DECISION DOCUMENT

1731 West Farms Road
Brownfield Cleanup Program
Bronx, Bronx County
Site No. C203134
September 2021

Department of Environmental Conservation

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

DECLARATION STATEMENT - DECISION DOCUMENT

1731 West Farms Road
Brownfield Cleanup Program
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Statement of Purpose and Basis

This document presents the remedy for the 1731 West Farms Road 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 1731 West Farms Road site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected Track 2 remedy are as follows:

1. Remedial Design

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

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

- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Excavation

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

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- 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.

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 feet. If a Track 2 restricted residential cleanup is achieved, a Cover System will not be a required element of the remedy.

Approximately 1,970 cubic yards of contaminated soil will be removed from the site.

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

3. Backfill

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

If a Track 2 restricted residential cleanup is not achieved, on-site soil which does not exceed the above excavation criteria may be used below the contingent Cover System described in remedial element 11 to backfill the excavation to establish the designed grades at the site.

4. Low Permeability Wall

A low permeability wall will serve as a permanent engineering control to limit off-site migration of residual contamination in groundwater and/or soil vapor and augment the selected groundwater remedy. The low permeability wall will be constructed at the most downgradient on-site location with respect to groundwater flow, along the northeastern, eastern, and southeastern site boundaries, and extend to the bedrock surface. The construction methods and design details will be determined during remedial design. Monitoring will be conducted for site related contaminants of concern including, tetrachloroethylene (PCE), trichloroethylene (TCE), cis-1,2-dichloroethylene (cis-1,2-DCE), and degradation byproducts downgradient from the low permeability wall to assess its effectiveness.

In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) will be implemented to treat PCE, TCE, and cis-1,2-DCE in groundwater. A chemical oxidant will be injected into the subsurface to destroy the contaminants in an approximately 4,000 square foot area located in the eastern portion of the site where chlorinated volatile organic compounds (VOCs) were elevated in the groundwater via shallow and deep injection wells. The method and depth of injection will be determined during the remedial design.

Prior to the full implementation of this technology, laboratory and on-site pilot scale studies will be conducted to define design parameters more clearly. Between the pilot and the full-scale implementations, it is estimated that 19 shallow and 5 deep injection points will be installed. It is estimated that the chemical oxidant sodium persulfate will be injected during approximately two separate events. Monitoring will be conducted for site related contaminants of concern including PCE, TCE, cis-1,2-DCE, and any other necessary parameters to assess the effectiveness of the remedy upgradient, downgradient and within the treatment zone.

5. Monitored Natural Attenuation

Groundwater contamination remaining after active remediation will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of the biological activity breaking down the contamination. Additional active remediation will be proposed if it appears that natural processes alone will not address any remaining contamination.

6. Vapor Mitigation

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

7. Institutional Control

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

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for 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.

8. Site Management Plan

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

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

   Institutional Controls: The Environmental Easement discussed in Paragraph 8 above.

   Engineering Controls: The contingent Soil Vapor Extraction System discussed in Paragraph 10, the contingent Cover System discussed in Paragraph 11 below, the Low Permeability Wall as discussed in Paragraph 4 above, and the sub-slab depressurization system discussed in Paragraph 7 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 11 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;
   - 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 remedy. The plan includes, but is not limited to:

   - procedures for operating and maintaining the remedy;
   - compliance monitoring of treatment systems and/or sub-slab deppresurization

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.

Contingent Track 4 Elements

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

9. Soil Vapor Extraction:

Soil vapor extraction (SVE) may be implemented to remove volatile organic compounds (VOCs) from the subsurface for any remaining source area contamination that is unable to be addressed during excavation. 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. If all source material is addressed during excavation, SVE will not be necessary.

10. Cover System

If a Track 2 restricted residential cleanup is not achieved, 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.

September 28, 2021

Date

Gerard Burke, Director, Remedial Bureau B

DECISION DOCUMENT

1731 West Farms Road
Bronx, Bronx County
Site No. C203134
September 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=C203134

NY Public Library - West Farms Library
2085 Honeywell Avenue
Bronx, NY 10460
Phone: (718) 367-5376

NY Public library - Morrisania Library
610 East 169th Street
Bronx, NY 10456
Phone: (718) 589-9268

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 0.22-acre site is located at 1731 West Farms Road in the West Farms section of the Bronx. The site is bounded by West Farms Road to the east, a two-story commercial building to the north, a large commercial self-storage building to the south, and a single-story commercial building to the west.

