POP DISPLAYS MANUFACTURING SITE

30-77 VERNON BOULEVARD AND 30-80 12TH STREET

QUEENS, NEW YORK

Draft Final Engineering Report

NYSDEC Site Number: C241181

AKRF Project Number: 180066

Prepared for:

Astoria West, LLC
375 Greenwich, 3rd Floor
New York, New York 10013

Prepared by:

AKRF Inc.
440 Park Avenue South
New York, New York 10016
(212) 696-0670

AUGUST 2020

CERTIFICATIONS

I, Michelle Lapin, P.E., am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Action Work Plan (RAWP) was implemented and completed in conformance with the Department-approved RAWP.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the RAWP and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established for the remedy.

I certify that all use restrictions, Institutional Controls, and Engineering Controls applicable to the Site are contained in an environmental easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper maintenance and monitoring of the Engineering Controls employed at the Site.

I certify that all documents generated in support of this report have been submitted in accordance with the DER's electronic submission protocols and have been accepted by the Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class “A” misdemeanor, pursuant to Section 210.45 of the Penal Law.

I, Michelle Lapin, of AKRF Inc., am certifying as the Owner’s Designated Site Representative for the Site.

NYS Professional Engineer # 073934-1	Date	Signature

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

FINAL ENGINEERING REPORT

1.0 BACKGROUND AND SITE DESCRIPTION

11-12 30th Drive LLC entered into a Brownfield Cleanup Agreement (BCA) (BCA Index No. C241181-02-16) with the New York State Department of Environmental Conservation (NYSDEC) in February 2016 as a Volunteer Applicant to investigate and remediate the "POP Displays Manufacturing Site," located at 30-77 Vernon Boulevard and 30-80 12th Street in Queens, New York ,also identified as Block 504, Lots 3, 121, and 122 (former Lot 3) on the New York City Tax Map (the "Site"). The approximately 2.75-acre Site is bound to the north by 30th Drive; to the east by 12th Street; to the south by 31st Avenue; and to the west by Vernon Boulevard, followed by the East River. Properties in the surrounding areas are predominantly residential, commercial, retail, and light industrial development. The Site also has an "E" Designation for hazardous materials in the New York City Department of City Planning (DCP) database (E-245). A Site Location Map is provided as Figure 1 and a Site Plan is provided as Figure 2. The boundaries of the Site are fully described in the Metes and Bounds provided in Appendix A.

The BCA's pre-construction requirements [i.e., Remedial Investigation (RI), Remedial Action Work Plan (RAWP), etc.] were managed by H2M Architects + Engineers (H2M) of New York, NY, with the RAWP and Decision Document approved by the NYSDEC in August 2018. The Site was sold to Astoria West, LLC (the current developer and owner) on April 25, 2018 and an amendment was filed with NYSDEC in May 2018 to include the new owner as a Volunteer Applicant party on the BCA. AKRF, Inc. (AKRF) oversaw and implemented the NYSDEC-approved RAWP. In accordance with the NYSDEC-approved RAWP, the Site was remediated to a Track 2 cleanup standard. Copies of the BCA Agreement and the BCA Amendment are provided in Appendix B.

1.1 Redevelopment Plan

The redevelopment included the construction of three new residential buildings with 534 residential units (162 affordable), approximately 500 square feet of retail space, parking, and courtyards with landscaped areas. The Site was excavated to approximately 2 feet (western portion) to 10 feet (eastern portion) below grade for the construction of the new building foundations. The elevation of the Site increases eastward, hence deeper excavation was required on the eastern portion to match the foundation level of the entire project. The courtyards will be completed at a later date.

The current zoning designation for the Site is R7a and R6, General Residence Districts, with a C1-3 local retail district overlay. The R7 and R6 districts are designed to provide for all types of residential buildings to permit a broad range of housing types. The C1 district is designed to provide for local shopping and include a wide range of retail stores and personal service establishments that cater to frequently recurring needs. The future use of the Site is consistent with existing zoning for the property.

2.0 SUMMARY OF SITE INTERIM REMEDIAL MEASURES

2.1 Remedial Action Objectives

The Remedial Action Objective (RAO) for the Site, as listed in the Decision Document (DD) dated August 2018, are as follows:

Soil Vapor RAO

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

No other RAOs were established for the Site.

2.2 Description of Selected Remedy

The Site was remediated in accordance with the remedy selected by the NYSDEC in the DD and H2M's May 2018 NYSDEC-approved RAWP. The RAWP was based upon previous investigations performed at the Site, including a Remedial Investigation (RI), conducted by H2M between July and November 2016. An Interim Remedial Measure (IRM) to remove and administratively close two aboveground storage tanks (ASTs) located on former Lot 21 was implemented as part of the RI and an IRM Construction Completion Report (IRMCCR) was submitted to the NYSDEC in September 2018 (described in Section 3.3.4). Copies of the RAWP, the RAWP approval letter, and the Decision Document are provided in Appendix B.

The factors considered during the selection of the remedy are those listed in 6 NYCRR 375-1.8. The following were the components of the selected remedy:

1. Implementation of the Community Protection Statement, as described in the RAWP, and performance of the NYSDEC Citizen Participation activities per the approved Citizen Participation Plan (CPP).
2. Site mobilization involving Site security setup, equipment mobilization, utility mark out, and marking and staking excavation areas associated with the removal of the on-site underground storage tank (UST).
3. Implementation of Site preparation activities, including building demolition and underpinning of adjacent structures to remove the UST.
4. Excavation and removal of one UST identified on the southern portion of the Site in accordance with Section 5.5 of DER-10, and reporting of any petroleum spill associated with the UST and appropriate closure of these petroleum spills in compliance with applicable local, state and federal laws and regulations.
5. Performance of a Community Air Monitoring Program (CAMP) for particulates and volatile organic compounds (VOCs) during excavation and removal of the UST.
6. Collection of end-point samples as directed by NYSDEC in the event that suspect unclassified soil were to be encountered during construction excavation.
7. Import of material for backfill and cover in compliance with the RAWP specifications and in accordance with applicable laws and regulations.
8. An engineering control consisting of a minimum of 20-mil thick vapor barrier system installed beneath the building slab and behind the sub-grade foundation sidewalls to mitigate soil vapor mitigation into the new buildings.
9. Dewatering in compliance with the city, state and federal laws, and regulations.

