DECISION DOCUMENT

M4778 Broadway LLC
Brownfield Cleanup Program
New York, New York County
Site No. C231131
August 2021

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

DECLARATION STATEMENT - DECISION DOCUMENT

M4778 Broadway LLC
Brownfield Cleanup Program
New York, New York County
Site No. C231131
August 2021

Statement of Purpose and Basis

This document presents the remedy for the M4778 Broadway LLC 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 M4778 Broadway LLC 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;
- 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.
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve

energy efficiency as an element of construction.

2. Excavation

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

- any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination;
- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil with visual waste material or non-aqueous phase liquid;
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Excavation and off-site disposal of all on-site soils which exceed restricted residential SCOs, as defined by 6 NYCRR Part 375-6.8 in the upper 15 ft. If a Track 2 restricted residential cleanup is achieved, a Cover System will not be a required element of the remedy.

Approximately 8,300 tons of contaminated soil will be removed from the site.

3. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site.

4. In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) will be implemented to treat contaminants in soil and groundwater. A chemical oxidant will be injected into the subsurface to destroy the contaminants in the northern portion of the site where the USTs are located. The method and depth of injection will be determined during the remedial design.

5. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system (SSDS) to mitigate the migration of vapors into the building from soil and 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:

a. An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
   - Institutional Controls: An Environmental Easement discussed in paragraph 6.
   - Engineering Controls: In-situ oxidation as discussed in paragraph 4, the vapor mitigation system as discussed in paragraph 5, and the cover system (if necessary) discussed in paragraph 8.

   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 8 below (if needed) will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs)
   - provisions for the management and inspection of the identified engineering controls;
   - maintaining site access controls and Department notification; and
   - the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to: monitoring of groundwater to assess the performance and effectiveness of the remedy;
   - a schedule of monitoring and frequency of submittals to the Department; and
   - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation 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.

Contingent Track 4 Remedy

In the event that Track 2 restricted residential use is not achieved, the following contingent remedial elements will be required, and the remedy will achieve a Track 4 restricted residential cleanup.

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

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.

August 19, 2021

Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

M4778 Broadway LLC
New York, New York County
Site No. C231131
August 2021

SECTION 1: SUMMARY AND PURPOSE

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

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

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

SECTION 2: CITIZEN PARTICIPATION

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

DECInfo Locator - Web Application
https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C231131

Community Board #12
530 West 166th Street, 6th Floor
New York, NY 10032
Phone: (212) 568-8500

NY Public Library - Washington Heights Branch

1000 Saint Nicholas Avenue
New York, NY 10032
Phone: (212) 923-6054

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location:
The site is located on the southeast side of Broadway, between Dyckman Street and Academy Street, in a commercial and residential area of the Manhattan, New York.

Site Features:
The site consists of a single-story former commercial car wash facility. The site is currently vacant; however, the most recent occupant was Soft Touch Car Wash, whose operations included interior and exterior automobile cleaning. In addition to the building, the site is improved with an asphalt paved parking area on the western portion of the property.

Current Zoning and Land Use:
The site is in a residential district (R7A) with a commercial use overlay (C4-4D). According to a Zoning Change diagram date August 8, 2018, the area of the site is within a “Special Inwood District”. The surrounding parcels are currently used for a combination of commercial and residential purposes.

Past Use of the Site:
The site was most recently occupied by an automobile laundry/car wash from approximately 1988 to 2017. Based on a review of historical sources, the site was developed with a gasoline filling and/or service station from as early as 1921 until 1988. Three gasoline tanks were labeled on Sanborn maps from 1935 and 1951 and additional tanks were installed in 1951 during the redevelopment of the site. No documentation has been identified that indicates typical tank closure activities (including proper tank closure/removal, soil and/or groundwater sampling, and summary closure reports) were performed. It appears that the prior occupancy of the site by a gasoline service station led to onsite contamination.

A Phase II was conducted at the site in March 2017. The results of this investigation indicated that a release of gasoline has impacted soil, groundwater, and soil vapor at the site. Based on this information, the Department was notified of the release on April 24, 2017, and Spill #1700751 was issued.

Site Geology and Hydrogeology:
The soil recovered in the borings advanced during the February 2020 Remedial Investigation generally consisted of grey to brown silt and reddish-brown silty sand with weathered schist gravel. Borings at the site have generally been advanced to 20 feet below ground surface (bgs), where refusal was encountered due to the presence of weathered schist bedrock.

