacts from the discharge of contaminated groundwater.

RESPONSE 11: The ROD provides for groundwater treatment as determined necessary by DEC. The design will evaluate whether the shallow groundwater may need to be treated near the southern terminus of the barrier wall should groundwater discharge to the canal prove necessary to prevent mounding of groundwater upland of the wall. If groundwater which passes under the barrier wall were to discharge vertically into the Gowanus Canal sediments, it must be noted that the EPA Superfund Remedy leaves a significant thicknesses of coal tar saturated sediments in place in the Canal below the dredge limits, near the Fulton site as well as throughout the length of the Canal. Regardless of the degree of treatment of groundwater called for by the remedy for the MGP site, groundwater discharging through these sediments is likely to be impacted by the coal tar saturated sediment left in place by the EPA remedy for the canal throughout its length.

Furthermore, the May 2014 Public Health Assessment prepared under the cooperative agreement with ATSDR did not indicate that groundwater discharge to the canal represented a significant exposure concern for users of the canal. All drinking water in the area is derived from the NYC Public Water Supply.

COMMENT 12: The PRAP should be amended to clarify if there are separate ongoing evaluations of vapor intrusion due to non-MGP chlorinated solvents, BTEX and non-MGP contaminants for buildings on Parcels III & V.

RESPONSE 12: The ROD addresses MGP-related contamination and provides for evaluation of soil vapor intrusion for any buildings where the current use changes and for any new construction in the area of the remedy. As indicated in Sections 5 and 6.3 of the ROD, National Grid is not responsible for addressing non-MGP vapor contamination, and the owners of the affected properties have been notified where mitigation or further monitoring is recommended.

COMMENT 13: The PRAP should discuss the need for independent environmental monitor during implementation of near-term measures or how National Grid will be held accountable during construction of the barrier.

RESPONSE 13: National Grid will implement this remedy under an order with DEC with appropriate DEC oversight of all design and construction activities. This request is beyond the scope of the ROD so no changes have been made.

The United States Environmental Protection Agency (USEPA) submitted a letter on June 2, 2015 which included the following comments:

COMMENT 14: *Page 9, Section 6.5, Summary of the Remediation Objectives:*
The Fulton former MGP remedial investigation (RI) data indicate that there is significant tar contamination and the Gowanus Canal RI data indicate that this tar has migrated to the Gowanus Canal. While there is a remedial action objective (RAO) calling for the prevention of the migration

of contaminants that would result in groundwater or surface water contamination, there is no RAO calling for the prevention of the migration of the tar contamination to the sediments in the Canal. It is suggested that this RAO be added.

RESPONSE 14: Agreed. The ROD includes an RAO for the prevention of the migration of coal tar contamination to the sediments in the canal.

COMMENT 15: *Page 10, Section 7, Summary of the Proposed Remedy: "It should be noted that the coal tar present at depths greater than 25 feet under Parcel VIII is not directly addressed by this remedy, but will be addressed as OU2 of the Fulton site."*

The RI data indicate that there is significant tar contamination at depths that would impact the Gowanus Canal remedy both through the free phase flow of tar to the Canal and through dissolved phase tar constituents that are transported by the high hydraulic conductivity groundwater in that area. Furthermore, the tar contamination appears not to be confined just to Parcel VIII, but extends to the north and south of that parcel's boundaries.
EPA's review of the data indicates that the aforementioned tar has originated at the Fulton former MGP site. Accordingly, Parcel VIII should be addressed as part of this remedial action, not deferred for action under a separate future operable unit. An approach similar to that proposed for Parcel VII (see Exhibit B, page 21, bullet 2) should be used for Parcel VIII. This would satisfy the RAO of EPA's Record of Decision that calls for preventing recontamination of the Canal by the removal and control of upland sources of contamination. The remedy selected for the Fulton former MGP should include removal of the significant masses of soil with mobile and potentially mobile tar; the eventual boundaries of the impacted areas should be defined with confirmatory sampling during the remedial design phase. EPA will require that a protective, sealed wall be constructed the entire length of the impacted land along this portion of the Canal as part of its Canal remedy. The remedial actions under the Fulton former MGP remedy should ensure that Parcel VIII is controlled as a source of contamination to the Canal.

RESPONSE 15: The creation of the second operable unit for the west side of the canal (Parcel VIII) was a recognition that although the coal tar present along the east bank of the canal is clearly a result of migration from the Fulton site, not all of the tar present along and beneath the west bank can be attributed to subsurface migration from the Fulton site. Rather, some of the coal tar present in the west bank entered the west bank via the canal. Furthermore, the tar contamination along the west bank is in places intermixed with petroleum contamination, some of which originated at the neighboring petroleum storage terminal. Given this complexity and need to better understand the other sources, DEC chose to designate the western bank of the canal as a separate operable unit, and informed EPA of this decision over a year ago.

Understanding the three-dimensional distribution of tar contamination associated with the Fulton site and the Gowanus Canal is essential to understanding the conceptual site model applied to the selection of the remedy. As noted in the Fulton RI, coal tar has migrated horizontally from the Fulton site westward at depth, extending beneath and beyond the west bank of the Canal. Much of the coal tar which originated from the former Fulton MGP site (Parcels II, III, and IV) has moved westward through the subsurface and has sunk beneath the bottom of the canal by the time it reaches the canal. This subsurface migration of coal tar is first identified at elevation -20 ft. msl, five feet below the

proposed final EPA dredge elevation of the canal bottom.

However, coal tar also reached the canal by direct discharge into the canal from tar handling facilities located on Parcel I, immediately adjacent to the canal, and other discharge points from the former MGPs. Inspection of the historic plans of the MGP itself confirm the existence of tar tanks only a few feet from the eastern bank of the canal, and discharge pipes leading from these tanks directly to the canal. Based on these documents, and the distribution of tar in the subsurface, it appears that most of the grossly tar-contaminated sediments in the canal were contaminated by these direct discharges.

Once discharged into the canal, the coal tar was subject to extensive transport along the length of the canal by tidal currents, and later by currents associated with the operation of the flushing tunnel. The importance of this transport and redistribution mechanism is underscored by the widespread distribution of tar beneath and adjacent to the canal today. Coal tar saturation is found in the native sediment virtually the entire length of the canal, including areas far removed from the three MGPs and other known tar-handling facilities. This coal tar has migrated vertically downward through the sediment. Tar is also extensively distributed in the banks of the canal, where it has migrated (typically a few feet) laterally into the fill material behind the canal bulkheads, this DEC terms bank-stored tar and it is DEC's understanding that it will be addressed as part of the EPA ROD. The EPA-approved bulkhead repair project at the Benson Scrap Metal site has already encountered this bank-stored tar. Horizontal holes drilled into the banks for tie-back installation have encountered mobile tar which briefly discharged through the boreholes into the canal. Bulkhead repairs along the entire length of the canal, required in order to support the canal dredging remedy, are likely to encounter similar conditions.

DEC agrees that control of coal tar or other contaminant discharge from Parcel VIII is essential to protecting the integrity of the canal dredging remedy and intends to release a PRAP for this parcel, after the issuance of the OU1 ROD.

COMMENT 16: *Page 10, Section 7, Summary of the Proposed Remedy, Subsection 2. Containment: "A subsurface barrier wall will be installed along the east bank of the Gowanus Canal to prevent the migration of coal tar to the canal from Parcels I, II, III, IV, VI and VII."*
As noted in the previous comment, Parcel VIII (further delineated, as described above) should also be included in the containment portion of the final selected remedy.

RESPONSE 16: Please refer to Response 15 above.