10. Implementation of stormwater pollution prevention (SWPP) measures in compliance with applicable laws and regulations.
11. Performance of all activities required for the remedial action plan, including acquisition of required permits and attainment of pretreatment requirements, in compliance with applicable laws and regulations.
12. Institutional Control in the form of an environmental easement that will require implementations of the Soil Management Plan (SMP).
13. Submission of a Final Engineering Report (FER) describing remedial activities, certifying that the remedial requirements have been achieved, and any changes from the RAWP.

The remedial activities were conducted under the NYSDEC-approved RAWP. Any deviations from the RAWP and/or the DD were promptly reported to NYSDEC for approval and are fully explained in this FER. A copy of the RAWP is provided in Appendix B.

3.0 DESCRIPTION OF REMEDIAL ACTIONS PERFORMED

The remedial activities completed at the Site were conducted in accordance with the NYSDEC-approved RAWP and with local, state and federal requirements.

3.1 Governing Documents

The NYSDEC-approved August 2018 RAWP included supporting documents as appendices included in the RAWP. These approved documents outlined specific aspects of the remedial action pertaining to Site-specific health and safety and sampling protocols. The following documents were utilized during the completion of the remedial action.

3.1.1 Site-Specific Construction Health & Safety Plan (CHASP)

A Site-specific Construction Health and Safety Plan (CHASP) was included in the NYSDEC-approved RAWP. All remedial work performed under the RAWP was in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA. The CHASP was complied with for all remedial and invasive work performed at the Site.

3.1.2 Soil/Materials Management Plan (S/MMP)

The procedures followed during the handling of the soil/fill materials on-site during the intrusive work are provided below:

Soil Screening Methods

Visual, olfactory, and photoionization detector (PID) soil screening and assessment of excavated materials was performed by an experienced field technician under the direction of the Remedial Engineer during all remedial excavations into known or potentially contaminated material. Soil screening was performed during the following activities:

1. The removal of the UST and associated petroleum-contaminated soil; and
2. The removal of hazardous lead-contaminated soil from an approximately 10-foot by 10-foot area in the northern portion of the Site.

Stockpiling Methods

Excavated soil from known areas of contamination were routinely inspected, including after every storm event. Results of inspections were recorded in a logbook and were maintained at the Site and available for inspection by NYSDEC.

Contaminated soil stockpiles were kept covered at all times with appropriately anchored tarps and damaged tarp covers were promptly replaced. A dedicated water hose connected to a fire hydrant or a water truck was available on-site for dust control.

Material Excavation and Load Out

A field person under the supervision of the Remedial Engineer oversaw all remedial excavation work, which included the excavation and load-out of all petroleum and hazardous lead-contaminated soil/fill materials. The contractor and/or persons under their supervision investigated the presence of utilities and easements on the Site. Loaded vehicles leaving the Site were appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and New York State Department of Transportation (NYSDOT) requirements (and all other applicable transportation requirements).

A truck tracking pad and wash station was maintained on-site. All outbound truck tires were washed before leaving the Site until the remedial construction was completed. Cleaning of the adjacent streets was performed as needed to maintain a clean condition with respect to Site-derived materials.

Material Disposal Off-Site

Soil waste characterization samples were collected prior to commencing soil/fill material removal, and as needed during Site excavation for remediation. Based on the waste characterization results, permitted waste disposal facilities were selected for off-site disposal of excavated material. A copy of the approval letters obtained from the disposal facilities were sent to the NYSDEC project manager prior to commencing the disposal activities.

A total of 201.52 tons of soil/fill materials were removed as part of the Site remediation, which included the removal of 83.98 tons of hazardous lead-contaminated soil/fill and removal of 117.54 tons of petroleum-contaminated soil/fill. All materials were disposed in accordance with all local, state (including 6NYCRR Part 360) and federal regulations, as detailed in Section 3.3 below.

Appropriately licensed haulers were used for material removed from the Site and were in full compliance with all applicable local, state, and federal regulations.

Demarcation

After completion of invasive remedial activities, endpoint samples were collected following the UST soil removals. In addition, a bottom sample was collected from the hazardous lead area during the delineation sampling.

3.1.3 Stormwater Pollution Prevention Plan (SWPPP)

Erosion and sediment controls measures during remedial intrusion activities were performed in conformance with requirements presented in the in the NYSDEC-approved RAWP. The stormwater control system and structure were inspected in accordance with RAWP specification and all the necessary repairs were made immediately. The SWPPP plan was prepared by XX

3.1.4 Community Air Monitoring Plan (CAMP)

Air monitoring was conducted during remedial activities in compliance with the New York State Department of Health (NYSDOH) CAMP and as per the CHASP included in the RAWP. The air monitoring was conducted to ensure that proper protections were employed to protect workers and the neighboring community. Air monitoring was performed between November 2019 and January 2020 during: 1) the UST tank removal and 2) excavation and removal of the RCRA hazardous lead-contaminated soil. Two dedicated monitoring stations, each conducting real time monitoring for volatile organic compounds (VOCs) and particulates, were located upwind and downwind of intrusive work activities, along with a mobile, roving set of air monitoring equipment.

