
2024-2025 PERIODIC REVIEW REPORT

for

GERARD AVENUE AND EAST 146TH STREET

404 Exterior Street, 417 and 445 Gerard Avenue,
440 Major Wm Deegan Boulevard
Bronx, New York
NYSDEC BCP Site No. C203111

Prepared For:

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Langan Project No. 170487003

LANGAN

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1.0 INTRODUCTION

Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan) prepared this Periodic Review Report (PRR) to document site inspection activities performed on April 25, 2025 at 445 Gerard (the site) located in the Mott Haven neighborhood of the Bronx, New York (Brownfield Cleanup Program [BCP] Site No. C203111). The about 38,000-square-foot (0.87 acre) site is identified as Block 2351, Lots 1, 3, 12, and 20 on the New York City Bronx Borough Tax Map. The site was developed into a 12-story mixed-use commercial and residential building with a partial cellar. The site was remediated pursuant to the Brownfield Cleanup Agreement (BCA) to meet BCP Track 4 remedial program criteria, which was documented and defined in the Final Engineering Report (FER) and Site Management Plan (SMP). A Certificate of Completion (COC) was issued by the New York State Department of Environmental Conservation (NYSDEC) on December 28, 2021. A site location map is provided as Figure 1 and a site layout plan is provided as Figure 2.

A Track 4 remedy was implemented in a manner that has rendered the site protective of public health and the environment, consistent with its use as a mixed-use commercial and residential building. The selected remedy was implemented in accordance with the NYSDEC-approved Remedial Action Work Plan (RAWP), dated April 28, 2020, and Decision Document, dated June 11, 2020. The engineering and institutional controls (EC/IC) are being maintained and monitoring in accordance with the SMP. Exposure to remaining contamination at the site is prevented by a cover system comprised of a 24- to 48-inch reinforced concrete slab pavement atop a minimum six-inch-thick, 0.75-inch stone subbase layer above a geotextile fabric.

This report is organized as follows:

- Periodic Review Report Certification (Section 2) – Langan documented that both the ECs and ICs were operated, maintained and monitored in accordance with the SMP.
- Periodic Review Report – Annual Inspections and Sampling (Section 3) – Langan completed the annual site inspection, and implemented a groundwater treatment work plan including off-site groundwater monitoring well installation, and one baseline groundwater monitoring event during the reporting period
- Compliance with SMP (Section 4) – Langan documented that all activities performed during the reporting period were in compliance with the SMP.
- SMP Operation Description (Section 5) – A summary of SMP operations during this reporting period is provided.

- Recommendations (Section 6) – A summary of recommendations is provided based on observations made during site inspection.

2.0 PERIODIC REVIEW REPORT CERTIFICATION

2.1 Institutional Controls

Per the NYSDEC determination that the Track 4 remedy was achieved, an Environmental Easement (EE) was executed to (1) implement, maintain and monitor EC systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the site to restricted-residential, commercial and industrial uses only. There have been no changes or actions since the NYSDEC issued the COC that would require modification to the EE. A copy of the EE is included as Appendix A.

2.2 Engineering Controls

Following the remediation, petroleum-related volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and metals remained in soil and groundwater; therefore, ECs were needed to manage the remaining contamination and to protect human health and the environment.

The ECs implemented at the site are shown on Figure 3 and consist of:

- A composite cover system (concrete building slabs) to prevent human exposure to remaining contaminated soil beneath the site - A vapor barrier/waterproofing membrane was installed beneath the 24- to 48-inch reinforced concrete slab
- A groundwater monitoring well network with periodic performance monitoring for petroleum-related VOCs and SVOCs remaining in groundwater after groundwater treatment

2.3 Institutional and Engineering Controls Certificate

The certification period covered by this report is February 28, 2024 to February 28, 2025. Annual inspections, groundwater treatment implementation, monitoring well installation and baseline groundwater sampling as described in Section 3, and SMP compliance, and described in Section 4, were completed in accordance with the requirements of the BCP. Sampling and compliance activities are certified by the owner and Professional Engineer in the EC/IC Certificate Form. The completed and signed EC/IC Certificate Form is provided as Appendix B.

3.0 PERIODIC REVIEW REPORT - ANNUAL INSPECTIONS, MONITORING WELL INSTALLATION, SAMPLING AND GROUNDWATER TREATMENT

Langan completed site inspections and collected periodic groundwater samples in accordance with the SMP for the PRR reporting period. Additionally, Langan implemented the December 2024 NYSDEC-approved groundwater treatment work plan between February 24 and 28, 2025. The investigation consisted of the in-situ injection of PetroFix® and calcium chloride in two off-site monitoring wells, installed in July 2024, and on-site monitoring well RMW-14. Annual inspections, implementation of the groundwater treatment work plan and sampling activities are described in the following sections. Daily field reports for this reporting period are included as Appendix C.

3.1 Composite Cover System Inspection

Langan conducted an annual inspection of the composite cover system on April 25, 2025. Langan inspected the composite cover system, including the building floor slabs, for quality and integrity. During the inspection, Langan did not identify cracks or joints in the cover system. Evidence of breach or compromise of the cover system were not identified. A detailed composite cover system inspection report and photograph log are included as Appendix D and Appendix E, respectively.

3.2 Groundwater Treatment Work Plan Implementation

The December 2, 2024 NYSDEC-approved groundwater treatment work plan was implemented between February 24 and 28, 2025 to remediate residual petroleum-related VOC impacts in groundwater. A summary of the off-site monitoring well installation, baseline groundwater monitoring event and implementation of the in-situ program are provided below.

3.2.1 Off-Site Groundwater Monitoring Well Installation

Prior to implementation of the work plan, Langan oversaw the installation of two off-site monitoring wells, OMW-01 and OMW-02, on the Gerard Avenue sidewalk. A geophysical survey was performed prior to drilling to identify potential subsurface anomalies along the sidewalk. On July 18 and 19, 2024, AARCO Environmental Services Inc. (AARCO) installed the monitoring wells, which were constructed of 15 feet of schedule 40 polyvinyl chloride (PVC) 0.020-slotted screen connected to about 15 feet of solid, 2-inch diameter PVC riser to grade surface. Each well annulus contains No. 1 filter sand between the bottom of the well to about two feet above the screened interval, followed by a grout/bentonite seal to grade. The monitoring wells were finished with flush-mounted road boxes and concrete pads. Upon installation, the wells were developed using a submersible Monsoon® pump until purged groundwater appeared clear and

were then allowed to stabilize until the baseline sampling event in August 2024. Monitoring well construction logs are included as Appendix F.

3.2.2 Baseline Groundwater Sampling, Analysis and Results

A baseline groundwater sampling event was completed on August 7 and 8, 2024. The baseline groundwater sampling event included on-site post-remediation monitoring wells, RMW01, RMW03, RMW09, RMW10, RMW14, and the newly installed off-site monitoring wells, OMW-01 and OMW-02. Monitoring well locations are shown on Figure 3.

Groundwater sampling during the baseline sampling event consisted of the following tasks:

- Collection of water level measurements and screening for light non-aqueous phase liquid (LNAPL)
- Measurement of total VOCs within all monitoring well headspaces using a photoionization detector (PID)
- Gauging of groundwater levels in all monitoring wells using a Solinst oil-water interface probe during a synoptic event to develop a groundwater contour map, and
- Collection and analysis of groundwater samples, plus quality assurance/quality control samples (QA/QC) from monitoring wells RMW01, RMW03, RMW09, RMW10, RMW14, OMW-01 and OMW-02.

Prior to groundwater sample collection at each well, total VOC headspace measurements were collected using a RAE Systems, Inc. MiniRAE 3000 PID. Water level measurements were collected and the well was screened for LNAPL using a decontaminated oil-water interface probe. A peristaltic pump with dedicated polyethylene tubing was used to purge and sample the performance monitoring wells. During purging, the turbidity, pH, temperature, conductivity, oxidation-reduction potential (ORP), and dissolved oxygen (DO) were monitored using a Horiba U-52 water quality meter with a flow-through cell. Groundwater was purged until water quality parameters were stable and the turbidity was below 50 nephelometric turbidity units (NTU) or one hour of purging had elapsed. Measurements were recorded on Langan field sampling forms, included as Appendix G.

After purging, groundwater samples were collected directly from the dedicated tubing into laboratory-supplied sample glassware, sealed, labeled, and placed in ice-chilled coolers. The samples were then submitted to Alpha Analytical Inc., a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-accredited laboratory in Westborough, Massachusetts. Duplicate and trip blank samples were collected during each

event for QA/QC. All samples were analyzed for Part 375/Target Compound List (TCL) VOCs via United States Environmental Protection Agency (USEPA) SW-846 method 8260C.

Groundwater analytical results were compared to the NYSDEC Title 6 of the Official Compilation of New York Codes, Rules, and Regulations (NYCRR) Part 703.5 and the NYSDEC Technical & Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA drinking water (herein collectively referenced as NYSDEC SGVs).

Analytical results from the baseline sampling event are summarized as follows:

- RMW01, RMW09 and RMW10: VOCs were not detected above the NYSDEC SGVs.
- RMW03: Benzene was detected above the NYSDEC SGV.
- RMW14: 1,2,4,5-Tetramethylbenzene, 1,2,4-trimethylbenzene, ethylbenzene, isopropylbenzene (cumene), naphthalene, n-propylbenzene, and sec-butylbenzene were detected above the NYSDEC SGVs.

Baseline groundwater sample analytical results are summarized in Table 1 and Figure 4. Baseline results were used to establish baseline groundwater conditions at the site prior to implementation of the groundwater remedy and will be used for data comparisons following the injection program.

3.2.3 Groundwater Treatment Work Plan Injection Implementation

In accordance with the December 2, 2024 Groundwater Treatment Work Plan, a series of three remedial technologies, 1) adsorption and bioremediation using PetroFix™, 2) chemical flocculation by calcium chloride, and 3) an Oxygen Reduction Compound (ORC) Advanced® sock were selected to address residual petroleum-related VOCs in groundwater. PetroFix™ is a proprietary product developed by Regenesis Remediation Solutions (Regenesis) that provides an adsorptive media onto which the dissolved VOCs can partition. In turn, attached microbial growth occurs on the surface of the adsorptive media, resulting in contaminant destruction via biodegradation. PetroFix™ employs the techniques of organic polymer dispersion chemistry to suspend activated carbon particles in a colloidal matrix. A calcium chloride flush can be used to prevent or “park” colloidal suspensions of carbon by flocculation, facilitating bonding between particles to create larger aggregates that can be separated, resulting in improved aquifer clarification. Finally, the application of ORC Advanced® to the subsurface via socks can enhance biological activity, which accelerates the rate of naturally-occurring aerobic biodegradation in groundwater.

The injection program was implemented by Regenesis and Coastal Environmental Solutions (Coastal) under the oversight of Langan between February 24, and February 28, 2024. Coastal injected PetroFix™ solution directly into post-remedial monitoring well RMW14 and off-site

monitoring wells OMW01 and OMW-02 using a “bottom-up” approach. Flexible hose extended from a mixing tank to the injection pump, and then to an injection manifold at the drill rig. A hollow steel injection rod delivered the PetroFix™ under low pressures ranging from 10 to 50 pounds per square inch (psi) so to not significantly alter groundwater elevation. The injection rod was gradually pulled upward through the target interval, about 15 to 30 feet bgs in off-site monitoring wells, and about 17 to 27 feet bgs in monitoring well RMW14. Approximately 800 pounds of PetroFix™ were injected over the course of the program.

Following PetroFix® injections, a calcium chloride flush was applied to RMW14. The calcium chloride flush consisted of injecting 29 gallons of fresh water, followed by 16.6 pounds of calcium chloride with 33 gallons of fresh water, and a final 29 gallons of fresh water into monitoring well RMW14 at pressures similar to that of the PetroFix™ application. ORC Advanced® socks consisting of 31, 1-foot socks laced together, were suspended in RMW14 to be left in place for up to nine months.

Documentation for the injection program, including logs, are provided in Appendix H.

3.2.4 Investigative Derived Waste

Purge water and decontamination fluids generated during the August 2024 groundwater monitoring event were containerized into a UN/Department of Transportation (DOT)-approved 55-gallon drums and is stored on-site pending future off-site disposal.

3.3 Periodic Groundwater Sampling

Eight quarterly post-injection sampling events have been completed in accordance with the SMP and a ninth post-injection sampling event was completed in accordance with the NYSDEC “Eighth Quarterly Groundwater Monitoring Report & Periodic Review Report” Comment Letter dated July 6, 2023. Monitoring was conducted at five post-injection permanent monitoring wells (RMW01, RMW03, RMW09, RMW10, and RMW14) that were installed following the injection program during implementation of the remedy. Results identified remaining petroleum-related VOC impacts in the northern part of the site, particularly in the vicinity of groundwater monitoring well RWM14, installed following completion of the ISCO program.

Per the groundwater treatment work plan, performance monitoring will be conducted quarterly at RMW03, RMW09, and RMW14 for at least a year following the February 2025 injection program. The first quarterly performance monitoring event is scheduled for May 2025.

4.0 COMPLIANCE WITH SMP

Specific SMP measures are described in the following sections.

4.1 Construction Health and Safety Plan

The annual site inspection and implementation of the groundwater treatment work plan were performed in compliance with the site-specific Construction Health and Safety Plan (CHASP) and applicable laws and regulations. The health and safety program manager for Langan was William Bohrer, PG.

4.2 Community Air Monitoring Plan

Ground intrusive activities were not conducted during this reporting period and therefore, the SMP Community Air Monitoring Plan (CAMP) was not implemented.

4.3 Soil/Materials Management Plan

The Soil/Materials Management Plan (SMMP) provides details for managing soil/materials, including excavation, material handling, stockpile management, transport and disposal. The plan includes controls to guide effective remedial activities in compliance with applicable laws and regulations. Ground intrusive activities were not conducted during this reporting period and therefore, the SMMP was not implemented.

4.4 Deviations from the Site Management Plan

There were no deviations from the SMP.

5.0 SMP OPERATION DESCRIPTION

No ground intrusive construction activities were performed on-site during the reporting period. The following sections describe SMP operations performed during this reporting period.

5.1 Site Controls

5.1.1 Erosion and Dust Control

No ground intrusive activities took place on-site during this reporting period; therefore, erosion and dust control measures were not required.

5.1.2 Soil Screening

Residual soil/fill beneath the composite cover system was not disturbed during this reporting period; therefore, soil screening for staining, odors, and elevated PID readings was not implemented.

5.1.3 Stockpile Management

Stockpiles were not constructed during this reporting period.

5.1.4 Truck Inspection

Soil/fill was not excavated for off-site disposal from the site during this reporting period; therefore, truck inspections were not necessary.

5.1.5 Nuisance Control

Community nuisance complaints were not received during this reporting period.

5.1.6 Fluids Management

One 55-gallon drum containing purged groundwater was generated during the August 2024 baseline sampling event performed during this reporting period. The drum is stored on-site pending future off-site disposal.

5.1.7 Reporting

Langan performed the annual site inspection and implemented the December 2, 2024 Groundwater Treatment Work Plan. The December 2024 groundwater treatment implementation is detailed in Section 3. Observations from the annual inspection were recorded in a field book that included the project number, and a summary of locations where inspection was performed.

A photograph log documenting the annual inspection is provided in Appendix E.

5.2 Material Handling and Excavation

Residual soil/fill beneath the composite cover system was not disturbed during this reporting period.

5.3 Soil/Fill Characterization

Soil/fill characterization was not conducted during this reporting period; therefore, soil characterization was not performed.

5.4 Transport and Off-Site Disposal

No fill/soil was transported off-site for disposal during this reporting period.

5.5 Imported Backfill

No material was imported to the site for use as backfill during this reporting period.

6.0 RECOMMENDATIONS

6.1 Amendments to the SMP

No changes to the SMP are recommended at this time.

6.2 Amendments to the Frequency of PRR Submissions

No changes in the frequency of PRR submissions are recommended at this time.

7.0 DIVISION OF ENVIRONMENTAL REMEDIATION GREEN REMEDIATION EVALUATION

The NYSDEC Division of Environmental Remediation (DER) Green Remediation Policy (DER-31) requires that green remediation concepts and techniques be considered during all stages of the remedial program, including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. A summary of green remediation metrics for site management during the reporting period is included in Appendix D. Goals for the project to incorporate green remediation principles and techniques during the next reporting period include use of public transit by personnel when possible during site visits, and minimization of waste during the post-injection groundwater sampling events.

Langan will continue to evaluate green remediation concepts and techniques for inclusion in site management, as applicable.

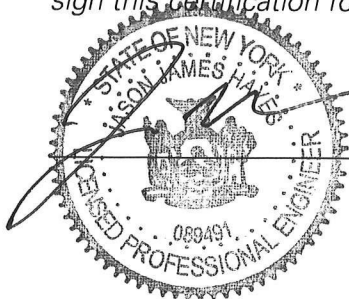
8.0 CERTIFICATION

For each institutional or engineering control identified for the site I certify that all of the following statements are true:

- The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction*
- The IC and/or ECs employed at this site are unchanged from the date the controls were put in place, or last approved by the NYSDEC*
- Nothing has occurred that would impair the ability of the control to protect the public health and environment*
- Nothing has occurred that would constitute a violation or failure to comply with the site management plan for this control*
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control*
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document*
- Use of the site is compliant with the environmental easement*
- The engineering control systems are performing as designed and are effective*
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices, and*
- The information presented in this report is accurate and complete*

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, Jason J. Hayes, P.E., of Langan, have been authorized and designated by the site owner to sign this certification for the site.



[P.E.]

5-13-2025 DATE

TABLES

Table 1
Baseline Groundwater Sample Analytical Results
Periodic Review Report

455 Gerard Avenue and East 146th Street
Bronx, New York
NYSDEC BCP Site No.: C203111
Langan Project No.: 170487001

Analyte	CAS Number	NYSDEC SGVs	Sampling Event	Quarter 10	Quarter 10	Quarter 10	Quarter 10	Quarter 10	Quarter 10	Quarter 10
			Location	RMW01	RMW03	RMW09	RMW10	RMW10	OMW-01	OMW-02
			Sample Name	RMW01_080824	RMW03_080824	RMW09_080724	RMW10_080824	DUP01_080824	OMW-01_080724	OMW-02_080724
			Sample Date	08/08/2024	08/08/2024	08/07/2024	08/08/2024	08/07/2024	08/07/2024	08/07/2024
			Unit	Result	Result	Result	Result	Result	Result	Result
Volatile Organic Compounds										
1,1,1,2-Tetrachloroethane	630-20-6	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,1,1-Trichloroethane	71-55-6	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,1,2,2-Tetrachloroethane	79-34-5	5	ug/l	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,1,2-Trichloroethane	79-00-5	1	ug/l	<1.5 U	<1.5 U	<1.5 U	<1.5 U	<1.5 U	<1.5 U	<1.5 U
1,1-Dichloroethane	75-34-3	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,1-Dichloroethene	75-35-4	5	ug/l	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
1,1-Dichloropropene	563-58-6	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,2,3-Trichlorobenzene	87-61-6	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,2,3-Trichloropropane	96-18-4	0.04	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,2,4,5-Tetramethylbenzene	95-93-2	5	ug/l	<2 U	<2 U	<2 U	<2 U	<2 U	13	190
1,2,4-Trichlorobenzene	120-82-1	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,2,4-Trimethylbenzene	95-63-6	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	1,200
1,2-Dibromo-3-Chloropropane	96-12-8	0.04	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.0006	ug/l	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<20 U
1,2-Dichlorobenzene	95-50-1	3	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,2-Dichloroethane	107-06-2	0.6	ug/l	<0.5 U	<0.5 U	<0.5 U	0.32 J	0.33 J	<0.5 U	<5 U
1,2-Dichloropropane	78-87-5	1	ug/l	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<10 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	120
1,3-Dichlorobenzene	541-73-1	3	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,3-Dichloropropane	142-28-9	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,4-Dichlorobenzene	106-46-7	3	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,4-Diethyl Benzene	105-05-5	NS	ug/l	<2 U	<2 U	<2 U	<2 U	<2 U	2.9	37
1,4-Dioxane (P-Dioxane)	123-91-1	0.35	ug/l	<250 U	<250 U	<250 U	<250 U	<250 U	<250 U	<2,500 U
2,2-Dichloropropane	594-20-7	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
2-Chlorotoluene	95-49-8	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
2-Hexanone (MBK)	591-78-6	50	ug/l	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<50 U
4-Chlorotoluene	106-43-4	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
4-Ethyltoluene	622-96-8	NS	ug/l	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	97
Acetone	67-64-1	50	ug/l	<5 U	2 J	<5 U	<5 U	<5 U	2.4 J	18 J
Acrylonitrile	107-13-1	5	ug/l	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<50 U
Benzene	71-43-2	1	ug/l	0.79	4.8	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U
Bromobenzene	108-86-1	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Bromochloromethane	74-97-5	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Bromodichloromethane	75-27-4	50	ug/l	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U
Bromoform	75-25-2	50	ug/l	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<20 U
Bromomethane	74-83-9	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	1.3 J	<2.5 U
Carbon Disulfide	75-15-0	60	ug/l	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<50 U
Carbon Tetrachloride	56-23-5	5	ug/l	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U
Chlorobenzene	108-90-7	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Chloroethane	75-00-3	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Chloroform	67-66-3	7	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Chloromethane	74-87-3	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Cis-1,2-Dichloroethene	156-59-2	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Cis-1,3-Dichloropropene	10061-01-5	0.4	ug/l	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U
Cymene	99-87-6	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	19 J
Dibromochloromethane	124-48-1	50	ug/l	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U
Dibromomethane	74-95-3	5	ug/l	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<50 U
Dichlorodifluoromethane	75-71-8	5	ug/l	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<50 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Ethylbenzene	100-41-4	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	730
Hexachlorobutadiene	87-68-3	0.5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Isopropylbenzene (Cumene)	98-82-8	5	ug/l	<2.5 U	0.87 J	<2.5 U	<2.5 U	<2.5 U	<2.5 U	150
M,P-Xylene	179601-23-1	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	59
Methyl Ethyl Ketone (2-Butanone)	78-93-3	50	ug/l	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<50 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	ug/l	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<50 U
Methylene Chloride	75-09-2	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Naphthalene	91-20-3	10	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	960
n-Butylbenzene	104-51-8	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	0.87 J	37
n-Propylbenzene	103-65-1	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	330
o-Xylene (1,2-Dimethylbenzene)	95-47-6	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	12 J
Sec-Butylbenzene	135-98-8	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	1.9 J	17 J
Styrene	100-42-5	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
T-Butylbenzene	98-06-6	5	ug/l	<2.5 U	<2.5 U	<2.5 U	1.1 J	0.96 J	<2.5 U	<2.5 U
Tert-Butyl Methyl Ether	1634-04-4	10	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Tetrachloroethene (PCE)	127-18-4	5	ug/l	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U
Toluene	108-88-3	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Total Xylenes	1330-20-7	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	71 J
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	0.4	ug/l	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U
Trans-1,2-Dichloroethene	156-60-5	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Trans-1,3-Dichloropropene	10061-02-6	0.4	ug/l	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U
Trans-1,4-Dichloro-2-Butene	110-57-6	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Trichloroethene (TCE)	79-01-6	5	ug/l	0.33 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<5 U
Trichlorofluoromethane	75-69-4	5	ug/l	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Vinyl Acetate	108-05-4	NS	ug/l	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<50 U
Vinyl Chloride	75-01-4	2	ug/l	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<10 U
Total BTEX	BTEX	NS	ug/l	0.79	4.8	ND	ND	ND	ND	801
Total VOCs	TOTAL VOCs	NS	ug/l	1.12	7.67	ND	1.42	1.29	22.37	4047

Table 1
Baseline Groundwater Sample Analytical Results
Periodic Review Report

455 Gerard Avenue and East 146th Street
Bronx, New York
NYSDEC BCP Site No.: C203111
Langan Project No.: 170487001

Notes:

CAS - Chemical Abstract Service

NS - No standard

ug/l - microgram per liter

NA - Not analyzed

ND - Not detected

RL - Reporting limit

<RL - Not detected

Groundwater sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the Official Compilation of New York Codes, Rules, and Regulations (NYCRR) Part 703.5 and the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA Water (herein collectively referenced as "NYSDEC SGVs").