COMMENT 17: *Page 11, Section 7, Summary of the Proposed Remedy, Subsection 2. Containment: "The final wall depth and configuration, including the need for hydraulic relief and associated treatment, will be determined during the design of this project."*

Please clarify whether hydraulic "relief" can be broadly interpreted to mean hydraulic "control." National Grid's groundwater modeling, to date, has shown that at the top area of the Canal, there exist high hydraulic conductivities resulting in significant groundwater discharge in the Canal and significant upwelling at the bottom of the Canal. Because tar-related contamination is transported to the Canal by the groundwater, the potential need for hydraulic control, rather than just hydraulic

"relief," should be specified in the final selected remedy.

RESPONSE 17: DEC is aware of the National Grid groundwater modeling efforts in this area, and will continue to work with National Grid to address issues related to the construction of the barrier wall, to the impermeable stabilized canal bottom specified in USEPA's ROD for the Gowanus Canal, and to the interaction between these structures.

The intent of the provision for hydraulic relief is to evaluate and prevent impacts in the surrounding area and the canal that may result from construction of the wall as well as from the solidifying of areas of the canal bottom as part of the EPA canal remedy. Such impacts could include localized basement flooding, diversion of contaminated groundwater around the barrier wall or in an extreme case, creation of a coal tar flow pathway around the barrier wall.

The conceptual design for the wall extends to 50 feet below ground surface, which is only a partial blockage of the very deep sand aquifer at this location. By itself, in a high permeability aquifer such as this only a minor diversion of groundwater flow, laterally around the wall and vertically beneath it would be anticipated. The presence of the solidified canal bottom however would be expected to complicate this situation, and the modeling effort needs to take both structures into account once the extent of the canal bottom solidification in the area is determined.

If modeling predicts lateral movement of contaminated groundwater (or even coal tar) around the end of the wall, wing walls and associated treatment may be required, as noted in Figure 5 of the ROD. If it appears that MGP-contaminated groundwater may flow around the wall, the ROD will require in-situ treatment to address contaminant migration to the canal. In-situ treatment options are preferable to hydraulic control measures, since they are simpler to install and operate, and use less energy over the long term. DEC and National Grid have had considerable success, for example, with treating heavily MGP-contaminated groundwater with simple oxygen injection systems. Such systems can effectively treat MGP contaminants eliminating them from groundwater prior to its reaching the canal. DEC notes that any treated water leaving the site would be expected to pass through coal tar saturated sands remaining below the dredged canal bottom and become re-contaminated prior to its discharge to the canal. In the sections of the canal adjacent to the Fulton site, where in-situ solidification (ISS) of sediments will be conducted by EPA, the low permeability of the ISS mass is likely to prevent the discharge of groundwater to the canal, potentially causing groundwater mounding in the upland area. Hydraulic relief "windows" in the canal bottom may be necessary to allow groundwater discharge. The design for these areas should include a provision for the treatment of groundwater prior to discharge through these windows since, as identified above, the passage of groundwater through tar-saturated sediment will result in recontamination following treatment at the end of the barrier wall.

COMMENT 18: *Page 11, Section 7, Summary of the Proposed Remedy, Subsection 3. Coal Tar Recovery: "Coal tar collection wells will also be constructed in upland areas where mobile coal tar is identified by the Department in the subsurface. Initially, the construction of these collection wells will be focused on the area near the intersection of Nevins and DeGraw Streets. These wells will be installed in public rights of way to the extent possible and will be constructed with sumps to allow passive accumulation of coal tar for periodic collection.*"

Tar recovery wells at a trafficked street intersection and across from a public park may be problematic. There is a potential for spills during the pumping of the wells and the potential for the emanation of chemical odors. The Proposed Remedial Action Plan does not currently include measures for mitigating these potential impacts. Such mitigation measures should be included in the final selected remedy.

RESPONSE 18: The remedy requires that community protections are in place, including community air monitoring and worker health and safety protocols during remedy implementation and any future ground intrusive activities. The specific mitigation measures for tar recovery in public areas will be addressed in the remedial design and site management plan. DEC and National Grid have completed numerous tar collection wells in publicly accessible areas statewide, which have not resulted in odor problems. Most wells are equipped with sumps of sufficient volume, so that collection is only required on a monthly or quarterly basis. During the intervals between collection events, the top of the well casing is capped with a lockable, expandable plug which prevents unauthorized access and also prevents tar vapors from escaping from the well. Such a system of passive collection wells has been in place at the Lowe's site (former Metropolitan MGP) located less than a mile from the Fulton site, for over a decade with no difficulties reported. In cases where wells produce tar in larger quantities, collection piping is installed below grade, further reducing the potential for public exposure.

COMMENT 19: Because there will be recovery wells placed in front of the wall along the Canal, these wells, in close proximity to the former MGP sources, will not be as necessary once the sources are removed. EPA recommends minimizing the number of recovery wells in the aforementioned areas by including a timely removal of the source and impacted areas to the fullest extent possible.

RESPONSE 19: DEC agrees that source removal, particularly removal of shallow sources close to the canal such as those beneath Parcel I, will allow for fewer collection wells. Provisions will be included in the site management plan for these wells to be plugged or removed once the flow of tar ceases and removal of coal tar can be considered complete.

COMMENT 20: *Page 13, Section 7, Summary of the Proposed Remedy, Subsection 8A. Excavation/Stabilization of MGP Structures and Source Material: "Excavation of MGP structures, including gas holder foundations and tanks, and immediately adjacent source areas and grossly contaminated soil, as defined in 6NYCRR Part 375-1.2(u), from Parcels I, II, III and IV will be required when each parcel becomes accessible."*
To prevent the migration of contaminants to the adjacent Canal following its dredging and capping, the excavation of the former MGP structures, source areas and impacted areas should be addressed in close conjunction (temporally) with the Canal remediation work.

RESPONSE 20: DEC agrees that removal of MGP source areas should occur as soon as practicable. The remedy is designed to achieve that goal, while minimizing impact to current owners and occupants of the buildings and structures located on the designated parcels. The ROD provides for excavation/stabilization of these source areas when they become accessible.

DEC considers, NAPL barrier walls with coal tar collection to be a proven remedy component for preventing MGP contaminant migration to surface waters. This has been demonstrated at the

following two sites in the DEC's MGP Program:

At the Newburgh MGP site in the City of Newburgh, Orange County, a barrier wall along the banks of the Hudson River has been in place since 2010, in an area where inaccessible mobile tar is present beneath an active sewage treatment plant. The wall was installed in conjunction with an offshore dredging project similar in nature to the Gowanus Canal. No leakage of tar has been identified in the area of the remediated sediments in the five years since the dredging project was completed. During this period over 6,000 gallons of coal tar have been collected from the sumps and wells immediately behind the wall.

A similar system has been in place at the Bay Shore MGP (Village of Bay Shore, Suffolk County) since 2008, in conjunction with a large scale removal of shallow (less than 25 feet bgs) coal tar saturated soil. No NAPL penetration of the wall has been detected, and the associated oxygen injection systems have effectively treated the dissolved phase groundwater plume which had been associated with the site.

A similar barrier wall is a component of the Carroll Gardens (Public Place) Former MGP site as well, which is located downstream of the Fulton Site on the Gowanus Canal.

COMMENT 21: *Page 13, Section 7, Summary of the Proposed Remedy, Subsection 8A. Excavation/Stabilization of MGP Structures and Source Material: "The excavation areas on these parcels, based on currently available information, are estimated to be: Parcel I - 50 ft. x 50 ft. x 10 ft. deep – approximately 925 cy; Parcel II - 250 ft. x 100 ft. x 20 ft. deep – approximately 18,500 cy; Parcels III and IV are expected to be a contiguous excavation measuring approximately 200 ft. x 75 ft. x 20 ft. deep – approximately 11,000 cy.",*

and

Page 14, Section 7, Summary of the Proposed Remedy, Subsection 8B. Additional Source Removal Evaluation Areas: "The need for additional soil removal will be evaluated beyond the immediate limits of the MGP structure areas identified above. Pre-design investigations…will be conducted on Parcels I, II, III, IV and VI to determine the extent of contamination outside the limits of the MGP structure excavations for those areas that exhibited source material at elevations above the meadow mat soil layer that is present approximately 20 feet below ground surface."