VOC Monitoring

Continuous monitoring for VOCs was conducted during the UST and contaminated soil removal, and during removal of the hazardous lead-contaminated soil. Upwind concentrations were measured at the start of each workday and periodically thereafter to establish background concentrations. VOCs were monitored continuously at the downwind perimeter of the exclusion zone. Monitoring was conducted with a PID equipped with a

10.6 eV lamp capable of calculating 15-minute running average concentrations. No exceedances of the standards noted in the RAWP were noted.

PID readings were recorded and included in the daily reports sent to the NYSDEC project manager.

Dust Monitoring

Continuous monitoring for particulates was conducted during the remedial activities (during the UST tank removal and the excavation and removal of the RCRA hazardous lead-contaminated soil), which involved the measurement of respirable dust. Community air monitoring for dust particulates was conducted using a DustTrak™ monitor to measure the concentration of airborne respirable particulates less than 10 micrometers in size (PM_{10}). The dust monitor was capable of calculating 15-minute running average concentrations and was equipped with an alarm to indicate an exceedance of action levels. An inspection of the monitoring stations was conducted on at least an hourly basis. Background readings and any readings that triggered response actions were recorded in the project logbook, which was available on-site for NYSDOH and/or NYSDEC review. Dust suppression measures were implemented as needed. Work was allowed to continue with dust suppression if downwind particulate levels did not exceed 100 micrograms per cubic meter ($\mu g/m^3$) above the background (upwind concentration) and provided that no visible dust was migrating from the work area. No exceedances were noted during the air monitoring.

The results of the air monitoring were provided in the daily reports (Appendix C) and are included in Appendix D.

3.1.5 Community Participation Plan

Copies of the RAWP were sent to the Queens Community Board 1 and to the Queens Astoria Library located in Queens, NY. Before the start of the remedial activities, a fact sheet was prepared and distributed to the Site contact list describing remedial action activities.

3.2 Remedial Program Elements

3.2.1 Contractors and Consultants

- Moore Group provided Construction Management.
- Civic Construction was the excavation contractor. Remedial tasks performed included excavation and disposal of petroleum- and hazardous lead-contaminated soil/fill, installation of the support of excavation, construction of the building foundation/Site cover, and installation of the vapor barrier.
- AKRF, Inc. was the environmental consultant during the remedial excavations. Tasks performed included the oversight of the implementation of the RAWP, environmental monitoring and oversight, and preparing and submitting Monthly Progress Reports to the NYSDEC Project Manager.

3.2.2 General Site Controls

Site Preparation

All appropriate New York City Department of Building (DOB) permits and other relevant Queens County agency approvals were obtained, as required, prior to mobilizing to the Site for the start of remedial and redevelopment work. All underground utilities were decommissioned in advance of the excavation and disposal facility approvals were

obtained prior to initiating trucking activities. On-site remedial work was completed between October 2018 and November 2020. In accordance with the RAWP, a representative from AKRF was on-site during all remedial excavation work to perform the real time roving and CAMP air monitoring for particulates and VOCs.

Prior to and during the completion of remedial excavation, a gravel pad was created at the entry/exit gate to control contaminated soil tracking onto the city streets, and a water source was made available to allow for dust suppression.

Soil Screening

Soil was screened during the remedial excavation activities by AKRF for visual and olfactory evidence of contamination (i.e., staining or odors) and with a PID to measure concentrations of VOCs. Contaminated soil with petroleum-like odors and elevated PID readings was noted during the UST removal and soil excavation. The findings were noted in the daily report sent to NYSDEC.

Stockpile Management

Stockpiles were generated only when necessary to prepare for planned trucking events and were removed as quickly as the construction schedule allowed. Any contaminated soil stockpile was covered with plastic sheeting at the end of each work day prior to off-site trucking and disposal. Stockpiles were routinely inspected to confirm that their contents and conditions remained unchanged. Broken or ripped tarps were promptly replaced.

Truck Inspection

A gravel pad was used at the entry/exit gate to prevent off-site tracking of soil onto city streets. All trucks exporting contaminated soil/fill were inspected for soil on the undercarriage, body and wheels prior to exiting the Site. The truck tires were washed, and soil and debris were removed (but contained within the Site) with brooms and shovels, as necessary.

Traffic Control

Truck drivers were instructed to proceed without stopping near the Site to prevent neighborhood impacts. Planned truck routes, included in the CHASP?t were implemented.

Site Security

The Site was controlled through gated entrances. Site was secured with fencing; jersey barriers were utilized to ensure the safety of pedestrian traffic. Barrier tape and fencing were installed to delineate and restrict access to work areas as needed.

Reporting

An AKRF field representative was on-site during all remedial activities. AKRF's field representative conducted a visual inspection during the installation of the vapor barrier membrane prior to the construction of the concrete slab. All observations were recorded in field books and/or associated log sheets. Daily reports included details pertaining to the type and location of remedial work being completed, the air monitoring results, and photographic documentation of the remedial activities.

Daily and monthly reports previously submitted to NYSDEC were compiled and are included as Appendix C. A photographic log summarizing the remedial action is included in Appendix E.

3.2.3 Nuisance Controls

An AKRF field representative monitored Site perimeters, the surrounding vicinity, and on-site working conditions during the excavation activities. Moore Group and Civic Construction were notified immediately if elevated particulate concentrations, odors, or visible dust was observed. Corrective actions included spraying the area with water, in accordance with the CAMP and HASP. No complaints from the public or surrounding property owners regarding dust and/or odors were reported during completion of remedial activities. At the adjacent building owner's request, dust and VOC monitoring was conducted along the property boundary of the southwest-adjacent building for a limited duration during the Site redevelopment. No exceedances were noted during any of the air monitoring conducted.

Odor Control Plan

A stabilized Site entrance was constructed. No odor or dust complaints were reported to AKRF or the development team during foundation construction.