Qualifiers:

B - The analyte was found in the associated analysis batch blank.

J - The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.

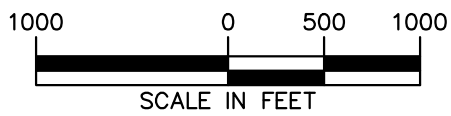
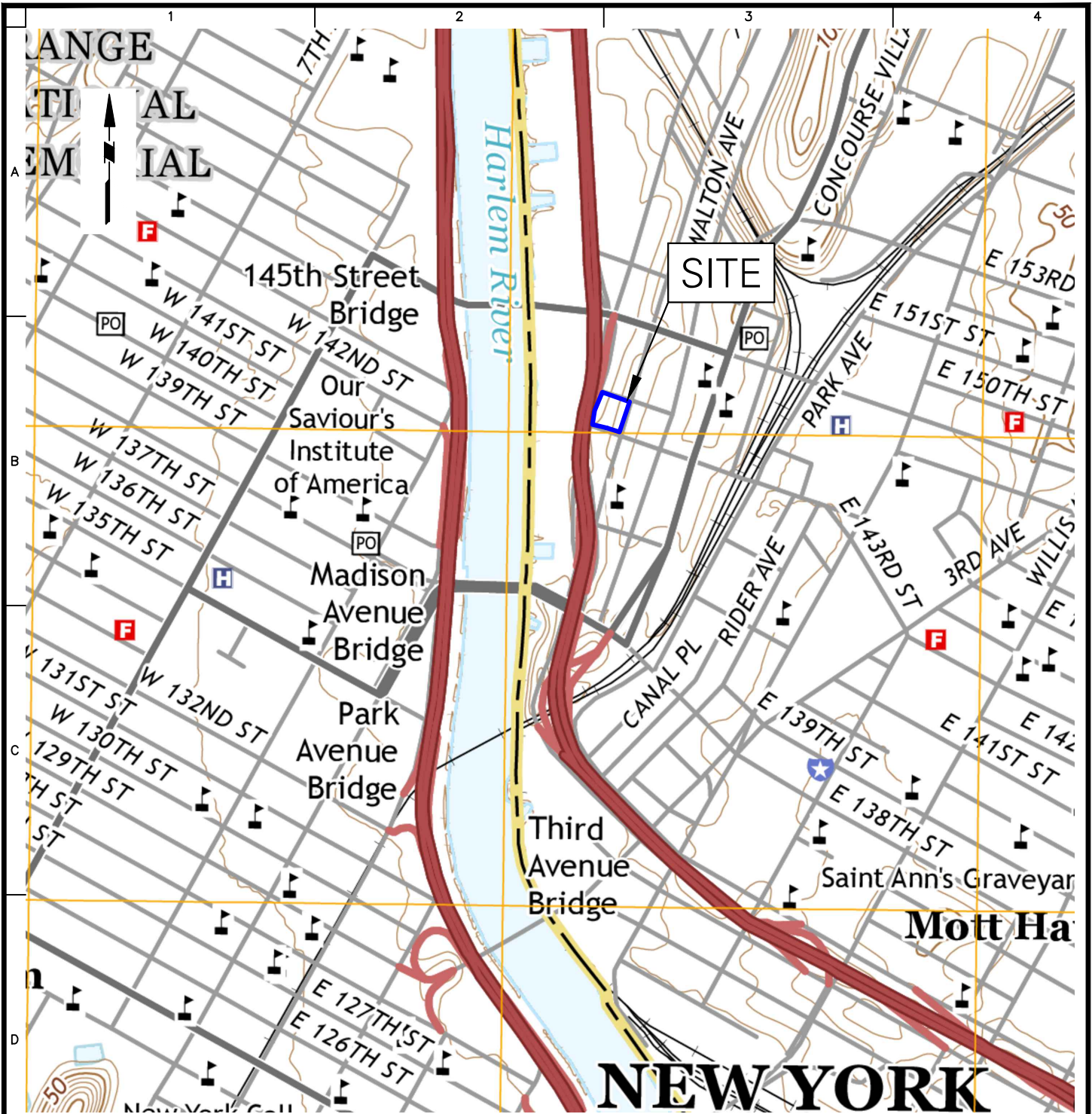
UJ - The analyte was not detected at a level greater than or equal to the RL; however, the reported RL is approximate and may be inaccurate or imprecise.

U - The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:

10 - Result exceeds NYSDEC SGVs

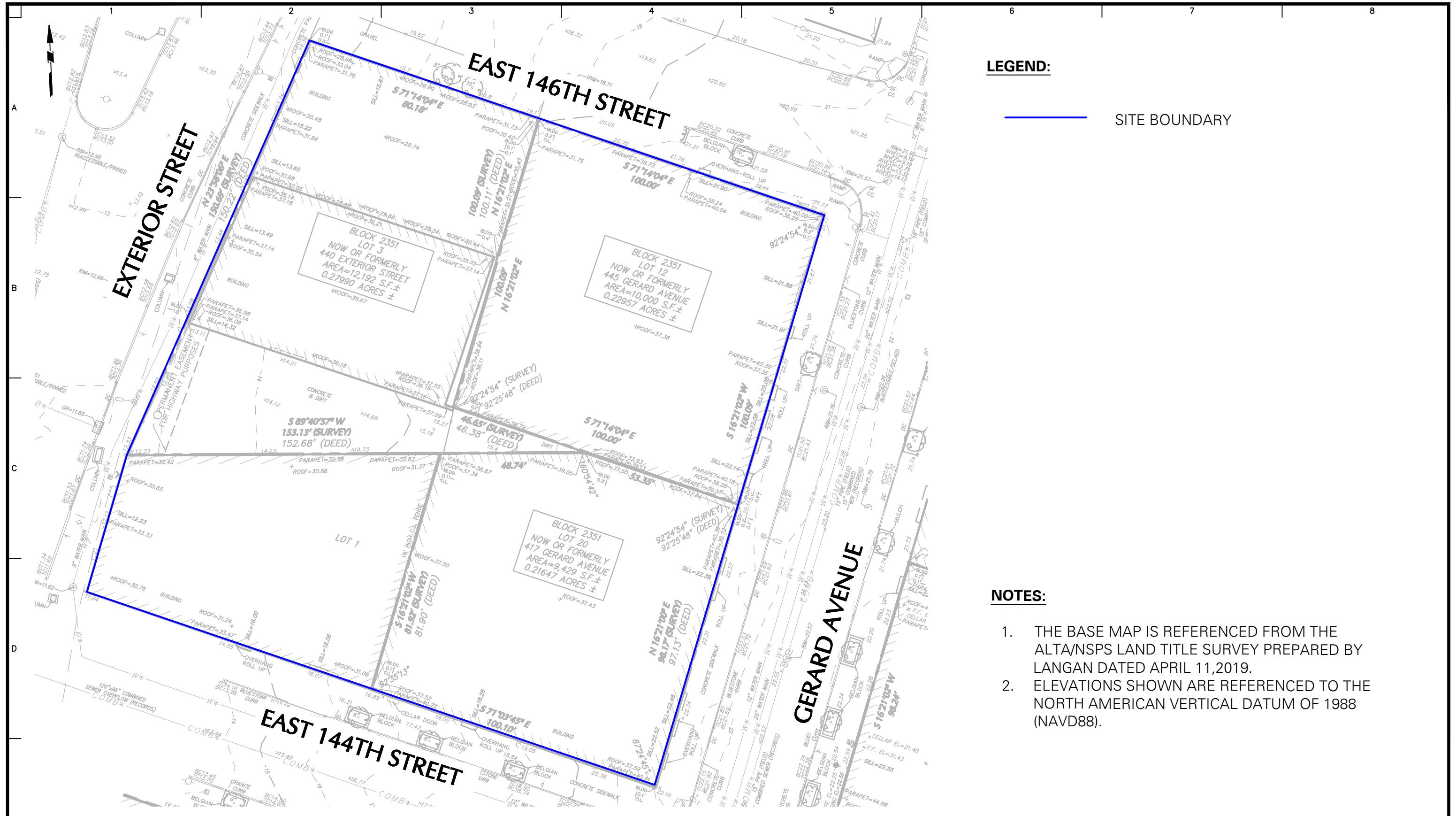
FIGURES



— SITE BOUNDARY

NOTE: BASE MAP IS REFERENCED FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5 MINUTE SERIES CENTRAL PARK QUADRANGLE MAP, DATED 2016

LANGAN Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 388 Ninth Avenue, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	Project	Figure Title	Project No.	Figure No.
	GERARD AVENUE AND EAST 146TH STREET	SITE LOCATION MAP	170487003	1
	BLOCK No. 2351, LOT Nos. 1, 3, 12, & 20		Date	
	BRONX NEW YORK		08/27/2021	
	Drawn By	Checked By		
	LE	KS		

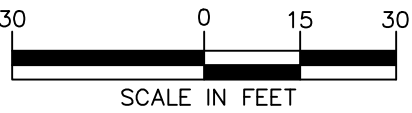


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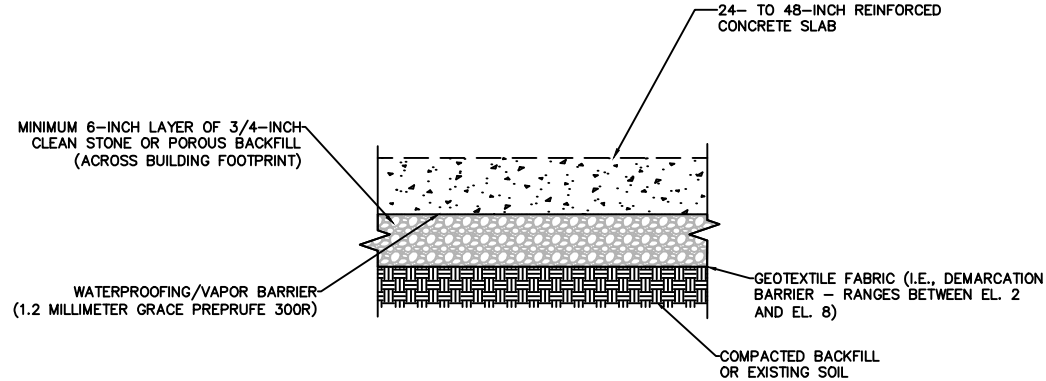
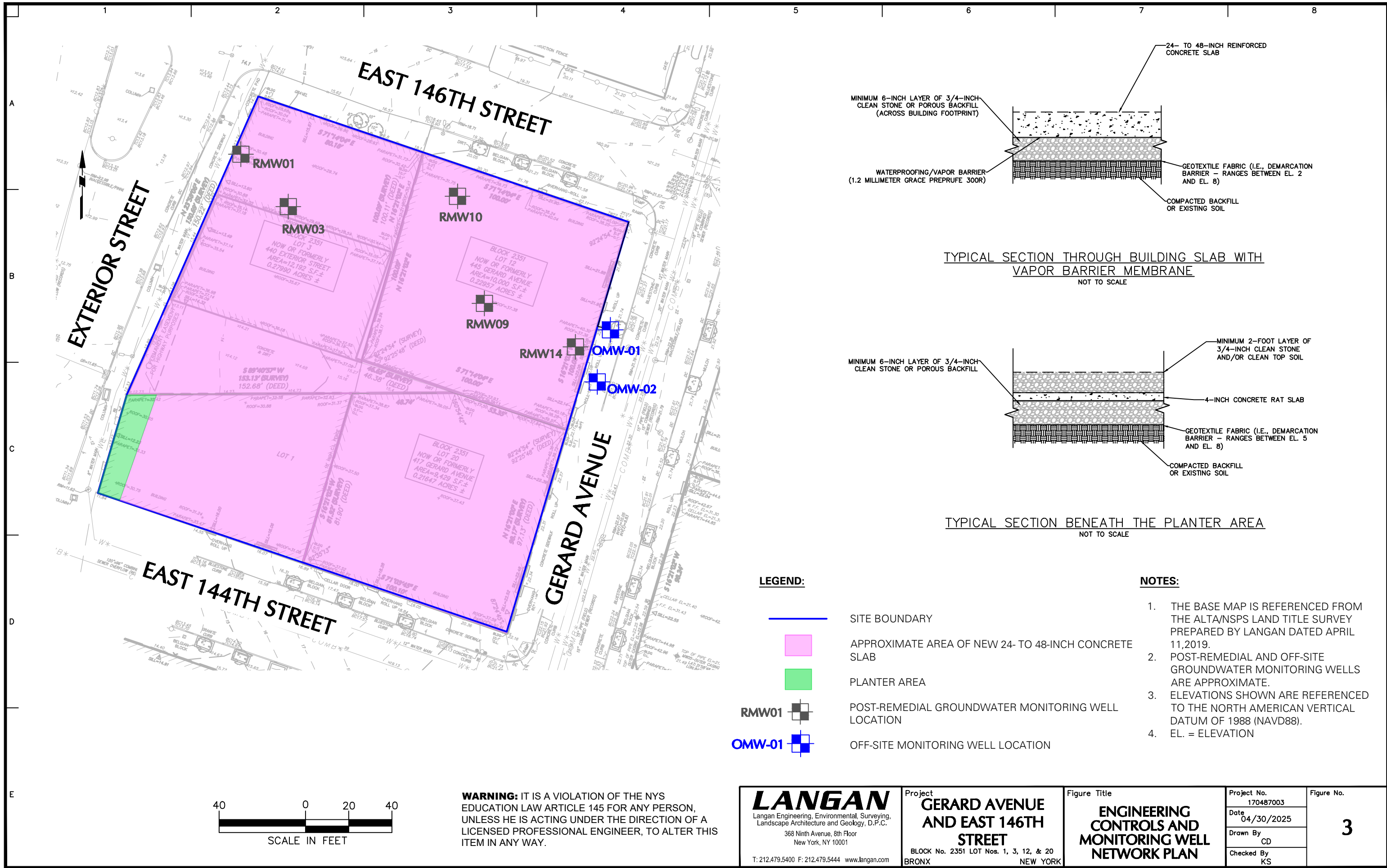
— SITE BOUNDARY

NOTES:

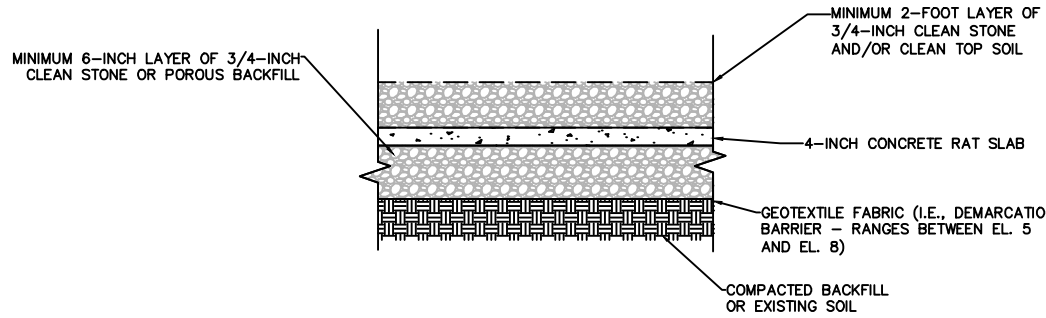
1. THE BASE MAP IS REFERENCED FROM THE ALTA/NSPS LAND TITLE SURVEY PREPARED BY LANGAN DATED APRIL 11, 2019.
2. ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).



LANGAN Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 368 Ninth Avenue, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	Project GERARD AVENUE AND EAST 146TH STREET BLOCK No. 2351 LOT Nos. 1, 3, 12, & 20 BRONX NEW YORK	Figure Title SITE LAYOUT PLAN	Project No. 170487003	Figure No. 2
			Date 5/23/2019	
			Drawn By RB	
			Checked By JL	



TYPICAL SECTION THROUGH BUILDING SLAB WITH VAPOR BARRIER MEMBRANE
NOT TO SCALE



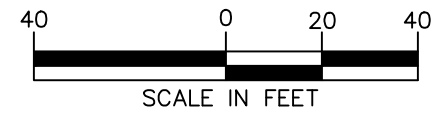
TYPICAL SECTION BENEATH THE PLANTER AREA
NOT TO SCALE

LEGEND:

- SITE BOUNDARY
- APPROXIMATE AREA OF NEW 24- TO 48-INCH CONCRETE SLAB
- PLANTER AREA
- POST-REMEDIATION GROUNDWATER MONITORING WELL LOCATION
- OFF-SITE MONITORING WELL LOCATION

NOTES:

1. THE BASE MAP IS REFERENCED FROM THE ALTA/NSPS LAND TITLE SURVEY PREPARED BY LANGAN DATED APRIL 11, 2019.
2. POST-REMEDIATION AND OFF-SITE GROUNDWATER MONITORING WELLS ARE APPROXIMATE.
3. ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
4. EL. = ELEVATION



WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

LANGAN Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 368 Ninth Avenue, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	Project GERARD AVENUE AND EAST 146TH STREET BLOCK No. 2351 LOT Nos. 1, 3, 12, & 20 BRONX NEW YORK	Figure Title ENGINEERING CONTROLS AND MONITORING WELL NETWORK PLAN	Project No. 170487003	Figure No. 3
			Date 04/30/2025	
			Drawn By CD	
			Checked By KS	

Sampling Event	Baseline	Baseline
Location	RMW10	RMW10
Sample Name	RMW10_080824	DUP01_080824
Sample Date	08/08/2024	08/08/2024
VOCs		
1,2,4,5-Tetramethylbenzene	<2 U	<2 U
1,2,4-Trimethylbenzene	<2.5 U	<2.5 U
1,2-Dichloroethane	0.32 J	0.33 J
1,2-Dichloropropane	<1 U	<1 U
1,3,5-Trimethylbenzene (Mesitylene)	<2.5 U	<2.5 U
Acetone	<5 U	<5 U
Benzene	<0.5 U	<0.5 U
Chloroethane	<2.5 U	<2.5 U
Chloroform	<2.5 U	<2.5 U
Cymene	<2.5 U	<2.5 U
Ethylbenzene	<2.5 U	<2.5 U
Isopropylbenzene (Cumene)	<2.5 U	<2.5 U
M,P-Xylene	<2.5 U	<2.5 U
Methyl Ethyl Ketone (2-Butanone)	<5 U	<5 U
Naphthalene	<2.5 U	<2.5 U
n-Butylbenzene	<2.5 U	<2.5 U
n-Propylbenzene	<2.5 U	<2.5 U
o-Xylene (1,2-Dimethylbenzene)	<2.5 U	<2.5 U
Sec-Butylbenzene	<2.5 U	<2.5 U
Toluene	<2.5 U	<2.5 U
Total Xylenes	<2.5 U	<2.5 U

Sampling Event	Baseline
Location	RMW01
Sample Name	RMW01_080824
Sample Date	08/08/2024
VOCs	
1,2,4,5-Tetramethylbenzene	<2 U
1,2,4-Trimethylbenzene	<2.5 U
1,2-Dichloroethane	<0.5 U
1,2-Dichloropropane	<1 U
1,3,5-Trimethylbenzene (Mesitylene)	<2.5 U
Acetone	<5 U
Benzene	0.79
Chloroethane	<2.5 U
Chloroform	<2.5 U
Cymene	<2.5 U
Ethylbenzene	<2.5 U
Isopropylbenzene (Cumene)	<2.5 U
M,P-Xylene	<2.5 U
Methyl Ethyl Ketone (2-Butanone)	<5 U
Naphthalene	<2.5 U
n-Butylbenzene	<2.5 U
n-Propylbenzene	<2.5 U
o-Xylene (1,2-Dimethylbenzene)	<2.5 U
Sec-Butylbenzene	<2.5 U
Toluene	<2.5 U
Total Xylenes	<2.5 U

Sampling Event	Baseline
Location	RMW03
Sample Name	RMW03_080824
Sample Date	08/08/2024
VOCs	
1,2,4,5-Tetramethylbenzene	<2 U
1,2,4-Trimethylbenzene	<2.5 U
1,2-Dichloroethane	<0.5 U
1,2-Dichloropropane	<1 U
1,3,5-Trimethylbenzene (Mesitylene)	<2.5 U
Acetone	2 J
Benzene	4.8
Chloroethane	<2.5 U
Chloroform	<2.5 U
Cymene	<2.5 U
Ethylbenzene	<2.5 U
Isopropylbenzene (Cumene)	0.87 J
M,P-Xylene	<2.5 U
Methyl Ethyl Ketone (2-Butanone)	<5 U
Naphthalene	<2.5 U
n-Butylbenzene	<2.5 U
n-Propylbenzene	<2.5 U
o-Xylene (1,2-Dimethylbenzene)	<2.5 U
Sec-Butylbenzene	<2.5 U
Toluene	<2.5 U
Total Xylenes	<2.5 U

Sampling Event	Baseline
Location	RMW14
Sample Name	RMW14_080724
Sample Date	08/07/2024
VOCs	
1,2,4,5-Tetramethylbenzene	20
1,2,4-Trimethylbenzene	6.5
1,2-Dichloroethane	<1 U
1,2-Dichloropropane	<2 U
1,3,5-Trimethylbenzene (Mesitylene)	<5 U
Acetone	<10 U
Benzene	<1 U
Chloroethane	<5 U
Chloroform	<5 U
Cymene	<5 U
Ethylbenzene	28
Isopropylbenzene (Cumene)	68
M,P-Xylene	2.4 J
Methyl Ethyl Ketone (2-Butanone)	<10 U
Naphthalene	28
n-Butylbenzene	3.6 J
n-Propylbenzene	100
o-Xylene (1,2-Dimethylbenzene)	2.4 J
Sec-Butylbenzene	5.3
Toluene	3.4 J
Total Xylenes	4.8 J

Sampling Event	Baseline
Location	RMW09
Sample Name	RMW09_080724
Sample Date	08/07/2024
VOCs	
1,2,4,5-Tetramethylbenzene	<2 U
1,2,4-Trimethylbenzene	<2.5 U
1,2-Dichloroethane	<0.5 U
1,2-Dichloropropane	<1 U
1,3,5-Trimethylbenzene (Mesitylene)	<2.5 U
Acetone	<5 U
Benzene	<0.5 U
Chloroethane	<2.5 U
Chloroform	<2.5 U
Cymene	<2.5 U
Ethylbenzene	<2.5 U
Isopropylbenzene (Cumene)	<2.5 U
M,P-Xylene	<2.5 U
Methyl Ethyl Ketone (2-Butanone)	<5 U
Naphthalene	<2.5 U
n-Butylbenzene	<2.5 U
n-Propylbenzene	<2.5 U
o-Xylene (1,2-Dimethylbenzene)	<2.5 U
Sec-Butylbenzene	<2.5 U
Toluene	<2.5 U
Total Xylenes	<2.5 U

Sampling Event	Baseline
Location	OMW-01
Sample Name	OMW-01_080724
Sample Date	08/07/2024
VOCs	
1,2,4,5-Tetramethylbenzene	13
1,2,4-Trimethylbenzene	<2.5 U
1,2-Dichloroethane	<0.5 U
1,2-Dichloropropane	<1 U
1,3,5-Trimethylbenzene (Mesitylene)	<2.5 U
Acetone	2.4 J
Benzene	<0.5 U
Chloroethane	<2.5 U
Chloroform	<2.5 U
Cymene	<2.5 U
Ethylbenzene	<2.5 U
Isopropylbenzene (Cumene)	<2.5 U
M,P-Xylene	<2.5 U
Methyl Ethyl Ketone (2-Butanone)	<5 U
Naphthalene	<2.5 U
n-Butylbenzene	0.87 J
n-Propylbenzene	<2.5 U
o-Xylene (1,2-Dimethylbenzene)	<2.5 U
Sec-Butylbenzene	1.9 J
Toluene	<2.5 U
Total Xylenes	<2.5 U

