

DECISION DOCUMENT

New 470 Project
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224242
November 2016



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

DECLARATION STATEMENT - DECISION DOCUMENT

New 470 Project
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224242
November 2016

Statement of Purpose and Basis

This document presents the remedy for the New 470 Project site, a brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the New 470 Project site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. Remedial Design

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

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

2. Excavation

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

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil exceeding the USEPA and 6 NYCRR Part 371 hazardous criteria for lead; and
- removal of any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination.

Approximately 1,600 cubic yards of contaminated soil (soil above restricted-residential SCOs in the upper 2 feet) will be removed from the site to allow installation of the cover system. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site, where necessary. The site will be re-graded to accommodate installation of a cover system as described in remedy element 3. Additional excavation related to site development is not part of the remedy.

3. Cover System

A site cover will be required to allow for restricted-residential use of the site in areas where the upper two feet of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs). The site cover may consist of paved parking areas, sidewalks, or a soil cover. Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d). In areas where building foundations or building slabs preclude contact with soil, the requirements for a site cover will be deferred until such time that they are removed.

4. Soil Vapor Extraction

Soil vapor extraction (SVE) will be implemented to remove volatile organic compounds (VOCs) from the subsurface. VOCs will be physically removed from the soil by applying a vacuum to wells that have been installed into the vadose zone (the area below the ground but above the water table). The vacuum draws air through the soil matrix which carries the VOCs from the soil to the SVE well. The air extracted from the SVE wells is then treated as necessary prior to being discharged to the atmosphere.

Four SVE wells will be installed into the vadose zone and screened from 3 feet below the ground surface to a depth of approximately 7 feet. The air containing VOCs extracted from the SVE wells will be treated by passing the air stream through activated carbon, which removes the VOCs from the air prior to it being discharged to the atmosphere. The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

5. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system, or a similar engineered system, to mitigate the migration of vapors into the building from soil and/or groundwater.

6. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled

property which will:

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

7. Site Management Plan

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

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

Institutional Controls: The environmental easement discussed in Paragraph 6, above.

Engineering Controls: The cover system discussed in Paragraph 3, the SVE system discussed in Paragraph 4, and the sub-slab depressurization system discussed in Paragraph 5, above.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
 - descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
 - a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 3, above, will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
 - provisions for the management and inspection of the identified engineering controls;
 - maintaining site access controls and Department notification; and
 - the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
2. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
 - monitoring of soil vapor to assess the performance and effectiveness of the remedy;
 - a schedule of monitoring and frequency of submittals to the Department;
 3. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system(s). The plan includes, but is not limited to:
 - procedures for operating and maintaining the system(s); and
 - compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting.

Declaration

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

November 30, 2016



Date

Robert Cozzy, Director
Remedial Bureau B

DECISION DOCUMENT

New 470 Project
Brooklyn, Kings County
Site No. C224242
November 2016

SECTION 1: SUMMARY AND PURPOSE

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

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

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

SECTION 2: CITIZEN PARTICIPATION

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

Greenpoint Library
107 Norman Avenue
Brooklyn, NY 11222
Phone: 718-349-8504

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

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, 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 site is located at 12 Eckford Street in an urban area in the Greenpoint neighborhood of Brooklyn, New York. The approximately 21,630-square foot site is bounded by a former commercial building currently being used as a construction office for the site and residential buildings to the north; residential buildings to the east; Newton Street to the southeast; Eckford Street to the west; and Manhattan Avenue to the southwest.

Site Features: Currently, the site is vacant and unpaved. The buildings on-site have been demolished.

Current Zoning and Land Use: The site is zoned as M1-2/R6A (light manufacturing and residential uses) and is currently vacant. This zoning is consistent with the proposed use of the site. The surrounding area is developed primarily with residential and commercial properties.