The text on these two pages of Section 7 do not appear to be entirely consistent with the text from the alternative description (Exhibit B, page 21); the text in Section 7 implies that the pre-design investigations will only occur laterally outside of the structures, not beneath the structures. Based on the analysis of the extent of the contamination presented in the RI/feasibility study report, EPA believes that the depth and the areal extent of the removal areas should be increased. In order to ensure that recontamination of the Canal does not occur, the excavation volume and boundary should be the extent of the contamination that could impact the Canal remedy, rather than just the footprints of former MGP structures and immediately adjacent source areas. Mobile tar contamination has been detected deeper than 20 feet. Therefore, to prevent the recontamination of the Canal, the source removal should be at considerably deeper depths.

RESPONSE 21: The ROD has been revised to clarify that additional investigation will be required over the entire area of these parcels when accessible, including both areas laterally adjacent to the structures and areas beneath them.

However, DEC notes that coal tar removal below 20 feet in a tidally connected sand aquifer results in greater implementability and cost issues. The meadow mat layer, which is found at depths of roughly 20 feet throughout most of the area, has impeded downward migration of coal tar, and consequently most of the heavily contaminated soils are found immediately above this level. During excavation, this meadow mat layer also serves as a low permeability boundary to limit the entry of groundwater into the excavation. Excavation below the meadow mat would require a significantly expanded dewatering effort, which would complicate and greatly slow down the remediation process.

In cases where significant coal tar penetration has occurred below the meadow mat, or in cases where site redevelopment requires excavation to depths below the meadow mat, stabilization of the heavily contaminated material using ISS techniques offers essentially the same level of protectiveness, with far lower community impact, less delay in completion and lower costs as well. This is the same approach and reasoning process employed by USEPA in selecting the remedy for the canal itself. Heavily impacted materials are removed to the maximum depths considered feasible, with contaminated areas below this depth stabilized in place using ISS.

COMMENT 22: The text in Section 7 also does not address Parcel VII, whereas Exhibit B calls for a pre-design investigation of Parcel VII. It is possible that contamination in Parcel IV could extend into Parcel VII, which had only limited samples collected during the RI. It is suggested that Parcel VII be included in the final selected remedy; however, given the limited sampling in this parcel, it is suggested that remedial action in this area be contingent upon the results of a pre-design investigation.

RESPONSE 22: See Response 4.

The Friends of Douglass Greene Park (FODGP) submitted a letter on June 2, 2015 which included the following comments:

COMMENT 23: FODGP would like to know, should the DEC Record of Decision (ROD) move forward with the excavation and removal of the tanks beneath the Double D Pool, what would be the exact timeline that this resource would be disabled? Also, what impacts to the pool and park can be anticipated by the construction of the interim retaining wall along the Canal?

RESPONSE 23: The timeline for the remediation of the pool area will be determined based on both the remedial design process and the New York City Department of Parks and Recreation (NYCDPR) timeline for the upgrade of the park. The community will be well informed regarding the time during which the pool and park may be off-line. Installation of the barrier wall can be accomplished without disruption of the park.

COMMENT 24: FODGP asks that the DEC ROD include enforceable measures to ensure full cost of temporary and permanent replacement of public park spaces and uses and the community's meaningful involvement in the plans involving Thomas Greene Park. FODGP asks that the ROD

include enforceable and quantitative measures to provide for temporary relocation and permanent reconstruction of the Park and its services at an immediately nearby location as needed.
FODGP would also like to see enforceable measures in place between the PRP's and the Parks Department for any necessary expenses should the new playground become damaged or disrupted during the cleanup. Finally, the costs of replacing facilities and services during a temporary disruption and permanently following the NYS DEC clean-up should be fully disclosed as part of the ROD.

RESPONSE 24: National Grid is responsible for the cleanup of MGP-related contamination which is identified by this ROD. Any upgrade of the park or specific restoration of any property made necessary by implementation of this remedy is a matter between National Grid and the property owner. DEC has consistently maintained, as set forth in this ROD, that the remediation of the park could be coordinated so that it will occur when NYC Department of Parks and Recreation (NYCDPR) has a design and funding for the park upgrade and that the remediation and the park upgrade will be coordinated in order to minimize the time during which this community resource will be off-line. National Grid will be responsible for repair of any damages resulting from their remedial program.

DEC has maintained close communication with the NYCDPR since investigation of the site began in 2007. DEC conducted its own preliminary investigation of the park early in the process, while the consent order negotiations were still under way, to determine whether there were any pathways by which park users or employees could be exposed to the underlying contamination. Prior to the renovation of the playground area referenced in the comment, DEC determined that, based on the RI data, no remediation of that part of Parcel II was required, allowing NYCDPR to enhance that portion of the park, secure in the knowledge that there would be no future disturbance required in that area. Similar informed discussion and coordination between DEC and NYCDPR will occur with regard to any remediation conducted on Parcel II. Throughout the remedial investigation, there has been a clear understanding that the remedial action on Parcel II will be closely coordinated with NYCDPR plans for redesign and redevelopment of the park

National Grid's responsibility is to address any MGP-related contamination. In the case of the park, this means National Grid will provide a clean footprint appropriate for park usage, on a schedule that allows NYCDPR to improve the park in a timely manner. Funding for replacement or upgrade of the park is beyond the scope of this ROD, as noted previously in this response.

COMMENT 25: DEC should work with FODGP and community stakeholders to identify and prescribe revenue strategies to support Park capital construction costs.

RESPONSE 25: Pursuit of revenue strategies for other entities is beyond the scope of this ROD and DEC authorities as relates to this site.

COMMENT 26: The ROD should seek to further address the inequitable situation regarding any temporary or permanent alienation of parkland that predominantly serves local public housing residents by identifying revenue strategies to support Park capital reconstruction costs.

RESPONSE 26: This comment appears to refer to the possibility of constructing a combined sewage overflow (CSO) tank underneath the location of Thomas Greene Park. This proposed tank location

is beyond the scope of the remedy presented here. The design and siting of such a tank is part of the City's ongoing Long Term Control Plan for controlling CSO discharges city-wide, and the USEPA remedy for the Gowanus Canal.

Although the remedy specified in this document would be protective if such a tank were to be located in the park, the remedy does not anticipate a tank would be located there. A second location, encompassing Parcels VI, VII, and potentially I has also been proposed. Either of these proposed locations can be accommodated under the terms of this remedy.
If CSO tankage is constructed beneath the park, concerns relating to alienation of park land should be addressed under the terms of the USEPA remedy for the Gowanus Canal, or through the DEC lead LTCP process

COMMENT 27: Conduct a thorough review and verify remedial investigation results at the former Fulton MGP site and address new potential exposure pathways with a human health risk assessment. While it was reassuring to hear publicly from DEC that the Park is protected from volatile organic compounds (VOC's) and exposure pathways from the cement cap on top of Parcel II, and there is no need to remediate the recently renovated playground, and there is a strong consensus to not disturb the valuable grove of sycamore trees, for the safety of the users of the Park and Pool, FODGP insists that the DEC perform a thorough inspection of their 2012 Remedial Investigations regarding risks of exposure.

We would like to see testing done by the DEC on the concrete barrier of Parcel II and the material of the two swimming pools onsite (the toddler pool and the regular pool) that tests for BTEX, PAH's, VOC's and NAPL. We would like to know if there is any issue with the porosity of these materials that could facilitate exposure pathways for these toxics? We would also like to see regular testing for these same chemicals done for the Pool water and the drinking and shower water at the Double D Pool facility. Finally, given the groundwater and storm water runoff contamination concerns, we would like to see groundwater testing done by the DEC onsite at the Park and Pool after wet weather events. Soil vapor intrusion, especially in the changing room facilities used by families at the Double D Pool, and health impacts to minors must be evaluated.