Sampling Event	Baseline
Location	OMW-02
Sample Name	OMW-02_080724
Sample Date	08/07/2024
VOCs	
1,2,4,5-Tetramethylbenzene	190
1,2,4-Trimethylbenzene	1,200
1,2-Dichloroethane	<5 U
1,2-Dichloropropane	<10 U
1,3,5-Trimethylbenzene (Mesitylene)	120
Acetone	18 J
Benzene	<5 U
Chloroethane	<25 U
Chloroform	<25 U
Cymene	19 J
Ethylbenzene	730
Isopropylbenzene (Cumene)	150
M,P-Xylene	59
Methyl Ethyl Ketone (2-Butanone)	<50 U
Naphthalene	960
n-Butylbenzene	37
n-Propylbenzene	330
o-Xylene (1,2-Dimethylbenzene)	12 J
Sec-Butylbenzene	17 J
Toluene	<25 U
Total Xylenes	71 J

LEGEND:

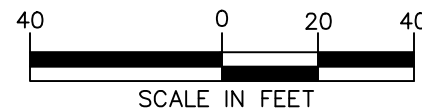
— SITE BOUNDARY

RMW01 POST-REMEDIAL GROUNDWATER MONITORING WELL LOCATION

OMW-01 OFF-SITE MONITORING WELL LOCATION

Analyte	NYSDEC SGVs
VOCs	
1,2,4,5-Tetramethylbenzene	5
1,2,4-Trimethylbenzene	5
1,2-Dichloroethane	0.6
1,2-Dichloropropane	1
1,3,5-Trimethylbenzene (Mesitylene)	5
Acetone	50
Benzene	1
Chloroethane	5
Chloroform	7
Cymene	5
Ethylbenzene	5
Isopropylbenzene (Cumene)	5
M,P-Xylene	5
Methyl Ethyl Ketone (2-Butanone)	50
Naphthalene	10
n-Butylbenzene	5
n-Propylbenzene	5
o-Xylene (1,2-Dimethylbenzene)	5
Sec-Butylbenzene	5
Toluene	5
Total Xylenes	5

- NOTES:**
- THE BASE MAP IS REFERENCED FROM THE ALTA/NSPS LAND TITLE SURVEY PREPARED BY LANGAN DATED APRIL 11, 2019.
 - POST-REMEDIAL GROUNDWATER MONITORING WELL LOCATIONS ARE APPROXIMATE.
 - ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
 - GROUNDWATER SAMPLE ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS (AWQS) AND GUIDANCE VALUES FOR DRINKING WATER (CLASS GA)(COLLECTIVELY REFERRED TO AS THE STANDARDS AND GUIDANCE VALUES (SGVs)).
 - RESULTS EXCEEDING THE SGVs ARE SHADED AND BOLDED.
 - J = THE ANALYTE WAS POSITIVELY IDENTIFIED AND THE ASSOCIATED NUMERICAL VALUE IS THE APPROXIMATE CONCENTRATION OF THE ANALYTE SAMPLE.
 - UJ = THE ANALYTE WAS NOT DETECTED AT A LEVEL GREATER THAN OR EQUAL TO THE REPORTING LIMIT (RL); HOWEVER, THE REPORTED RL IS APPROXIMATE AND MAY BE INACCURATE OR IMPRECISE.
 - U = THE ANALYTE WAS ANALYZED FOR, BUT WAS NOT DETECTED AT A LEVEL GREATER THAN OR EQUAL TO THE LEVEL OF THE RL OR THE SAMPLE CONCENTRATION FOR RESULTS IMPACTED BY BLANK CONTAMINATION.



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Project
**GERARD AVENUE
 AND EAST 146TH
 STREET**
 BLOCK No. 2351 LOT Nos. 1, 3, 12, & 20
 BRONX NEW YORK

Figure Title
**BASELINE
 GROUNDWATER
 SAMPLE RESULTS MAP**

Project No.
 170487003
 Date
 04/30/2025
 Drawn By
 CD
 Checked By
 KS

Figure No.
4

APPENDIX A
Environmental Easement

**ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36
OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW**

THIS INDENTURE made this 12th day of October, 2021, between Owner, 445 Gerard Owner LLC, having an office at 11 Park Place, Suite 1705, New York, New York 10007 (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the addresses of 404 Major William Deegan Blvd., 440 Major William Deegan Blvd., 445 Gerard Avenue and 417 Gerard Avenue in the City of New York, County of Bronx and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 2351 Lots 1, 3, 12 and 20, being the same as that property conveyed to Grantor by deed dated December 31, 2020 and recorded in the City Register of the City of New York as CRFN # 2021000004641. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.87445 +/- acres, and is hereinafter more fully described in the Land Title Survey dated June 4, 2021 prepared by Paul Fisher, L.L.S. of Langan Engineering, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C203111-05-18, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

**Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii),
Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial
as described in 6 NYCRR Part 375-1.8(g)(2)(iv)**

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to

use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest

in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to: Site Number: C203111
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to: Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the

Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

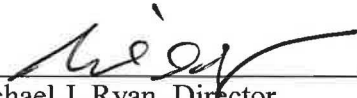
9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

11. Consistency with the SMP. To the extent there is any conflict or inconsistency between the terms of this Environmental Easement and the SMP, regarding matters specifically addressed by the SMP, the terms of the SMP will control.

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THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: 
Michael J. Ryan, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 12th day of October in the year 2021, before me, the undersigned, personally appeared Michael J. Ryan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.


Notary Public - State of New York

Dale L. Thiel
Notary Public, State of New York
Qualified in Columbia County
No 01TH6414394
Commission Expires February 22/2025

SCHEDULE "A" PROPERTY DESCRIPTION

SURVEY DESCRIPTION DEC EASEMENT (BLOCK 2351 LOTS 1, 3, 12, & 20)

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF BRONX, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF EAST 144TH STREET (60' WIDE) WITH THE EASTERLY SIDE OF EXTERIOR STREET (AKA MAJOR DEEGAN BOULEVARD) (IRREGULAR WIDTH), AND RUNNING THENCE;

NORTHERLY ALONG SAID EASTERLY SIDE OF EXTERIOR STREET, N16°21'00"E 47.46 FEET TO A POINT, THENCE;

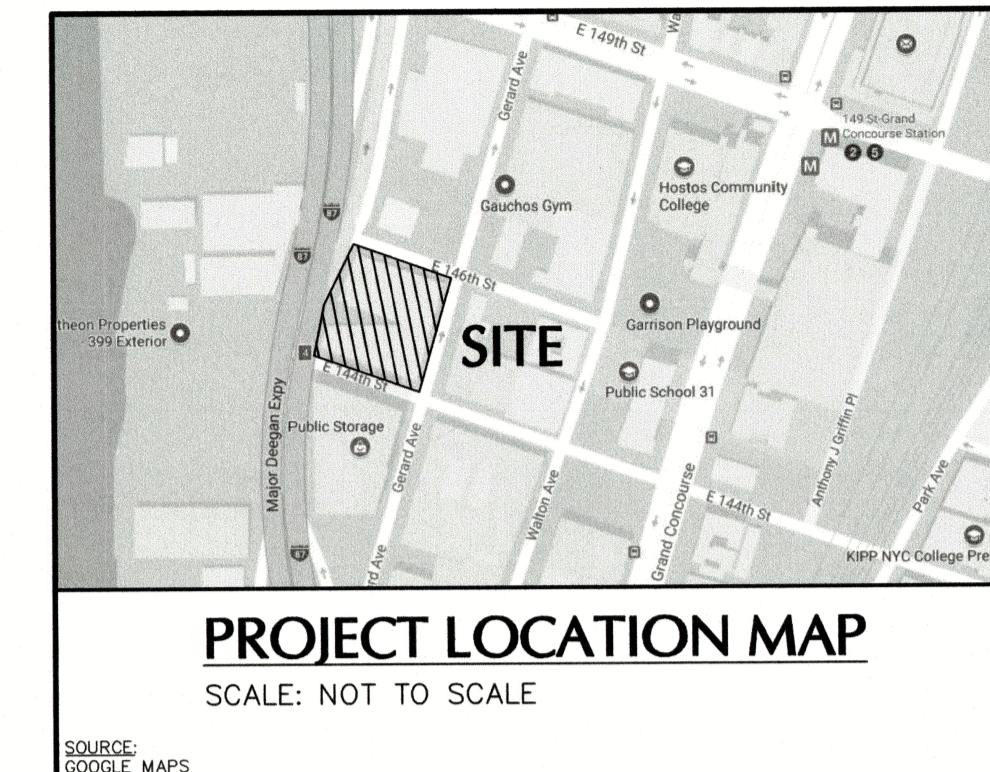
NORTHERLY CONTINUING ALONG SAID EASTERLY SIDE OF EXTERIOR STREET, N23°58'06"E 150.69 FEET TO THE CORNER FORMED BY THE INTERSECTION OF SAID EASTERLY SIDE OF EXTERIOR STREET WITH THE SOUTHERLY SIDE OF EAST 146TH STREET (60' WIDE), THENCE;

EASTERLY ALONG SAID SOUTHERLY SIDE OF EAST 146TH STREET, S71°14'04"E 180.18 FEET TO THE CORNER FORMED BY THE INTERSECTION OF SAID SOUTHERLY SIDE OF EAST 146TH STREET WITH THE WESTERLY SIDE OF GERARD AVENUE (60' WIDE), THENCE;

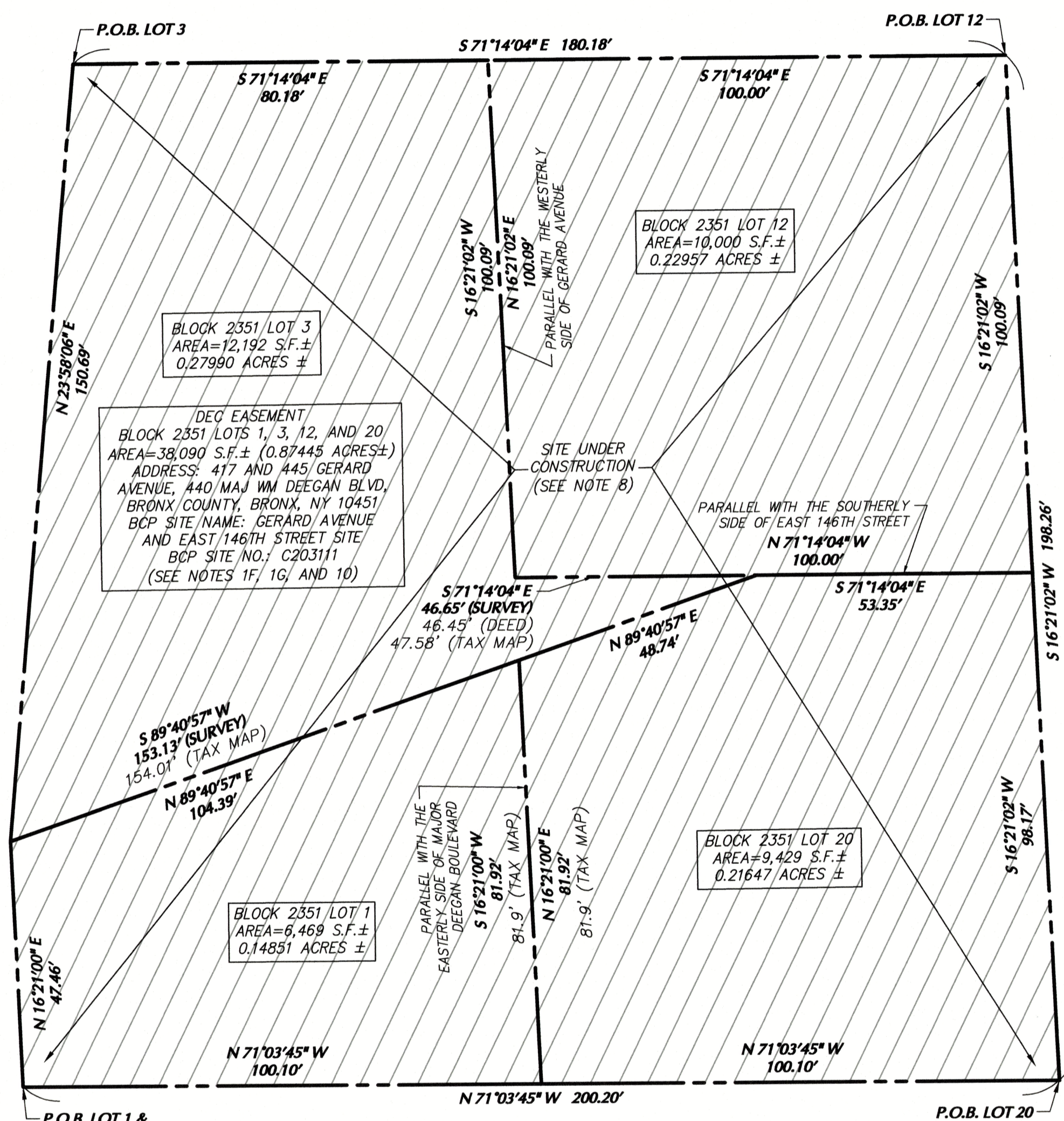
SOUTHERLY ALONG SAID WESTERLY SIDE OF GERARD AVENUE, S16°21'02"W 198.26 FEET TO THE CORNER FORMED BY THE INTERSECTION OF SAID WESTERLY SIDE OF GERARD AVENUE WITH SAID NORTHERLY SIDE OF EAST 144TH STREET, THENCE;

WESTERLY ALONG SAID NORTHERLY SIDE OF EAST 144TH STREET N71°03'45"W 200.20 FEET TO THE POINT OR PLACE OF BEGINNING.

ENCOMPASSING AN AREA OF 0.87445 ACRES, MORE OR LESS.



**EAST 146TH STREET
(60' WIDE)**



**EAST 144TH STREET
(60' WIDE)**

NOTES

- THIS SURVEY IS BASED UPON EXISTING PHYSICAL CONDITIONS FOUND AT THE SUBJECT SITE, AND THE FOLLOWING REFERENCES:
 - CURRENT NYC DEPARTMENT OF FINANCE TAX MAP FOR BLOCK 2351 IN THE BRONX, DATED 10/11/18 15:30:00.
 - BOROUGH OF BRONX, RECORD MAP SECTION 7.
 - BOROUGH OF BRONX, OFFICE MAP SECTION 7.
 - "ALTA/NPS LAND TITLE SURVEY, 404 EXTERIOR STREET, 445 GERARD AVENUE, 417 GERARD AVENUE", BY LANGAN, PROJECT NO. 170487003, DRAWING NO. V.101, DATED 03/29/19, LAST REVISED 12/10/20.
 - OPEN: 202100004641, RECORDED/FILED 01/06/21 14:48 [DEED- BLOCK 2351 LOTS 1, 3, 12, & 20]
 - "NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION BROWNFIELD CLEANUP PROGRAM, BROWNFIELD SITE CLEANUP AGREEMENT, INDEX NO. C20311-05-18, GERARD AVENUE AND EAST 146TH STREET SITE", DEC. SITE NO.: C20311, SIGNED AND DATED 06/27/18 BY MICHAEL J. RYAN, P.E., DIRECTOR, DIVISION OF ENVIRONMENTAL REMEDIATION.
 - LETTER FROM MICHAEL J. RYAN, P.E., DIRECTOR, DIVISION OF ENVIRONMENTAL REMEDIATION, "RE: SITE NAME: GERARD AVENUE AND EAST 146TH STREET SITE, SITE NO.: C20311, LOCATION OF SITE: 417 AND 445 GERARD AVENUE, 440 MAJ WM DEEGAN BLVD, BRONX COUNTY, BRONX, NY 10451, TAX MAP ID NOS.: 2351-1, 2351-3, 2351-12 AND 2351-20" DATED 12/18/19.
- THE SURVEYED PROPERTY IS SUBJECT BUT NOT LIMITED TO THE FOLLOWING FACTS AS REVEALED BY THE HERON REFERENCED INFORMATION, THE INFORMATION SHOWN HEREON DOES NOT CONSTITUTE A TITLE SEARCH BY THE SURVEYOR. ALL INFORMATION THAT MAY AFFECT THE QUALITY OF TITLE TO BOTH THE SUBJECT AND ADJOINING PARCELS SHOULD BE VERIFIED BY AN ACCURATE AND CURRENT TITLE REPORT.
- THE MERIDIAN OF THIS SURVEY IS REFERENCED TO THE NEW YORK STATE PLANE COORDINATE SYSTEM NY11 WADSWORTH AS ESTABLISHED BY GPS METHODS.
- STREET NAMES, R.O.W. WIDTHS, BLOCK, AND LOT NUMBERS AS PER MAPS REFERENCED IN NOTES 1A, 1B, AND 1D.
- OFFSETS (IF SHOWN) ARE FOR SURVEY REFERENCES ONLY AND ARE NOT TO BE USED IN CONSTRUCTION OF ANY TYPE.
- METLANDS, ENVIRONMENTAL AND/OR HAZARDOUS MATERIALS LOCATION, IF ANY, NOT COVERED UNDER THIS CONTRACT.
- UNLESS SPECIFICALLY NOTED HERON, STORM AND SANITARY SEWER INFORMATION (INCLUDING PIPE INVERT, PIPE MATERIAL, AND PIPE SIZE) WAS OBSERVED AT FIELD LOCATED STRUCTURES (MANHOLES/CATCH BASINS, ETC.). CONDITIONS CAN VARY FROM THOSE INDICATED AT THE TIMES WHEN AND THE LOCATIONS WHERE DATA WAS OBTAINED, DESPITE MEETING THE REQUIRED STANDARD OF CARE. THE SURVEYOR CANNOT AND DOES NOT WARRANT THAT PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE RUN ARE THE SAME AS THOSE OBSERVED AT EACH STRUCTURE, OR THAT THE PIPE RUN IS STRAIGHT BETWEEN THE LOCATED STRUCTURES.
- ADDITIONAL UTILITY (WATER, GAS, ELECTRIC, ETC.) DATA MAY BE SHOWN FROM FIELD LOCATED SURFACE MARKINGS (BY OTHERS), EXISTING STRUCTURES, AND/OR FROM EXISTING DRAWINGS.
- UNLESS SPECIFICALLY NOTED HERON THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES TO THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFORMATION INDICATED HERON.
- PRIOR TO ANY DESIGN OR CONSTRUCTION THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.
- UNLESS NOTED BELOW SUPPLEMENTAL DOCUMENTS WERE NOT USED TO COMPLETE THE SUBSURFACE UTILITY INFORMATION SHOWN HEREON.
- BLOCK 2351 LOTS 1, 3, 12, AND 20 ARE CURRENTLY UNDER CONSTRUCTION.
- EASEMENTS AND/OR LIMITING PLANES, IF ANY, IN ADDITION TO THE DEC EASEMENT ARE NOT SHOWN.
- ADDRESS, BOP SITE NAME, BOP SITE NUMBER, AND LOTS TO BE INCLUDED IN PROPOSED EASEMENT SHOWN PER DOCUMENTS CITED IN NOTES 1F AND 1G.
- UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7208, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.
- THIS PLAN NOT VALID UNLESS EMBOSSED OR BLUE INK STAMPED WITH THE SEAL OF THE PROFESSIONAL.

**SURVEY DESCRIPTION
DEC EASEMENT (BLOCK 2351 LOTS 1, 3, 12, & 20)**

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF BRONX, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF EAST 144TH STREET (60' WIDE) WITH THE EASTERLY SIDE OF EXTERIOR STREET (AKA MAJOR DEEGAN BOULEVARD) (IRREGULAR WIDTH), AND RUNNING THENCE:

NORTHERLY ALONG SAID EASTERLY SIDE OF EXTERIOR STREET, N16°21'00"E 47.46 FEET TO A POINT; THENCE NORTHERLY CONTINUING ALONG SAID EASTERLY SIDE OF EXTERIOR STREET, N23°58'06"E 150.69 FEET TO THE CORNER FORMED BY THE INTERSECTION OF SAID EASTERLY SIDE OF EXTERIOR STREET WITH THE SOUTHERLY SIDE OF EAST 146TH STREET (60' WIDE); THENCE:

EASTERLY ALONG SAID SOUTHERLY SIDE OF EAST 146TH STREET, S71°14'04"E 180.18 FEET TO THE CORNER FORMED BY THE INTERSECTION OF SAID SOUTHERLY SIDE OF EAST 146TH STREET WITH THE WESTERLY SIDE OF GERARD AVENUE (60' WIDE); THENCE:

SOUTHERLY ALONG SAID WESTERLY SIDE OF GERARD AVENUE, S16°21'02"W 188.26 FEET TO THE CORNER FORMED BY THE INTERSECTION OF SAID WESTERLY SIDE OF GERARD AVENUE WITH SAID NORTHERLY SIDE OF EAST 144TH STREET; THENCE:

WESTERLY ALONG SAID NORTHERLY SIDE OF EAST 144TH STREET N71°03'45"W 200.20 FEET TO THE POINT OR PLACE OF BEGINNING.

ENCLOSING AN AREA OF 0.87445 ACRES, MORE OR LESS.

**DEED DESCRIPTION
BLOCK 2351 LOT 1 (SEE NOTE 1E)**

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF BRONX, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF EAST 144TH STREET WITH THE EASTERLY SIDE OF EXTERIOR STREET (AKA MAJOR DEEGAN BOULEVARD);

RUNNING THENCE NORTHERLY ALONG SAID EASTERLY SIDE OF EXTERIOR STREET, NORTH 16 DEGREES 21' 00" EAST 47.46 FEET TO A POINT;

THENCE EASTERLY ALONG A LINE, NORTH 89 DEGREES 40' 57" EAST 104.39 FEET TO A POINT;

THENCE SOUTHERLY AND PARALLEL WITH THE EASTERLY SIDE OF EXTERIOR STREET, SOUTH 16 DEGREES 21' 00" WEST 81.92 FEET TO THE AFOREMENTIONED NORTHERLY SIDE OF EAST 144TH STREET;

THENCE WESTERLY ALONG SAID NORTHERLY SIDE OF EAST 144TH STREET, NORTH 71 DEGREES 03' 45" WEST 100.10 FEET TO THE POINT OR PLACE OF BEGINNING.

**DEED DESCRIPTION
BLOCK 2351 LOT 3 (SEE NOTE 1E)**

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF BRONX, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE SOUTHERLY SIDE OF EAST 146TH STREET WITH THE EASTERLY SIDE OF EXTERIOR STREET (AKA MAJOR DEEGAN BOULEVARD);

RUNNING THENCE EASTERLY ALONG SAID SOUTHERLY SIDE OF EAST 146TH STREET, SOUTH 71 DEGREES 14' 04" 80.18 FEET TO A POINT;

THENCE SOUTHERLY AND PARALLEL WITH THE WESTERLY SIDE OF GERARD AVENUE, SOUTH 16 DEGREES 21' 02" WEST 100.09 FEET TO A POINT;

THENCE EASTERLY AND PARALLEL WITH THE AFOREMENTIONED SOUTHERLY SIDE OF EAST 146TH STREET, SOUTH 71 DEGREES 14' 04" EAST 46.65 FEET TO A POINT;

THENCE WESTERLY ALONG A LINE, SOUTH 89 DEGREES 40' 57" WEST 153.13 FEET TO THE AFOREMENTIONED EASTERLY SIDE OF EXTERIOR STREET;

THENCE ALONG SAID EASTERLY SIDE OF EXTERIOR STREET, NORTH 23 DEGREES 58' 06" EAST 150.69 FEET TO THE POINT OR PLACE OF BEGINNING.