Dust Control Plan

The following measures were adopted for dust control:

- Dust suppression was achieved through the use of a dedicated hose connected to a fire hydrant. The hose was equipped with a nozzle capable of spraying water directly onto off-road areas including excavations and stockpiles.
- The Site excavation was completed in stages to limit the area of exposed soil vulnerable to dust production.

Gravel was used on-site to create a trucking pad. All trucks leaving the Site with contaminated soil/fill were checked at the gate and the tires were washed to remove soil/dirt, as required.

3.2.4 Air Monitoring Results

Air monitoring was conducted as per the requirements of the HASP and CAMP, included in the NYSDEC-approved RAWP. No exceedances of action levels stated in the HASP were noted during the air monitoring conducted. Air monitoring logs and the graphical representation of the findings are provided in Appendix D.

3.2.5 Reporting

During remedial construction, daily and monthly reports were submitted to the NYSDEC and included:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (i.e., tons of material exported and imported, etc.);
- Description of approved activity modifications, including changes in work scope and/or schedule;
- Results of the air monitoring conducted;
- Sampling results received following internal data review and validation; and
- An update of the remedial schedule, unresolved delays encountered or anticipated that may have affected the upcoming schedule, and efforts made to mitigate such delays.

Copies of the daily and monthly reports are provided in Appendix C. A photographic log documenting the remedial action is provided as Appendix E.

3.3 Contaminated Materials Removal

Based on the findings of the RI and as noted in the RAWP, soil remediation was not required at the Site. However, the RAWP and NYSDEC Decision Document (DD) included the excavation and off-site disposal of any petroleum-contaminated soil/fill, and associated with the known UST or any additional tanks encountered during the redevelopment. In addition, hazardous lead contaminated soil was identified during the soil waste characterization sampling, and was excavated and removed from the Site as part of the remedial action.

The Site was excavated to a depth ranging from approximately 2 to 10 feet below grade for the redevelopment. A total of 201.52 tons of soil/fill were excavated and removed from the Site during the remedial action. The remedial excavation included removal of petroleum-contaminated soil/fill associated with the tank and hazardous lead-contaminated soil/fill.. The material type, quantity, and disposal locations of materials removed and disposed off-site is presented below:

Disposal Facility Name Location/Address	Type of Material	Quantity
Clean Earth of Carteret 24 Middlesex Avenue, Carteret, New Jersey	Non-Hazardous Petroleum Contaminated Soil/Fill (for Site remediation)	117.54 tons
Cycle Chem, Inc. 217 South First Street, Elizabeth, New Jersey	Hazardous Lead Contaminated Soil/Fill (for Site remediation)	83.98 tons
	Total:	**201.52 tons**

The extent of remedial excavation is shown on Figure 3; additional details are provided in the following subsections. The acceptance letters from disposal facilities granting approval to accept the materials listed in the previous table and the disposal manifests are included in Appendix F. The waste characterization report and analytical data sheets are provided in Appendix G.

3.3.1 Underground Storage Tank Removal

On October 10 and 11, 2018, an approximately 1,080-gallon No. 2 fuel oil UST was removed from the southern portion of the Site. The closure and sampling associated with the UST was completed in accordance with NYSDEC DER-10 procedures. The location of the tank and associated endpoint samples are shown on Figure 3. Endpoint sample laboratory analytical results are provided in Table 1. A Petroleum Bulk Storage (PBS) application (PBS Site Number 2-612497) was submitted to the NYSDEC Region 2 Division of Environmental Remediation to register the UST as closed-removed pursuant to Environmental Conservation Law Article 17, Title 10 and 6 NYCRR Parts 612-614 and Subpart 374-2. Tank removal documentation, including manifests associated with the off-site disposal of residual oily water and tank bottoms, scrap metal receipts from the tank carcass, the PBS application, and the fire department affidavit prepared by the tank removal contractor that performed the closure activities are included in Appendix H.

Tank closure activities were performed by Don Carlo Environmental Services of Brooklyn, New York, a NYC-licensed tank contractor, in accordance with NYSDEC DER-10 procedures. The top of the tank was excavated to expose the fill port through which the tank contents were pumped out. The tank was cut open to allow for the interior cleanup, including removal of any residual oily water and/or sludge. The tank and associated piping were subsequently removed and temporarily placed on polyethylene sheeting to await off-

site disposal. AKRF provided oversight during the tank cleanup activities, and field-screened soil with a PID for evidence of contamination. Petroleum-contaminated soil was observed in the UST excavation. PID readings up to 222 parts per million (ppm) were detected in the vicinity of the fill pipe and PID readings up to 31.2 ppm were detected along the western sidewall. Petroleum-contaminated soil was excavated to a depth of approximately eight feet below grade and temporarily stockpiled on (and covered with) polyethylene sheeting prior to off-site disposal.

PID readings ranging between 0.6 ppm and 3.7 ppm were detected on the excavation bottom and the sidewalls. Following the excavation, six endpoint soil samples (one from each sidewall and two from the bottom) were collected for laboratory analysis, specifically, EP-UST-1-S_8_20181011, EP-UST-1-E_8_20181011, EP-UST-1-N_8_20181011, EP-UST-1-W_8_20181011, EP-UST-1-B1_8_20181011, and EP-UST-1-B2. The samples were analyzed by Test America (Test America) of Edison, New Jersey, a New York State Department of Health-certified laboratory, for the CP-51 listed VOCs by EPA Method 8260 and semi-volatile organic compounds (SVOCs) by EPA Method 8270. No VOCs were detected in the samples. SVOCs were detected in each of the samples at concentrations ranging from an estimate trace concentration of 0.0093 milligrams per kilogram (mg/kg) to a maximum of 1.2 mg/kg in sample EP-UST-1-W_8_20181011. Indeno(1,2,3-cd)pyrene was detected at a concentration of 0.51 mg/kg in sample EP-UST-1-W_8_20181011, slightly above its UUSCO of 0.50 mg/kg. The remainder of the detections were well below their respective UUSCOs. The results were provided to NYSDEC for review; no further excavation was required. Data Usability Summary Reports (DUSRs) were prepared for all data generated in this remedial performance evaluation program. These DUSRs are included in Appendix I.