RESPONSE 27: Due to the depth and nature of MGP contamination relative to the park facilities there is no exposure pathway for park users to come into contact with site-related contamination. Based on the information presented in the RI Report there is no need to conduct additional testing of the park facilities. Additionally, New York State does not rely on risk assessment when selecting remedial actions for the protection of public health. A qualitative exposure assessment (QEA) was completed during the RI. The QEA evaluated all potential exposure pathways and can be found in the RI Report. The potential for soil vapor intrusion was also evaluated as part of the RI and it was concluded that actions are not needed to address soil vapor intrusion in the park under current conditions. There is no new information that would require revisiting the previous conclusions. A site cover currently exists and is preventing exposure to site-related contaminants and that cover will be maintained as necessary in accordance with the remedy. The remedy requires an evaluation of the potential for exposure in the event that the current use of the park changes or if new structures are constructed. Testing and inspection of the pool facilities and the public drinking water system does occur on a regular basis because they are permitted by the NYC office of Mental Health and Hygiene and copies of those reports can be obtained from that office.

The Fifth Avenue Committee submitted a letter on June 2, 2015 which included the following comments:

COMMENT 28: Specifically, to date DEC has not taken meaningful and consistent steps to engage with the community on the future vision for Gowanus that DEC could help achieve through this cleanup and the other upland former MGP site cleanups in Gowanus. DEC must do more to participate in local meetings to communicate their role for the future of Gowanus and to ensure that the Record of Decision (ROD) adheres to prescribed community acceptance principles.

RESPONSE 28: DEC has conducted several public meetings concerning the Fulton MGP. Initially, at the beginning of the Remedial Investigation to explain the investigation approach and scope, at the conclusion of the investigation, where the results were explained and the next steps were described and at the recent PRAP public meeting. In addition, DEC has attended numerous USEPA Gowanus Canal Citizens Advisory Group and Community Board 6 meetings where these bodies were informed on the status of the Fulton MGP project. DEC does not have a role to play in decisions regarding local land use, zoning, or redevelopment. These issues are the role of local government.

COMMENT 29: Identify and ensure the full cost of temporary and/or permanent replacement of public park spaces during and after remediation.

RESPONSE 29: See Response 25.

COMMENT 30: Ensure meaningful community involvement in the plans involving public park spaces.

RESPONSE 30: This is an issue for NYCDPR and other local government entities.

COMMENT 31: What impacts to the pool and park can be anticipated by the construction of the interim retaining wall along the Canal? It is imperative, regardless of which remedy is selected that when the park and pool site have to be closed for safety, that temporary and/or permanent replacement facilities are provided for our community that ensures no gap in the provision of open, active and passive recreational space.

RESPONSE 31: The containment and prevention of further migration of coal tar to the Gowanus Canal provided by the barrier wall element of the Fulton MGP remedy is a not an interim remedial action. Installation of the barrier wall at the canal is a permanent measure, and it can be accomplished without any extended closure of the park. Likewise, the treed, eastern portion of the park, adjacent to Third Avenue is expected to remain available to the public during the remediation of the pool area. The use of the park is also expected to continue during remediation of the other adjacent parcels. Excavation in these areas will be performed under temporary tent-like structures, which will prevent nuisance odors and the release of volatile organic compounds to the ambient air. However there will be increased noise and congestion in the area, and some short-term limitations on the full use of the park may be necessary at certain times.

COMMENT 32: What compensation will be provided for a community losing an open space recreational facility and how would the DEC adhere to City and State open space standards for an already underserved part of the Gowanus community that suffers disproportionately from a number of health issues linked to a lack of access to open space?

RESPONSE 32: See Response 27.

COMMENT 33: FAC asks that the ROD include enforceable measures to provide for temporary and permanent relocation of services at an immediately nearby location as needed. The costs of replacing facilities and services during a temporary disruption and, permanently following the NYS DEC clean-up, should be fully disclosed as part of the ROD. DEC remediation planning efforts must address the fate of Thomas Greene Park specifically and the open space needs of Gowanus residents in general both in the short and long term.

RESPONSE 33: See Response 24.

COMMENT 34: The ROD should seek to further address the inequitable situation regarding temporary or permanent alienation of parkland that predominantly serves local public housing residents by identifying revenue strategies to support park capital reconstruction costs.

RESPONSE 34: See Response 27.

COMMENT 35: The State should be recognizing this Park reconstruction as an opportunity to expand its partnerships with Parks to control storm water runoff, especially in the floodplain of Gowanus that was impacted by Sandy, where US HUD CDBG monies can be spent to support storm-related infrastructure in parks.

RESPONSE 35: With the exception of the need to maintain a site cover, the reconstruction of the park following remediation and any related storm water runoff controls, is beyond the scope of the remediation project addressed by the selected remedy. Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals, and integration of the remedy with the end use where possible and encouraging green and sustainable re-development are considerations during the Remedial Design (Item 1) of the remedy.

COMMENT 36: The State's failure to fully fund Parks through the Environmental Protection Fund, which is supported through the State real estate transfer tax designed to directly benefit parks and the environment, could be addressed to assist Gowanus (and other Parks impacted by MGP site remediation under NYS DEC jurisdiction).

RESPONSE 36: This is beyond the scope of DEC's remediation project for this site.

COMMENT 37: Consider use of eminent domain to expedite the remedy and avoid the delay of the "opportunistic" approach.

RESPONSE 37: DEC would not use the State's eminent domain authority under these circumstances. Pursuant to Environmental Conservation Law (ECL) §27-1313, the DEC can enter

properties to implement a remedy. The component of the remedy for which immediate access is required to achieve the remedial goals is the barrier wall along the bank of the canal. At this time, it appears that access to construct this wall can be obtained by National Grid without DEC invoking ECL § 27-1313.

The areas identified for action beneath the existing buildings, etc., on the footprint of the former MGP site are currently in use, with no exposure pathways identified. The potential for future exposures is addressed by the remedy. DEC recognizes that the area around the MGP site is experiencing significant development pressure, with at least some of the parcels currently listed for sale. Consequently, it appears that the approach identified by the selected remedy is likely to occur in the near future.

COMMENT 38: Conduct and present a more cogent Department of Health (DOH) analysis.
The DOH analysis and presentation provided at the public meeting for the proposed remedy on April 16, 2015 did not appear to be very thorough – and it did not speak to the actual DEC 17 page listing of all the concentrations of contaminants in the water and subsurface soil. DOH advised 'everything is fine' because there is no human contact with the coal tar, but there are community concerns around volatile organic compounds (VOC's) that present themselves in the air we breathe. The dismissal of these concerns contributes to the histrionics and mistrust around remediation's at the local former MGP sites.

Soil vapor intrusion, especially in the changing room facilities used by families at the Double D Pool, and health impacts to minors must be evaluated.

Since it has also been determined that coal tar waste has permeated the sewer pipes and gas lines, there should also be testing for NAPL in the water pipelines that bring drinking water to the park fountains, shower facilities and the pool and park sprinklers, as well as the businesses in the contaminated parcels and the nearby public housing residential buildings.
DOH presentations and analysis should also prepare our community to understand the risks and health impacts around the proposed remediation's themselves. For example, how could the air quality during remediation potentially affect those residents living in the tall public housing buildings nearby?

Also, to what standards is DEC cleaning up each of these parcels. For example, if it is to industrial, and not residential standards, does this approach have any future risks for the community (especially the children) that live, work and recreate there?
Finally, the DEC must consider barging in and out materials for construction and the transportation of and removal of source materials. Our community already suffers the health impacts of truck traffic and mitigation of further emissions must be explored to avoid additional impacts to air quality.