**DEED DESCRIPTION
BLOCK 2351 LOT 12 (SEE NOTE 1E)**

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF BRONX, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE SOUTHERLY SIDE OF EAST 146TH STREET WITH THE WESTERLY SIDE OF GERARD AVENUE;

RUNNING THENCE SOUTHERLY ALONG SAID WESTERLY SIDE OF GERARD AVENUE, SOUTH 16 DEGREES 21' 02" WEST 100.09 FEET TO A POINT;

THENCE WESTERLY AND PARALLEL WITH SAID SOUTHERLY SIDE OF EAST 146TH STREET, NORTH 71 DEGREES 14' 04" WEST 100.00 FEET TO A POINT;

THENCE NORTHERLY AND PARALLEL WITH SAID WESTERLY SIDE OF GERARD AVENUE, NORTH 16 DEGREES 21' 02" EAST 100.09 FEET TO THE AFOREMENTIONED SOUTHERLY SIDE OF EAST 146TH STREET;

THENCE EASTERLY ALONG SAID SOUTHERLY SIDE OF EAST 144TH STREET, SOUTH 71 DEGREES 14' 04" EAST 100.00 FEET TO THE POINT OR PLACE OF BEGINNING.

**DEED DESCRIPTION
BLOCK 2351 LOT 20 (SEE NOTE 1E)**

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF BRONX, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF EAST 144TH STREET WITH THE WESTERLY SIDE OF GERARD AVENUE;

RUNNING THENCE WESTERLY ALONG SAID NORTHERLY SIDE OF EAST 144TH STREET, NORTH 71 DEGREES 03' 45" WEST 100.10 FEET TO A POINT;

THENCE NORTHERLY ALONG A LINE, NORTH 16 DEGREES 21' 00" EAST 81.92 FEET TO A POINT;

THENCE NORTHERLY ALONG A LINE, NORTH 89 DEGREES 40' 57" EAST 48.74 FEET TO A POINT;

THENCE EASTERLY AND PARALLEL WITH THE SOUTHERLY SIDE OF EAST 146TH STREET, SOUTH 71 DEGREES 14' 04" EAST 53.35 FEET TO A POINT;

THENCE SOUTHERLY ALONG SAID WESTERLY SIDE OF GERARD AVENUE, SOUTH 16 DEGREES 21' 02" WEST 98.17 FEET TO THE POINT OR PLACE OF BEGINNING.

**SURVEY DESCRIPTION
BLOCK 2351 LOT 3**

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF BRONX, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE SOUTHERLY SIDE OF EAST 146TH STREET WITH THE EASTERLY SIDE OF EXTERIOR STREET (AKA MAJOR DEEGAN BOULEVARD);

RUNNING THENCE SOUTHERLY ALONG SAID SOUTHERLY SIDE OF EAST 146TH STREET, SOUTH 71 DEGREES 14' 04" EAST 80.18 FEET TO A POINT;

THENCE WESTERLY AND PARALLEL WITH THE WESTERLY SIDE OF GERARD AVENUE, SOUTH 16 DEGREES 21' 02" WEST 100.09 FEET TO A POINT;

THENCE EASTERLY AND PARALLEL WITH THE AFOREMENTIONED SOUTHERLY SIDE OF EAST 146TH STREET, SOUTH 71 DEGREES 14' 04" EAST 46.65 FEET TO A POINT;

THENCE WESTERLY ALONG A LINE, SOUTH 89 DEGREES 40' 57" WEST 153.13 FEET TO THE AFOREMENTIONED EASTERLY SIDE OF EXTERIOR STREET;

THENCE NORTHERLY ALONG SAID EASTERLY SIDE OF EXTERIOR STREET, NORTH 23 DEGREES 58' 06" EAST 150.69 FEET TO THE POINT OR PLACE OF BEGINNING.

**SURVEY DESCRIPTION
BLOCK 2351 LOT 12**

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF BRONX, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE SOUTHERLY SIDE OF EAST 146TH STREET WITH THE WESTERLY SIDE OF GERARD AVENUE;

RUNNING THENCE SOUTHERLY ALONG SAID WESTERLY SIDE OF GERARD AVENUE, SOUTH 16 DEGREES 21' 02" WEST 100.09 FEET TO A POINT;

THENCE WESTERLY AND PARALLEL WITH SAID SOUTHERLY SIDE OF EAST 146TH STREET, NORTH 71 DEGREES 14' 04" WEST 100.00 FEET TO A POINT;

THENCE NORTHERLY AND PARALLEL WITH SAID WESTERLY SIDE OF GERARD AVENUE, NORTH 16 DEGREES 21' 02" EAST 100.09 FEET TO THE AFOREMENTIONED SOUTHERLY SIDE OF EAST 146TH STREET;

THENCE EASTERLY ALONG SAID SOUTHERLY SIDE OF EAST 144TH STREET, SOUTH 71 DEGREES 14' 04" EAST 100.00 FEET TO THE POINT OR PLACE OF BEGINNING.

**SURVEY DESCRIPTION
BLOCK 2351 LOT 20**

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF BRONX, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF EAST 144TH STREET WITH THE WESTERLY SIDE OF GERARD AVENUE;

RUNNING THENCE WESTERLY ALONG SAID NORTHERLY SIDE OF EAST 144TH STREET, NORTH 71 DEGREES 03' 45" WEST 100.10 FEET TO A POINT;

THENCE NORTHERLY ALONG A LINE, NORTH 16 DEGREES 21' 00" EAST 81.92 FEET TO A POINT;

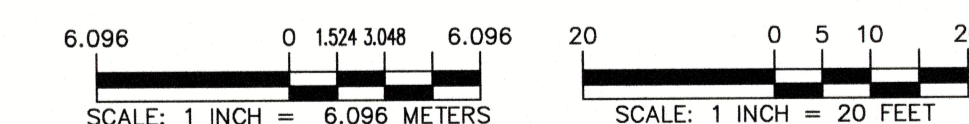
THENCE NORTHERLY ALONG A LINE, NORTH 89 DEGREES 40' 57" EAST 48.74 FEET TO A POINT;

THENCE EASTERLY AND PARALLEL WITH THE SOUTHERLY SIDE OF EAST 146TH STREET, SOUTH 71 DEGREES 14' 04" EAST 53.35 FEET TO A POINT;

THENCE SOUTHERLY ALONG SAID WESTERLY SIDE OF GERARD AVENUE, SOUTH 16 DEGREES 21' 02" WEST 98.17 FEET TO THE POINT OR PLACE OF BEGINNING.

LEGEND (NOT SHOWN TO SCALE)

- P.O.B. ——— POINT OF BEGINNING
- S.F. ——— SQUARE FEET
- AKA ——— ALSO KNOWN AS
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- DEC EASEMENT



THIS PROPERTY IS SUBJECT TO AN ENVIRONMENTAL EASEMENT HELD BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PURSUANT TO TITLE 36 OF ARTICLE 71 OF THE NEW YORK ENVIRONMENTAL CONSERVATION LAW. THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THIS EASEMENT ARE SET FORTH IN MORE DETAIL IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP CAN BE OBTAINED FROM NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NY 12233 OR AT derweb@dec.ny.gov.

Date	Description	No.
REVISIONS		

I hereby state that this plan is the result of a field survey made by me or under my immediate supervision in accordance with NYSPLS Code of Practice for Land Surveyors and to the best of my professional knowledge, information and belief, and in conformity with the conditions of my professional contract, bearing in mind the conditions found on the site of the subject property.

SIGNATURE: *Paul Fisher* DATE SIGNED: *05-20-2021*
 PROFESSIONAL LAND SURVEYOR NY Lic. No. 050784-1

LANGAN
 Langan Engineering, Environmental, Surveying,
 Landscape Architecture and Geology, D.P.C.
 21 Penn Plaza, 360 West 31st Street, 8th Floor
 New York, NY 10001
 T: 212.479.5400 F: 212.479.5444 www.langan.com

Project
417 AND 445 GERARD AVENUE, 440 MAJ WM DEEGAN BLVD, BRONX COUNTY, BRONX, NY 10451
 BCP SITE NAME: GERARD AVENUE AND EAST 146TH STREET SITE
 BCP SITE NO.: C20311
 BLOCK No. 2351, LOT Nos. 1, 3, 12, & 20
 BOROUGH OF BRONX
 CITY OF NEW YORK
 NEW YORK

Drawing Title
DEC EASEMENT SURVEY

Project No. **170487003**
 Date **06/04/21**
 Scale **1"=20'**
 Drawn By **LB**
 Checked By **PDF**
 Drawing No. **DEC101**
 Sheet 001 of 001

Filename: \\langan.com\data\NY\10487003\Survey\Draw - 170487003\Cartoon\Existing\170487003 & 170488401-DEC101-DEC Easement Surveys.dwg Date: 9/15/2021 Time: 14:52 User: berliner Style Table: Langan.sbt Layout: ARCHD-BL-170487003-For Block 2351 DEC Easement Survey

APPENDIX B
IC/EC Certification Form



Enclosure 2
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form



	Site Details	Box 1	
Site No.	C203111		
Site Name Gerard Avenue and East 146th Street Site			
Site Address: 417 and 445 Gerard Ave, 440 Maj. Wm. Deegan Blvd,		Zip Code: 10451	
City/Town: Bronx			
County: Bronx			
Site Acreage: 0.874			
Reporting Period: February 28, 2024 to February 28, 2025			
		YES	NO
1.	Is the information above correct?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If NO, include handwritten above or on a separate sheet.			
2.	Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.	Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.	Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.			
5.	Is the site currently undergoing development?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		Box 2	
		YES	NO
6.	Is the current site use consistent with the use(s) listed below? Restricted-Residential, Commercial, and Industrial	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7.	Are all ICs in place and functioning as designed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.			
A Corrective Measures Work Plan must be submitted along with this form to address these issues.			
_____ Signature of Owner, Remedial Party or Designated Representative		_____ Date	

Box 2A

8. Has any new information revealed that assumptions made in the Qualitative Exposure Assessment regarding offsite contamination are no longer valid?

YES NO

If you answered YES to question 8, include documentation or evidence that documentation has been previously submitted with this certification form.

9. Are the assumptions in the Qualitative Exposure Assessment still valid?
(The Qualitative Exposure Assessment must be certified every five years)

If you answered NO to question 9, the Periodic Review Report must include an updated Qualitative Exposure Assessment based on the new assumptions.

SITE NO. C203111

Box 3

Description of Institutional Controls

Parcel

Owner

Institutional Control

2351-1

445 Gerard Owner LLC

Ground Water Use Restriction
Soil Management Plan
Landuse Restriction
Monitoring Plan
Site Management Plan
IC/EC Plan

- Compliance with the Environmental Easement and SMP
- Operation and maintenance of Environmental Controls as specified in the SMP
- Inspection of all Engineering Controls at frequency specified in the SMP
- Reporting of data at frequency specified in SMP

Institutional Controls in the form of site restrictions:

- Long-term IC/EC must be employed to allow for restricted residential, commercial or industrial use
- Property may not be used for a higher level of use
- Future activities disturbing remaining contamination must be adhere to SMP
- Prohibited use of groundwater without treatment
- Prohibited farming and vegetable gardens
- Periodic review and certification at frequency specified in the SMP
- Monitoring to assess the performance and effectiveness of the remedy as defined in the SMP
- Access to the site must be provided to NYS with reasonable prior notice

2351-12

445 Gerard Owner LLC

Ground Water Use Restriction
Soil Management Plan
Landuse Restriction
Monitoring Plan
Site Management Plan
IC/EC Plan

- Compliance with the Environmental Easement and SMP
- Operation and maintenance of Environmental Controls as specified in the SMP
- Inspection of all Engineering Controls at frequency specified in the SMP
- Reporting of data at frequency specified in SMP

Institutional Controls in the form of site restrictions:

- Long-term IC/EC must be employed to allow for restricted residential, commercial or industrial use
- Property may not be used for a higher level of use
- Future activities disturbing remaining contamination must be adhere to SMP
- Prohibited use of groundwater without treatment
- Prohibited farming and vegetable gardens
- Periodic review and certification at frequency specified in the SMP
- Monitoring to assess the performance and effectiveness of the remedy as defined in the SMP
- Access to the site must be provided to NYS with reasonable prior notice

2351-20

445 Gerard Owner LLC

Ground Water Use Restriction
Soil Management Plan
Landuse Restriction
Monitoring Plan
Site Management Plan
IC/EC Plan

- Compliance with the Environmental Easement and SMP
- Operation and maintenance of Environmental Controls as specified in the SMP
- Inspection of all Engineering Controls at frequency specified in the SMP
- Reporting of data at frequency specified in SMP

Institutional Controls in the form of site restrictions:

- Long-term IC/EC must be employed to allow for restricted residential, commercial or industrial use
- Property may not be used for a higher level of use
- Future activities disturbing remaining contamination must be adhere to SMP
- Prohibited use of groundwater without treatment
- Prohibited farming and vegetable gardens

- Periodic review and certification at frequency specified in the SMP
- Monitoring to assess the performance and effectiveness of the remedy as defined in the SMP
- Access to the site must be provided to NYS with reasonable prior notice

2351-3

445 Gerard Owner LLC

Ground Water Use Restriction
 Soil Management Plan
 Landuse Restriction
 Monitoring Plan
 Site Management Plan
 IC/EC Plan

- Compliance with the Environmental Easement and SMP
- Operation and maintenance of Environmental Controls as specified in the SMP
- Inspection of all Engineering Controls at frequency specified in the SMP
- Reporting of data at frequency specified in SMP

Institutional Controls in the form of site restrictions:

- Long-term IC/EC must be employed to allow for restricted residential, commercial or industrial use
- Property may not be used for a higher level of use
- Future activities disturbing remaining contamination must be adhere to SMP
- Prohibited use of groundwater without treatment
- Prohibited farming and vegetable gardens
- Periodic review and certification at frequency specified in the SMP
- Monitoring to assess the performance and effectiveness of the remedy as defined in the SMP
- Access to the site must be provided to NYS with reasonable prior notice

Box 4

Description of Engineering Controls

<u>Parcel</u>	<u>Engineering Control</u>
2351-1	Cover System
Cover System	
2351-12	Cover System Monitoring Wells
Site Cover	
2351-20	Cover System
Site Cover	
2351-3	Cover System Monitoring Wells
- Site Cover	

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that:

a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the Engineering Control certification;

b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and complete.

YES NO

2. For each Engineering control listed in Box 4, I certify by checking "YES" below that all of the following statements are true:

(a) The Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

(b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

(c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

(d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

(e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES NO

IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

Signature of Owner, Remedial Party or Designated Representative

Date

EC CERTIFICATIONS

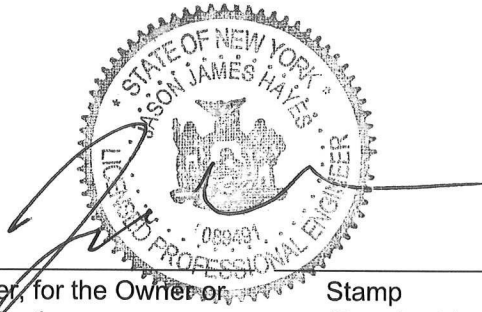
Box 7

Professional Engineer Signature

I certify that all information in Boxes 4 and 5 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 JASON HAYES at 360 W 31ST ST., 8TH FL, NEW YORK, N.Y
print name print business address

am certifying as a Professional Engineer for the OWNER
(Owner or Remedial Party)



Signature of Professional Engineer, for the Owner or Remedial Party, Rendering Certification

Stamp
(Required for PE)

5-13-2025
Date

IC CERTIFICATIONS
SITE NO. C203111

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 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 Chris Papamichael at The Domain Companies, 11 Park Place, Suite
1705, New York, New York 10007
print name print business address

am certifying as 445 Gerard Owner LLC (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.



Signature of Owner, Remedial Party, or Designated Representative
Rendering Certification

5/13/2025
Date

APPENDIX C
Daily Field Reports

DAILY FIELD REPORT

WEATHER	Snow		Rain		Overcast		Partly Cloudy		Sunny	X
TEMP.	< 32		32-50		50-70		70-85		>85	X

Prepared By: LANGAN

BCP Project No:	C203111	Langan Project No:	170487003	Date/Time:	July 18, 2024 07:00 – 16:30
Project Name:	Gerard Ave and East 146 th Street				

Consultant: Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology D.P.C.	Langan Field Engineer(s): Andrew Ashley
Contractors: AARCO Environmental Services NOVA Geophysical Services	

Langan was present to oversee implementation of the July 1, 2024 Groundwater Treatment Work Plan for Brownfield Cleanup Program (BCP) Site No. C203111.

Work Activities Performed (Since Last Report):

- NOVA performed a geophysical survey to identify subsurface anomalies in preparation for the installation of monitoring wells OMW-01 and OMW-02 along the Gerard Avenue sidewalk.
- AARCO advanced a soil boring to about 30 feet below grade surface (bgs) for the installation of monitoring well OMW-2. Langan screened the recovered soil for odors, staining and organic vapors using a photoionization detector (PID).
 - Petroleum-like odor was observed from about 16 feet to 30 feet bgs. A maximum PID reading of 1,734 parts-per-million (ppm) was observed at about 22 feet bgs.
 - Groundwater was observed at about 20 feet bgs.
 - Monitoring well OMW-2 was installed at 30 feet bgs using 15 feet of schedule 40 polyvinyl chloride (PVC) 0.020-slotted screen from 30 to 15 feet bgs, and 15 feet of solid, 2-inch diameter PVC riser from 15 feet bgs to grade surface. The annulus around the well was filled No. 1 sand from 30 feet to 14 feet bgs and sealed with a grout-bentonite slurry seal to about 10 inches bgs. The monitoring well was finished with a flush-mount manhole cover.
- AARCO advanced a soil boring to about 28 feet bgs and installed monitoring well OMW-1 by setting 15 feet of schedule 40 PVC 0.020-slotted screen and about 13 feet of solid, 2-inch diameter PVC riser.

Samples Collected:

- No samples were collected

Community Air Monitoring Program (Since Last Report):

- The site is covered in a concrete cap and ground intrusive work was not performed within the BCP Site therefore, Community Air Monitoring Program (CAMP) was not implemented.

Planned Activities:

- AARCO will continue the installation of monitoring well OMW-01 along the sidewalk.

Photo Log

Photo 1:
NOVA conducting
a geophysical
survey along the
Gerard Avenue
sidewalk.






Photo 2:
AARCO installing
monitoring well
OMW-02.



SITE PLAN



LEGEND

-  CONCRETE SLAB AREA
-  PREVIOUSLY INSTALLED ON-SITE POST-REMEDIAION MONITORING WELL LOCATION
-  OFF-SITE MONITORING WELL

DAILY FIELD REPORT

Prepared By: LANGAN

WEATHER	Snow		Rain		Overcast		Partly Cloudy		Sunny	X
TEMP.	< 32		32-50		50-70		70-85		>85	X

BCP Project No:	C203111	Langan Project No:	170487003	Date/Time:	July 19, 2024 08:30 – 12:45
Project Name:	Gerard Ave and East 146 th Street				

Consultant: Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology D.P.C.	Langan Field Engineer(s): Andrew Ashley
Contractors: AARCO Environmental Services NOVA Geophysical Services	

Langan was present to oversee implementation of the July 1, 2024 Groundwater Treatment Work Plan for Brownfield Cleanup Program (BCP) Site No. C203111.

Work Activities Performed (Since Last Report):

- AARCO installed a flush-mounted road box and concrete pad for the installation of monitoring well OMW-01.
- AARCO developed monitoring wells OMW-1 and OMW-2 using a submersible pump and 1-7/8-inch surge block until purged groundwater was no longer turbid.
 - A sheen and petroleum-like odor were observed on the purged groundwater in both wells.
 - The well headspaces were screened with a photoionization detector (PID); maximum PID readings of 34.5 parts-per-million (ppm) and 55.1 ppm were observed at the purged groundwater from OMW-1 and OMW-2, respectively.

Samples Collected:

- No samples were collected

Community Air Monitoring Program (Since Last Report):

- The site is covered in a concrete cap; therefore, Community Air Monitoring Program (CAMP) was not implemented.

Planned Activities:

- Langan will document the groundwater treatment.

Photo Log

Photo 1:
AARCO installing
a flush-mounted
road box and
concrete pad at
OMW-01.






Photo 2:
AARCO
developing
OMW-02.



SITE PLAN



LEGEND

-  CONCRETE SLAB AREA
-  PREVIOUSLY INSTALLED ON-SITE POST-REMEDIATION MONITORING WELL LOCATION
-  OFF-SITE MONITORING WELL

DAILY FIELD REPORT – Day 129

WEATHER	Snow		Rain	x	Overcast		Partly Cloudy		Sunny	
TEMP.	< 32		32-50		50-70	x	70-85		>85	

Prepared By: LANGAN

BCP Project No:	C203111	Langan Project No:	170487003	Date/Time:	August 07, 2024 07:45 – 16:15
Project Name:	Gerard Ave and East 146 th Street				

Consultant: Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology D.P.C.	Langan Field Engineer(s): Loagan Clements
Contractors: N/A	

Langan was present to oversee implementation of the April 28, 2020 Remedial Action Work Plan (RAWP) for Brownfield Cleanup Program (BCP) Site No. C203111.

Work Activities Performed (Since Last Report):

- Langan performed synoptic gauging of four groundwater monitoring wells.
- Langan used a peristaltic pump to purge and sample post-injection groundwater monitoring wells RMW09, RMW14, OMW-01, and OMW-02. Purged groundwater was screened for odors, sheen, and organic vapors using a photoionization detector (PID).
 - PID readings between 1.0 parts per million (ppm) and 3.8 ppm were observed in the headspace of all wells.
 - Petroleum-like odors were observed in water purged from well RMW14. Visual signs of impacts were not observed. Odors and visual signs of impacts were not observed in the wells RMW09, OMW-01, or OMW-02.
 - Purged groundwater was containerized in a 55-gallon New York State Department of Transportation (NYSDOT)-approved drum for future disposal.

Samples Collected:

- Langan collected four groundwater samples, OMW-01_080724, OMW-02_080724, RMW14_080724, and RMW09_080724, plus quality assurance/quality control (QA/QC) samples, to be analyzed for volatile organic compounds (VOCs).
- Samples were submitted to Alpha Analytical Laboratories, Inc. (Alpha) of Mahwah, New Jersey, a New York State Department of Health (NYSDOH) Environmental Laboratory Accredited Program (ELAP)-certified laboratory under standard chain-of-custody protocols.

Community Air Monitoring Program (Since Last Report):

- The site is covered in a concrete cap; therefore, Community Air Monitoring Program (CAMP) was not implemented.

Planned Activities:

- Langan will continue groundwater sampling on August 08, 2024.

Photo Log

Photo 1:
View of
groundwater
sampling at
OMW-02.







Photo 2:
View of
groundwater
purged from
RMW14.



SITE PLAN



LEGEND

-  CONCRETE SLAB AREA
-  MONITORING WELL LOCATION
-  MONITORING WELL SAMPLED TODAY
-  DRUM LOCATION

DAILY FIELD REPORT – Day 129

WEATHER	Snow		Rain	x	Overcast		Partly Cloudy		Sunny	
TEMP.	< 32		32-50		50-70	x	70-85		>85	

Prepared By: LANGAN

BCP Project No:	C203111	Langan Project No:	170487003	Date/Time:	August 08, 2024 07:50 – 13:10
Project Name:	Gerard Ave and East 146 th Street				

Consultant: Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology D.P.C.	Langan Field Engineer(s): Loagan Clements
Contractors: N/A	

Langan was present to oversee implementation of the April 28, 2020 Remedial Action Work Plan (RAWP) for Brownfield Cleanup Program (BCP) Site No. C203111.