The site is relatively flat at an elevation of approximately 25 feet above mean sea level. The depth to groundwater was measured between 13.14 feet and 14.30 feet bgs. Based on a survey of monitoring wells on-site and groundwater measurements in the wells, the measured groundwater gradient on-site is to the southwest. The closest surface water body, the Hudson River, is located approximately 0.38 miles to the west of 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(s) under the Brownfield Cleanup Agreement is a/are Volunteer(s). The Applicant(s) does/do not have an obligation to address off-site contamination. However, the Department has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

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

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

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

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

benzene
toluene
xylene (mixed)
ethylbenzene
2,2,4-trimethylpentane
benzo(b)fluoranthene
indeno(1,2,3-CD)pyrene
phenol
naphthalene

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

- groundwater
- soil

6.2: Interim Remedial Measures

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

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.

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances (PFAS), and pesticides. Soil vapor samples were analyzed for VOCs. Based on the investigations done to date, the primary contaminants of concern for the site include petroleum VOCs in the soil, groundwater, and in soil vapor.

Soil - The highest concentrations of VOCs on-site were all detected at the north western corner of the site near the former underground storage tanks at depths of 19.5 ft to 20 ft. Benzene was found at a maximum concentration of 54 parts per million (ppm), which exceeds the applicable protection of groundwater soil cleanup objectives (PGSCO) of 0.06 ppm and the restricted residential soil cleanup objective (RRSCO) of 4.8 ppm, toluene was found at a maximum concentration of 810 ppm (PGSCO is 0.7 ppm, RRSCO is 100 ppm), ethylbenzene was found at a maximum concentration of 360 ppm (PGSCO is 1 ppm, RRSCO is 41 ppm), and mixed xylenes were found at a maximum concentration of 1,700 ppm (PGSCO is 1.6 ppm, RRSCO is 100 ppm). SVOCs were detected in highest concentrations in the southern portion of the site in shallow soil (0-2 ft). Benzo(b)fluoranthene was detected at 2.4 ppm (RRSCO is 1.0 ppm) and indeno(1,2,3-cd)pyrene was detected at 1.2 ppm (RRSCO is 0.5 ppm). No metals, pesticides or PCBs were detected exceeding the RRSCOs. For emerging contaminants, the highest PFOA concentration was 2.93 parts per billion (ppb) compared to the restricted residential guidance value (RRGV) of 33 ppb and the protection of groundwater guidance value (PGGV) of 1.1 ppb and highest PFOS concentration was 28.6 ppb (RRGV is 44 ppb and PGGV is 3.7 ppb).

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

Groundwater - Petroleum VOCs were found primarily along the western edge of the site at concentrations exceeding the Ambient Water Quality Standards (AWQS), including benzene at a maximum concentration of 8,200 parts per billion, or ppb (AWQS is 1 ppb), toluene at 39,000 ppb (AWQS is 5 ppb), ethylbenzene at 5,300 ppb (AWQS is 1 ppb), and mixed xylene at 16,000 ppb (AWQS is 1ppb). The following SVOCs were detected: phenol at 380 ppb (AWQS is 1 ppb) and naphthalene at 300 ppb (AWQS is 10 ppb). For emerging contaminants, PFOA was detected at a

maximum concentration of 84.1 part per trillion compared to the Maximum Contaminant Level (MCL) of 10 ppt, and PFOS was detected at 1530 ppt (MCL is 10 ppt). Only naturally occurring metals were found at concentrations exceeding the AWQS.

Data indicated there is potential for off-site migration of petroleum VOCs in groundwater.

Soil Vapor - Petroleum VOCs were detected at elevated concentrations in soil vapor. At the north-western corner of the site benzene was detected at 371,000 micrograms per cubic meter (ug/m3), toluene at 897,000 ug/m3, ethylbenzene at 155,000 ug/m3, p/m-xylene at 199,000 ug/m3, and 2,2,4-trimethylpentane at 5,000,000 ug/m3.

Data indicated there is potential for off-site migration of petroleum VOCs in soil vapor.

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.*

Since the site is fenced and covered by a building and asphalt or concrete, people will not come in contact with contaminated soils unless they dig below the surface materials. Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a different source not affected by this contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect 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. Because the on-site building is vacant, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a concern for the site in its current condition. However, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development. In addition, environmental sampling indicates soil vapor intrusion is not a concern for off-site buildings.

6.5: Summary of the Remediation Objectives

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

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- 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 2: Restricted use with generic soil cleanup objectives remedy.

The selected remedy is referred to as the Excavation, Groundwater Treatment and Soil Vapor Mitigation remedy.