Site Features:
The site is currently vacant, and is covered in gravel, undeveloped, fenced and locked. Previously, a 6,480 square-foot one- to two-story commercial building with partial basement occupied the site along with a paved parking lot.

Current Zoning and Land Use:
The site is zoned residential, partially R7X and partially R7A, both an Inclusionary Housing designated area. The surrounding area is primarily commercial, with a public park containing recreational fields, walking paths, and a playground to the east, located across the adjacent expressway.

Past Use of the Site:
Residential buildings occupied the site prior to 1931, with the date of original development unknown. From 1931 to the 1970s, a marble shop and stone mason reportedly occupied the site. Subsequent site occupants included a machine shop during the 1970s and 1980s, and various dry cleaning and laundry equipment sales and refurbishing operations from the 1980s until at least 2005. The site is currently vacant.

Site Geology and Hydrogeology:
Soil stratigraphy at the site generally consists of fill material extending from ground surface down to bedrock. Based on soil borings, the bedrock surface ranges from 2 to 20 feet below grade and slopes downward to the east, with a bedrock outcrop present near the western site boundary. The fill generally consists of sand with brick, concrete, coal, cinders, clay, gravel, and silt with native sand, silt, and gravel in the eastern area of the site where bedrock is approximately eight or more feet below grade. Native material underlies the fill layer where bedrock is deeper in the eastern portion of the site. The western end of the site is bordered by a bedrock ridge oriented in a roughly north to south direction.

Monitoring well data indicates groundwater flows in an easterly direction towards the Bronx River, consistent with regional groundwater flow. The depth to groundwater is approximately 10 feet below grade at the eastern portion of the site. Groundwater was not encountered at the western portion of the site where the bedrock surface is shallower than the groundwater table.

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 Volunteer(s) does/do 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(s)) 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 and supplemental RI reports are 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:

tetrachloroethene (PCE)
trichloroethene (TCE)
cis-1,2-dichloroethene (DCE)
benzo(a)anthracene
benzo(a)pyrene
benzo(b)fluoranthene
benzo(k)fluoranthene
chrysene
dibenzo(a,h)anthracene
indeno(1,2,3-cd)pyrene
barium
lead
mercury
cadmium

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.

Nature and Extent of Contamination: Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), pesticides, per- and polyfluoroalkyl substances (PFAS), and 1,4-dioxane. Soil vapor was analyzed for VOCs. The primary contaminants of concern detected in all media were tetrachloroethylene (PCE), trichloroethylene (TCE), and cis-1,2-dichloroethene (cis-1,2-DCE).

Soil - The following chlorinated VOCs were detected to a depth of 9 feet below ground surface (bgs) at levels exceeding restricted residential soil cleanup objectives (RRSCOs) and/or protection of groundwater soil cleanup objectives (PGWSCOs): PCE up to 113 parts per million (ppm) (RRSCO of 19 ppm and PGWSCO of 1.3 ppm), TCE up to 8.6 ppm (PGWSCO of 0.47 ppm), and cis-1,2-DCE up to 4.5 ppm (PGWSCO of 0.25 ppm). Detections were present throughout site soils, with the source area located in the northeastern area of the site where detections were the highest and most frequent. A former on-site dry-cleaning equipment repair facility was likely the source of the chlorinated VOC contamination.

SVOCs detected at levels exceeding RRSCOs include: benzo(a)anthracene up to 16 ppm (RRSCO of 1.0 ppm), benzo(a)pyrene up to 13.2 ppm (RRSCO of 1.0 ppm), benzo(b)fluoranthene up to 19.3 ppm (RRSCO of 1.0 ppm), benzo(k)fluoranthene up to 5.1 ppm (RRSCO of 3.9 ppm), chrysene up to 17.7 ppm (RRSCO of 3.9 ppm), dibenzo(a,h)anthracene up to 2.5 ppm (RRSCO of 0.33 ppm), and indeno(1,2,3-cd)pyrene up to 0.58 ppm (RRSCO of 0.5 ppm). Metals detected at levels exceeding RRSCOs include barium up to 376 ppm (RRSCO of 350 ppm), lead up to 4,890 ppm (RRSCO of 400 ppm), mercury up to 3.18 ppm (RRSCO of 0.81 ppm), and cadmium up to 5.46 ppm (RRSCO of 4.3 ppm). PCBs and pesticides were not detected above their respective RRSCOs.