Work Activities Performed (Since Last Report):

- Langan performed synoptic gauging of four groundwater monitoring wells.
- Langan used a peristaltic pump to purge and sample post-injection groundwater monitoring wells RMW10, RMW03, and RMW01. Purged groundwater was screened for odors, sheen, and organic vapors using a photoionization detector (PID).
 - PID readings between 0.4 parts per million (ppm) and 3.9 ppm were observed in all wells beneath the well caps.
 - Petroleum-like odors were observed in water purged from well RMW10. Visual signs of impacts were not observed. Odors and visual signs of impacts were not observed in the well RMW03 or RMW01.
 - Purged groundwater was containerized in a 55-gallon New York State Department of Transportation (NYSDOT)-approved drum for future disposal.

Samples Collected:

- Langan collected three groundwater samples, RMW10_080824, RMW03_080824, and RMW01_080824 plus quality assurance/quality control (QA/QC) samples, to be analyzed for volatile organic compounds (VOCs).
- Samples were submitted to Alpha Analytical Laboratories, Inc. (Alpha) of Mahwah, New Jersey, a New York State Department of Health (NYSDOH) Environmental Laboratory Accredited Program (ELAP)-certified laboratory under standard chain-of-custody protocols.

Community Air Monitoring Program (Since Last Report):

- The site is covered in a concrete cap; therefore, Community Air Monitoring Program (CAMP) was not implemented.

Planned Activities:

- None.

Photo Log

Photo 1:
View of
groundwater
sampling at
RMW10.







Photo 2:
View of
groundwater
sampling at
RMW03.



SITE PLAN



LEGEND

-  CONCRETE SLAB AREA
-  MONITORING WELL LOCATION
-  MONITORING WELL SAMPLED TODAY
-  DRUM LOCATION

DAILY FIELD REPORT

LANGAN

PROJECT No.: 170487001	CLIENT:	DATE: Monday, February 24, 2024
PROJECT: 445 Gerard Avenue	445 Gerard Owner LLC c/o The Domain Companies	WEATHER: Overcast, 36-45 °F Wind: N @ 3 – 5 mph
LOCATION: Brooklyn, New York		TIME: 7:00 am – 2:00 pm
BCP Site Number: C203111		MONITOR: Shawn Martin

EQUIPMENT: Sigma 92 CFM Compressor Pneumatic Pump	PRESENT AT SITE: Langan: Shawn Martin Coastal Environmental Solutions, Inc. (Coastal) (Drilling Subcontractor): John Slavin, Anthony Pittelli
--	--

OBSERVATIONS, DISCUSSIONS, TEST RESULTS, ETC.: Langan was on-site to document implementation of the New York State Department of Environmental Conservation (NYSDEC)-approved December 2, 2024 Groundwater Treatment Work Plan. Site Activities <ul style="list-style-type: none">Coastal Environmental Solutions, Inc. (Coastal) partially completed PetroFix® application in existing off-site monitoring well, OMW-02.<ul style="list-style-type: none">A total of 1,000 gallons of PetroFix® was injected at approximately 10-15 psi using a pneumatic pump at the target interval of 15-30 feet below grade surface (bgs).The mixture was applied in 20, 50 gallon batches.Langan used a YSI 600 XL water quality meter to collect water quality readings from off-site monitoring wells OMW-01 and OMW-02, and on-site post-remediation monitoring well RMW14 during remedial injections. Monitoring well headspace readings were collected using a photoionization detector (PID); a maximum headspace reading of 13.2 parts per million (ppm) was observed in OMW-02; PID readings above background were not observed in OMW-01 and RMW14. Material Tracking <ul style="list-style-type: none">No material was exported from the site.No material was imported to the site. Sampling <ul style="list-style-type: none">No samples were collected.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin
			LANGAN

CAMP Activities

- Community air monitoring was not implemented as ground intrusive work was not being performed.

Anticipated Activities

- Coastal will continue remedial injections in OMW-02 and begin injections in monitoring well OMW-01.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin LANGAN
-----	---	-----	-------------------------------

Site Photographs:



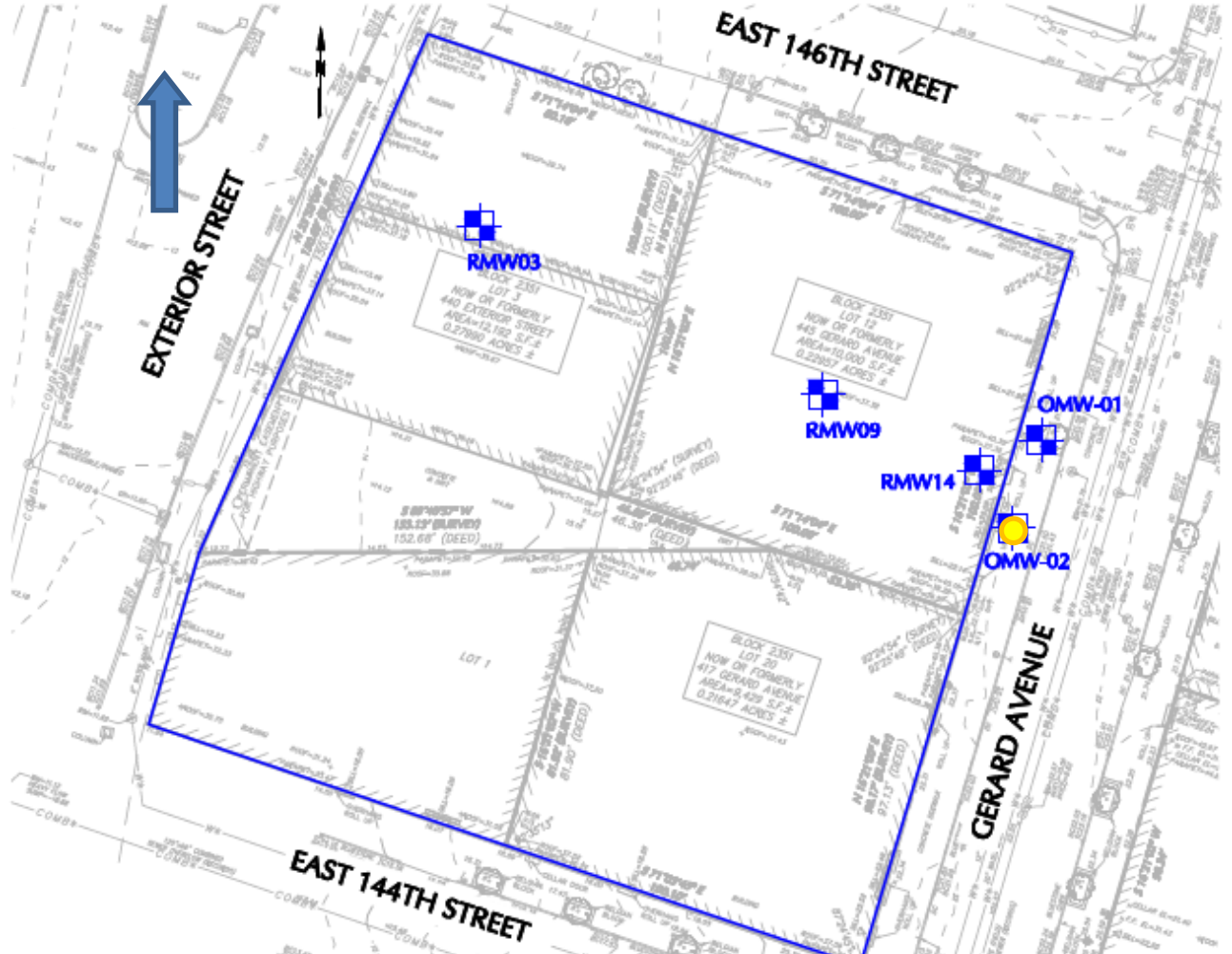
Photo 1: View of Coastal injecting PetroFix into off-site monitoring well OMW-02.

Cc: K. Semon, M. Aronica, C. Devin (Langan)





By: Shawn Martin

LANGAN

Site Map



Legend:

-  Wind Direction
-  Site Boundary
-  In progress Injection Point
-  Completed Injection Point

Cc: K. Semon, M. Aronica, C. Devin (Langan)

By: Shawn Martin

LANGAN

DAILY FIELD REPORT

LANGAN

PROJECT No.: 170487001	CLIENT: 445 Gerard Owner LLC c/o The Domain Companies	DATE: Tuesday, February 25, 2024
PROJECT: 445 Gerard Avenue		WEATHER: Sunny, 36-45 °F Wind: SSW @ 2 – 6 mph
LOCATION: Brooklyn, New York		TIME: 7:00 am – 2:30 pm
BCP Site Number: C203111		MONITOR: Shawn Martin

EQUIPMENT: Sigma 92 CFM Compressor Pneumatic Pump	PRESENT AT SITE: Langan: Shawn Martin Coastal Environmental - Inc. (Coastal) (Drilling Subcontractor): John Slavin, Anthony Pittelli
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OBSERVATIONS, DISCUSSIONS, TEST RESULTS, ETC.:
Langan was on-site to document implementation of the New York State Department of Environmental Conservation (NYSDEC)-approved December 2, 2024 Groundwater Treatment Work Plan.

Site Activities

- Coastal Environmental Solutions, Inc. (Coastal) completed PetroFix® application in existing off-site monitoring well, OMW-02.
 - 1,047 gallons of PetroFix® was injected at approximately 10-15 psi using a pneumatic pump at the target interval of 15-30 feet below grade surface (bgs).
 - A total of 2,047 gallons of PetroFix® were injected into the monitoring point on February 24 and 25, 2025. The mixture was applied in 40, 50-gallon batches, with the exception of the final batch which was applied in 47 gallons.
- Langan used a YSI 600 XL water quality meter to collect water quality readings from off-site monitoring wells OMW-01, OMW-02, and on-site post -remediation monitoring well RMW14 during remedial injections. Monitoring well headspace readings were collected using a photoionization detector (PID); maximum headspace readings of 11.6 parts per million (ppm) was observed in OMW-02; PID readings above background were not observed in OMW-01 and RMW14. The elevated PID reading in OMW-02 is believed to be a result of the PVC compound glue used when assembling the injection components.

Material Tracking

- No material was exported from the site.
- No material was imported to the site.

Sampling

- No samples were collected.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin
			LANGAN

CAMP Activities

- Community air monitoring was not implemented as ground intrusive work was not being performed.

Anticipated Activities

- Coastal will begin injections on monitoring well OMW-01.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin LANGAN
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Site Photographs:



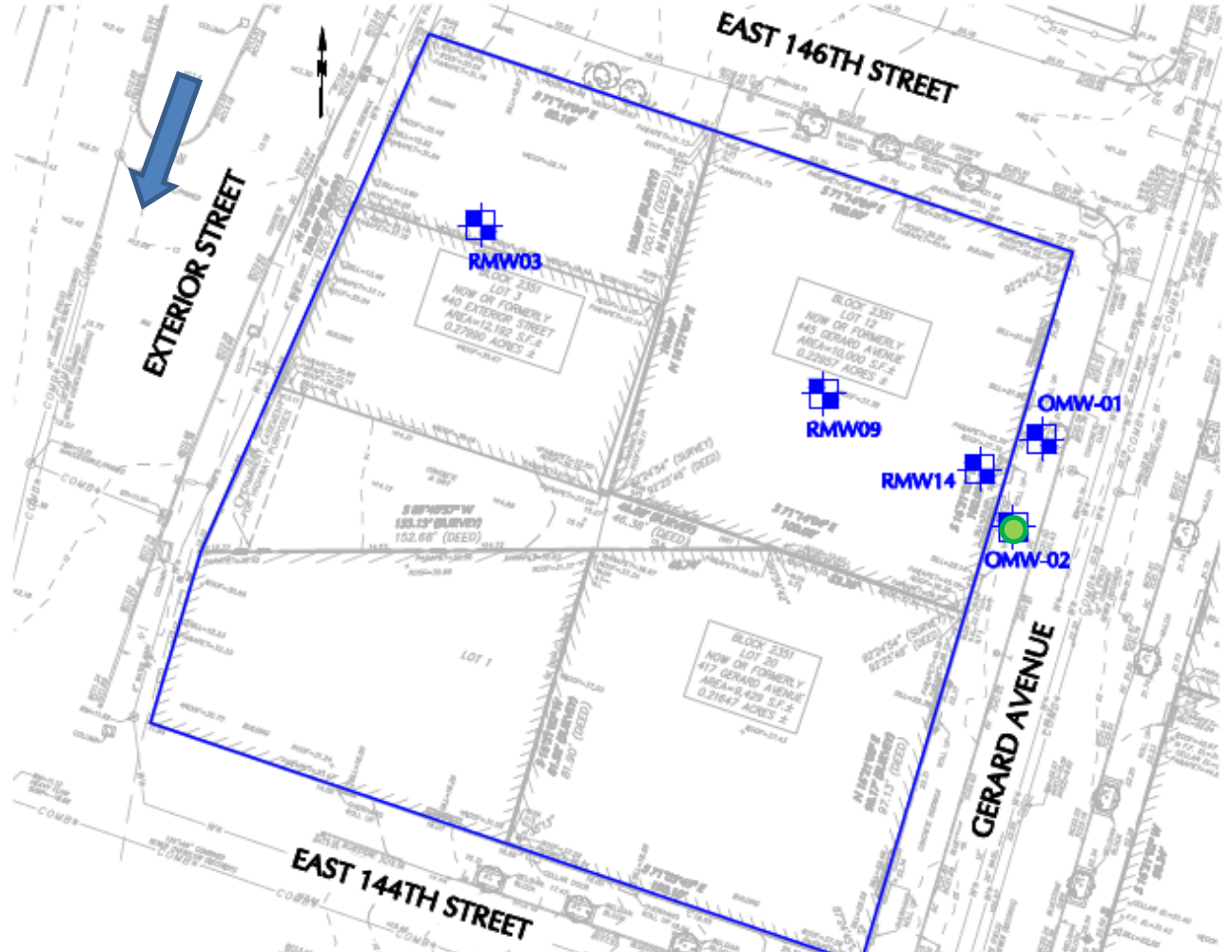
Photo 1: Injection housing and fittings connected to OMW-02







Photo 2: Injection system set up prior for injections in OMW-02

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin LANGAN
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Figure 1: Site Map



Legend:

-  Wind Direction
-  Site boundary
-  In progress injection point
-  Completed Injection Point

Cc: K. Semon, M. Aronica, C. Devin (Langan)

By: Shawn Martin

LANGAN

DAILY FIELD REPORT

LANGAN

PROJECT No.: 170487001	CLIENT:	DATE: Wednesday, February 26, 2025
PROJECT: 445 Gerard Avenue	445 Gerard Owner LLC c/o The Domain Companies	WEATHER: Sunny, 42-50 °F Wind: NE @ 1 – 5 mph
LOCATION: Brooklyn, New York		TIME: 7:00 am – 2:30 pm
BCP Site Number: C203111		MONITOR: Shawn Martin

EQUIPMENT: Sigma 92 CFM Compressor Pneumatic Pump	PRESENT AT SITE: Langan: Shawn Martin Coastal Environmental - Inc. (Coastal) (Drilling Subcontractor): John Slavin, Anthony Pittelli
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OBSERVATIONS, DISCUSSIONS, TEST RESULTS, ETC.:
Langan was on-site to observe environmental protocols in accordance with the NYSDEC-approved December 2024 Groundwater Treatment Work Plan

Site Activities

- Coastal Environmental Solutions, Inc. (Coastal) completed PetroFix® application in existing off-site monitoring well, OMW-01.
 - A total of 1,024 gallons of PetroFix® was injected at approximately 10-15 psi using a pneumatic pump at the target interval of 15-30 feet below grade surface (bgs). The mixture was applied in 21, 50 gallon batches, with the exception of the final batch which was applied in 24 gallons.
- Langan used a YSI 600 XL water quality meter to collect water quality readings from monitoring wells OMW-01, OMW-02, and RMW14 during remedial injections. Monitoring well headspace readings were collected using a photoionization detector (PID); a maximum headspace reading of 9.4 parts per million (ppm) was observed in OMW-02; PID readings above background were not observed in OMW-01 and RMW14. The elevated PID reading in OMW-02 is believed to be a result of the PVC compound glue used when assembling the injection components.

Material Tracking

- No material was exported from the site.
- No material was imported to the site.

Sampling

- No samples were collected.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin
			LANGAN

CAMP Activities

- Community air monitoring was not implemented as ground intrusive work was not being performed.

Anticipated Activities

- Coastal will begin injections on monitoring well RMW14.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin LANGAN
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Site Photographs:



Photo 1: Injection housing and fittings connected to OMW-01.

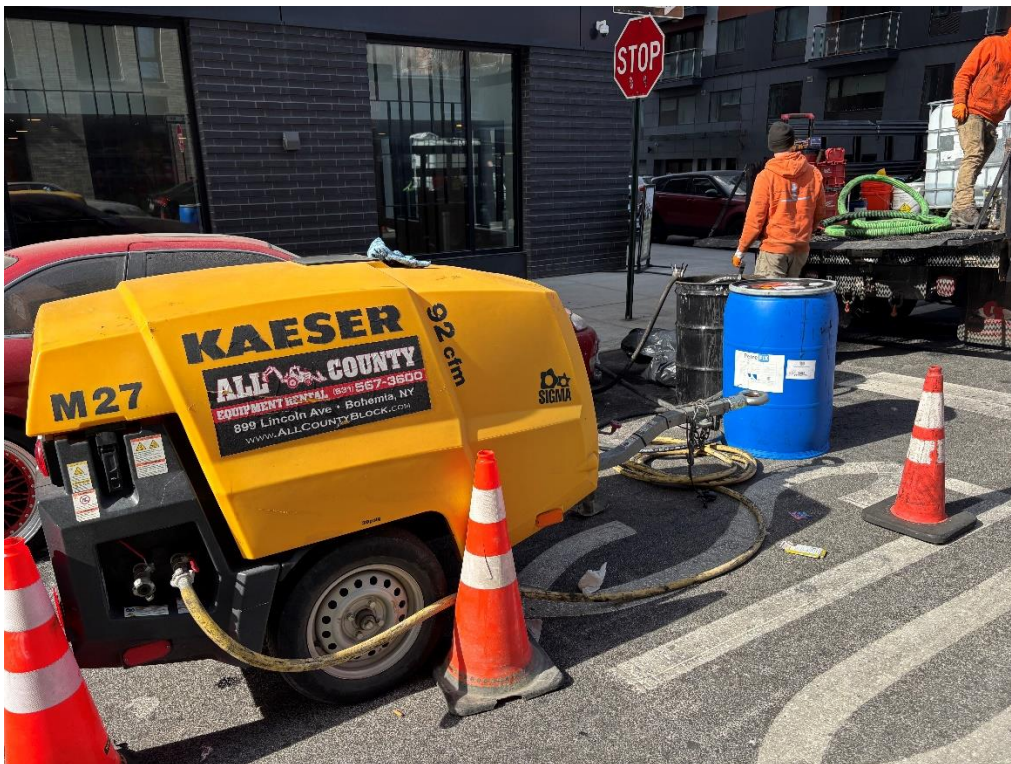


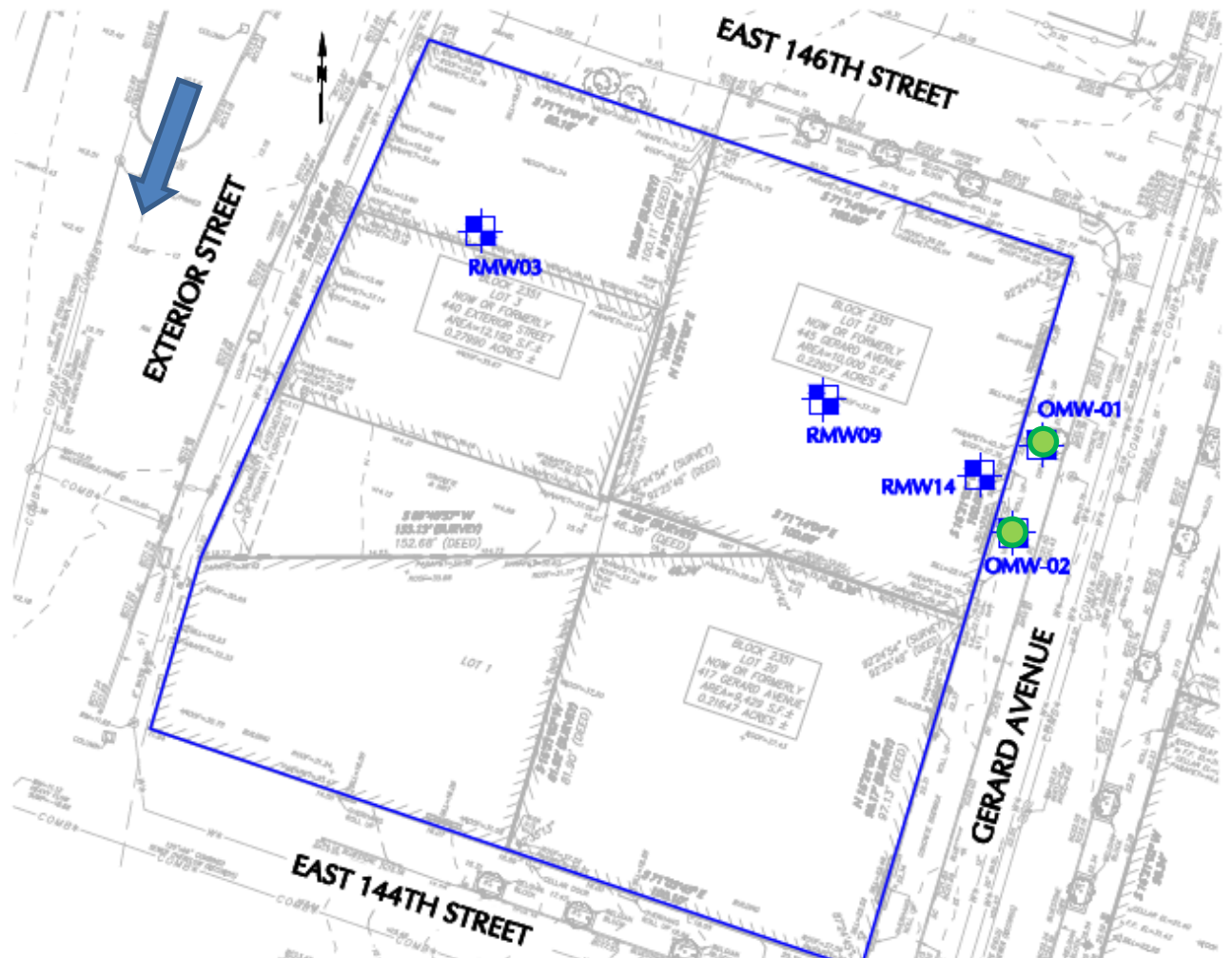
Photo 2: Injection system set up to perform injections on OMW-01

Cc: K. Semon, M. Aronica, C. Devin (Langan)





By: Shawn Martin

LANGAN

Figure 1: Site Map



Legend:

-  Wind Direction
-  Site Boundary
-  In progress Injection Point
-  Completed Injection Point

Cc: K. Semon, M. Aronica, C. Devin (Langan)

By: Shawn Martin

LANGAN

DAILY FIELD REPORT

LANGAN

PROJECT No.: 170487001	CLIENT:	DATE: Thursday, February 27, 2025
PROJECT: 445 Gerard Avenue	445 Gerard Owner LLC c/o The Domain Companies	WEATHER: Sunny, 41-53 °F Wind: NE @ 3 – 8 mph
LOCATION: Brooklyn, New York		TIME: 7:00 am – 2:30 pm
BCP Site Number: C203111		MONITOR: Shawn Martin

EQUIPMENT: Sigma 92 CFM Compressor Pneumatic Pump	PRESENT AT SITE: Langan: Shawn Martin Coastal Environmental - Inc. (Coastal) (Drilling Subcontractor): John Slavin, Anthony Pittelli
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OBSERVATIONS, DISCUSSIONS, TEST RESULTS, ETC.:
Langan was on-site to observe environmental protocols in accordance with the NYSDEC-approved December 2024 Groundwater Treatment Work Plan

Site Activities

- Coastal Environmental Solutions, Inc. (Coastal) partially completed PetroFix® application in existing on-site post-remediation monitoring well, RMW14.
 - 600 gallons of PetroFix® were injected at approximately 5-10 psi using a pneumatic pump at the target interval of 17-27 feet below grade surface (bgs). The mixture was applied in 12, 50 gallon batches.
- Langan used a YSI 600 XL water quality meter to collect water quality readings from off-site monitoring wells OMW-01, OMW-02, and RMW14 during remedial injections. Monitoring well headspace readings were collected using a photoionization detector (PID); maximum headspace readings of 14.6 parts per million (ppm) was recorded in OMW-01, 8.5 ppm in OMW-02, and 0.1 ppm in RMW14. Elevated PID readings are believed to be a result of the PVC compound glue used when assembling the injection components.