RESPONSE 38: All drinking water in the area, including the water used by the park, is derived from the NYC Public Water Supply and is routinely monitored by NYC to ensure that it meets drinking water standards. Also, there is no evidence that coal tar has permeated the gas lines or entered the utility bedding for the gas lines. The selected remedy requires that community protections are in place, including community air monitoring and worker health and safety protocols, during remedy implementation and any future ground intrusive activities. The remedy restricts the use of Parcel II

to restricted-residential use and the remaining Parcels associated with the site are restricted to commercial use as defined in 6 NYCRR Part 375-1.8(g), although land use is subject to local zoning laws. Also see Response 27.

COMMENT 39: DEC Citizen Participation Plan must realize fuller community representation. Public Housing residents must be more robustly engaged and considered in the Citizen Participation Plan and future private and public land use actions, and have an opportunity to directly and meaningfully participate in decisions which will impact them and their community.

RESPONSE 39: Prior to the release of the PRAP, DEC notified all stakeholders, elected officials and community organizations in the area of the PRAP's availability for review and the date of the public meeting. The PRAP public meeting was held in the public housing meeting space. DEC has, and will continue to, maintain effective communication with all stakeholders.

COMMENT 40: DEC should assess the need for other government programs to take action or provide information to modify implementation of the selected remedy to minimize any disproportionately high and adverse environmental burdens impacting this community.
DEC should also have designated community liaisons who can present meetings in Spanish and Spanish language materials must be readily accessible.

RESPONSE 40: As presented in the first element of the remedy, the remedial design will seek to minimize any adverse effects the remedial action may have on the community. DEC has and will continue to keep local elected officials informed regarding the remediation of the site. Future public notice documents will also be translated into Spanish.

COMMENT 41 DEC should collaborate with the other entities engaging the surrounding community in the EPA Superfund cleanup of the Gowanus Canal and the *Bridging Gowanus* process, where there is already a foundation from which many current stakeholders involved in the future planning of the Gowanus neighborhood can build upon. In the context of proposed development projects, large scale resiliency efforts, remediation and infrastructure improvements and the likely rezoning of Gowanus, *Bridging Gowanus* has suggested that an Environmental Quality partnership and Community Oversight body should be created. Not only can this serve to build upon community cohesion, and ensure more meaningful public involvement, but it can also expose where adverse environmental or other burdens impacting the community exist and identify symbiotic opportunities for solutions. DEC should not operate its CPP in isolation, but rather in collaboration with these other bodies in CB6 and the CAG.

RESPONSE 41: DEC has conducted several public meetings concerning the Fulton MGP and DEC has attended numerous Gowanus Canal CAG and Community Board 6 meetings where these bodies were informed on the status of the Fulton MGP project. Resiliency in developments as well as local zoning and land use issues are the role of local government. Also see Response 29.

COMMENT 42: The DEC ROD should acknowledge the context of remediation on the social infrastructure of the neighborhood and consider mitigations, including but not limited to, an anti-displacement and anti- eviction fund to pay for tenant organizing, legal services and (industrial) business support services.

RESPONSE 42: Local zoning and land use issues such as those mentioned are the role of local government.

COMMENT 43: Leverage remediation spending to connect local residents to job opportunities and engage local community based organizations for training and placement.
It is imperative that some direct benefits to local low and moderate income residents be realized in association with these significant economic and environmental remediation investments. FAC would like to see the DEC ROD specifically commit to local hiring and plan for job training and placement. FAC directly through our Neighborhood Employment Services (NES) program and through our workforce development affiliate, Brooklyn Workforce Innovations (BWI), trains and places over 1,000 low and moderate income residents into a range of decent jobs with career ladders. Our NYCHA Resident Training Academy, for instance, trains and places public housing residents into a range of NYCHA positions, assisting NYCHA with their Section 3 requirements. The ROD should specifically commit to local hiring and workforce development opportunities benefitting local unemployed and underemployed residents.

RESPONSE 43: The selection of contractors is the responsibility of National Grid, who will pay for the cleanup. National Grid is responsible for ensuring its contractors abide by all legal requirements with regard to hiring, worker training and safety.

The following comments were raised at the April 16, 2015 Public Meeting

COMMENT 44: I want to make a simple statement to the DEC. It's been 90 years since this community has had to live with contamination, since the MGP site was closed, I believe you said, 1919. You have worked on the remediation for about eight years, started in 2007, to get us to this point. What I saw and what I read when you released the plan two weeks ago was, this is a containment plan. This is not a cleanup plan. It is not worthy of the State Environmental Agency.

RESPONSE 44: Only the first part of the site remediation (construction of the barrier wall) is properly considered a containment plan. This is the portion that needs to be accomplished quickly, to avoid interfering with the USEPA's plans for dredging and stabilizing the sediments in the canal. Occupied buildings and other structures currently cover the MGP source areas and the selected remedy calls for active remediation of these source areas as they become available. The remedy also addresses the potential for people to be exposed to site-related contaminants whether they are removed from the environment now or in the future. It is reasonable to coordinate remediation of these areas as access allows and prior to any reconstruction or redevelopment.

COMMENT 45: I would like to know from you how you can come to this community that has been living with this contamination for decades and propose a plan that basically just contains the coal tar without even scratching the surface. And go ahead and say that, you know, we will be able to build afterwards and bring more residents into an area that's going to continue to be contaminated. I would like to know from you how you can come in front of this community and propose a plan that is cheap for National Grid but very expensive in terms of health for this community. It's a disgrace.

RESPONSE 45: The coal tar contamination in the subsurface has been there, as you note, for many

decades and has gone largely undetected for precisely this reason. The contamination is below ground, and with the exception of the tar migrating into the Gowanus Canal, it has remained there without any resulting disruption to the neighborhood, which is why it had escaped detection for those decades. If the public were exposed to this contamination, the remedy would be implemented as you have asked. Since this is not the case, and since DEC avoids displacing viable businesses or public parks to deal with contamination that people are not now, nor expected to be, exposed to, the remedy will ensure that the prevention of public exposures continues along with the redevelopment-coordinated approach that has been selected regarding source removal.

COMMENT 46: Tar will continue to migrate up against that wall, right?

RESPONSE 46: That is not the intent, the wall will be installed in conjunction with a tar collection system to prevent the accumulation of tar behind the wall. It is not acting as a dam to impound tar but as a collection point, past which migration will not occur.

COMMENT 47: From a legal standpoint, the implications for zoning and avoiding situations where people would, in the future, come in contact with the tar, that's going to be a complex thing. Putting in zoning that has covenants on use of soil. Do you have examples of that having happened in other places?

RESPONSE 47: The step-by-step redevelopment-coordinated approach has been executed successfully elsewhere. The best example is along the High Line Park in Manhattan where Con Ed's West 18th Street site encompasses the area from 17th Street to above 19th, and from the High Line Park to the Hudson River. As you may be aware, that area has been experiencing significant development. And, in each and every one of those cases, Con Ed has implemented similar redevelopment-coordinated remedies as are planned for the Fulton site. ConEd has excavated contaminated soilwhere accessible and in some cases, where there were concerns that coal tar that could not be removed might migrate back into the cleaned up area, DEC required the builders to leave the sheeting in the ground, as will be the case for this area as well. There are legally enforceable controls (i.e., institutional controls not based on zoning) in the form of the environmental easement and related site management plan, which set forth how any remaining contaminated soil will be handled in the future.

As for the barrier wall design, we have a successful example of this installed in Newburgh on the bank of the Hudson River in 2010. See Response 20 for this description and that of a second site in Bay Shore, Long Island.

COMMENT 48: What I'm looking at is examples of changes, language changes, to land use and zoning. How far back do you have examples on that? Because, you know, we live in New York where people have exceptions and gotchas for everything.

RESPONSE 48: There are legal instruments that the State requires to control the land uses beyond zoning. An environmental easement is the primary legal instrument used that provides that the use of a contaminated site will be controlled based on the degree of clean up, and which requires a site management plan be followed to ensure that uncontrolled development does not occur and people do not get exposed when development or other ground intrusive activity may be necessary.