Past Uses of the Site: The site formerly comprised Lots 30, 32, 33, and a portion of Lot 1. Former Lots 30, 32, and 33 have now been merged into Lot 33. According to historic Sanborn fire insurance maps, the site was undeveloped between 1887 and 1905. By 1916, Lot 1 was developed as an unspecified factory building, and former Lot 33 was developed with a barrel shed, a carriage garage, and a cooperage with an office. By 1942, Lot 1 was developed with a sash and door storage and a woodworking shop associated with the north-adjacent I. Feldman & Son Inc. sash and door manufacturer. Former Lot 30 was developed with a two-story building used for window sash storage. A gasoline tank was shown on the southwestern portion of former Lot 32. Former Lot 32 was labeled as "barrels, boxes, and automobile". Former Lot 33 was developed with a cooperage and an office. By 1951, Lot 1 was developed with a metal container manufacturer and an enameling works with a baking oven and spray booths and former Lot 30 was labeled "to be: garage". Former Lot 1 was developed with a new factory building in 1963 and with a spray booth and storage on the eastern portion by 1965. By 1965, former Lot 30 was developed as a garage and as a factory by 1978. By 1983, former Lot 32 was used for freight storage, and for motor freight storage between 1986 and 1991.

Site Geology and Hydrogeology: The stratigraphy of the site from the surface down consists of approximately 6-12 feet of historic fill, characterized by sand, gravel, and silt with concrete, asphalt, brick, and ash. Below the historic fill is a native sand, gravel, and silt stratum to a depth of at least 20 feet below grade. Bedrock was not encountered during the investigations.

Groundwater was encountered between approximately 10 and 12.5 feet below grade and flow is generally from east to west beneath the site.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

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

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

SECTION 5: ENFORCEMENT STATUS

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

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

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

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

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess

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

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

6.1.2: RI Results

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

1,1,1-trichloroethane	benzo(b)fluoranthene
trichloroethene (TCE)	arsenic
tetrachloroethene (PCE)	lead
1,1-dichloroethane	mercury
MTBE (methyl-tert-butyl ether)	

The contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Decision Document.

There were no IRMs performed at this site during the RI.

6.3: Summary of Environmental Assessment

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

Nature and Extent of Contamination:

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides.

Soil: Soil samples were compared to the restricted-residential soil cleanup objectives (SCOs). No VOCs, PCBs, or pesticides were found above SCOs. Several heavy metals such as arsenic (maximum of 39 parts per million [ppm], compared to the SCO of 16 ppm), lead (14,000 ppm vs. 400 ppm), and mercury (7.6 ppm vs. 0.81 ppm) were found in the shallow soil across the site.

Shallow soil was also contaminated above the SCOs with SVOCs in a class of contaminants called polycyclic aromatic hydrocarbons (PAHs) (for example, benzo(b)fluoranthene). The highest PAH concentration found during the investigations was benzo(b)fluoranthene at 21 ppm (1 ppm SCO). PAHs are typically associated with incomplete combustion of coal or oil. Soil with heavy metal and PAH contamination of this nature is consistent with historic fill. No source area for the VOCs was found in on-site soil, but based on the groundwater and soil vapor results, a source area may be present at the boundary with the off-site portion of Lot 1.

Groundwater: Groundwater samples were compared to Class GA Ambient Water Quality Standards. PAHs were the only SVOCs detected slightly above standards. Naturally-occurring metals were also detected above standards in several samples, and a pesticide was found in a single water sample from the off-site portion of Lot 1. There were no PCBs in any samples.

On-site groundwater samples contained methyl tert butyl ether (MTBE) at concentrations of up to 48 ppb, above the standard of 10 ppb. Although on-site groundwater samples did not contain chlorinated VOCs, samples from the off-site portions of Lot 1 had VOCs 1,1,1-trichloroethane (1,1,1-TCA) at a maximum concentration of 43 ppb, 1,1-dichloroethane at 740 ppb, and trichloroethene (TCE) at 7.6 ppb. All three of these VOCs have a standard of 5 ppb.

Soil Vapor: Soil vapor was analyzed for VOCs, and the primary contaminants of concern for the site include 1,1,1-TCA, tetrachloroethene (PCE), and TCE. The highest levels of these VOCs

were measured in the northeastern part of the site in the northern part of former Lot 30, with 1,1,1-TCA at 37,300 micrograms/cubic meter (ug/m3), PCE at 956 ug/m3, and TCE at 1,120 ug/m3. Because these soil vapor concentrations were measured near the site boundary, off-site soil vapor may be a concern for the residential buildings adjacent to the site.

Special Resources Impacted/Threatened: None.