Additionally, a soil waste classification sample was collected from the excavated petroleum-contaminated soil for disposal purposes. Approximately 500 gallons of tank bottoms were removed from the tank via vacuum truck and transported off-site for disposal at the J.B Waste Oil facility located in Staten Island, NY. The tank carcass was transported off-site as scrap metal for disposal at TNT Scrap located in Brooklyn, New York. A total of 117.54 tons of petroleum-contaminated soil were transported off-site for disposal at the Clean Earth Carteret facility located in Carteret, New Jersey.

3.3.2 Excavation and Removal of Hazardous Lead-Contamination Soil

Soil waste classification samples were collected across a majority of the Site by others in 2017. A lead concentration above the United States Environmental Protection Agency's (USEPA's) Resource Conservation and Recovery Act (RCRA) hazardous threshold of 5 mg/kg, as analyzed by the toxicity characteristic and leaching procedure (TCLP), was detected in one sample [A4(5-10)COMP], collected from the north-central portion of the Site. In June 2019, AKRF performed additional soil sampling to delineate the hazardous lead-contaminated soil. AKRF collected composite and grab soil samples using a Geoprobe® Direct Push drill rig. Composite soil samples were collected from the 5 to 10-foot depth interval at the location where the 2017 hazardous sample was collected, and from five-foot lateral offsets in each direction (north, south, east and west). Additionally, confirmatory grab samples were collected from beneath and above the suspected contaminated zone. The samples were laboratory-analyzed for total and TCLP lead.

Analytical results of the hazardous lead delineation sampling detected TCLP lead concentrations below the hazardous waste threshold, as noted in the following table:

Hazardous Lead Delineation Sample Results

Sample Name	Sample Type (Grab or Composite)	Sampling Depth (feet below grade)	TCLP Lead Concentration (parts per million)	Total Lead Concentration (parts per million)
A4(5-10)COMP; original sample	Composite	5 to 10	**20**	5.65
A4(5)C	Grab	5	0.0068J	2.56
A4(10)C	Grab	10	0.0065J	1.7
A4(5-10)C	Composite	5 to 10	0.0079J	2
A4(5-10)N1	Composite	5 to 10	Non-detect	1.44
A4(5-10)S1	Composite	5 to 10	0.0054J	1.48
A4(5-10)E1	Composite	5 to 10	Non-detect	1.89
A4(5-10)W1	Composite	5 to 10	Non-detect	2.06

Notes: result in bold exceed the hazardous threshold level of 5 parts per million
J- estimated trace concentration

Based on these results, the extent of soil requiring management as hazardous waste was determined to be an approximately 10-foot by 10-foot area around the original sample location collected from 5 to 10 feet below Site grade. The results of the hazardous lead soil delineation are presented in AKRF's June 18, 2019 Waste Characterization Soil Sampling report provided in Appendix G.

Excavation and removal of hazardous lead-contaminated soil was conducted on February 12, 2020. A total of 83.98 tons of hazardous lead-contaminated soil/fill were transported to Cycle Chem Inc. of Elizabeth, New Jersey. A USEPA hazardous waste generator Site ID (Number NYR000243428) was obtained prior to the disposal of the hazardous waste. Prior to shipping material off-site, the selected disposal facility was provided with copies of waste characterization test results, a summary of the soil profiling methodologies, and historical environmental reports.

The location of the hazardous lead-contaminated soil is shown on Figure 3. Soil removal documentation, including a copy of the USEPA Site ID and manifests associated with the off-site disposal of soil, are included in Appendix F.

3.3.3 Aboveground Storage Tank Removal

Two aboveground storage tanks were removed from the Site by the original BCP Applicant (11-12 30th Drive LLC) prior to demolition of the former buildings and implementation of the RAWP by Astoria West, LLC. The work was conducted in accordance with the NYSDEC-approved Interim Remedial Measures (IRM) Work Plan (IRMWP) dated August 11, 2016, prepared by H2M. The tanks were removed and the findings were noted in the IRM Construction Completion Report (IRMCCR) dated September 30, 2016, prepared by H2M. Copies of the IRMWP and the IRMCCR are provided in Appendix J.

3.4 Remedial Performance/Documentation Sampling

In accordance with the NYSDEC-approved RAWP, confirmatory endpoint soil samples were not required to be collected for documenting the concentrations of contaminants of concerns in soil left in place following the remedy. Based on the results of the RI, soil remaining at the Site after the UST and the RCRA hazardous lead-contaminated soil removal activities met the UUSCOs across the property boundary down to approximately 15 feet below grade. However, endpoint soil sampling was conducted in the remediated areas of the Site, as described in the following sections.

UST Removal Area

Confirmatory endpoint samples were collected from the sidewalls and bottom of the tank excavation, as discussed in Section 3.3.1. The soil samples collected during the RI were analyzed for:

- Volatile organic compounds by EPA Method 8260;
- Semi-volatile organic compounds by EPA Method 8270;
- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

The samples were collected in laboratory-supplied glassware and relinquished under proper chain-of-custody to Test America. Indeno(1,2,3-cd)pyrene was detected at a concentration of 0.51 mg/kg in sample EP-UST-1-W_8_20181011, slightly above its UUSCO and RRSCO of 0.50 mg/kg. The remainder of the detections were well below the UUSCOs. The results were provided to NYSDEC for review; no further excavation was required. A tabulated summary of endpoint sampling results compared to the UUSCOs is included in Table 1 and the sample locations are provided on Figure 3. The analytical laboratory reports are included in Appendix H. Data Usability Summary Reports (DUSRs) were prepared for all data generated in this remedial performance evaluation program. These DUSRs are included in Appendix I.