Material Tracking

- No material was exported from the site.
- No material was imported to the site.

Sampling

- No samples were collected.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin
			LANGAN

CAMP Activities

- Community air monitoring was not implemented as ground intrusive work was not being performed.

Anticipated Activities

- Coastal will continue injections on monitoring well RMW14.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin LANGAN
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Site Photographs:







Photo 1: Injection housing and fittings connected to RMW14.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin LANGAN
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Figure 1: Site Map



Legend:

-  Wind Direction
-  Site Boundary
-  In progress Injection Point
-  Completed Injection Point

Cc: K. Semon, M. Aronica, C. Devin (Langan)

By: Shawn Martin

LANGAN

DAILY FIELD REPORT

LANGAN

PROJECT No.: 170487001	CLIENT: 445 Gerard Owner LLC c/o The Domain Companies	DATE: Friday, February 28, 2025
PROJECT: 445 Gerard Avenue		WEATHER: Sunny, 48-56 °F Wind: NE @ 3 – 8 mph
LOCATION: Brooklyn, New York		TIME: 6:15 am – 12:15 pm
BCP Site Number: C203111		MONITOR: Shawn Martin

EQUIPMENT: Sigma 92 CFM Compressor Pneumatic Pump	PRESENT AT SITE: Langan: Shawn Martin Coastal Environmental - Inc. (Coastal) (Drilling Subcontractor): John Slavin, Anthony Pittelli
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OBSERVATIONS, DISCUSSIONS, TEST RESULTS, ETC.: Langan was on-site to observe environmental protocols in accordance with the NYSDEC-approved December 2024 Groundwater Treatment Work Plan
Site Activities
<ul style="list-style-type: none"> • Coastal Environmental Solutions, Inc. (Coastal) completed PetroFix® application in existing on-site post-remediation monitoring well RMW14. <ul style="list-style-type: none"> ○ 424 gallons of PetroFix® was injected at approximately 10-15 psi using a pneumatic pump at the target interval of 17-27 feet below grade surface (bgs). ○ A total of 1,024 gallons of PetroFix® were injected into the monitoring point on February 27 and 28, 2025. The mixture was applied in 21, 50-gallon batches, with the exception of the final batch which was applied in 24 gallons. • Coastal completed a calcium chloride (CaCl₂) flush in RMW14 following PetroFix® application. The flush was completed in three steps: <ul style="list-style-type: none"> ○ RMW14 was surged followed by an injection of 29 gallons of water ○ CaCl₂ solution consisting of 33 gallons of water and 16.6 pounds of CaCl₂ was applied to RMW14 ○ 29 gallons of water was flushed in RMW14 following the CaCl₂ injections • Coastal deployed ORC socks to RMW14 following the calcium chloride flush. Socks were deployed within the water column, from 10-15.5 feet bgs. • Langan used a YSI 600 XL water quality meter to collect water quality readings from off-site monitoring wells OMW-01, OMW-02, and on-site post-remediation monitoring well RMW14 during remedial injections. Monitoring well headspace readings were collected using a photoionization detector (PID); maximum headspace readings of 13.7 parts per million (ppm) was recorded in OMW-01, 8.2 ppm in OMW-02, and 0.2 ppm in RMW14. Elevated PID readings are believed to be a result of the PVC compound glue used when assembling the injection components.
Material Tracking
<ul style="list-style-type: none"> • No material was exported from the site. • No material was imported to the site.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin
			LANGAN

Sampling

- No samples were collected.

CAMP Activities

- Community air monitoring was not implemented as ground intrusive work was not being performed.

Anticipated Activities

- Langan will conduct quarterly sampling per the Groundwater Treatment Work Plan in May 2025.

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin LANGAN
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Site Photographs:



Photo 1: ORC sock deployment in RMW14







Photo 2: Injection set-up for RMW14

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin LANGAN
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Figure 1: Site Map



Legend:

-  Wind Direction
-  Site Boundary
-  In progress Injection Point
-  Completed Injection Point

Cc:	K. Semon, M. Aronica, C. Devin (Langan)	By:	Shawn Martin
			LANGAN

APPENDIX D
Site Inspection Forms

SITE INSPECTION CHECKLIST

Site Name: GERARD AVE & E 146th STREET Location: Bronx, NY Project Number: 170487003

Inspector Name: Cristina Niclas Date: 4/25/2025 Weather Conditions: 62°F; Partly Cloudy; 13mph E

Reason for Inspection (i.e., routine, severe condition, etc.): Routine

Check one of the following:
(Y: Yes N: No N/A: Not Applicable)

		Y	N	N/A	Normal Situation	Remarks
General						
1	What are the current site conditions?	-	-	-	X	The site is currently developed with a multi-family high rise residential building with resident parking.
2	Are all applicable site records (e.g., documentation of construction activity, SMD system maintenance and repair, most current easement, etc.) complete and up to date?	X			X	
Environmental Easement						
3	Has site use (restricted residential) remained the same?	X			X	The building has become occupied since the last inspection on 1.12.2023.
4	Does it appear that all environmental easement restrictions have been followed?	X			X	
Impermeable Cap						
5	Are there any indications of a breach in the capping system at the time of this inspection?		X		X	
6	Are there any cracks in the building slabs?		X		X	
7	Are there any cracks in the building walls?		X		X	
8	Is there any construction activity, or indication of any construction activity within the past certification year (including any tenant improvements), that included the breaching of the capping system, on-site at the time of this inspection?		X		X	
9	If YES to number 7, is there documentation that the Soil Management Plan, HASP, and CAMP for the site was/is being followed?			X	X	

***** If the answer to any of the above questions indicate non-compliance with any Institutional Controls/Engineering Controls (ICs/ECs) for the site, additional remarks must be provided and, where applicable, documentation attached to this checklist detailing additional inspection and repair activities.**

Additional remarks: _____

Minimum Inspection Schedule:

- Site-wide inspections will be conducted annually, per certification year, at a minimum.
- Additional inspections will also be conducted at times of severe weather condition events.
- All inspection events will use this checklist.

Summary of Green Remediation Metrics for Site Management

Site Name: Gerard Avenue and East 146th Street Site Code: C203111

Address: 404 Exterior Street, 417 and 445 Gerard Avenue, and 440 Major Wm Deegan Boulevard City: Bronx

State: NY Zip Code: 10451 County: Bronx

Initial Report Period (Start Date of period covered by the Initial Report submittal)

Start Date: 01/12/2023

Current Reporting Period

Reporting Period From: 04/04/2024 To: 04/04/2025

Contact Information

Preparer's Name: Cristina Niclas Phone No.: (516) 524-2388

Preparer's Affiliation: Langan

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

	Current Reporting Period	Total to Date
Fuel Type 1 (e.g. natural gas (cf))	N/A	N/A
Fuel Type 2 (e.g. fuel oil, propane (gals))	N/A	N/A
Electricity (kWh)	N/A	N/A
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)	N/A	N/A

Other energy sources (e.g. geothermal, solar thermal (Btu))	N/A	N/A
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Provide a description of all energy usage reduction programs for the site in the space provided on Page 5.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (tons)	Total to Date (tons)
Total waste generated on-site		
OM&M generated waste	4065 Gallons of water	4065 Gallons of water
Of that total amount, provide quantity:		
Transported off-site to landfills	0	0
Transported off-site to other disposal facilities	N/A	53 gallons of purged groundwater
Transported off-site for recycling/reuse	N/A	N/A
Reused on-site	N/A	N/A

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 5.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	Total to Date (miles)
Standby Engineer/Contractor	3,116 miles	3,116 miles
Laboratory Courier/Delivery Service	246 miles	246 miles
Waste Removal/Hauling	N/A	N/A

Provide a description of all mileage reduction programs for the site in the space provided on Page 5. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	Total to Date (gallons)
Total quantity of water used on-site	4,012 gallons	4,012 gallons
Of that total amount, provide quantity:		
Public potable water supply usage	4,012 gallons	4,012 gallons
Surface water usage	N/A	N/A
On-site groundwater usage	N/A	N/A
Collected or diverted storm water usage	N/A	N/A

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 5.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	Total to Date (acres)
Land disturbed	N/A	N/A
Land restored	N/A	N/A

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 5.

Description of green remediation programs reported above

(Attach additional sheets if needed)

Energy Usage:

Waste Generation:

59 gallons of purged groundwater from monitoring well development and the baseline groundwater sampling event was generated and currently stored on-site for future off-site disposal.

Transportation/Shipping:

The laboratory courier, equipment courier, Langan personnel and subcontractors travelled approximately 3,362 miles for work implemented during the reporting period.

Water usage:

Approximately 4,012 gallons of potable water from the public water supply was used during the injection implementation.

Land Use and Ecosystems:

N/A

Other: N/A

APPENDIX E
Photograph Log



Photo 1: General view of the site exterior

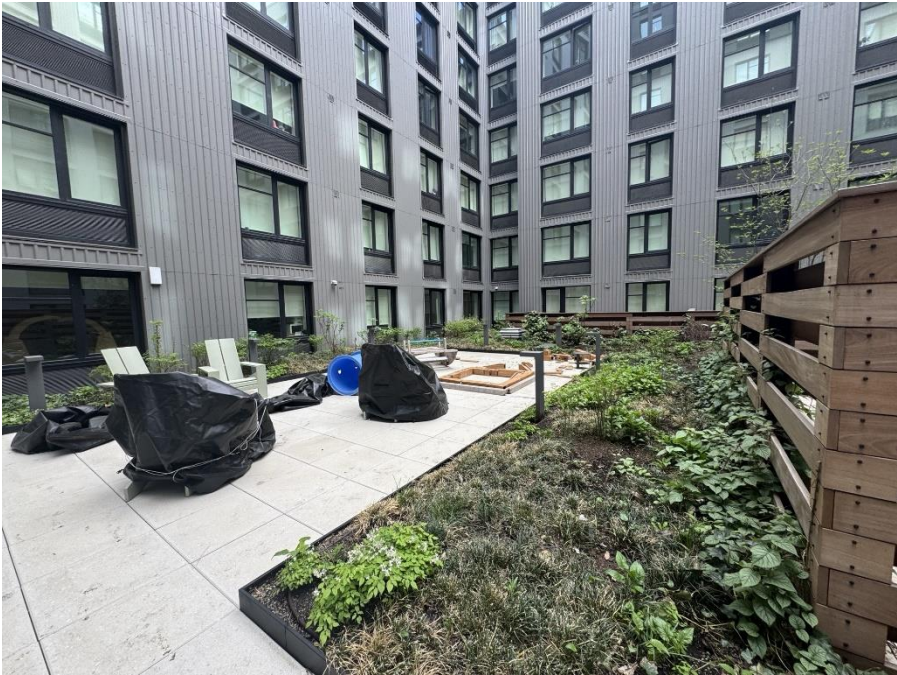


Photo 2: View of courtyard in the central part of the site

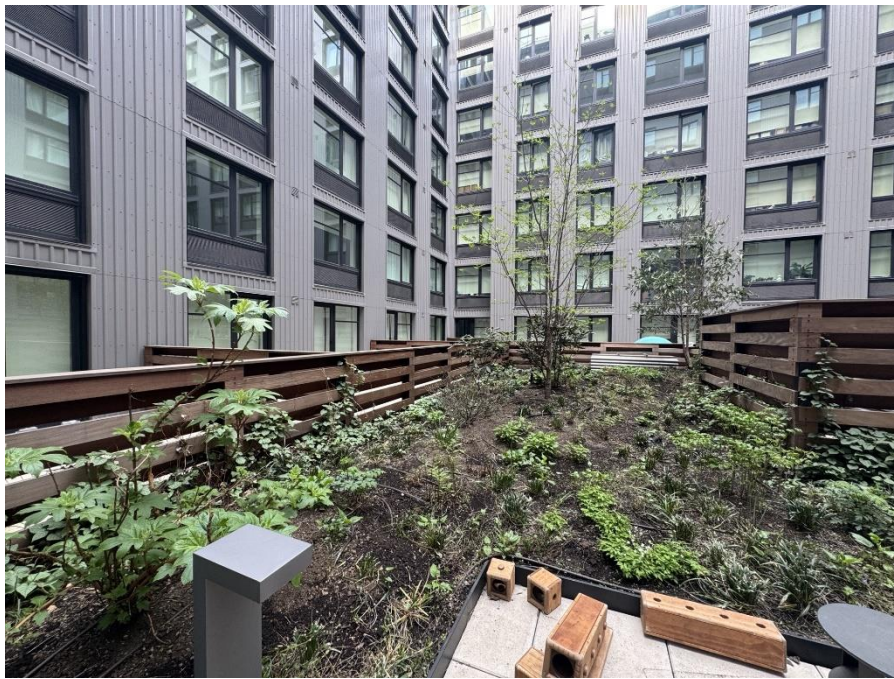


Photo 3: View of surface cover and vegetation in the courtyard



Photo 4: View of surface cover in a common area

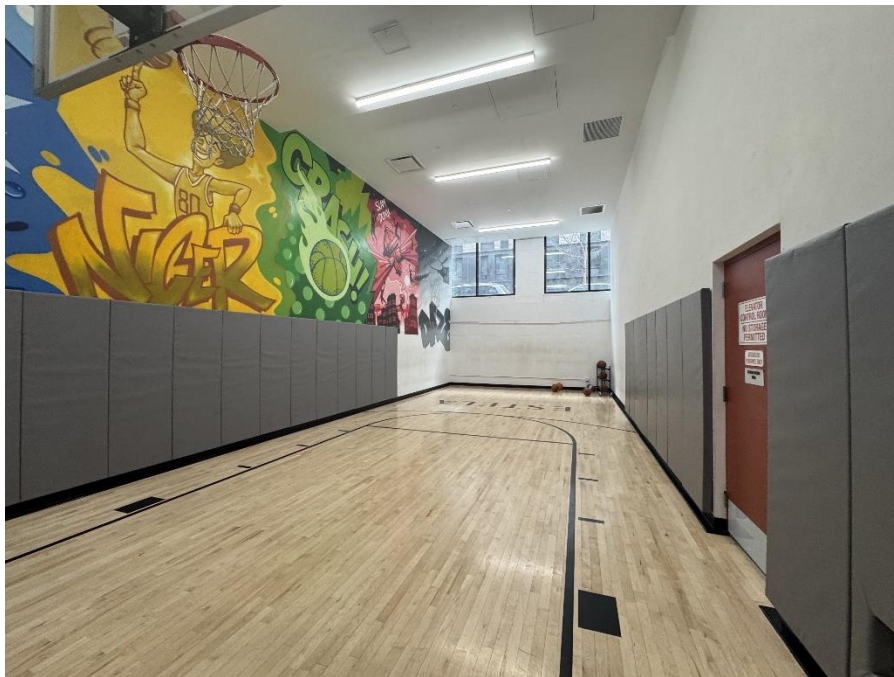


Photo 5: View of basketball court constructed over surface cover within a common recreational area

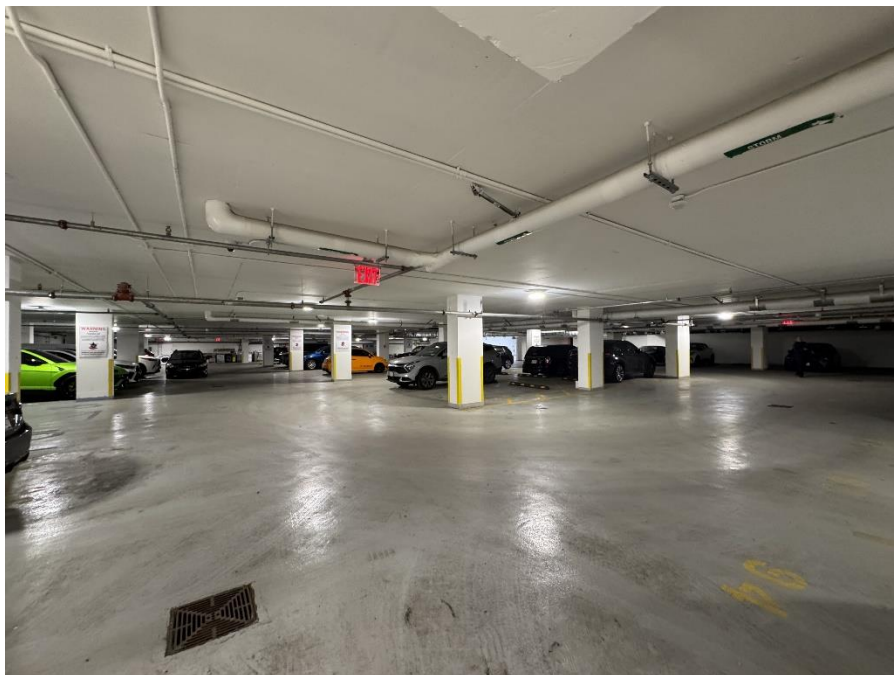


Photo 6: View of surface cover with the parking garage



Photo 7: General view of surface cover in the building cellar



Photo 8: View of off-site groundwater monitoring well OMW-02.

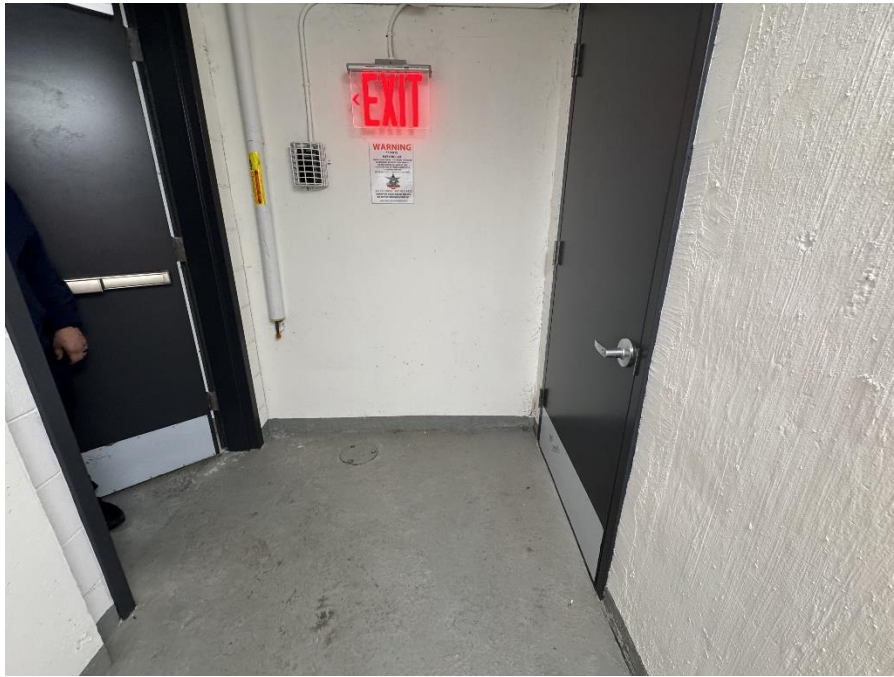


Photo 9: View of post-remediation groundwater monitoring well RMW09 in building cellar

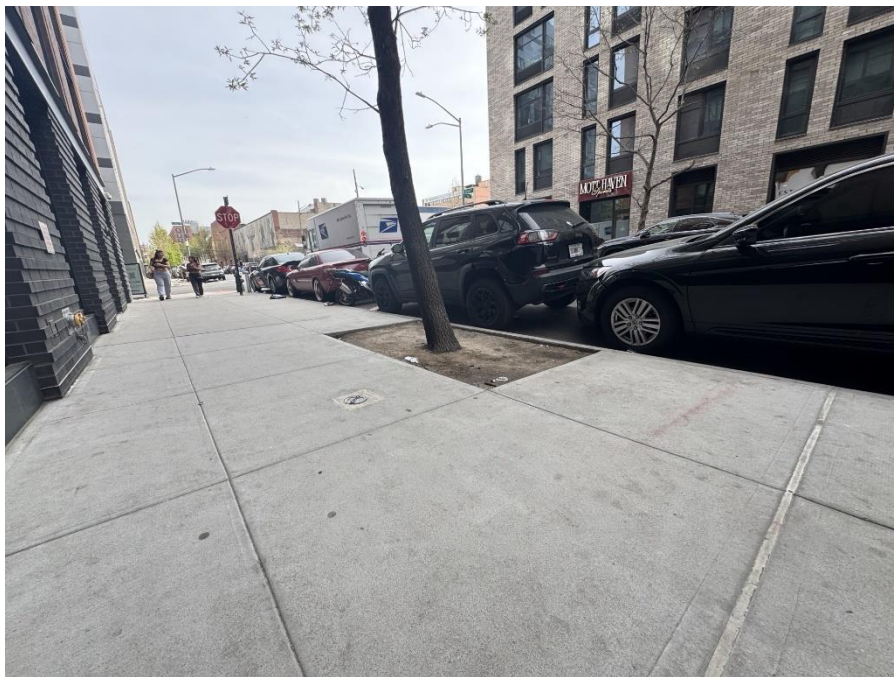


Photo 10: View of off-site groundwater monitoring well OMW-01



Photo 11: View of post-remediation groundwater monitoring well RMW03



Photo 12: View of post-remediation groundwater monitoring well RMW14.

APPENDIX F

Off-Site Monitoring Well Construction Logs

WELL CONSTRUCTION AND DEVELOPMENT SUMMARY

Well No.