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

1. Remedial Design

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

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- 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.
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

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

- any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination;
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- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Excavation and off-site disposal of all on-site soils which exceed restricted residential SCOs, as defined by 6 NYCRR Part 375-6.8 in the upper 15 ft. If a Track 2 restricted residential cleanup is achieved, a Cover System will not be a required element of the remedy.

Approximately 8,300 tons of contaminated soil will be removed from the site.

3. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site.

4. In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) will be implemented to treat contaminants in soil and groundwater. A chemical oxidant will be injected into the subsurface to destroy the contaminants in the northern portion of the site where the USTs are located. The method and depth of injection will be determined during the remedial design.

5. Vapor Mitigation

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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);
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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:

d. 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: An Environmental Easement discussed in paragraph 6.
   - Engineering Controls: In-situ oxidation as discussed in paragraph 4, the vapor mitigation system as discussed in paragraph 5, and the cover system (if necessary) discussed in paragraph 8.

   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 8 below (if needed) 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.

e. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to: monitoring of groundwater to assess the performance and effectiveness of the remedy;
   - a schedule of monitoring and frequency of submittals to the Department; and
   - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

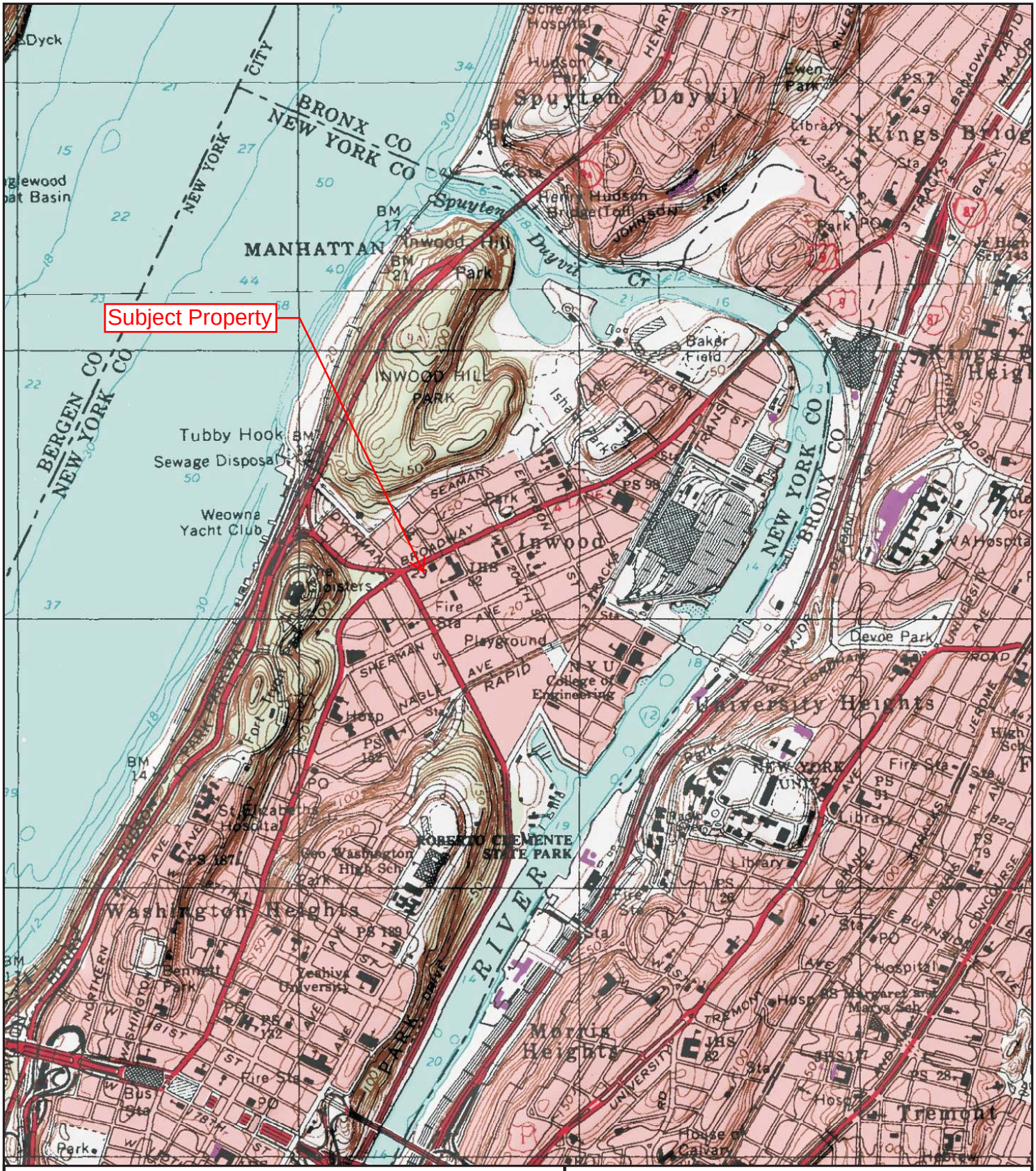
f. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system(s). The plan includes, but is not limited to:
   - procedures for operating and maintaining the system(s); and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