The PFAS compounds perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were detected in soil at concentrations below their respective restricted residential use guidance values of 33 parts per billion (ppb) and 44 ppb, respectively.

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

Groundwater - Chlorinated VOCs detected above Class GA Ambient Water Quality Standards (AWQS) include: PCE up to 610 parts per billion (ppb), TCE up to 16.1 ppb and cis-1,2-DCE up to 22 ppb, all with an AWQS of 5 ppb. No other VOCs were detected above AWQS. Excluding naturally occurring minerals, no metals were detected above AWQS in site groundwater and no SVOCs, pesticides, or PCBs detected above the AWQS.

For PFAS compounds, PFOA and PFOS were reported at concentrations up to 96 parts per trillion (ppt) and 190 ppt, respectively, exceeding the Maximum Contaminant Levels (MCLs) (drinking water standard) of 10 ppt each in groundwater. The compound 1,4- dioxane was not detected above the MCL of 1 ppb. There are no public water supply wells within a half a mile and there is a municipal prohibition for use of groundwater at the site.

Off-site migration of contaminants of concern have been observed in groundwater and the contaminant plume extends off-site to the east, with a maximum concentration of 120 ppb for PCE, 32 ppb for TCE, and 9.5 ppb for cis-1,2-DCE.

Soil Vapor - Chlorinated VOCs were detected in soil vapor throughout the site, with the highest concentrations located within and near the soil source area in the northeastern area of the site. PCE concentrations range from 297 micrograms per cubic meter (ug/m^3) near the western boundary of the site up to 679,000 ug/m^3 located within the source area, near the eastern boundary. TCE, cis-1,2-DCE, and vinyl chloride were also detected across the site with maximum concentrations of 88.7 ug/m^3, 11,500 ug/m^3, and 93.6 ug/m^3, respectively.

Data indicates impacts within off-site soil vapor. Two soil vapor points were installed off-site beneath the sidewalk at the eastern boundary of the site with a maximum concentration of 35,000 ug/m^3 for PCE. Based on the results, further action is necessary to evaluate off-site locations for possible soil vapor intrusion.

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 asphalt or concrete, people will not come into contact with site related soil and groundwater contamination unless they dig below the surface. 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 (VOCs) in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This process, which is similar to the

movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because there is no onsite building, inhalation of site contaminants in indoor air 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 the planned onsite development. In addition, elevated concentrations of site related VOCs in off-site soil vapor indicates that soil vapor intrusion is a potential exposure concern for occupants of 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, Low Permeability Wall, Groundwater Treatment, and Vapor Mitigation remedy.

The elements of the selected remedy, as shown in Figure 3A, 3B, and 3C are as follows:

1. Remedial Design

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

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Excavation

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

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- 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.

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 feet. If a Track 2 restricted residential cleanup is achieved, a Cover System will not be a required element of the remedy.

Approximately 1,970 cubic yards of contaminated soil will be removed from the site.

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

3. Backfill

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

If a Track 2 restricted residential cleanup is not achieved, on-site soil which does not exceed the above excavation criteria may be used below the cover system described in remedial element 11 to backfill the excavation to establish the designed grades at the site.

4. Low Permeability Wall

A low permeability wall will serve as a permanent engineering control to limit off-site migration of residual contamination in groundwater and/or soil vapor and augment the selected groundwater remedy. The low permeability wall will be constructed at the most downgradient on-site location with respect to groundwater flow, along the northeastern, eastern, and southeastern site boundaries, and extend to the bedrock surface. The construction methods and design details will be determined during remedial design. Monitoring will be conducted for site related contaminants of concern including tetrachloroethylene (PCE), trichloroethylene (TCE), cis-1,2-dichloroethylene (cis-1,2-DCE), and degradation byproducts downgradient from the low permeability wall to assess its effectiveness.

5. In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) will be implemented to treat PCE, TCE, and cis-1,2-DCE in groundwater. A chemical oxidant will be injected into the subsurface to destroy the contaminants in an approximately 4,000 square foot area located in the eastern portion of the site where chlorinated volatile organic compounds (VOCs) were elevated in the groundwater via shallow and deep injection wells. The method and depth of injection will be determined during the

remedial design.