OMW-01

PROJECT		PROJECT NO.	
445 Gerard Avenue		170487003	
LOCATION		ELEVATION AND DATUM	
Bronx, New York		N/A	
DRILLING AGENCY		DATE STARTED	DATE FINISHED
AARCO Environmental Services Corp.		7/18/2024	7/19/2024
DRILLING EQUIPMENT		DRILLER	
Geoprobe® 7822 DT		Jose Garcia	
SIZE AND TYPE OF BIT		INSPECTOR	
2-inch Diameter ID x 2.25-inch Diameter OD		Andrew Ashley	
BOREHOLE DIAMETER		TYPE OF WELL (OVERBURDEN / BEDROCK)	
4-inch		Overburden	
RISER MATERIAL	DIAMETER	TYPE OF BACKFILL MATERIAL	
PVC	2-inch	Grout/Bentonite slurry	
TYPE OF SCREEN	DIAMETER	TYPE OF WELL PACK	TYPE OF SEAL MATERIAL
PVC No. 20 Slot	2-inch	No. 1 Sand	Grout w/ 5% Bentonite
METHOD OF INSTALLATION			
<p>A Geoprobe 7822 DT was used to advance a boring to about 28 feet below grade surface (bgs). A 2-inch diameter polyvinyl chloride (PVC) monitoring well was installed which consisted of 15 feet of 20 slot (0.020-inch) well screen, and a solid 2-inch diameter PVC riser. Well screen was installed from approximately 13 feet bgs to 28 feet bgs with riser from 0.5 feet bgs to 13 feet bgs. The annulus around the well was filled with No. 1 sand from 12 feet to 28 feet bgs. A grout/bentonite slurry seal was installed from 1 foot bgs to 12 feet bgs. The well was finished with a flush-mounted road box and concrete pad.</p>			
WELL DEVELOPMENT DATA			
SURGE BLOCK DIAMETER	1 7/8-inch	TYPE PUMP	Submersible
DRILLER OR LANGAN	Driller	MAX PUMP RATE	1 LPM
NUMBER OF SURGE CYCLES	3	TOTAL VOLUME	3 Gallons
Well developed until purged groundwater was no longer turbid.			
TOP OF CASING	ELEVATION	DEPTH (ft)	WELL DETAILS
	N/A	0.5	
TOP OF SEAL	ELEVATION	DEPTH (ft)	WELL DETAILS
	N/A	1	
TOP OF FILTER	ELEVATION	DEPTH (ft)	WELL DETAILS
	N/A	12	
TOP OF SCREEN	ELEVATION	DEPTH (ft)	WELL DETAILS
	N/A	13	
BOTTOM OF BORING	ELEVATION	DEPTH (ft)	WELL DETAILS
	N/A	28	
SCREEN LENGTH		(ft)	WELL DETAILS
		15	
SLOT SIZE	No. 20 Slot; 0.020 Inches		WELL DETAILS
GROUNDWATER ELEVATIONS			
ELEVATION	DATE	DEPTH TO WATER	
N/A	7/18/2024	19 ft	
ELEVATION	DATE	DEPTH TO WATER	
N/A			
ELEVATION	DATE	DEPTH TO WATER	
ELEVATION	DATE	DEPTH TO WATER	
ELEVATION	DATE	DEPTH TO WATER	
ELEVATION	DATE	DEPTH TO WATER	
ELEVATION	DATE	DEPTH TO WATER	28
LANGAN Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.			
360 West 31st Street, 8th Floor, New York			

WELL CONSTRUCTION AND DEVELOPMENT SUMMARY

Well No.

OMW-02

PROJECT		PROJECT NO.	
445 Gerard Avenue		170487003	
LOCATION		ELEVATION AND DATUM	
Bronx, New York		N/A	
DRILLING AGENCY		DATE STARTED	DATE FINISHED
AARCO Environmental Services Corp.		7/18/2024	7/19/2024
DRILLING EQUIPMENT		DRILLER	
Geoprobe® 7822 DT		Jose Garcia	
SIZE AND TYPE OF BIT		INSPECTOR	
2-inch Diameter ID x 2.25-inch Diameter OD		Andrew Ashley	
BOREHOLE DIAMETER		TYPE OF WELL (OVERBURDEN / BEDROCK)	
4-inch		Overburden	
RISER MATERIAL	DIAMETER	TYPE OF BACKFILL MATERIAL	
PVC	2-inch	Grout/Bentonite slurry	
TYPE OF SCREEN	DIAMETER	TYPE OF WELL PACK	TYPE OF SEAL MATERIAL
PVC No. 20 Slot	2-inch	No. 1 Sand	Grout w/ 5% Bentonite
METHOD OF INSTALLATION			
<p>A Geoprobe 7822 DT was used to advance a boring to about 30 feet below grade surface (bgs). A 2-inch diameter polyvinyl chloride (PVC) monitoring well was installed which consisted of 15 feet of 20 slot (0.020-inch) well screen, and a solid 2-inch diameter PVC riser. Well screen was installed from approximately 15 feet bgs to 30 feet bgs with riser from 0.5 feet bgs to 15 feet bgs. The annulus around the well was filled with No. 1 sand from 14 feet to 30 feet bgs. A grout/bentonite slurry seal was installed from 0.8 feet bgs to 14 feet bgs. The well was finished with a flush-mounted road box and concrete pad.</p>			
WELL DEVELOPMENT DATA			
SURGE BLOCK DIAMETER	1 7/8-inch	TYPE PUMP	Submersible
DRILLER OR LANGAN	Driller	MAX PUMP RATE	1 LPM
NUMBER OF SURGE CYCLES	3	TOTAL VOLUME	3 Gallons
Well developed until purged groundwater was no longer turbid.			
TOP OF CASING	ELEVATION	DEPTH (ft)	WELL DETAILS
	N/A	0.5	
TOP OF SEAL	ELEVATION	DEPTH (ft)	Cover →
	N/A	1	
TOP OF FILTER	ELEVATION	DEPTH (ft)	Riser →
	N/A	14	
TOP OF SCREEN	ELEVATION	DEPTH (ft)	← Grout / bentonite slurry
	N/A	15	
BOTTOM OF BORING	ELEVATION	DEPTH (ft)	← Bedrock
	N/A	30	
SCREEN LENGTH		(ft)	PVC Screen
		15	
SLOT SIZE	No. 20 Slot; 0.020 Inches		14
GROUNDWATER ELEVATIONS			
ELEVATION	DATE	DEPTH TO WATER	30
N/A	7/18/2024	19 ft	
ELEVATION	DATE	DEPTH TO WATER	
N/A			
ELEVATION	DATE	DEPTH TO WATER	
ELEVATION	DATE	DEPTH TO WATER	
ELEVATION	DATE	DEPTH TO WATER	
ELEVATION	DATE	DEPTH TO WATER	
LANGAN Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.			
360 West 31st Street, 8th Floor, New York			

APPENDIX G

Low Flow Groundwater Sampling Logs

Project Information		Well Information		Equipment Information		Sampling Conditions		Sampling Information	
Project Name:	445 Gerard Ave	Well No:	OMW01	Water Quality Device Model:	Horiba	Weather:	Rainy	Sample(s):	OMW-01_080724
Project Number:	170487003	Well Depth:	25.14	Pine Number:	25355	Background PID (ppm):	0.0		
Site Location:	Bronx, New York	Well Diameter:	2 inch	Pump Make and Model:	Peristaltic	PID Beneath Inner Cap (ppm):	2.9		
Sampling Personnel:	Loagan Clements	Well Screen Interval:	13 feet 28 feet	Pine Number:	24014	Pump Intake Depth:	22	Sample Date:	8/7/2024
				Tubing Diameter:	1/4" LDPE	Depth to Water Before Purge:	18.84	Sample Time:	10:08

STABILIZATION = 3 successive readings within limits

TIME	TEMP °Celsius (+/- 3%)	PH (+/- 0.1)	ORP mV (+/- 10mV)	CONDUCTIVITY mS/cm (+/- 3%)	TURBIDITY ntu (+/- 10%) above 5 NTU	DO mg/l (+/- 10%) above 0.5 mg/l	DTW ft Drawdown < 0.33 ft	Flow Rate (gpm) <0.13 gpm)	Cumulative Discharge Volume (Gal)	NOTES color, odor etc.	Stabilized?
BEGIN PURGING											
9:33	18.9	6.4	184	1.65	118	0.83	18.95	0.1	0.5		N/A
9:38	18.49	6.4	160	1.68	105	0.62	18.95	0.05	0.75		N/A
9:43	18.21	6.41	144	1.76	102	0.58	18.95	0.05	1		N
9:48	18.04	6.4	136	1.83	102	0.51	18.95	0.05	1.25		N
9:53	17.9	6.4	129	1.89	91.4	0.42	18.95	0.03	1.4		N
9:58	17.79	6.39	125	1.92	87	0.41	18.95	0.02	1.5		N
10:03	17.59	6.38	122	1.94	82.6	0.36	18.95		1.75		Y

Notes:

1. Well depths and groundwater depths were measured in feet below the top of well casing, northern most point.
2. Well and tubing diameters are measured in inches.
3. PID = Photoionization Detector
4. PPM = Parts per million
5. pH = Hydrogen ion concentration
6. ORP = Oxidation-reduction potential, measured in millivolts (mV)
7. DO = Dissolved Oxygen, measured in milligrams per liter (mg/L)
8. DTW = Depth to water
9. mS/cm = milli-Siemens per centimeter
10. NTU = Nephelometric Turbidity Unit

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Project Information		Well Information		Equipment Information		Sampling Conditions		Sampling Information			
Project Name:	445 Gerard Ave	Well No:	OMW02	Water Quality Device Model:	Horiba	Weather:	Rainy	Sample(s):	OMW-02_080724		
Project Number:	170487003	Well Depth:	28.15	Pine Number:	25355	Background PID (ppm):	0.0				
Site Location:	Bronx, New York	Well Diameter:	2 inch	Pump Make and Model:	Peristaltic	PID Beneath Inner Cap (ppm):	3.8	Sample Date:	8/7/2024		
Sampling Personnel:	Loagan Clements	Well Screen Interval:	15 feet 30 feet	Pine Number:	24014	Pump Intake Depth:	24 feet	Sample Time:	11:52		
				Tubing Diameter:	1/4" LDPE	Depth to Water Before Purge:	18.97 feet				
STABILIZATION = 3 successive readings within limits											
TIME	TEMP °Celsius (+/- 3%)	PH (+/- 0.1)	ORP mV (+/- 10mV)	CONDUCTIVITY mS/cm (+/- 3%)	TURBIDITY ntu (+/- 10%) above 5 NTU	DO mg/l (+/- 10%) above 0.5 mg/l	DTW ft Drawdown < 0.33 ft	Flow Rate (gpm) <0.13 gpm)	Cumulative Discharge Volume (Gal)	NOTES color, odor etc.	Stabilized?
BEGIN PURGING											
10:48	17.27	6.23	102	2.58	127	0.84	19.29	0.05	0.25		N/A
10:53	17.2	6.22	91	2.62	104	0.57	19.27	0.05	0.5		N/A
10:58	17.13	6.24	69	2.62	55.2	0.47	19.28	0.05	0.75		N
11:03	17.09	6.25	53	2.63	31.7	0.42	19.29	0.07	1.1		N
11:08	17.04	6.27	45	2.62	22.9	0.39	19.29	0.04	1.3		N
11:13	17.04	6.28	37	2.52	15.1	0.37	19.3	0.06	1.6		N
11:18	17.03	6.31	32	2.43	11.7	0.35	19.3	0.04	1.8		N
11:23	17.01	6.32	29	2.36	10.3	0.34	19.3	0.06	2.1		N
11:28	17.01	6.33	26	2.31	8.9	0.33	19.32	0.04	2.3		N
11:33	17.02	6.34	23	2.26	8.6	0.32	19.32	0.06	2.6		N
11:38	17.01	6.35	21	2.23	8	0.32	19.33	0.04	2.8		N
11:43	17.04	6.36	18	2.2	7.4	0.31	19.31	0.06	3.1		N
11:48	17.05	6.37	17	2.18	6.8	0.31	19.3	0.06	3.4		N
Well was purged for 1 hour before sampling.											
Notes:											
1. Well depths and groundwater depths were measured in feet below the top of well casing, northern most point.											
2. Well and tubing diameters are measured in inches.											
3. PID = Photoionization Detector											
4. PPM = Parts per million											
5. pH = Hydrogen ion concentration											
6. ORP = Oxidation-reduction potential, measured in millivolts (mV)											
7. DO = Dissolved Oxygen, measured in milligrams per liter (mg/L)											
8. DTW = Depth to water											
9. mS/cm = milli-Siemens per centimeter											
10. NTU = Nephelometric Turbidity Unit											
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Project Information		Well Information		Equipment Information			Sampling Conditions			Sampling Information	
Project Name:	445 Gerard Ave	Well No:	RMW01	Water Quality Device Model:	Horiba	Weather:	Rain	Sample(s):	RMW01_080824		
Project Number:	170487003	Well Depth:	17.05	Pine Number:	25355	Background PID (ppm):	0.7				
Site Location:	Bronx, New York	Well Diameter:	2 inch	Pump Make and Model:	Peristalic	PID Beneath Inner Cap (ppm):	3.9	Sample Date:	8/8/2024		
Sampling Personnel:	Loagan Clements	Well Screen Interval:	1 foot 11 feet	Pine Number:	24014	Pump Intake Depth:	15 feet	Sample Time:	12:29		
STABILIZATION = 3 successive readings within limits											
TIME	TEMP °Celsius (+/- 3%)	PH (+/- 0.1)	ORP mV (+/- 10mV)	CONDUCTIVITY mS/cm (+/- 3%)	TURBIDITY ntu (+/- 10%) above 5 NTU	DO mg/l (+/- 10%) above 0.5 mg/l	DTW ft Drawdown < 0.33 ft	Flow Rate (gpm) <0.13 gpm	Cumulative Discharge Volume (Gal)	NOTES color, odor etc.	Stabilized?
BEGIN PURGING											
11:37	18.2	7.06	33	2.5	8.4	0.94	10.61	0.1	0.4	sheen, reduced sulfur smell, p	N/A
11:42	18.18	7.04	39	2.25	3.7	1.76	10.84	0.02	0.5		N/A
11:47	18.22	7.02	43	2.25	4.7	2.09	10.88	0.05	0.75		N
11:52	18.19	6.99	20	2.57	0	0.96	10.89	0.07	1.1		N
11:57	18.3	6.99	14	2.75	0	0.74	10.85	0.04	1.3		N
12:02	18.18	6.97	8	2.93	0	0.56	10.85	0.04	1.5		N
12:07	18.12	6.97	5	3.070	0.0	0.46	10.88	0.05	1.75		N
12:12	18.04	6.96	3	3.210	0.0	0.41	10.92	0.05	2		N
12:17	18.01	6.96	1	3.280	0.0	0.38	10.95	0.05	2.25		N
12:22	17.99	6.96	0	3.320	0.0	0.36	10.92	0.05	2.5		N
12:27	17.99	6.96	0	3.340	0.0	0.36	10.92	0.05	2.75		Y

Notes:

- Well depths and groundwater depths were measured in feet below the top of well casing, northern most point.
- Well and tubing diameters are measured in inches.
- PID = Photoionization Detector
- PPM = Parts per million
- pH = Hydrogen ion concentration
- ORP = Oxidation-reduction potential, measured in millivolts (mV)
- DO = Dissolved Oxygen, measured in milligrams per liter (mg/L)
- DTW = Depth to water
- mS/cm = milli-Siemens per centimeter
- NTU = Nephelometric Turbidity Unit

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Project Information		Well Information		Equipment Information		Sampling Conditions		Sampling Information	
Project Name:	445 Gerard Ave	Well No:	RMW03	Water Quality Device Model:	Horiba	Weather:	Rain	Sample(s):	RMW03_080824
Project Number:	170487003	Well Depth:	15.72	Pine Number:	25355	Background PID (ppm):	0.7		
Site Location:	Bronx, New York	Well Diameter:	2 inch	Pump Make and Model:	Peristalic	PID Beneath Inner Cap (ppm):	0.8	Sample Date:	8/8/2024
Sampling Personnel:	Loagan Clements	Well Screen Interval:	2 feet 12 feet	Pine Number:	24014	Pump Intake Depth:	11*		Sample Time:
STABILIZATION = 3 successive readings within limits									

TIME	TEMP °Celsius (+/- 3%)	PH (+/- 0.1)	ORP mV (+/- 10mV)	CONDUCTIVITY mS/cm (+/- 3%)	TURBIDITY ntu (+/- 10%) above 5 NTU	DO mg/l (+/- 10%) above 0.5 mg/l	DTW ft Drawdown < 0.33 ft	Flow Rate (gpm) <0.13 gpm)	Cumulative Discharge Volume (Gal)	NOTES color, odor etc.	Stabilized?
BEGIN PURGING											
9:35	18.73	7.12	133	2.9	0	0.93	9.64	0.1	0.4	dor, no sheen, purged water	N/A
9:40	18.66	7.1	133	2.89	0	0.82	10.5	0.04	0.6		N/A
9:45	18.62	7.1	131	2.89	0	0.86	10.52	0.04	0.8		N
9:50	18.5	7.13	10	2.76	0	0.84	10.89	0.04	1		N
9:55										purged below pump depth; lowered pump intake	N
10:00										*	N
10:05										*	N
10:10	18.34	7.18	55	2.970	28.5	0.70	10.47	0.25	1.25	resumed purge at 10:05	N
10:15	17.94	7.16	43	2.970	46.9	0.77	11.44	0.05	1.5		N
10:20	17.94	7.17	28	3.020	51.0	0.63	11.73	0.05	1.75		N
10:25	17.98	7.17	15	3.090	59.2	0.44	11.85	0.05	2	gray color	N
10:30	17.94	7.18	2	3.220	42.5	0.40	11.87	0.03	2.15		N
10:35	17.88	7.22	-10	3.400	24.0	0.43	11.95	0.05	2.4		N
10:40	17.88	7.25	-13	3.520	3.1	1.06	11.95	0.03	2.55		N
10:45	17.65	7.29	-22	3.600	0.0	0.42	12.50	0.05	2.8		N

Well was purged for 1 hour before sampling.

Notes:

1. Well depths and groundwater depths were measured in feet below the top of well casing, northern most point.
2. Well and tubing diameters are measured in inches.
3. PID = Photoionization Detector
4. PPM = Parts per million
5. pH = Hydrogen ion concentration
6. ORP = Oxidation-reduction potential, measured in millivolts (mV)
7. DO = Dissolved Oxygen, measured in milligrams per liter (mg/L)
8. DTW = Depth to water
9. mS/cm = milli-Siemens per centimeter
10. NTU = Nephelometric Turbidity Unit

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Project Information		Well Information		Equipment Information		Sampling Conditions			Sampling Information		
Project Name:	445 Gerard Ave	Well No:	RMW09	Water Quality Device Model:	Horiba	Weather:	Rainy		Sample(s):	RMW09_080724	
Project Number:	170487003	Well Depth:	17.05	Pine Number:	25355	Background PID (ppm):	0.7				
Site Location:	Bronx, New York	Well Diameter:	2 inch	Pump Make and Model:	Peristaltic	PID Beneath Inner Cap (ppm):	1.0		Sample Date:	8/7/2024	
Sampling Personnel:	Loagan Clements	Well Screen Interval:	16 feet	Pine Number:	24014	Pump Intake Depth:	12 feet				
			26 feet	Tubing Diameter:	1/4" LDPE	Depth to Water Before Purge:	8.94 feet		Sample Time:	14:52	
STABILIZATION = 3 successive readings within limits											
TIME	TEMP °Celsius (+/- 3%)	PH (+/- 0.1)	ORP mV (+/- 10mV)	CONDUCTIVITY mS/cm (+/- 3%)	TURBIDITY ntu (+/- 10%) above 5 NTU	DO mg/l (+/- 10%) above 0.5 mg/l	DTW ft Drawdown < 0.33 ft	Flow Rate (gpm) <0.13 gpm)	Cumulative Discharge Volume (Gal)	NOTES color, odor etc.	Stabilized?
BEGIN PURGING											
14:25	19.63	7.21	58	3.29	6.6	1.02	9.04	0.1	0.5	lorless, no odor, no sheen, purge	N/A
14:30	19.6	7.19	56	3.28	4.4	0.76	9.04	0.06	0.8		N/A
14:35	19.62	7.16	60	3.27	0.5	0.55	9.04	0.1	1.3		N
14:40	19.69	7.13	66	3.26	0	0.45	9.04	0.04	1.5		N
14:45	19.75	7.12	70	3.25	0	0.04	9.04	0.06	1.8		N
14:50	19.78	7.12	74	3.25	0	0.36	9.04	0.09	2.25		Y
Notes:											
1. Well depths and groundwater depths were measured in feet below the top of well casing, northern most point.											
2. Well and tubing diameters are measured in inches.											
3. PID = Photoionization Detector											
4. PPM = Parts per million											
5. pH = Hydrogen ion concentration											
6. ORP = Oxidation-reduction potential, measured in millivolts (mV)											
7. DO = Dissolved Oxygen, measured in milligrams per liter (mg/L)											
8. DTW = Depth to water											
9. mS/cm = milli-Siemens per centimeter											
10. NTU = Nephelometric Turbidity Unit											
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Project Information		Well Information		Equipment Information		Sampling Conditions			Sampling Information		
Project Name:	445 Gerard Ave	Well No:	RMW10	Water Quality Device Model:	Horiba	Weather:	Rain		Sample(s):	RMW10_080824	
Project Number:	170487003	Well Depth:	15.43	Pine Number:	25355	Background PID (ppm):	0.4			DUP01_080824	
Site Location:	Bronx, New York	Well Diameter:	2 inch	Pump Make and Model:	Peristalic	PID Beneath Inner Cap (ppm):	0.4		Sample Date:	8/8/2024	
Sampling Personnel:	Loagan Clements	Well Screen Interval:	16 feet 26 feet	Pine Number:	24014	Pump Intake Depth:	11 feet		Sample Time:	10:08	
STABILIZATION = 3 successive readings within limits											
TIME	TEMP °Celsius (+/- 3%)	PH (+/- 0.1)	ORP mV (+/- 10mV)	CONDUCTIVITY mS/cm (+/- 3%)	TURBIDITY ntu (+/- 10%) above 5 NTU	DO mg/l (+/- 10%) above 0.5 mg/l	DTW ft Drawdown < 0.33 ft	Flow Rate (gpm) <0.13 gpm)	Cumulative Discharge Volume (Gal)	NOTES color, odor etc.	Stabilized?
BEGIN PURGING											
8:30	19.28	7.12	-38	4.65	0	0.42	9.27	0.1	0.5	odor (like asphalt or burning ru	N/A
8:35	18.66	7.13	-52	4.73	0	0.39	9.24	0.05	0.75		N/A
8:40	18.54	7.12	-56	4.75	0	0.37	9.24	0.05	1		N
8:45	18.49	7.12	-57	4.75	0	0.37	9.24	0.03	1.15		Y
Notes:											
1. Well depths and groundwater depths were measured in feet below the top of well casing, northern most point.											
2. Well and tubing diameters are measured in inches.											
3. PID = Photoionization Detector											
4. PPM = Parts per million											
5. pH = Hydrogen ion concentration											
6. ORP = Oxidation-reduction potential, measured in millivolts (mV)											
7. DO = Dissolved Oxygen, measured in milligrams per liter (mg/L)											
8. DTW = Depth to water											
9. mS/cm = milli-Siemens per centimeter											
10. NTU = Nephelometric Turbidity Unit											
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Project Information		Well Information		Equipment Information		Sampling Conditions		Sampling Information	
Project Name:	445 Gerard Ave	Well No:	RMW14	Water Quality Device Model:	Horiba	Weather:	Rainy	Sample(s):	OMW-01_080724
Project Number:	170487003	Well Depth:	14.84	Pine Number:	25355	Background PID (ppm):	0.7		
Site Location:	Bronx, New York	Well Diameter:	2 inch	Pump Make and Model:	Peristaltic	PID Beneath Inner Cap (ppm):	1.0		
Sampling Personnel:	Loagan Clements	Well Screen Interval:	16 feet	Pine Number:	24014	Pump Intake Depth:	13 feet	Sample Date:	8/7/2024
		Interval:	26 feet	Tubing Diameter:	1/4" LDPE	Depth to Water Before Purge:	9.04 feet	Sample Time:	11:52

STABILIZATION = 3 successive readings within limits

TIME	TEMP °Celsius (+/- 3%)	PH (+/- 0.1)	ORP mV (+/- 10mV)	CONDUCTIVITY mS/cm (+/- 3%)	TURBIDITY ntu (+/- 10%) above 5 NTU	DO mg/l (+/- 10%) above 0.5 mg/l	DTW ft Drawdown < 0.33 ft	Flow Rate (gpm) <0.13 gpm)	Cumulative Discharge Volume (Gal)	NOTES color, odor etc.	Stabilized?
BEGIN PURGING											
12:52	18.12	6.73	10	3.93	23.1	1.55	9.92	0.0	0.15	sheen, petroleum-like odor, purge	N/A
12:57	18.03	6.7	8	3.92	20.5	0.68	10.14	0.1	0.65		N/A
13:02	18.08	6.71	6	3.93	21	1.09	9.93	0.05	0.9		N
13:07	18.06	6.7	6	3.91	14	0.57	10.04	0.04	1.1		N
13:12	17.96	6.65	5	3.88	12.4	0.49	10.14	0.06	1.4		N
13:17	17.9	6.64	5	3.88	11.8	0.47	10.18	0.04	1.6		N
13:22	17.9	6.62	5	3.86	11.8	0.45	10.25	0.08	2		Y

Notes:

- Well depths and groundwater depths were measured in feet below the top of well casing, northern most point.
- Well and tubing diameters are measured in inches.
- PID = Photoionization Detector
- PPM = Parts per million
- pH = Hydrogen ion concentration
- ORP = Oxidation-reduction potential, measured in millivolts (mV)
- DO = Dissolved Oxygen, measured in milligrams per liter (mg/L)
- DTW = Depth to water
- mS/cm = milli-Siemens per centimeter
- NTU = Nephelometric Turbidity Unit

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APPENDIX H

Injection Documentation



REGENESIS

Technology-Based Solutions for the Environment

PROJECT NAME

Gerard Avenue

RW14, OMW-01, and OMW-02 Polish Proposal

PREPARED FOR

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PREPARED BY

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October 11, 2024

Project Summary

REGENESIS appreciates the opportunity to provide Langan Engineering & Environmental Services our remedial design and cost estimate for the Gerard Avenue project. This proposal includes an overview of our proposed solution, the project goals, technologies proposed, application design summary table and a treatment area map.