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*.

Access is restricted by a fence. However, people who enter may come into contact with contaminants in soil by walking on the site, digging, or otherwise disturbing the soil. People will not come into contact with site related groundwater contamination unless they dig below the surface. People are not drinking the contaminated water because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the groundwater and soil may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. The site is vacant so inhalation of site contaminants in indoor air via vapor intrusion is not a current concern. However, the potential exists for inhalation of site contaminants due to soil vapor intrusion for any future on-site development. Further evaluation is needed to determine whether soil vapor intrusion is a concern for off-site structures.

6.5: Summary of the Remediation Objectives

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

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

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

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

The selected remedy is referred to as the Vapor Mitigation and Cover System remedy.

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

1. Remedial Design

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

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
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- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
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- 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.

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Approximately 1,600 cubic yards of contaminated soil (soil above restricted-residential SCOs in the upper 2 feet) will be removed from the site to allow installation of the cover system. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site, where necessary. The site will be re-graded to accommodate installation of a cover system as described in remedy element 3. Additional excavation related to site development is not part of the remedy.

3. Cover System

A site cover will be required to allow for restricted-residential use of the site, in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). The site cover may consist of paved parking areas, sidewalks, or a soil cover. Where the soil cover is required it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d). In areas where buildings or building foundations are located which preclude contact with site soil, they will serve in place of a site cover.

4. Soil Vapor Extraction

Soil vapor extraction (SVE) will be implemented to remove volatile organic compounds (VOCs) from the subsurface. VOCs will be physically removed from the soil by applying a vacuum to wells that have been installed into the vadose zone (the area below the ground but above the water table). The vacuum draws air through the soil matrix which carries the VOCs from the soil to the SVE well. The air extracted from the SVE wells is then treated as necessary prior to being discharged to the atmosphere.

Four SVE wells will be installed into the vadose zone and screened from 3 feet below the ground surface to a depth of approximately 7 feet. The air containing VOCs extracted from the SVE wells will be treated by passing the air stream through activated carbon, which removes the VOCs from the air prior to it being discharged to the atmosphere. The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

5. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system, or a similar engineered system, to mitigate the migration of vapors into the building from soil and/or groundwater.