Prior to the full implementation of this technology, laboratory and on-site pilot scale studies will be conducted to define design parameters more clearly. Between the pilot and the full-scale implementations, it is estimated that 19 shallow and 5 deep injection points will be installed. It is estimated that the chemical oxidant sodium persulfate will be injected during approximately two separate events. Monitoring will be conducted for site related contaminants of concern including PCE, TCE, cis-1,2-DCE, and degradation byproducts upgradient, downgradient and within the treatment zone.

6. Monitored Natural Attenuation

Groundwater contamination (remaining after active remediation) will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of the biological activity breaking down the contamination. Active remediation will be proposed if it appears that natural processes alone will not address any remaining contamination.

7. Vapor Mitigation

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

8. 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.

9. Site Management Plan

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

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

Institutional Controls: The Environmental Easement discussed in Paragraph 8 above.

Engineering Controls: The contingent Soil Vapor Extraction System discussed in Paragraph 10, the contingent Cover System discussed in Paragraph 11 below, the Low Permeability Wall as discussed in Paragraph 4 above, and the sub-slab depressurization system discussed in Paragraph 7 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 11 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;
- 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 remedy. The plan includes, but is not limited to:

- procedures for operating and maintaining the remedy;
- compliance monitoring of treatment systems and/or sub-slab depressurization 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.

Contingent Track 4 Elements

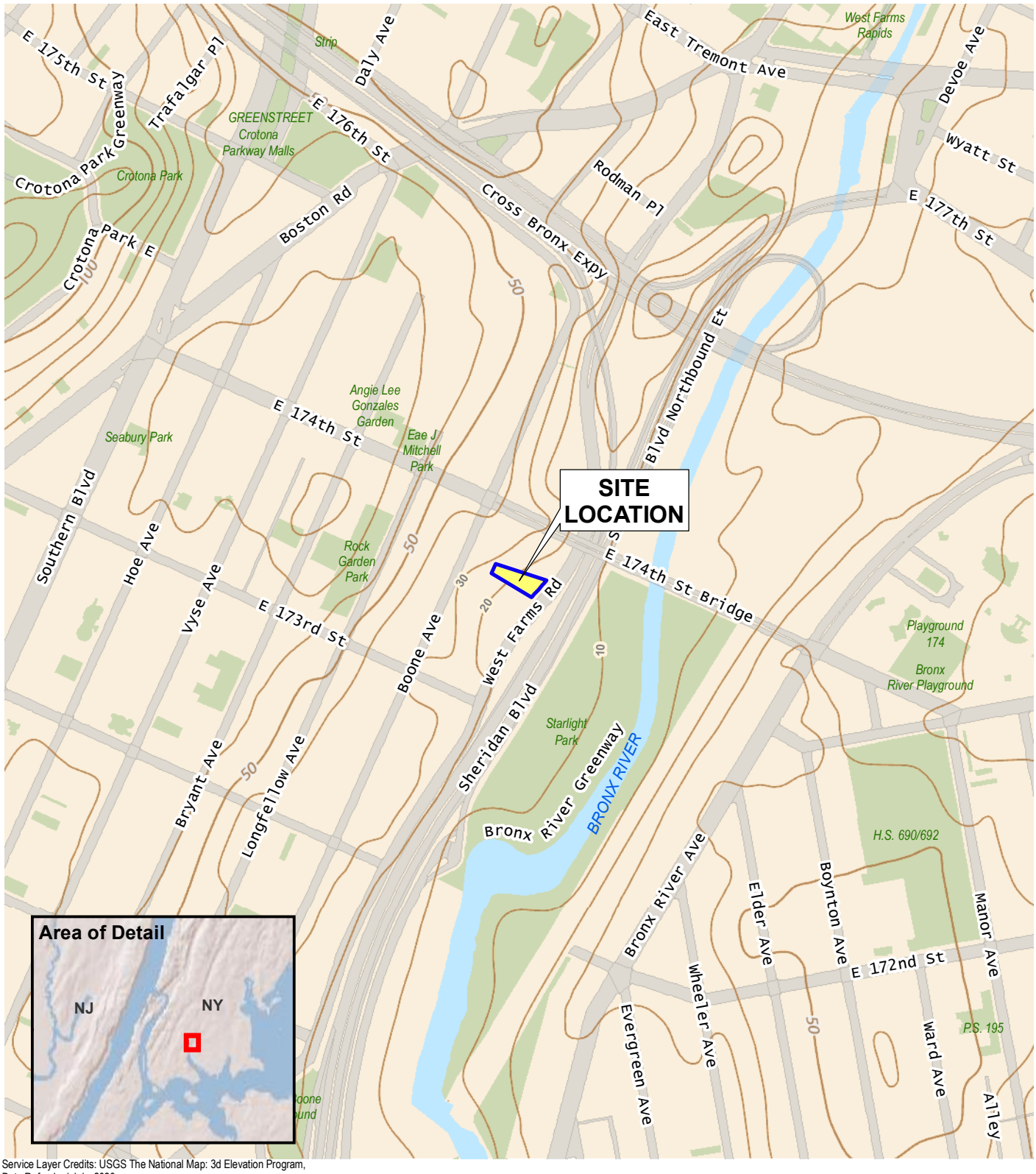
In the event that a Track 2 restricted residential use is not achieved, the following contingent remedial elements will also be required, and the remedy will achieve a Track 4 restricted residential cleanup.