Contingent Track 4 Remedy

In the event that Track 2 restricted residential use is not achieved, the following contingent remedial elements will be required, and the remedy will achieve a Track 4 restricted residential cleanup.

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



LEGEND

Source: USGS

SITE LOCATION MAP

4778 BROADWAY MANHATTAN, NEW YORK 10034

FIGURE 1

LEGEND

Site Boundary

In–Situ Injection Point*

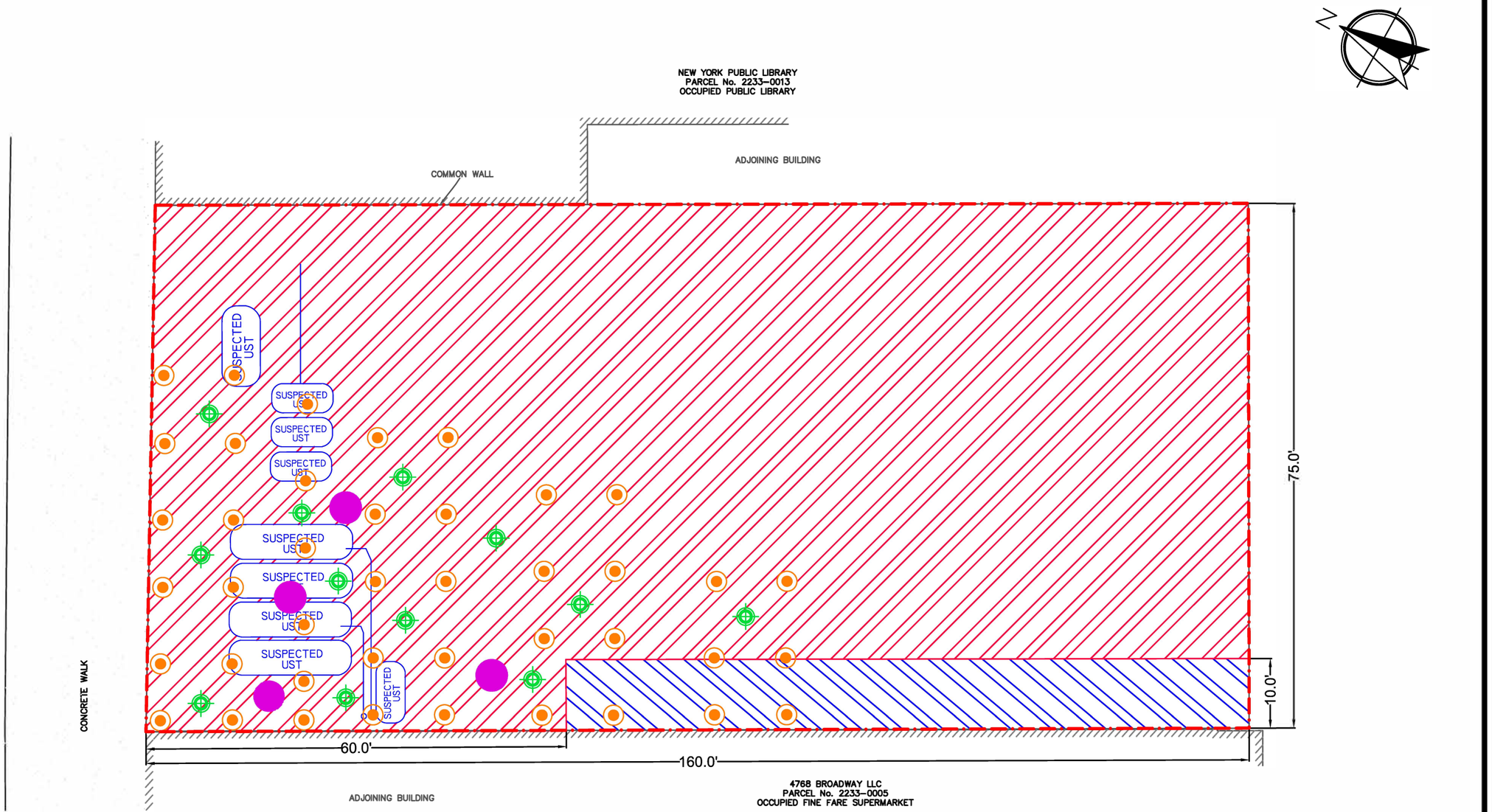
Temporary Groundwater Recovery Well

Area of Excavation to 14 feet BGS

Area of Excavation to 6 feet BGS

Post–Remedial Soil Boring