COMMENT 49: Does the DEC have examples of those types of easements that go back more than 30 years?

RESPONSE 49: Environmental Easements (EEs) are a relatively new control established by law in 2003. They are intended to provide the state with a permanent, enforceable interest in a land parcel addressed by a DEC remedial program, which cannot be extinguished or ignored by future land owners. A listing of sites where EEs have been placed is available on DEC's website at http://www.dec.ny.gov/chemical/36045.html .

COMMENT 50: You keep on saying that you tested all this water but I don't believe you. I really don't believe you. Because, right now, I know I'm sick. Because I keep on breathing in all these different chemicals they were digging up over here on 3rd Avenue and everywhere all around us. There's a lot of digging going on everywhere, on the canal and everything, but, then, you are still not giving us a guarantee that we are going to be okay by breathing in all these chemical dusts or whatever kind of chemical that will be floating. And you keep on digging and digging and keep on saying 20 years ago or 30 years ago. You are not giving us anything concrete. So explain it to me, please. I need to understand what you are talking about and that we are going to be okay. I'm talking about the whole community is going to be okay. I don't think so.

RESPONSE 50: All sampling results are included in the RI Report, which is available for public review at the document repository located at Brooklyn Community Board 6, 250 Baltic Street in Brooklyn. The selection of this remedy requires that site-related contamination be addressed in a manner that is protective of public health and the environment. The remedy also requires that worker health and safety and community protections are in place, including community air monitoring, during remedy implementation and any future ground intrusive activities. Also see Response 27.

COMMENT 51: But when you developed the proposals, you didn't come here to the community and invite us to your roundtable so that we could discuss about how we feel about this. Nobody came to us. And they said, oh, we are going to be digging and digging. Nobody said a word. The only thing we know is that you already put it in motion. This was a done deal already in motion.

RESPONSE 51: The DEC meet with the community at the end of the comprehensive investigation. The DEC held a meeting here, at the Childrens School on 1st St. on October 18, 2012. The remedy for this site was not predetermined. Also see Response 28.

COMMENT 52: I want to follow up to how you answered her question that there are many things that cause health problems. There are many things causing those problems, and we are all being exposed in various ways all over the place, which is the fundamental reason why you need to get that stuff out of our neighborhood (applause). If people are sick, you cannot prove that in a court of law -- they proved that in Toms River, New Jersey. They proved them wrong when they had dozens of children dying of leukemia from waste -- you cannot prove it in a court of law, and you cannot get justice because we are exposed in so many ways. We have an opportunity to get that stuff out of our neighborhood, and we need to get it out of our neighborhood.

You keep saying in no way is there exposure, but I know of a house, a neighbor of mine across the canal, just across from that one little site that you have there that you knew they were dumping into it. They were going to work on their basement and they dug down in the dirt and what did they come across? Coal tar. Many of these houses don't even have concrete basements. A lot of them are built without foundations. They were just bricks laid down. People are living in them all around here. That's just one source of contamination.

RESPONSE 52: National Grid has completed a thorough investigation of this site, under DEC oversight, and the investigation has not identified coal tar contamination at depths which would result in coal tar being encountered in a building basement. If someone finds tar or something they suspect is tar, this should be reported to DEC's spill hotline and it will be investigated. Both EPA and DEC recognize that coal tar has been transported up and down the canal, and consequently there are areas along the banks of the canal where tar may be found at shallower depths.

NYSDOH has reviewed the information collected by National Grid and based on the depth to MGP related material at upland locations a completed exposure pathway has not been identified. Additional details about the potential for human exposure to site-related contaminants can be found in the qualitative exposure assessment section of the RI Report. It is fully understood that MGP material has impacted the Gowanus Canal and NYSDOH has evaluated all information provided by DEC and USEPA and DOH's conclusions are contained in the May 2014 Public Health Assessment prepared under the cooperative agreement with the federal Agency for Toxic Substance and Disease Registry, which is publically available.

COMMENT 53: These things vaporize, and, as we have learned from the EPA, they sink but they come up. We have all witnessed those coal tar bubbles in Gowanus Canal and seen the coal tar bubble to the surface. We have experienced these things, and we know what's going on. We also know you have done other coal tar sites in the neighborhood, and I think you have done a lot more than you are doing here. And I think there's no comparison in this entire process to what we already know, how it was contaminated. We know you tented it down there, and you did a lot more. You are pumping it all out, and here you are saying you are just going to leave it there until you find the right moment to get around to doing it. It's a cleanup in our mind as opposed to reality. It's not adequate. It's time to make an action to get under the source points to stop the stuff from fluctuating in and around the community. The vapors are present and you guys from the Health Department, you laid this beautiful presentation before us and you carefully avoided any explanation about any chemicals. It's just some substance. The EPA, at least, used the chemistry, you are exposed to PAH. We know what these things are. You fluffed it over. You can't come here and expect to build trust with the community when you give us a presentation that is fluffed over.

There's a recent study last week in the New York Times showing how PAH, which comes from gasoline also, but PAH comes from coal tar. That PAH has now been found through watching children from in utero all the way through age eight -- that they are definitely causing parts of the brain to shrink. And they are definitely related to ADHD, learning disabilities, and autism. This is a study that's very scientific, and people are accepting that these exposures do have consequences. And we have kids that go play in the park, and you say there's no risk because it has sunk so deep. And you haven't tested everywhere, you haven't checked every spot. We know when we come out here,

we smell things in the air. We can taste the petroleum products in the air through our neighborhood.

One petroleum facility has been closed down for ten years. If you want to assure the community, you don't come with a presentation that fluffs and pretend that these chemicals are not serious. You gave the complete history of coal tar and all of that stuff, but you never mentioned what was the very first toxin shown to have caused cancer. That's why Toms River is the horrible place it is. That's where you made all those horrible dyes which poisoned everyone and caused the leukemia down there. I think we need to remove the source points. To sit here and say, well, sometime in the future, is not a plan. Thank you.

RESPONSE 53: See response 27.

COMMENT 54: This is called a Superfund site, right? The Gowanus Canal is called a Superfund? Right? A $500 million project is going on to clean up the Gowanus Canal. But all I heard tonight was contain, mix contaminants with cement just to hold it there, for what, another 30 years? My grandchildren, will be here standing before your grandchildrens saying, oh, we should have cleaned it up 30 years ago, but we didn't.

We should just go in and clean up. Now the park, many of us, we love the park, the pool. If you move -- not you -- whoever chooses to move that pool and put that tank underneath, the tank, we say -- don't look at that. I want it on the record. That space is not city property valued at zero but the value of replacing, so whatever it costs to replace our parks, our pool, our homes, whatever, that's the value of those locations. So whoever is charged with removal, cleanup, you need to factor in how you make you us whole. However it's done, but it needs to be done. It has to be cleaned, so I'm standing here saying we don't want it contained. We don't want no holes. We want it cleaned, but we also want, whoever is charged with it, replacement value.

RESPONSE 54: Comment noted.

COMMENT 55: I'm Chairman of the Environmental Protection Committee at Brooklyn C6. I didn't plan to say anything until you gave us a higher status than we deserve. At the Community Board, we don't decide anything about anything. We do make recommendations about certain things, and once in a while, we are listened to and sometimes we are not.
That being said, I don't know how I feel about all this yet. I do know that I don't like the opportunistic approach. I also know that we don't know yet what's going to happen with regard to the retention tanks, and we are not going to know that until June or July. And you are supposed to ask us to come to this in May. If I have to come to this in May without knowing what's going to happen and what opportunities might present themselves, sooner rather than later, then I would have to say I'm not really fond of this approach.
I don't see that park being redone or remediated anytime within my lifetime, but if they put the retention tanks there, like it might be done, very soon. If they put it on another site, I don't know what's going to happen at all. So I would've liked for you to extend the comment period, so I know what's going on.