10. Soil Vapor Extraction:

Soil vapor extraction (SVE) may be implemented to remove volatile organic compounds (VOCs) from the subsurface for any remaining source area contamination that is unable to be addressed during excavation. 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. If all source material is addressed during excavation, SVE will not be necessary.

11. Cover System

If a Track 2 restricted residential cleanup is not achieved, 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.



Service Layer Credits: USGS The National Map: 3d Elevation Program, Data Refreshed July, 2020.

0 600 1,200

SCALE IN FEET

AKRF
440 Park Avenue South, New York, NY 10016

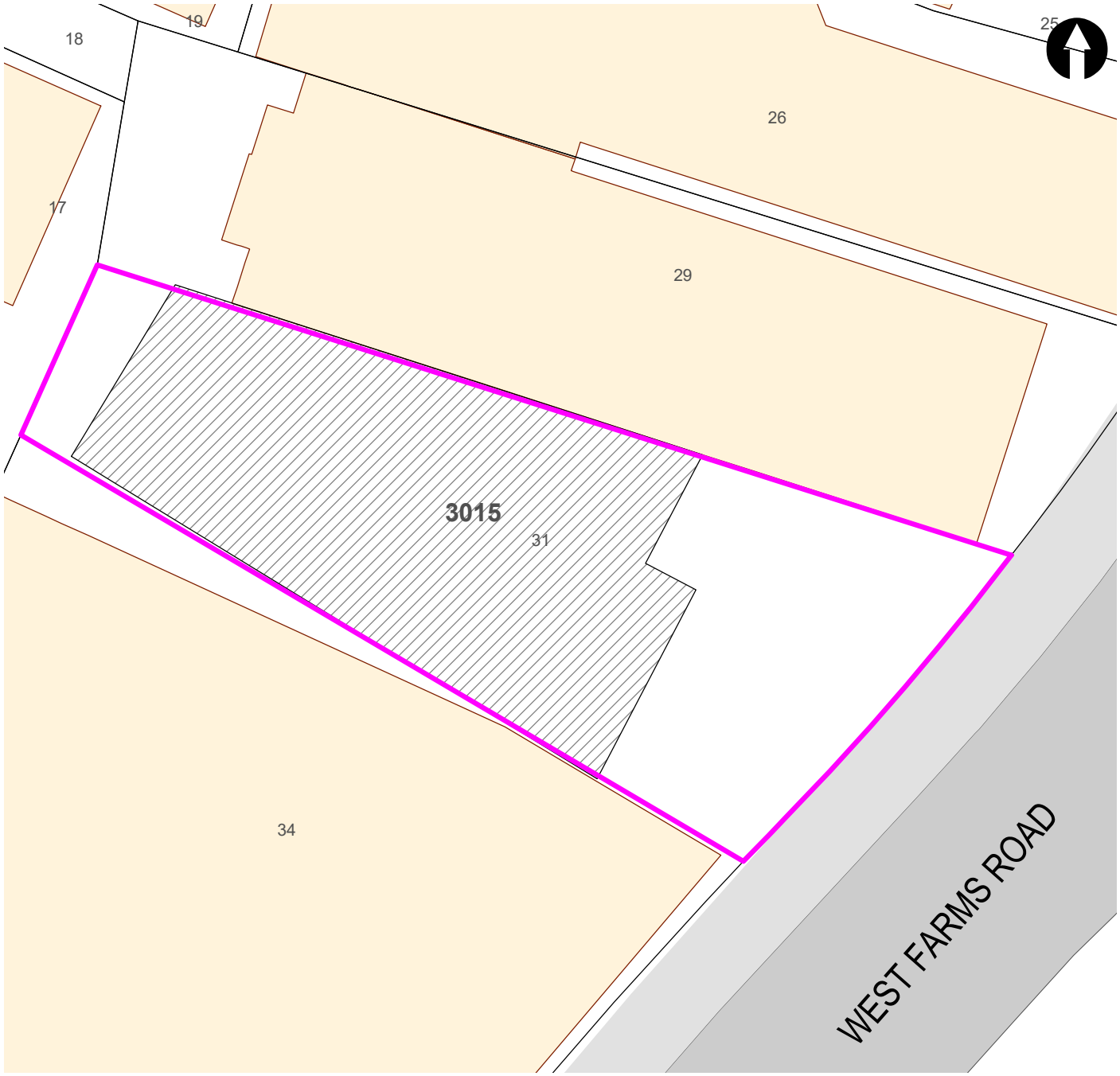
1731 West Farms Road
Bronx, New York

SITE LOCATION

DATE
3/23/2021

PROJECT NO.
200402

FIGURE
1