6. Institutional Control

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

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

7. Site Management Plan

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

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

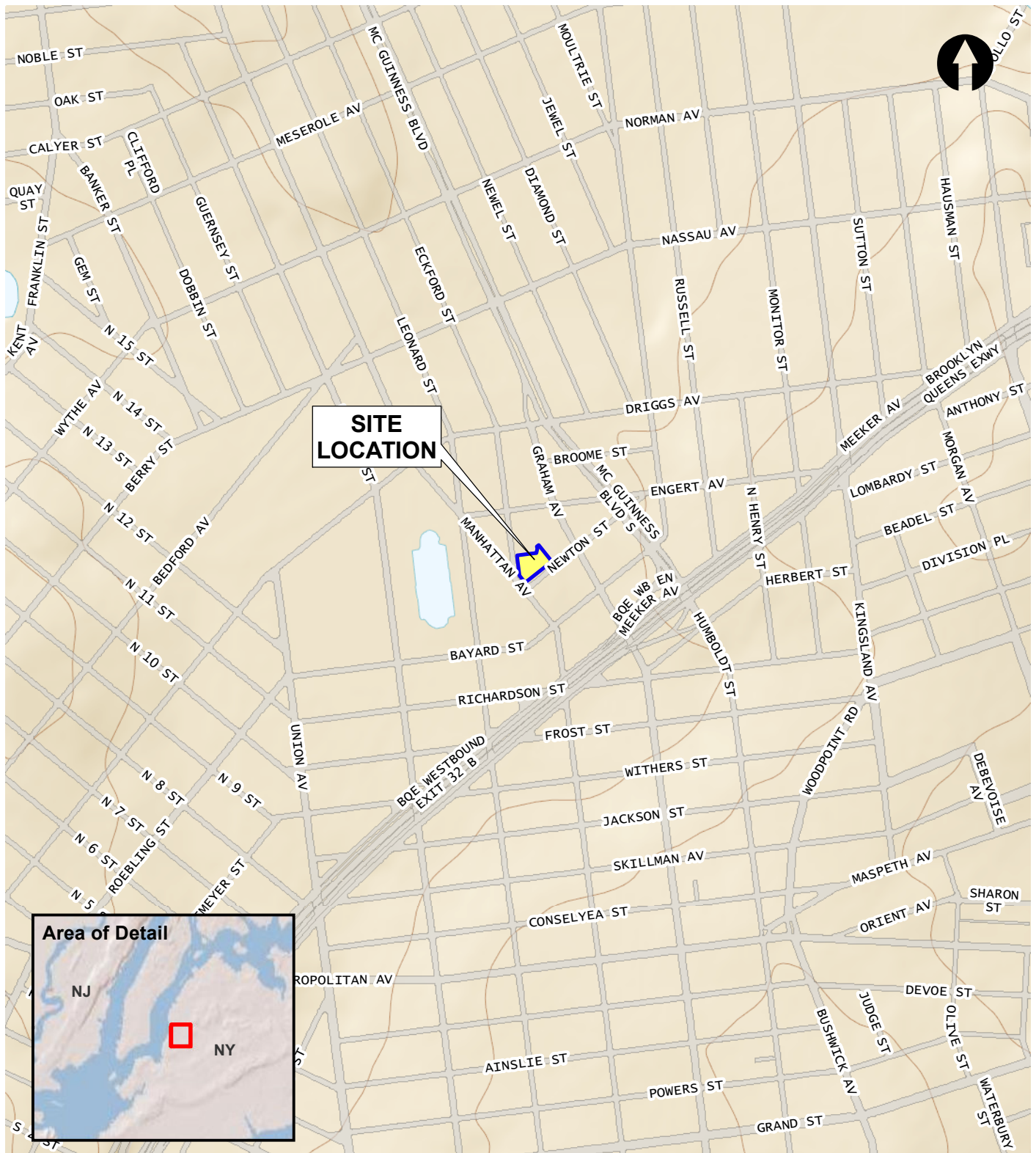
Institutional Controls: The environmental easement discussed in Paragraph 6, above.

Engineering Controls: The cover system discussed in Paragraph 3, the SVE system discussed in Paragraph 4, and the sub-slab depressurization system discussed in Paragraph 5, above.

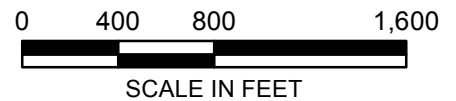
This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
 - descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
 - a provision that should an existing or future on-site building be demolished in the future, a cover system consistent with that described in Paragraph 3 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
 - provisions for the management and inspection of the identified engineering controls;
 - maintaining site access controls and Department notification; and
 - the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
2. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
 - monitoring of soil vapor to assess the performance and effectiveness of the remedy;
 - a schedule of monitoring and frequency of submittals to the Department;

3. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system(s). The plan includes, but is not limited to:
- procedures for operating and maintaining the system(s); and
 - compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting.