*Proposed in-situ injection points will be advanced in a grid formation with the grid spacing at approximately 100 square feet per injection point.



GRAPHIC SCALE

0 16 32

(1 INCH = 16 FEET)

REMEDIATION ENGINEER:
HCS Civil & Environmental Engineering, LLC
169 UPPER VALLEY ROAD
WASHINGTON, MA 01223

STATE OF NEW YORK · PHILIP GERALD CLARK · 16 086422 · LICENSED PROFESSIONAL ENGINEER

DRAWN BY: AC

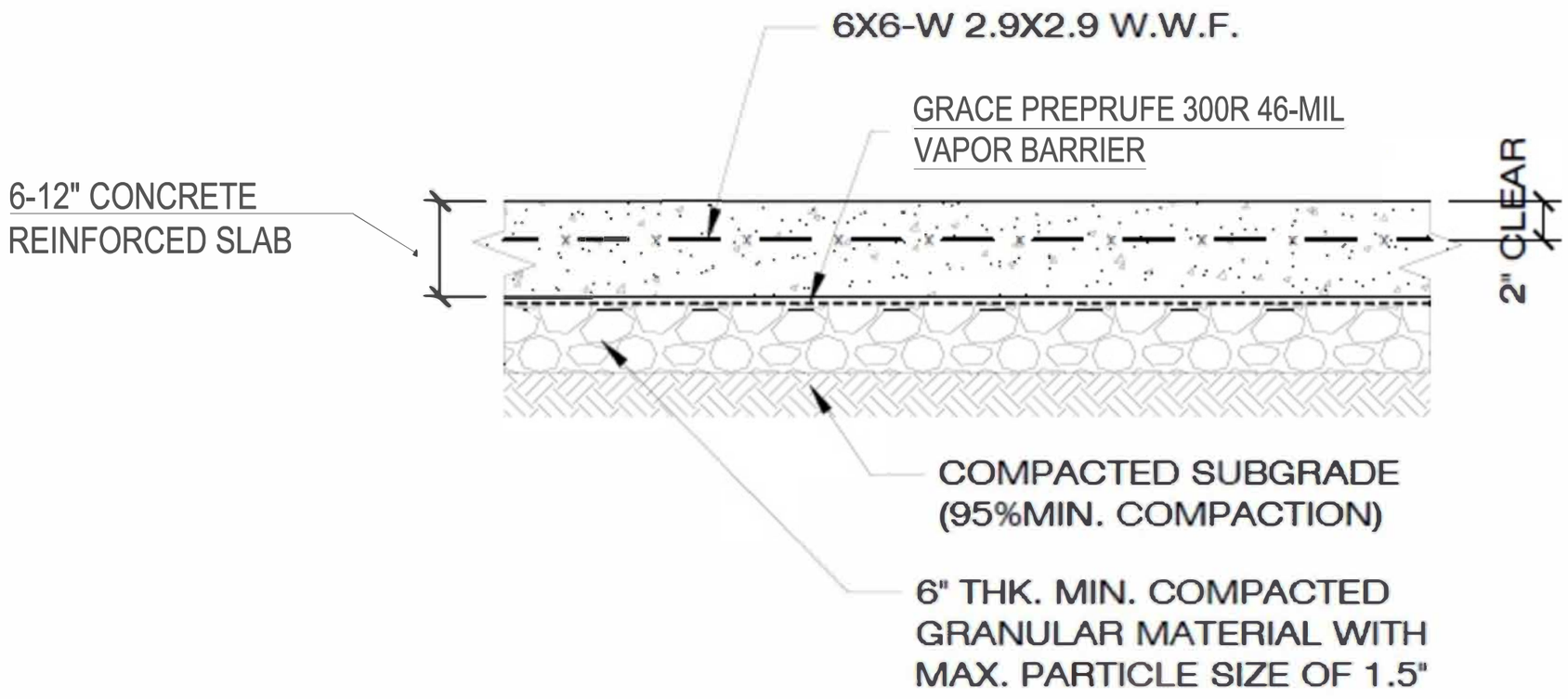
APPROVED BY: PG CLARK 3/11/2021

EXCAVATION AND GROUNDWATER TREATMENT PLAN

4778 Broadway,
New York, New York 10034

BCP #C231131

FIGURE 2



REMEDIATION ENGINEER:
HCS Civil & Environmental Engineering, LLC
169 UPPER VALLEY ROAD
WASHINGTON, MA 01223