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

LEGEND

- BCP SITE BOUNDARY
- 31 — LOT BOUNDARY AND TAX LOT NUMBER
- 3015 — BLOCK NUMBER
- BUILDING
- FORMER BUILDING

0 30 60
SCALE IN FEET

NEW YORK STATE OF OPPORTUNITY
Department of Environmental Conservation

1731 West Farms Road
Bronx, New York

SITE BOUNDARY

DATE
6/28/2021

NYSDEC SITE ID:
C203134

FIGURE
2

LEGEND

- BCP SITE BOUNDARY
- LOT BOUNDARY AND TAX LOT NUMBER
- FORMER BUILDING
- BUILDING
- MONITORING WELL LOCATION
- SOIL BORING LOCATION (2019 RI)
- SOIL VAPOR POINT LOCATION (2019 RI)
- SOIL BORING LOCATION (2020 SRI)
- SOIL VAPOR POINT LOCATION (2020 SRI)
- EXTENT OF SOIL REMOVAL TO APPROXIMATELY 4 FEET BELOW GRADE
- EXTENT OF CVOC SOURCE AREA, SOIL REMOVAL TO APPROXIMATELY 10 FEET BELOW GRADE (1-2 FEET BELOW WATER TABLE)
- PROPOSED LOW-PERMEABILITY WALL EXTENT