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



12 Eckford Street (a.k.a. 470 Manhattan Avenue)
Brooklyn, New York

SITE LOCATION



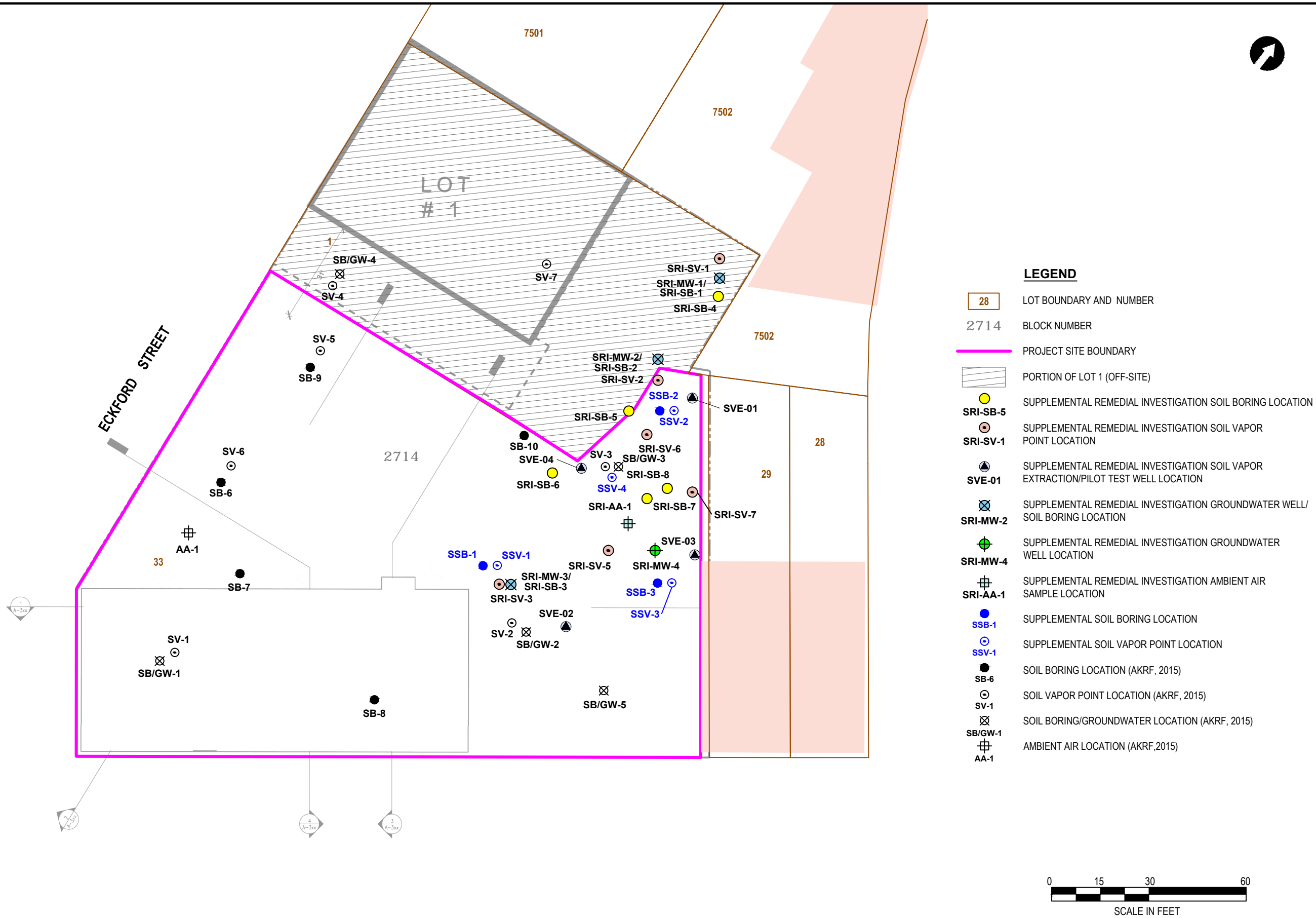
AKRF Engineering, P.C.
440 Park Avenue South, New York, NY 10016

DATE
8/2/2016

PROJECT NO.
12306

FIGURE
1

© 2016 AKRF, Inc. Environmental Consultants W:\Projects\12306 - 470 MANHATTAN AVENUE\Technical\Drawings\BCP\12306 Fig 2 BCP and RAWP.dwg