RESPONSE 55: The need for a tank(s), the size of the tank(s), the placement of the tank(s), is, as you say, something to be proposed independently of the Fulton site RODby New York City. The

intent of this remedy is to allow redevelopment in the area, it does not support any specific nor any possible outcome. If a determination is made to place a CSO control tank under the park, the ROD remedy will allow for that. If a decision is made to locate the tank on the bank of the canal, this ROD would allow for that as well.

Note: the comment period was subsequently extended to June 3, 2015.

COMMENT 56: A parcel by parcel opportunistic cleanup doesn't feel right for our community, and I'm really concerned about two things. I'm concerned about possible multiple disruptions, unspecified closures of the park and pool, and possible prolonged exposure to these hazardous substances. And I talk about that in terms of the sump cleanup, having the stuff collect behind the walls. I don't really understand as to how that can be protective of the community, you know, to make sure that's a closed environment where there's no air exposure to us.

I feel like this is not necessarily being proposed with the benefit of our community in mind. I feel that this is for the benefit of real estate speculation and new industry and new residents who have yet to arrive in our community. So I'm concerned about that.

I also want to talk about coordination. I mean, I appreciate your clarifying it a little bit about DEC and DEP and EPA, but, at the same time, it's very siloed, and I just find it really disconcerting that, in all this time, there hasn't really been an effective coordination between your agencies with these cleanups that are so dependent upon each other.

We are being told different things by different agencies, so that also creates a trust problem with our community. Because we have been told by the EPA that regardless of which remedy is selected, that the park and pool site would have to be closed for safety reasons. So when they build this interim or permanent barrier wall, we have been told that would be disruptive enough to have the park pool site closed.It seems to us that if that needs to happen, that there would need to be temporary facilities provided for our community anyway. That's what we are talking about in terms of coordination though. Why aren't we coordinating with that end goal in mind?

My other concern is there are multiple properties of land in these identified contaminated parcels that are for sale right now. So why aren't we capitalizing or taking advantage of that opportunity to provide a comprehensive cleanup right now? I don't think those opportunities will be there, you know, in a few years' time. Those parcels are for sale right now. And I also feel like our community needs more green space, not less. There's an opportunity to, it's not popular, but why not use, eminent domain. Why can't our city, state, and federal agencies work collectively to purchase, especially Parcels VI and VII, right next to the canal where the retention tank could be and this barrier wall is going to be. Why can't we use eminent domain now for the benefit of our community? That's what eminent domain is designed for. Thank you.

RESPONSE 56: DEC is aware that there are parcels for sale, and the prospective buyers have contacted us as to what the DEC will require. They have been told, that they will not be allowed redevelop any of the parcels identified for action by this ROD until National Grid addresses the contamination as described in this ROD.

As far as the barrier wall, many have been built and are successfully controlling contaminant migration at sites across NYS. The collection wells are drilled into the ground behind the wall, and finished level with the ground surface. When a well is not being used it is plugged to avoid vapor escape, with a locking metal cover. There are 15 of these wells in the sidewalk in front of the Lowes on 12th Street. DEC has installed tar collection systems under recreational bike paths and sidewalks, and have not had significant problems with odor. The statement that the park needs to be closed for safety reasons has been evaluated by DEC, the NY State Health Department, NY City Health Department and NY City Parks, none of which have concluded that the park needs to be closed due to the presence of MGP related contamination. While there may be occasions when its use may be restricted during some elements of the construction associated with the remedy, no prolonged closure is anticipated.

COMMENT 57: When we have a meeting with the EPA, they are going to say your denial is incorrect. I'm just pointing out there's a big problem there in terms of communication and coordination, and we are aware of it in the community and that is, that continues to foster everyone's reaction here that we don't feel the trust and we need to have that.

RESPONSE 57: DEC has been involved in the investigation and evaluation of impacts to the park since our contractors initial investigation which for this project which started in 2007. As the agency directing the investigation, and we have a very clear and detailed knowledge and understanding of what is under the park. The NYSDOH has reviewed all information collected by National Grid under DEC oversight and based on the depth to MGP related material at upland locations has determined that a completed exposure pathway does not exist. Additional details about the potential for human exposure to site-related contaminants can be found in the qualitative exposure assessment section of the RI Report. Based upon this understanding of the nature and extent of contamination, how the park is currently maintained by the Parks and Recreation Department and the depth at which the MGP material is present, there is no need to close this park.

COMMENT 58: But you have to remember the tanks that are underneath it, right?

RESPONSE 58: There will be a point at which cleanup beneath the park can proceed. At that point, there will be a need for a temporary closure of your park. The remedy requires that worker health and safety and community protections are in place, including community air monitoring, during remedy implementation and any future ground intrusive activities. DEC has required this type of work under temporary structures a few feet from an active school and occupied residences and has routinely completed such remedial programs with no exposures. The idea, that installing the wall along the canal will require a closure of the park, is unsubstantiated.

COMMENT 59: You didn't talk about barging as an alternative for transporting the debris after it's been excavated.

RESPONSE 59: DEC has evaluated this concept both here and at the Citizens site and would prefer to barge the soil out, however this is currently not feasible due to the limited depth of the canal.The current state of the canal would not allow barges to the Fulton MGP area. The barrier wall element of the Fulton remediation project needs to get done before EPA's work to dredge the canal proceeds. Right now, the north end of the canal is so shallow, a barge cannot get in there.

Another problem is that most treatment and/or disposal facilities for this material do not have barge access. Therefore, options are generally limited to covered dump trucks because that is the way the facilities can accept the material. DEC has required similar removals at several other sites around the coast of Brooklyn and have looked closely at taking the soil out by barge in each instance. We are fully aware of the nuisance that this creates within the community, but have not been able to make barge transportation work.

COMMENT 60: My question is about the wall you are building along the canal. I understand that National Grid is responsible for it, but how are they going to build this wall? Do landowners have to pay for the deteriorated bulkheads, or is National Grid paying for that? And, finally, what's the impact of the site management plan for the sites along the canal?

RESPONSE 60: National Grid has already started work on designing the wall for this remedy. Some of the design pilot test work done for the Citizens site is transferable to Fulton. National Grid has come up with a design where sheet piling is driven in four-foot strips with an interlocking piece at the joints, sealed with a cement mix to make sure that is impermeable. DEC is confident this will work. Ideally, the wall would be built from the land side, and that would involve getting access to Parcels I, VI and VII. As a fallback, National Grid is also looking at ways to install the wall from the water side and, while it would be more difficult and more expensive, it can be done. The owners of the property needed for the alignment of the wall are not expected to have to contribute to its cost. Elsewhere, under EPA's project, if you own a piece of property along the canal and have a failing bulkhead, it will be up to the property owner to fix the wall to allow the dredging to proceed under the EPA remedy. That is not the case here because the wall is a necessary element for this remedy. With regard to the site management plan it will be National Grid's responsibility to develop and implement a site management plan. There might be some obligation on the part of the owner not to perform deep excavations without contacting National Grid to manage the soil that may come out of it, but, for the most part, the owner has little responsibility for implementing or funding the site management plan.

COMMENT 61: What's the depth of those sheets?

RESPONSE 61: About 50 feet. The exact depth will be determined during the design. We are going deeper than we need to cut off the migration, and protect the canal, because the wall also will serve as a structural bulkhead during and after the dredging thus it needs to go deeper to provide the necessary stability.

COMMENT 62: Are they going to remove existing bulkhead?

RESPONSE 62: Probably not. It is anticipated that the new wall will be set slightly beyond the current bulkhead. It would be very difficult to drive sheeting at the current bulkhead location because of the obstructions.

COMMENT 63: How are they going to get access to the canal? Are they going to use the property owners' site or go through the canal?

RESPONSE 63: That is under negotiation at this time.

COMMENT 64: What about other contaminants in the soil other than coal tar?