0 10 20 40

SCALE IN FEET

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

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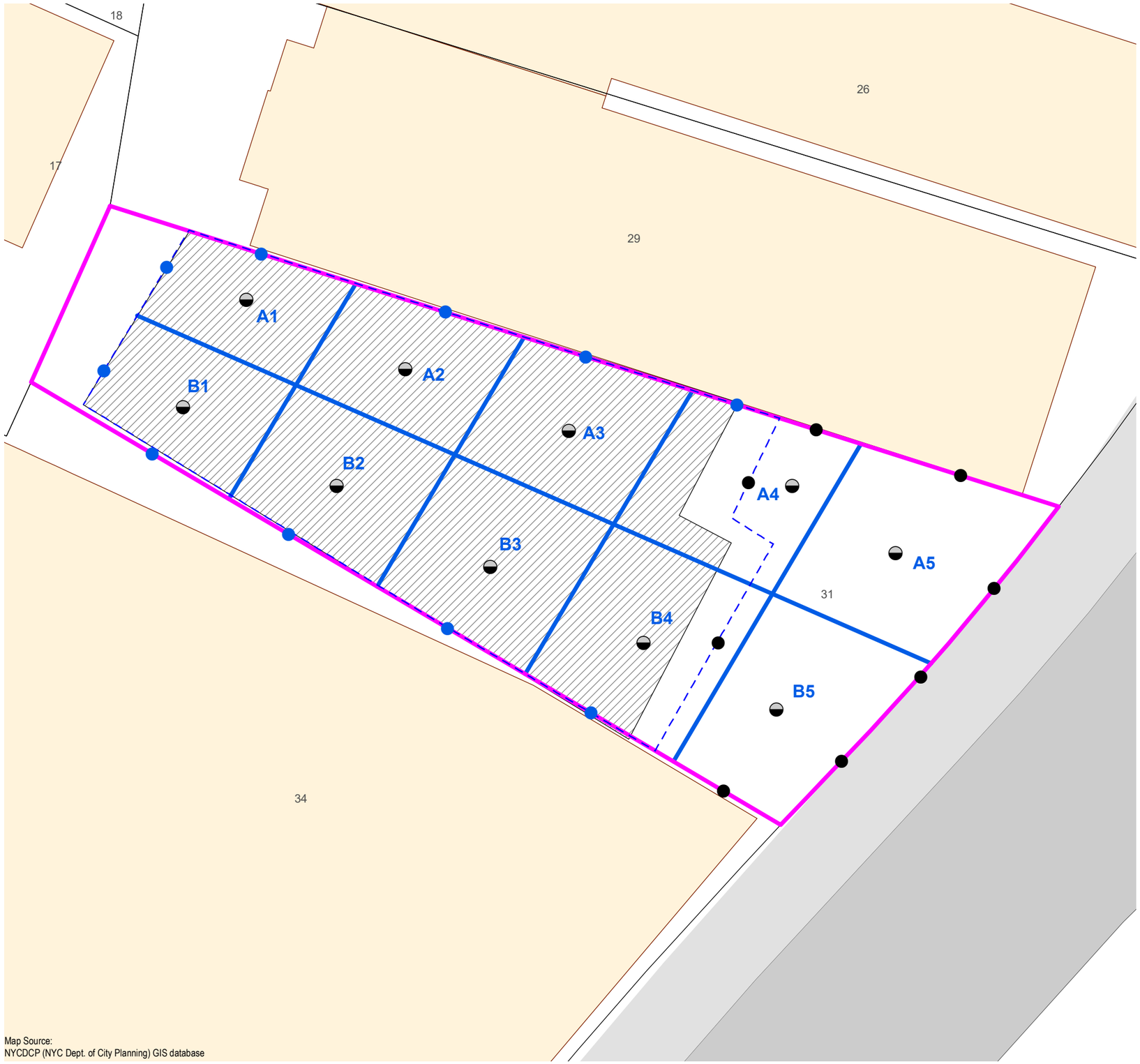
Bronx, New York

PROPOSED EXTENTS OF REMEDIAL EXCAVATIONS AND LOW-PERMEABILITY WALL

DATE
7/28/2021

PROJECT NO.
200402

FIGURE
3A



LEGEND

- BCP SITE BOUNDARY
- 31 LOT BOUNDARY AND TAX LOT NUMBER
- FORMER BUILDING
- BUILDING
- ALPHA NUMERIC GRID
- PROPOSED BOTTOM ENDPOINT SAMPLE LOCATION
- PROPOSED SIDEWALL ENDPOINT SAMPLE LOCATION (DEEP EXCAVATION)
- PROPOSED SIDEWALL ENDPOINT SAMPLE LOCATION (SHALLOW EXCAVATION)
- EXTENT OF CVOC SOURCE AREA EXCAVATION