AKRF Engineering, P.C.
440 Park Avenue South, New York, N.Y. 10016

12 Eckford Street (a.k.a. 470 Manhattan Avenue)
Brooklyn, New York

SITE PLAN

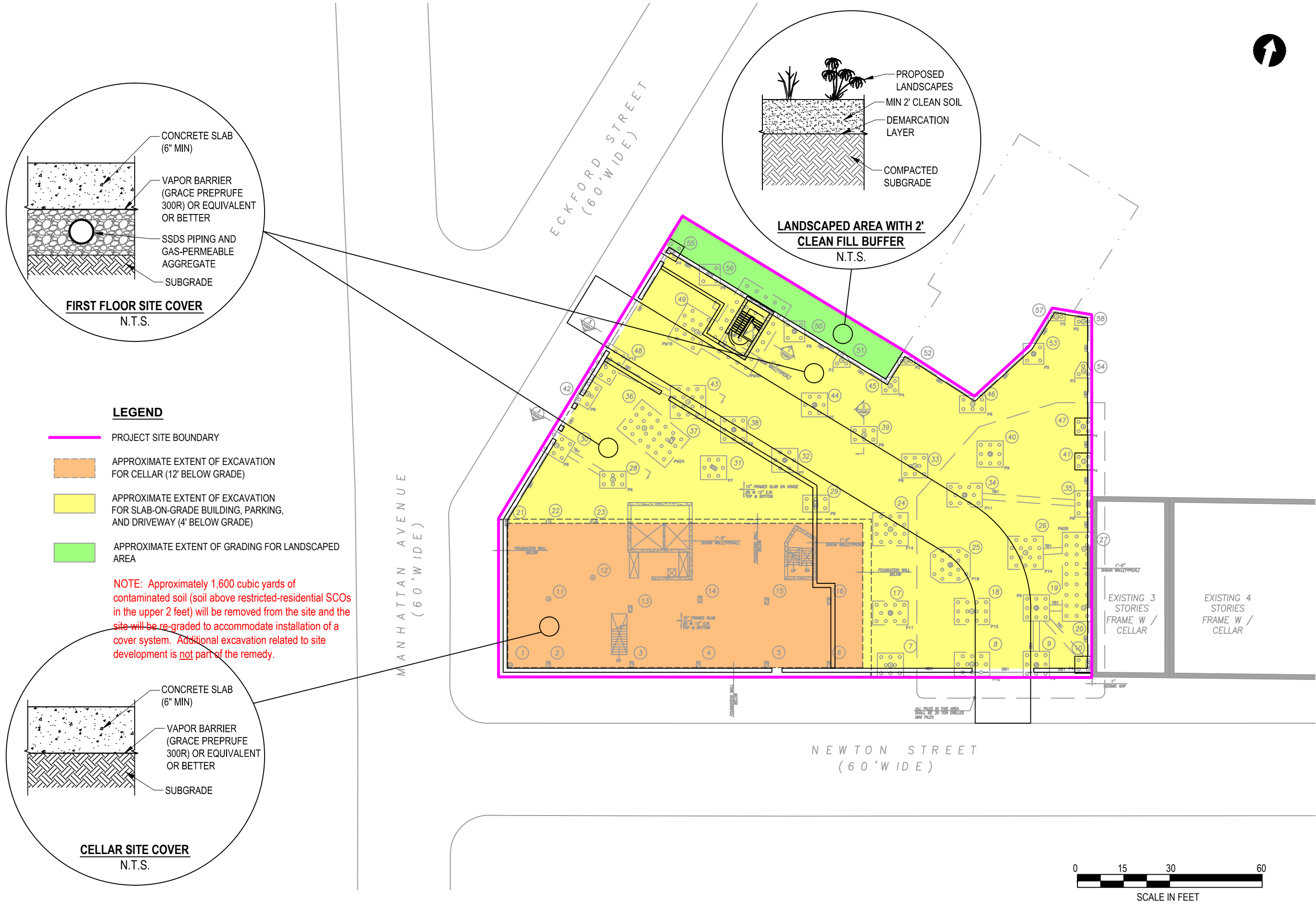
DATE
8/3/2016

PROJECT NO.
12306

FIGURE

2

© 2016 AKRF, Inc. Environmental Consultants W:\Projects\12306 - 470 MANHATTAN AVENUE\Technical\Drawings\DEC RAWP\12306 Fig 9 Site Cover.dwg