RCRA Hazardous Lead-Contaminated Soil Area

Prior soil disposal testing conducted by others in the northern portion of the Site detected RCRA hazardous lead in one sample. AKRF conducted a soil boring investigation using a Geoprobe® Direct Push drill rig to delineate the extent of hazardous lead soil in this area. Analytical results of the hazardous lead delineation sampling identified the extent of soil requiring management as a hazardous waste to an approximately 10-foot by 10-foot area around the original sample location collected from 5 to 10 feet below Site grade. The hazardous lead delineation is discussed in Section 3.3.2.

3.5 Backfill Material

Gravel was imported to the Site for grading below the foundation slab of the three buildings. A total of approximately XXX cubic yards of XXX material were imported to the Site from XXXX. Prior to material import, information regarding the source material and the sieve analysis report was provided to the NYSDEC PM for review and approval. The material import documentation and NYSDEC approval are provided in Appendix K and the backfill locations are shown on Figure 4.

3.6 Engineering Controls

No soil-related Engineering Controls were required for the Site and as part of the remedial action. However, to satisfy the RAO for soil vapor and to address the potential for soil vapor intrusion into buildings at the Site, the installation of a vapor barrier system beneath the foundation slab and behind the subgrade foundation walls was required. This vapor barrier system constitutes an Engineering Control (EC) for the Site.

Exposure to soil vapor intrusion is prevented by a vapor barrier system built on the Site, which is composed of a concrete building slab and foundation walls, underlain and surrounded by a 32-mil GCP Applied Technologies' Preprufe 200 membrane and an approximately 6-inch layer of ¾-inch stone laid on top of the compacted existing subgrade material. The vapor barrier system was extended below the grade beam/footings and continued along the subgrade foundation walls, as required to prevent future vapor intrusion into the building.

The vapor barrier system was installed in accordance with the manufacturer's specifications and required a concrete surface/foundation for the vapor barrier membrane to become integrally bonded in order to function properly (i.e., the underside of the foundation and exterior surface of subgrade walls). Additionally, the barrier system, which includes the foundation and subgrade walls and also serves as the waterproofing membrane, needed to be structurally fortified sufficiently to compensate for shallow groundwater levels, counter the hydrostatic pressure, and thereby maintain its integrity. As such, based on building design conditions, the vapor barrier system engineer stipulated that a 10-inch thick reinforced concrete foundation slab and 12-inch thick foundation walls were required to both preserve its integrity and ensure its performance as a vapor mitigation system. Although the foundation and subgrade walls were constructed to be thicker in some areas, the aforementioned thicknesses were determined to be the minimum requirements.

The contractor for the installation of the vapor barrier was Civic Construction. Figure 4 shows the location and the cross-section of the vapor barrier installed at the Site. Specifications for the vapor barrier membrane are provided in Appendix L.

3.7 Institutional Controls

The Site remedy requires placement of an environmental easement on the property to (1) implement, maintain and monitor the Engineering Control; (2) limit the use and development of the site to restricted-residential use or commercial use or industrial use only; and (3) require compliance with the NYSDEC-approved Site Management Plan (SMP).

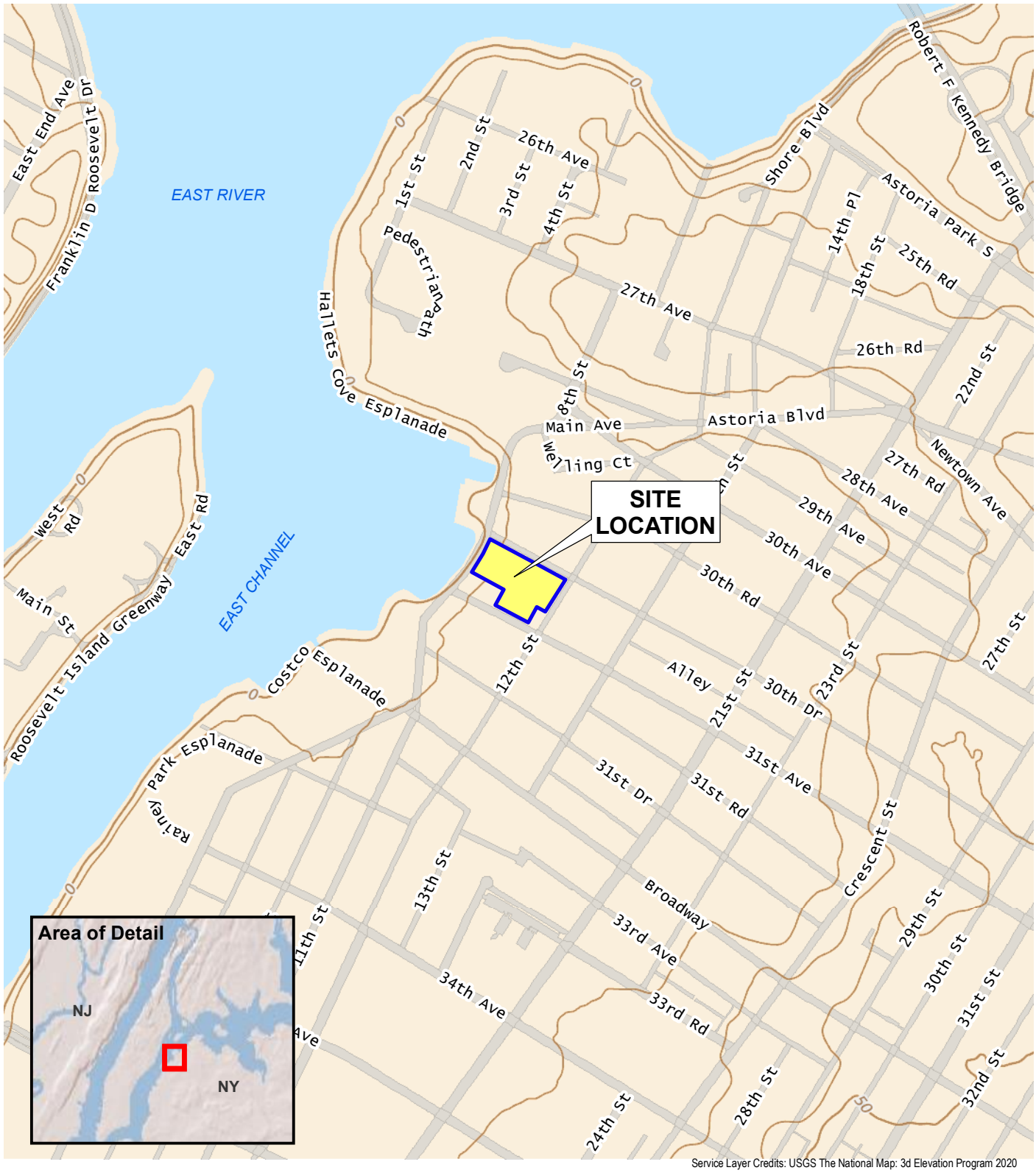
The environmental easement for the site was executed by the Department on [date], and filed with the [County] County Clerk on [date]. The County Recording Identifier number for this filing is [number]. A copy of the easement and proof of filing is provided in Appendix M.