0 10 20 40

SCALE IN FEET

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

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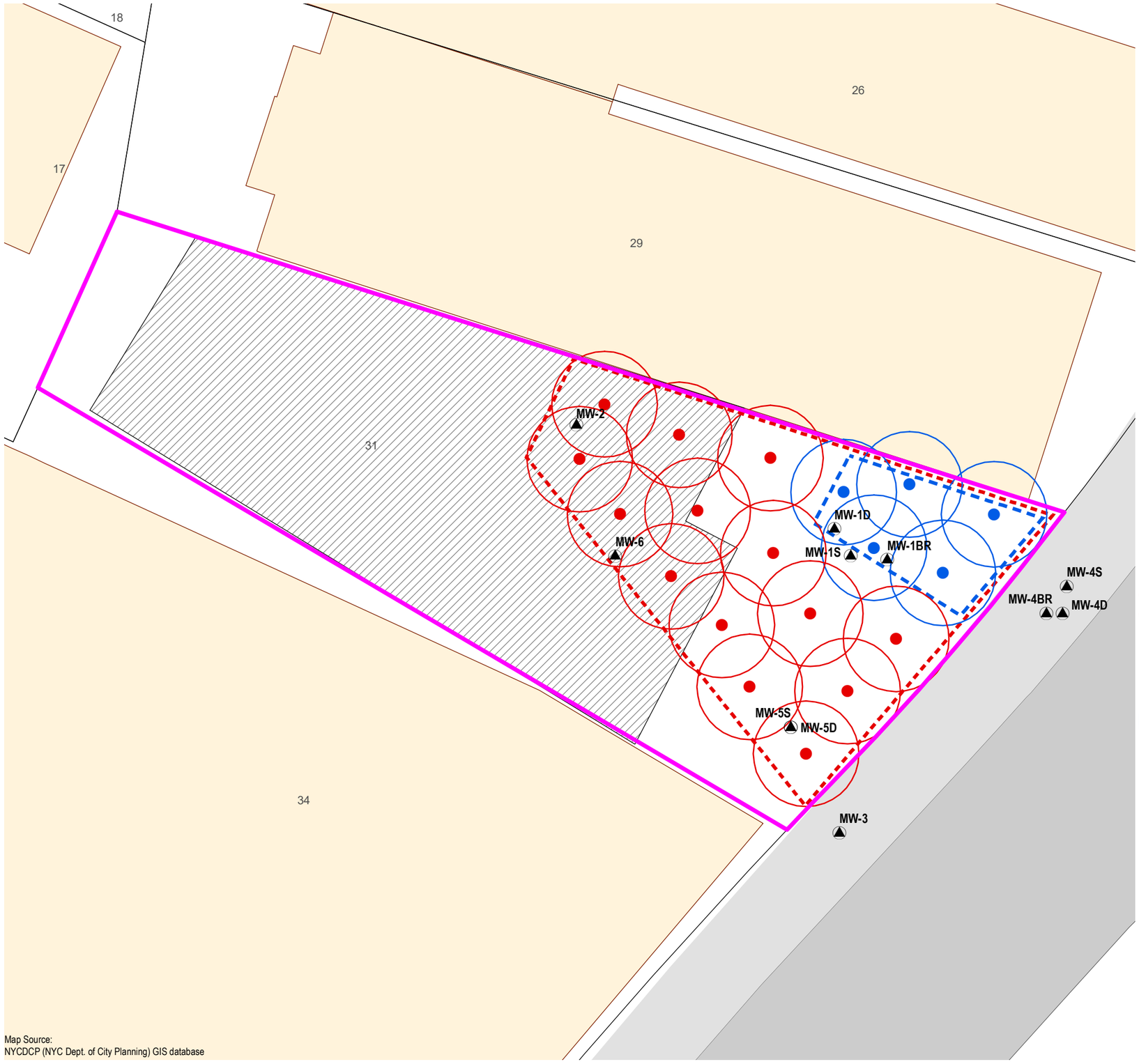
Bronx, New York

PROPOSED ENDPOINT SAMPLE LOCATIONS AND ALPHA-NUMERIC GRID

DATE
7/28/2021

PROJECT NO.
200402

FIGURE
3B



LEGEND

- BCP SITE BOUNDARY
- FORMER BUILDING
- 20 — LOT BOUNDARY AND TAX LOT NUMBER
- BUILDING
- PROPOSED SHALLOW GROUNDWATER TREATMENT AREA
- PROPOSED DEEP GROUNDWATER TREATMENT AREA
- MONITORING WELL LOCATION
- PROPOSED SHALLOW INJECTION POINT AND RADIUS OF INFLUENCE (10')
- PROPOSED SHALLOW/DEEP INJECTION POINT CLUSTER AND RADIUS OF INFLUENCE (10')

0 10 20 40

SCALE IN FEET

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

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Bronx, New York

PROPOSED GROUNDWATER TREATMENT AREAS AND INJECTION POINT LAYOUT

DATE
7/28/2021

PROJECT NO.
200402

FIGURE
3C