RESPONSE 64: Contaminants, other than MGP related or those comingled with MGP related, are not National Grid's responsibility. If other sources of contamination are encountered, for instance a leaking oil tank, that could be the tank owner's responsibility. If there are other contaminants present in the soil that must be excavated in order to get to the tar, National Grid will be responsible since they need to get to the coal tar.

COMMENT 65: I would like an explanation or description of your understanding of the possibility of exposure due to flooding either from the canal or from sewer backups. Could that be a vehicle for contamination spreading?

RESPONSE 65: National Grid went out after Sandy and did a site inspection at Fulton, as they did at all of their potentially affected, MGP sites throughout New York City and Long Island, and saw no impact on the surface related to the MGP material at depth. DEC has no evidence that this event mobilized coal tar in the subsurface or into sewers, etc. There are several MGP sites in Brooklyn right on the water, both cleaned up and not cleaned up, that were flooded and we did not see any impact at any of them. Groundwater moves very slowly, so a very short term increase in water levels or flooding does little to move the tar.

COMMENT 66: I just want to remind everybody that the State DEC is actually here to help us, so we should keep in mind that we have common goals in trying to protect people, and, while we may have differences in the methods, we have the same goals. Some people have said this remedy here is just containment, not really cleanup, but there is a degree of excavation and there is a degree of capping to keep exposure from happening and keep stuff down.
If you look at the cleanup of the Gowanus Canal that the EPA is proposing, it's similar in that it's dredging to a certain depth that's reachable and then hardening and making an impermeable surface on the bottom to keep stuff down because the stuff goes down 100 feet. No one would expect to be digging down 100 feet to excavate everything out.. On the other hand, some people feel like we should go to a greater degree of remediation in terms of depth or in terms of scope. I just want to point that out.

In terms of the comment about smelling petroleum in people's basements and things like that we know, for instance, that in Newtown Creek, there's an oil spill that's many times bigger that the Exxon Valdez spill. And there's an area where that spill extended to and DEC had a program for homeowners where you could have testing done to see if there's any vapor intrusion or anything in people's basements and offer a kind of ventilation installation system to extract that to ensure that that contact isn't happening.

I would also point out that what you are saying about these pipes that go into the canal and actually finding what the pathway is for some of the coal tar residue to get into those pipes and come out in the outfall, actually bolsters the EPA's argument that the City had been fighting against. The City has said the CSOs aren't contributors to this contamination, so, therefore, we shouldn't require tanks

or any other remedies because the CSOs don't have to do with the actual chemical contamination. So I just wanted to point out that some of what they presented here actually bolsters EPA's original argument that the CSOs and remedying that situation needs to be tied into the Gowanus Canal cleanup.

RESPONSE 66: Comment noted. If anyone has petroleum or tar odors in their basement, or if you see actual product, you should call DEC's spill hotline. DEC will then inspect the property, and investigate the source of where those odors may be coming from.

COMMENT 67: I have a couple of questions. First, it's a very small area for such a big problem. My question is will there be more sites where there will be more cleanup as we go down the road?

RESPONSE 67: The DEC has a good understanding of the nature and extent of the contamination from the Fulton MGP. The tar's primary direction of migration is generally downward, and as it went deeper it also moved laterally toward and under the canal Clean borings exist all around the MGP property that tell us where we need to focus and which properties have been affected.

COMMENT 68: My concern is what would the public safety concerns be when they start doing all this redevelopment? You're talking about knocking buildings down, building tremendous buildings. When we get to an area that maybe the coal tar leaked to that's in not your map, what happens then when they start excavating and it's exposed? What's the point of health concerns, at that point, when that area is now exposed to large amounts of people? Is it in your plans to fix it?

RESPONSE 68: The purpose of this remedial plan is to make sure that what is described does not occur in the areas that are contaminated, the remedy requires that site-related contamination be addressed in a manner that is protective of public health and the environment. The remedy also requires that worker health and safety and community protections are in place, including community air monitoring, during remedy implementation and any future ground intrusive activities. Also see Responses 18 and 50.

COMMENT 69: It gets to a certain point where it's not practical. Is it at that point it's not an issue because it's going to be a small amount? We don't know.

RESPONSE 69: In the areas where the tar has moved the most laterally, it is so far underground that it is not likely to be encountered unless an extraordinary development were planned, such as the CSO tankage. The deepest penetration of tar is a little over 100 feet.

COMMENT 70: What is the time table for the proposed project, if it goes through the way you are planning?

RESPONSE 70: Our target is to get the barrier wall under construction by 2017, in keeping with the current EPA schedule for the canal remedy. The primary scheduling goal at this point, is to support EPA's much larger plan for the canal. Also see Responses 37, 42, 47, 48 and 56.

APPENDIX B

Administrative Record

Administrative Record

K – Fulton Works
Operable Unit No. 1: Plant Site and Near Off-site
Brooklyn, Kings County, New York
Site No. 254051

1. Proposed Remedial Action Plan for the K – Fulton Works site, Unit No. 1, dated April, 2015 prepared by the Department.

2. Order on Consent, Index No. A2-0552-0606, between the Department and Keyspan Energy Delivery, New York and Keyspan Energy Delivery, Long Island, corporate predecessors to National Grid, executed on August 10, 2007.

3. "Site Characterization Report for the Fulton Former Manufactured Gas Plant" September, 2007, prepared by the Department.

4. "Final Remedial Investigation Work Plan for the Fulton Municipal Works Former MGP Site" March, 2008, prepared by GEI.

5. "Final Remedial Investigation Work Plan for the Fulton Municipal Works Former MGP Site Addendum No.1" July, 2009, prepared by GEI.

6. "Final Remedial Investigation Work Plan for the Fulton Municipal Works Former MGP Site Addendum No.2" October, 2010, prepared by GEI.

7. "Final Revised Remedial Investigation Work Plan for the Fulton Municipal Works Former MGP Site Addendum No.2" February, 2011, prepared by GEI.

8. "Addendum to Final Remedial Investigation Work Plan for the Fulton Municipal Works Former MGP Site Addendum No.2, Proposed Boring in the Nevins St. Right-of-Way" March 2011, prepared by GEI.

9. "Field Decision Confirmation Form (Final Remedial Investigation Work Plan for the Fulton Municipal Works Former MGP Site Addendum No.2)" April, 2011, prepared by GEI.

10. "Final Remedial Investigation Report Fulton Municipal Works" July 2012, prepared by GEI.

11. "Feasibility Study Fulton Municipal Works Former MGP Site" March 2015, prepared by GEI.

12. "Citizen Participation Plan for the Fulton Municipal Works Former manufactured Gas Plant Site" November 2014, prepared by National Grid.

13. “Fulton Final RI Fact Sheet 09 12” October 2012, prepared by NYSDEC.

14. “Fulton 224051 PRAP FactSheet” March 2015, prepared by NYSDEC.

Correspondence:

15. Email dated April 29, 2015 from Gowanus Canal Community Advisory Group (CAG).

16. Email dated May 1, 2015 from DEC to Gowanus Canal Community Advisory Group.

17. Letter dated May 1, 2015 from Mr. Theodor Leissing of National Grid.

18. Letter dated May 1, 2015 from Senator Velmanette Montgomery, Congresswoman Nydia Velazquez, Assemblywoman JoAnne Simon and NYC Councilman Brad Lander.

19. Letter dated May 29, 2015 from NYC Councilmember Stephen Levin.

20. Email dated June 2, 2015 from DEC to NYC Councilmember Stephen Levin.

21. Letter dated June 1, 2015 from Gowanus Canal Community Advisory Group.

22. Email dated June 2, 2015 from DEC to Gowanus Canal Community Advisory Group.

23. Letter dated June 1, 2015 from the NYC Law Department.

24. Letter dated June 1, 2015 from the Fifth Avenue Committee.

25. Letter dated June 1, 2015 from the Friends of Douglass Greene Park.

26. Email dated June 2, 2015 from USEPA.