Long-term management of these EC/ICs and residual contamination will be performed under the SMP approved by the NYSDEC.

3.8 Deviations From The Remedial Action Work Plan

The DD required the installation of a minimum 20-mil vapor barrier membrane below the foundation slab and the RAWP specified installation of a 47-mil Grace® Preprufe 300R vapor barrier membrane below the horizontal foundation slab and behind the foundations walls. However, due to construction constraints and limitations, the installation of the vapor barrier membrane was revised to 32-Mil Grace® Preprufe 200 vapor barrier membrane below the horizontal slab across the building footprint and behind the subgrade foundation walls. The barrier system was overlapped and sealed to ensure a continuous and complete membrane system beneath the building slab in accordance with the manufacturers' specifications. The proposed change to the vapor barrier system was submitted to the NYSDEC PM for review and was approved by NYSEC in an email dated February 13, 2020, which is provided in Appendix L, along with the vapor barrier product specifications. The product is protective of public health and environment.

FIGURES



AKRF
440 Park Avenue South, New York, NY 10016

POP Displays Manufacturing Site

30-77 Vernon Boulevard and 30-80 12th Street
Astoria, New York

SITE LOCATION

DATE
7/20/2020

PROJECT NO.
180066

FIGURE
1

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

AKRF
440 Park Avenue South, New York, NY 10016

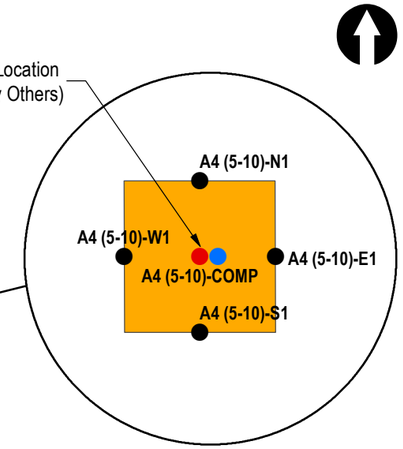
POP Displays Manufacturing Site
30-77 Vernon Boulevard and 30-80 12th Street
Astoria, New York

SITE PLAN

DATE
8/13/2020

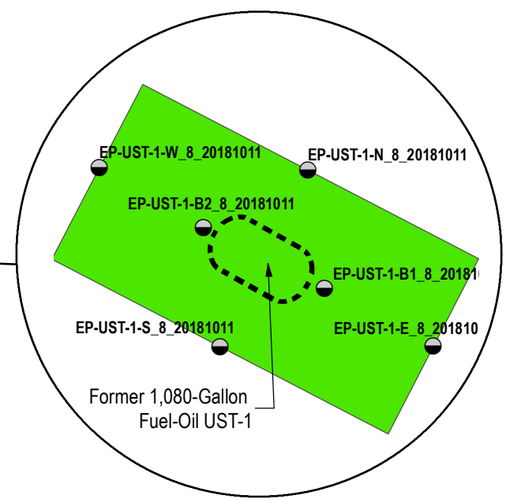
PROJECT NO.
180066

FIGURE
2



LEGEND

- PROJECT SITE BOUNDARY
- BUILDING FOOTPRINTS
- EXTENT OF REMEDIAL EXCAVATION TO REMOVE LEAD-CONTAMINATED SOIL FROM 5 TO10 FEET BELOW GRADE
- EXTENT OF REMEDIAL EXCAVATION TO REMOVE PETROLEUM CONTAMINATED SOIL 9 FEET BELOW GRADE
- 3 LOT BOUNDARY AND TAX LOT NUMBER
- ENDPOINT SAMPLE LOCATION
- HAZARDOUS LEAD DELINEATION SAMPLE
- A4 (5-10)COMP ORIGINAL SAMPLE LOCATION COLLECTED BY OTHERS (TCLP LEAD> 5MG/L)
- A4 (5-10)C AKRF (TCLP LEAD< 5MG/L)
  A4 (5)C AKRF (TCLP LEAD< 5MG/L)
  A4 (10)C AKRF (TCLP LEAD< 5MG/L)
- UST UNDERGROUND STORAGE TANK



AKRF
440 Park Avenue South, New York, NY 10016

POP Displays Manufacturing Site
30-77 Vernon Boulevard and 30-80 12th Street
Astoria, New York