SCALE: N.T.S.

DRAWN BY: AC

APPROVED BY: PG CLARK 3/11/2021

TYPICAL COVER DETAIL
FOR ALL COVER TYPES

4778 Broadway,
New York, New York 10034

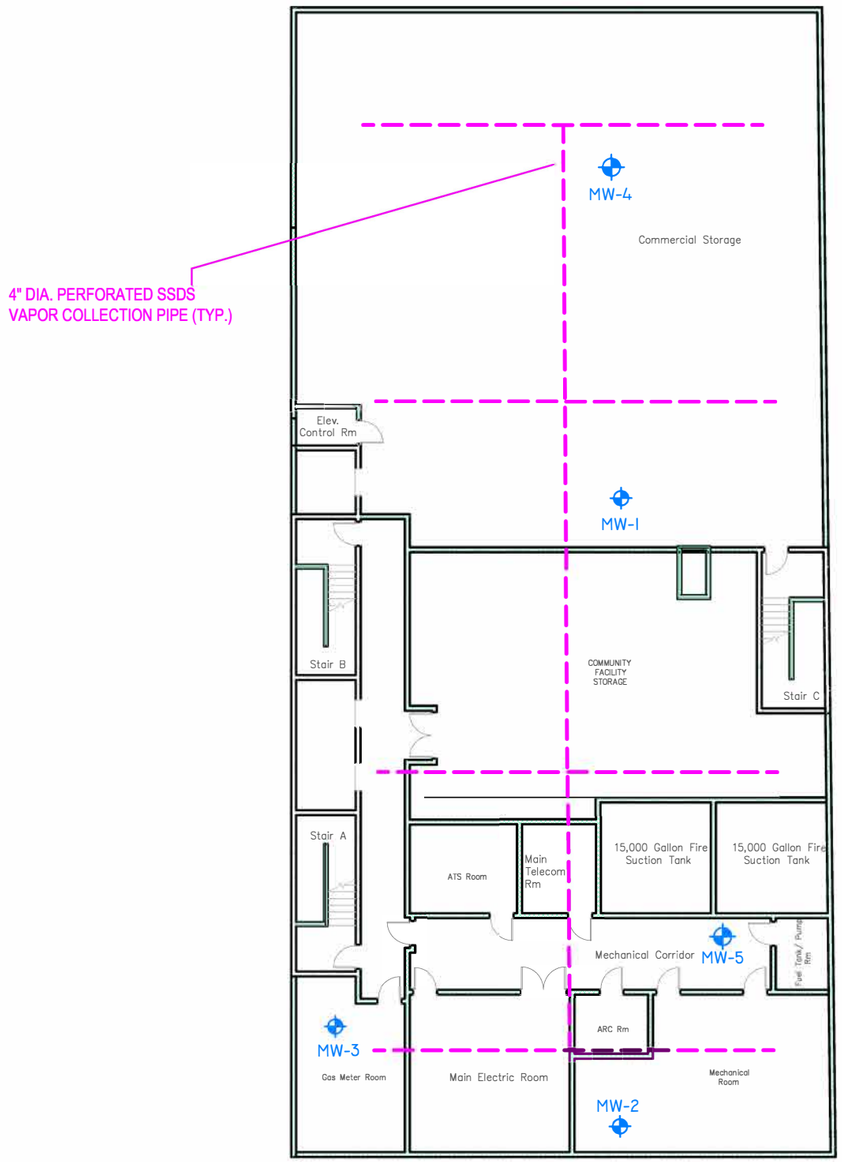
BCP #C231131

FIGURE
3

LEGEND

Proposed Monitoring Well Location

1 / - PROPOSED CELLAR PLAN



N

SCALE: N.T.S.

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VAPOR MITIGATION/SSDS & MONITORING WELL LOCATION PLAN

4778 Broadway,
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BCP #C231131

FIGURE
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