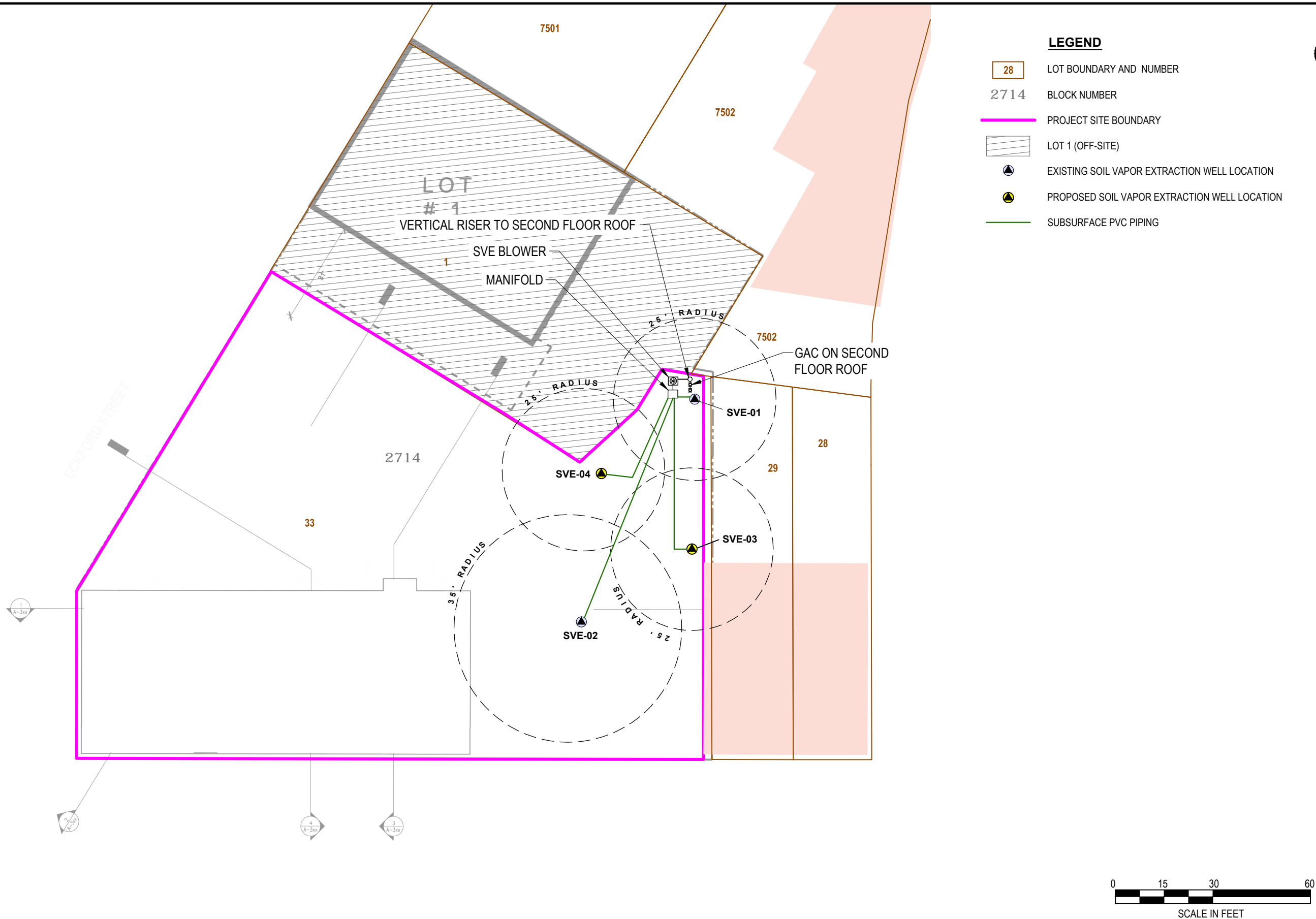


12 Eckford Street (a.k.a. 470 Manhattan Avenue)
Brooklyn, New York



AKRF Engineering, P.C.
440 Park Avenue South, New York, N.Y. 10016

COMPOSITE COVER SYSTEM



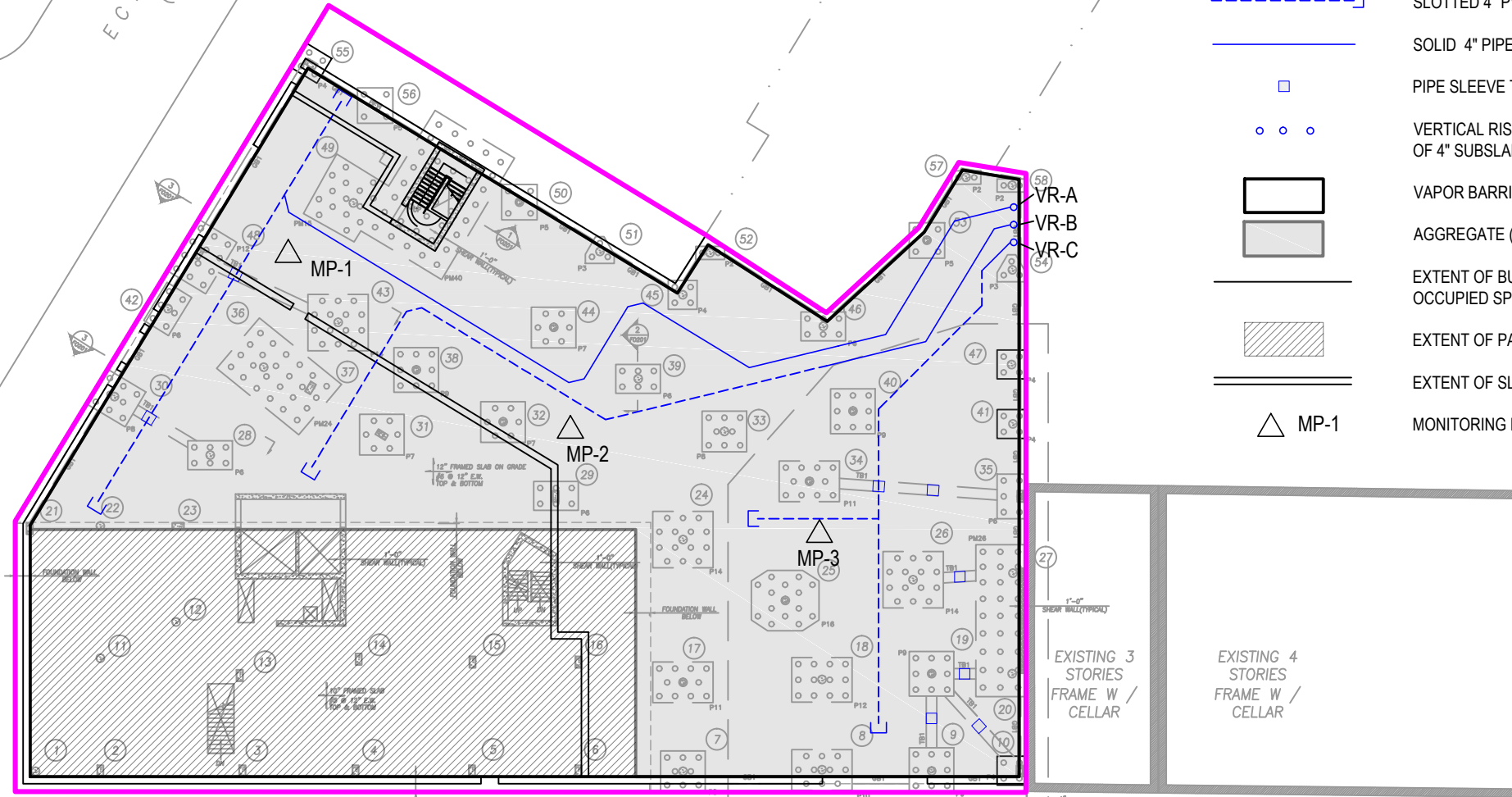
Map Source:
GHW Architects, LLP, "Cellar Floor Plan, A-100", Dated 11-17-2015.

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MANHATTAN AVENUE
(60' WIDE)

ECKFORD STREET
(60' WIDE)

NEWTON STREET
(60' WIDE)



- LEGEND**
- PROJECT SITE BOUNDARY
 - SLOTTED 4" PVC PIPE BENEATH SLAB WITH ENDCAP
 - SOLID 4" PIPE BENEATH SLAB
 - PIPE SLEEVE THROUGH GRADE BEAM
 - VERTICAL RISER PENETRATION LOCATIONS OF 4" SUBSLAB PIPE
 - VAPOR BARRIER INSTALLATION LOCATION
 - AGGREGATE (SSDS) INSTALLATION LOCATION
 - EXTENT OF BUILDING A FIRST FLOOR ENCLOSED OCCUPIED SPACE
 - EXTENT OF PARTIAL CELLAR
 - EXTENT OF SLAB-ON-GRADE BUILDING
 - MONITORING POINT LOCATION



12 Eckford Street (a.k.a. 470 Manhattan Avenue)
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SUB-SLAB DEPRESSURIZATION SYSTEM PLAN



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FIGURE	3C