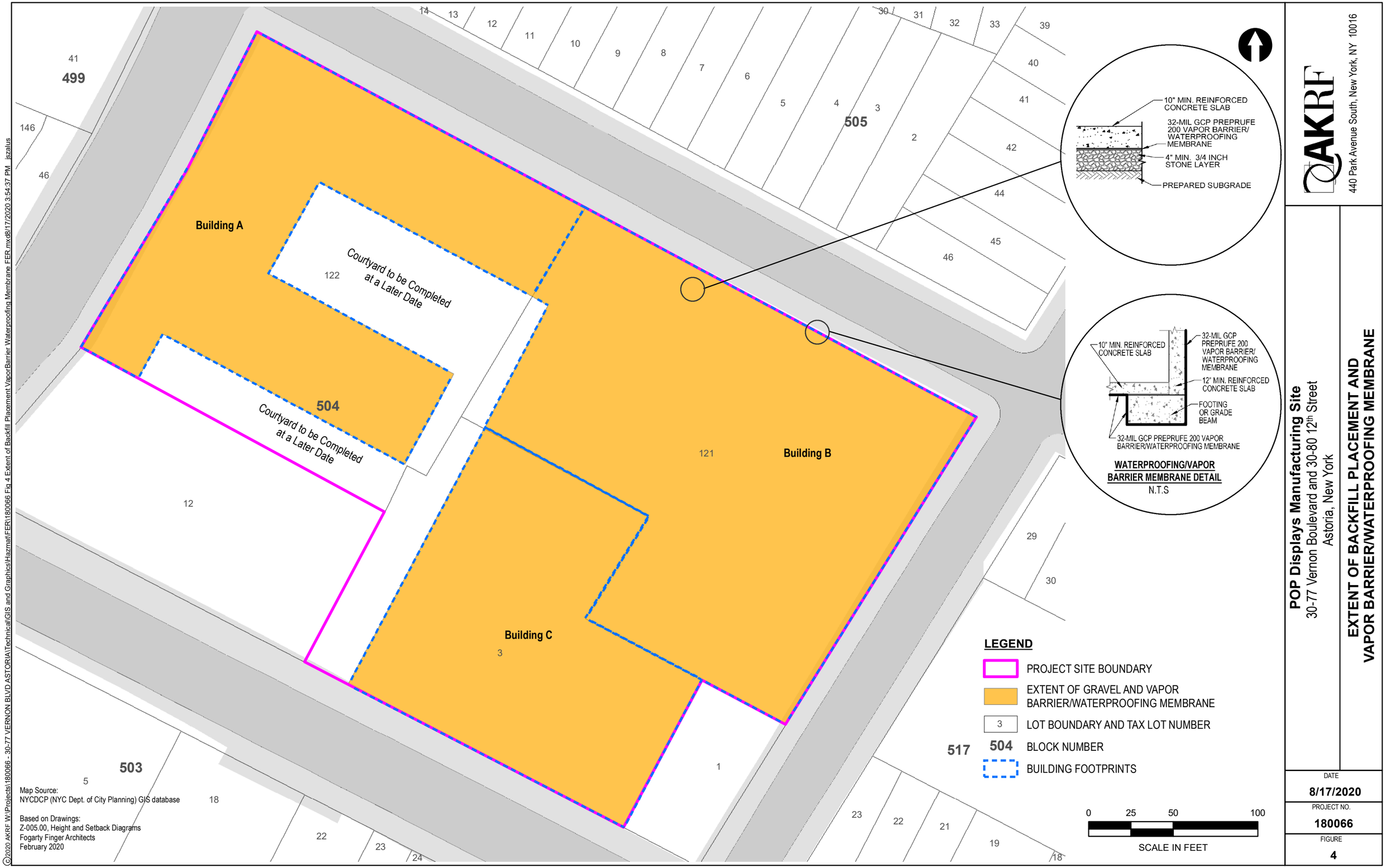
EXTENT OF REMEDIAL EXCAVATION AND FORMER UNDERGROUND STORAGE TANK LOCATION

DATE
8/13/2020

PROJECT NO.
180066

FIGURE
3

 W:\Projects\180066 - 30-77 VERNON BLVD ASTORIA\Technical\GIS and Graphics\Hazmat\FER\180066 Fig 3 Extent of Remedial Excavation and Underground Storage Tank Location FER.mxd 8/13/2020 11:41:53 AM iszalus



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

Based on Drawings:
Z-005.00, Height and Setback Diagrams
Fogarty Finger Architects
February 2020

AKRF
440 Park Avenue South, New York, NY 10016

POP Displays Manufacturing Site
30-77 Vernon Boulevard and 30-80 12th Street
Astoria, New York

EXTENT OF BACKFILL PLACEMENT AND VAPOR BARRIER/WATERPROOFING MEMBRANE

DATE
8/17/2020

PROJECT NO.
180066

FIGURE
4

TABLES

APPENDIX A

METES AND BOUNDS

APPENDIX B

BCA, BCA AMENDMENT, RAWP, AND RAWP APPROVAL LETTER

APPENDIX C

DAILY AND MONTHLY REPORTS

APPENDIX D
AIR MONITORING RESULTS

APPENDIX E
PHOTOGRAPHIC LOG

APPENDIX F

SOIL DISPOSAL DOCUMENTATION

APPENDIX G

SOIL WASTE CHARACTERIZATION REPORT AND ANALYTICAL DATA

APPENDIX H

UNDERGROUND STORAGE TANK REMOVAL DOCUMENTATION

APPENDIX I

DATA USABILITY SUMMARY REPORTS (DUSRS)

APPENDIX J

IRMWP AND IRMCCR

APPENDIX K

BACKFILL DOCUMENTATION

APPENDIX L

VAPOR BARRIER SPECIFICATIONS AND NYSDEC APPROVAL

APPENDIX M

EASEMENT DOCUMENT