Proposed Solution

We propose the implementation of [PetroFix](#) Remedial Fluid directly applied into RW14, OMW-01, and OMW-02. The flushing of each well with a calcium chloride solution to allow for the limiting of suspended PetroFix within monitoring locations after the application. Finally, the addition of an ORC Advanced® sock in each well to further stimulate bioremediation.

Project Goals

This proposal is designed for the remediation of all three wells to to nondetect levels.

Design Assumptions

- The application is limited to RW14, OMW-01, and OMW-02 due to the logistics on-site of a more expansive application.
- RW14 is screened 17-27 ft bgs with a 2 inch diameter 20 slot screen. OMW-01 is screened 13-28 ft bgs with a 2 inch diameter 20 slot screen. OMW-02 is screened from 15-30 ft bgs with a 2 inch diameter 20 slot screen. The borehole diameter varies but averages to 3.25 inches.
- Depth to water ranges between 18-20 feet.

Site Specific Recommendations

- The order of application is significant and described below.
- Calcium chloride flushing and passive diffusion bags are likely required to allow for sampling soon after the application.

[Greater detail on site specific testing and application details are provided in the Technical Approaches Section.](#)

Step	Description	Week
1	Passive diffusion bag baseline	-2
2	PetroFix application into all three wells	0
3	Calcium chloride flush into all three wells	0
4	ORC Advanced Sock placed in all three wells	0-36
5	Sampling can be done before week 36 by temporarily removing and then repositioning the sock. Will need passive diffusion bag is suspended carbon is above 100ppm.	8+

Pricing

Below is the cost estimate to provide the remediation technologies and execute the application design provided in this proposal. Please also see the assumptions and qualifications section.

Description	Price	Qty	Subtotal
PetroFix Drums (400 lb)	\$5.57	800	\$4,456
PetroFix EA Blend Pail (20 lb)	\$0	1	\$0
<input checked="" type="checkbox"/> calcium chloride (50 lb)	\$35.50	1	\$35.50
2" ORC Advanced® Socks	\$133.56	33	\$4,407.48
Subtotal			\$8,898.98
Shipping and Tax (18%)			+\$1,601.82
Total			\$10,500.80

Electron Acceptor Blend (a mix of ammonium sulfate and sodium nitrate) is included in the price of PetroFix.

COST ESTIMATE DISCLAIMER: The cost listed assumes conditions set forth within the proposed scope of work and assumptions and qualifications. Changes to either could impact the final cost of the project. This may include final shipping arrangements, sales tax or application-related tasks such as product storage and handling, access to water, etc. If items listed need to be modified, please contact Regenesys for further evaluation.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those who completed the earlier environmental site assessment(s), and in reliance upon REGENESIS' prior experience on similar project sites. The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity that seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity that seeks reimbursement from Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the government.

PROFESSIONAL JUDGEMENT: In generating this estimate, REGENESIS relied upon professional judgment and site-specific information provided by others. Using this information as input, we performed calculations based upon the known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to effect remediation of the site.

Technical Approach



(Click the above product logo to access to product specification sheet for the product)

Site Specific Recommendations

As a result of applying PetroFix directly into monitoring locations, it should be expected that suspended PetroFix would naturally remain in the well for a prolonged time. This suspended carbon can prevent accurate sampling. This proposal includes a calcium chloride flush in RW14, OMW-01, and OMW-02 to reduce this concern. However, the application of PetroFix directly into the well means that elevated carbon suspensions should still be anticipated. Because of this potential REGENESIS recommends collecting a baseline sample with a passive diffusion bag in each monitoring well in case one is needed for sampling later following the application. More regarding suspended carbon can be read in this document:

[Colloidal Activated Carbon \(CAC\) Sampling Guidance Document](#)

Passive diffusion bags contain a pore size less than that of the particle size of PetroFix and are filled with deionized water. These can be lowered into the well and allowed to equilibrate for 2 weeks. This allows VOCs to enter the bag while preventing PetroFix from entering.

PetroFix should then be applied directly into RW14, OMW-01, and OMW-02 under pressures between 10-50 PSI. This can be performed without modifying the well by using an expansion plug, as discussed on page 12 of the above document. Depending on the quality and age of well construction, surfacing may occur and injections below this pressure range may be required.

The calcium chloride flush can occur immediately following the application of PetroFix or several weeks later and should be applied under pressures similar to those of the PetroFix injection. This flushing procedure needs to be applied under pressure to work properly. This step may need to be delayed to allow for pressurized injections. The flush consists of three steps. All three steps should be performed immediately, one after the other without any time between them. The first step applies 29 gallons of fresh water into each well. Step two applies 16.6 lbs of calcium chloride with 33 gallons of water. The third step repeats the first by applying another 29 gallons of fresh water. This acts to physically move the PetroFix out of the well space and sand pack before causing flocculation, which makes the PetroFix particles too large to reenter the well. The final flush flush helps push any excess calcium chloride out of the well and ensures its interaction with the PetroFix.

The final remedial step is the application of the ORC Advanced sock. This can be applied at any time, including months following the application of PetroFix. Since passive diffusion bags require two weeks for sampling, Sampling with a passive diffusion bag can be performed prior to the installation of the ORC Advanced Sock. The sock can be removed temporarily for sampling, but if passive diffusions are required for sampling, this is not recommended due to the time required for sampling.

The ORC-A Sock consists of a total of 31 1-foot sections of ORC and rope to be used between all well locations. These sections should be tied together and suspended in the well from the top of saturation to the bottom of the well. The sock should be left in the well until dissolved oxygen appears to return to baseline levels, or up to 9 months. The sock can be removed for sampling, but should not be removed for greater than one hour, and it will dry and no longer be effective. More details can be found in the [ORC Advanced Socks Installation Instructions](#) guidebook.

Monitoring Parameters

To measure performance at your site, we recommend the following analytical parameters be collected at all monitoring locations constructed in or within 10 ft of the planned treatment areas. The recommended [PetroFix Monitoring Parameters](#) (see next page) should be recorded for at least one sampling event before the application of PetroFix to establish a baseline as well as sampling events following the application of PetroFix. The recommended parameters are all that are needed for most sites. If you seek to identify microbial response post application, we recommend including methane, CO₂, and QuantArray-Petroleum on the optional list at locations where PetroFix has been confirmed to have been distributed. Please contact REGENESIS for questions.

Technology Overview

PetroFix is a unique activated carbon remedial fluid (carbon milled to a diameter of 1 to 2 micrometers) paired with soluble, anaerobic electron acceptors designed to remediate dissolved hydrocarbons. This allows the product to be injected as a fluid using low pressure. PetroFix is commonly used for source and plume treatment, excavation polishing, and barrier applications. PetroFix features:

- Provides rapid and sustained results allowing for faster and more certain site closure
- Dual-technology approach relies on both carbon sorption and anaerobic biodegradation
- Low-pressure "flooding" vs high pressure "fracturing" improves distribution and reduces surfacing
- Safe to handle
- Mitigates hydrocarbon back diffusion which is a cause of concentration rebound

PetroFix is typically self-applied and is supported by a large library of [application instruction, technical bulletin, and videos](#). Based on our experience at hundreds of sites we have developed recommendations listed in a hyperlinked planning document included in the following sections. Below are links for additional technologies information:

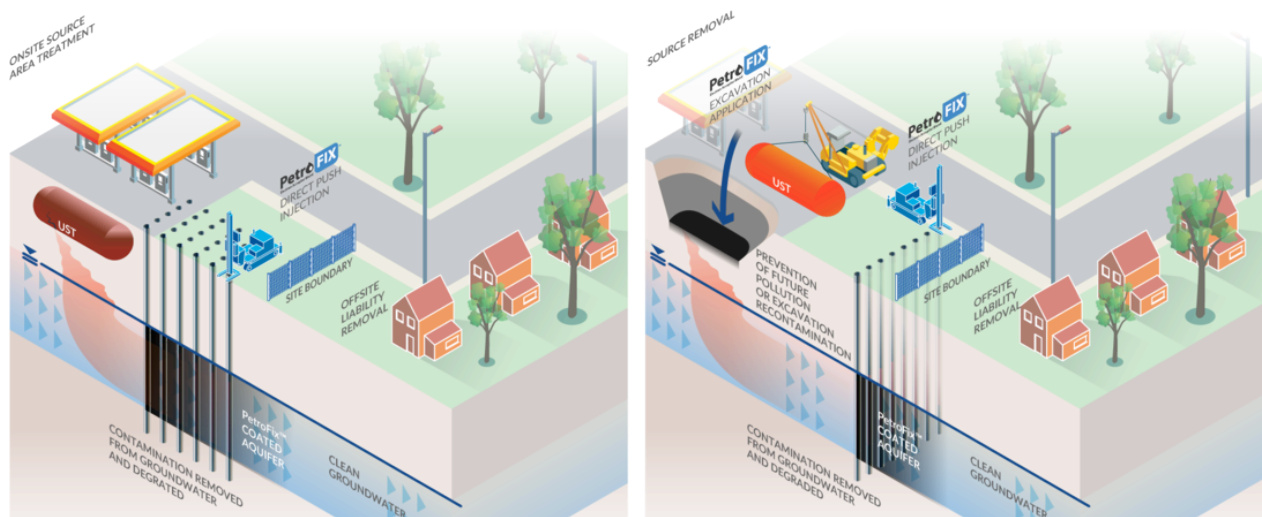
[PetroFix - An Animated Overview](#)

[PetroFix - All Webinars](#)

[PetroFix SDS](#)

Representative Case Studies

- [PetroFix Case Study - Engineering Rapid Closures Multi-Site](#)
- [PetroFix Case Study - Former Gas Station Closure and +99% Reductions - CO](#)
- [PetroFix Case Study - PetroFix Estimated to Save \\$1 Million Compared to Long-Term Monitoring](#)
- [PetroFix Case Study - All](#)



Storage

While PetroFix has a multiple month shelf-life while stored in proper conditions, it is recommended to deliver PetroFix as soon to the planned application as possible.

How to store for immediate use:

- Out of direct or prolonged sunlight
- Prevent freezing conditions
- Do not store in temperatures exceeding 90 degrees for greater than three weeks



Additional information on long term storage can be found in the [PetroFix Technical Memo: Freezing and Hot Weather Handling](#) document. Proper prolonged storage conditions include:

- Shade - no direct sunlight
- In original CLOSED containers
- Between 40 - 90°F
- Well ventilated

Mixing & Transferring

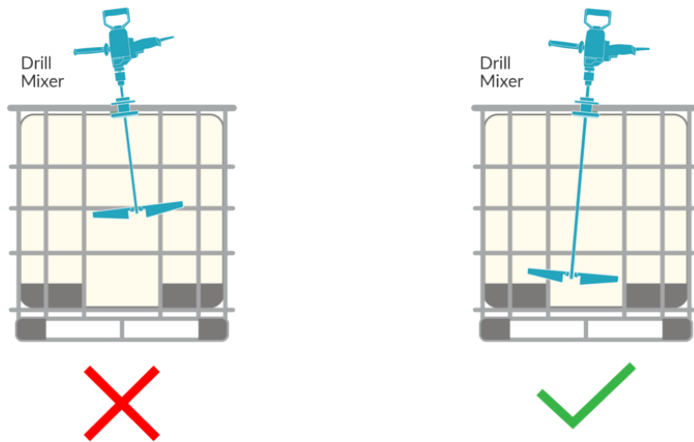
Below is an abbreviated overview of product mixing recommendations for injection.

1. Homogenization – All PetroFix is checked for quality control specifications prior to shipment. The typical material viscosity is similar to motor oil (sometimes thicker) in the shipping containers. The shipped PetroFix should be homogenized prior to dilution to ensure consistency. In some cases, PetroFix may exhibit some settling or some lump formation, both of which can easily be mixed back into the product upon homogenization. REGENESIS recommends a mixer capable of being freely moved to all parts and corners of the tote or drum and capable of reaching within 3 inches of the bottom of the tote or drum to ensure complete homogenization (see illustration on next page). Dedicated tote mixers are not recommended.
2. Transferring PetroFix to mix tank - Prior to transferring PetroFix to the mix tank the specified amount of dilution water should be added to the mix tank. The recommended amount of water can be found on the design summary page. Next, the injection contractor should determine their preferred way of measuring the amount of PetroFix to be transferred to the mix tanks. Examples included physical volume transfers (i.e., graduated buckets), use of volumetric flow meters couple to pumps, internal staging sticks, or external staging marks. Specific pump recommendations that can be used for machine transfer will be discussed later under equipment recommendations.
3. Adding electron acceptor to mix tank- The electron acceptor must be added AFTER the PetroFix remedial fluid is added to the dilution tank with water. We recommend the use of a field scale to measure recommended amounts of electron acceptor needed per batch.

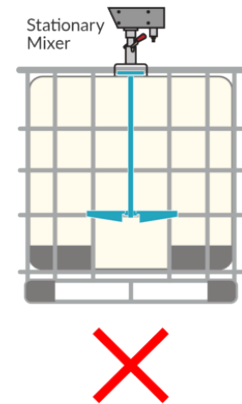
4. **Solution Mixing** – The diluted PetroFix solution should be allowed to mix for at least five minutes prior to application. Once mixed, the solution should be mixed at least every twenty minutes if continuous mixing is impractical. Recirculation mixing is not recommended. Recirculation tends to inadequately mix the PetroFix solution resulting in the collection in corners of the mixing vessel.

Homogenizing PetroFix In Totes and Drums

All mixers should access the bottom of the mixing vessel or PetroFix concentrate containers.
Minimum rod length: 48 inches.

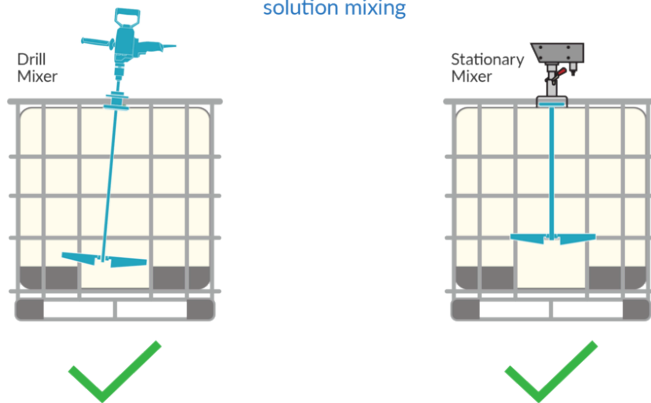


Stationary mixers inadequately access corners of the PetroFix concentrate containers.



Mixing Diluted PetroFix in Mix Tanks

Stationary mixers and handheld paddle mixers are recommended for PetroFix solution mixing



Recirculation inadequately mixes the PetroFix solution

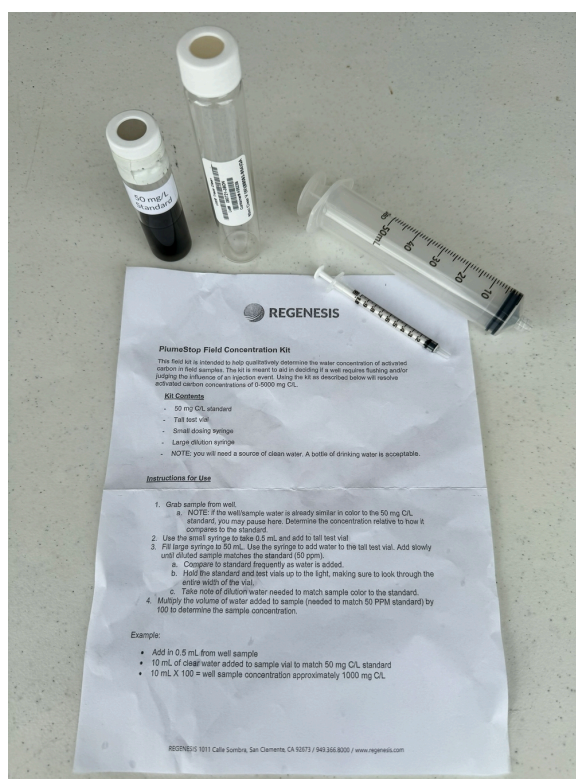


Groundwater Sampling Guidance

PetroFix Test Kit

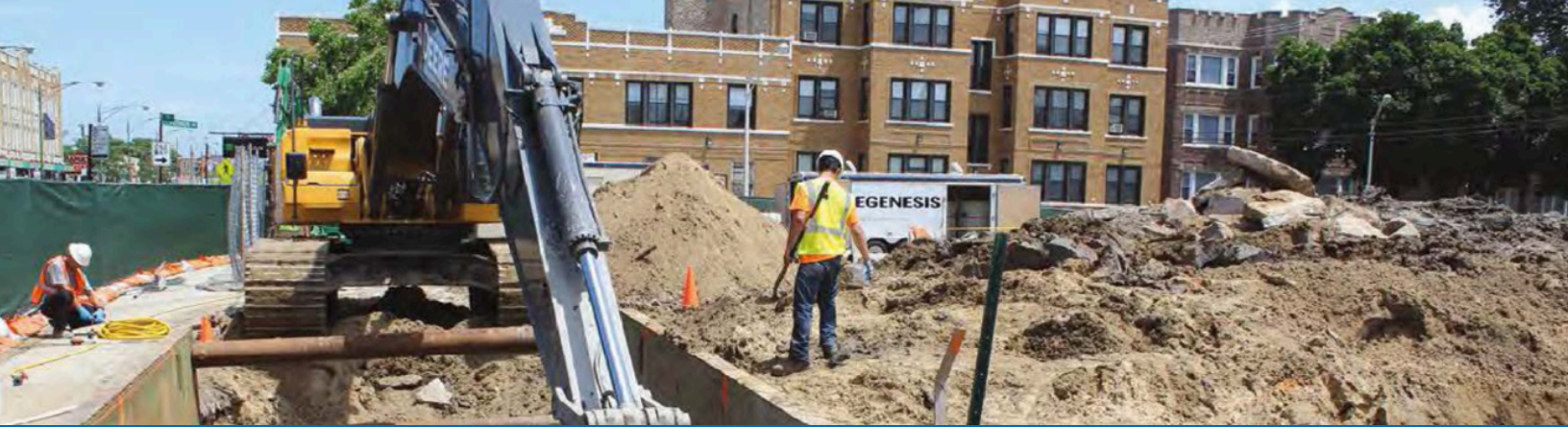
For the convenience of our customers, each shipment of PetroFix includes a field concentration test kit. This kit is used to measure PetroFix concentrations in groundwater and is typically used for injection distribution testing or to determine if groundwater is within safe sampling ranges post-application.

A single test kit should arrive taped to the tops or sides of a PetroFix tote or drum, or possibly with the electron acceptor buckets. Please ensure that injection crews transfer the kits to responsible site managers to avoid loss. If a test kit cannot be found, please inform REGENESIS, and a replacement kit will be shipped out. These test kits are reusable if stored under similar conditions as recommended for PetroFix.



You can begin monitoring after the water clarifies to background conditions or drops below 100 ppm of residual suspended PetroFix. In most cases, suspended concentrations of PetroFix fall below this level within three months. However, site-specific conditions or application events may extend this timeframe. A comprehensive summary of groundwater sampling procedures and techniques to obtain clarified samples is described in the [Colloidal Activated Carbon \(CAC\) Sampling Guidance Document](#).

If you need to sample within three months post-application, please contact REGENESIS to discuss possible design modifications or options presented in the sampling guidance document.



Acknowledgement

This scope and associated costs are budgetary and should not be considered final. Listed below are the next steps to secure a final design and cost estimate from REGENESIS.

Steps to Final Design and Scope of Work

1. Signature notifying REGENESIS to proceed with final design.
2. REGENESIS technical team contacts Langan Engineering & Environmental Services to review final scope of work and provide detailed design and cost estimate
3. Provide Detailed Remediation Services Scope of Work, if applicable.
4. Confirm Implementation Schedule
5. Submit Detailed Design and Cost Estimate to Langan Engineering & Environmental Services for review and final approval

Signature below confirms signee accepts this preliminary scope of work and would like REGENESIS to proceed with a detailed design and cost estimate.

 SIGNATURE
Brian Gochenaur

Not yet accepted

Langan Engineering & Environmental Services | Brian Gochenaur, Senior Project Manager

Terms & Conditions

1. **PAYMENT TERMS.** Net 30 Days. Accounts outstanding after 30 days will be assessed 1.5% monthly interest. Volume discount pricing will be rescinded on all accounts outstanding over 90 days. An early payment discount of 1.5% Net 10 is available for cash or check payments only. We accept Master Card, Visa and American Express.
2. **RETURN POLICY.** A 15% re-stocking fee will be charged for all returned goods. All requests to return product must be pre-approved by seller. Returned product must be in original condition and no product will be accepted for return after a period of 90 days.
3. **FORCE MAJEURE.** Seller shall not be liable for delays in delivery or services or failure to manufacture or deliver due to causes beyond its reasonable control, including but not limited to acts of God, acts of buyer, acts of military or civil authorities, fires, strikes, flood, epidemic, war, riot, delays in transportation or car shortages, or inability to obtain necessary labor, materials, components or services through seller's usual and regular sources at usual and regular prices. In any such event Seller may, without notice to buyer, at any time and from time to time, postpone the delivery or service dates under this contract or make partial delivery or performance or cancel all or any portion of this and any other contract with buyer without further liability to buyer. Cancellation of any part of this order shall not affect Seller's right to payment for any product delivered or service performed hereunder.
4. **LIMITED WARRANTY.** Seller warrants the product(s) sold and services provided as specified on face of invoice, solely to buyer. Seller makes no other warranty of any kind respecting the product and services, and expressly DISCLAIMS ALL OTHER WARRANTIES OF WHATEVER KIND RESPECTING THE PRODUCT AND SERVICES, INCLUDING ALL WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE AND NON-INFRINGEMENT.
5. **DISCLAIMER.** Where warranties to a person other than buyer may not be disclaimed under law, seller extends to such a person the same warranty seller makes to buyer as set forth herein, subject to all disclaimers, exclusions and limitations of warranties, all limitations of liability and all other provisions set forth in the Terms and Conditions herein. Buyer agrees to transmit a copy of the Terms and Conditions set forth herein to any and all persons to whom buyer sells, or otherwise furnishes the products and/or services provided by seller and buyer agrees to indemnify seller for any liability, loss, costs and attorneys' fees which seller may incur by reason, in whole or in part, of failure by buyer to transmit the Terms and Conditions as provided herein.
6. **LIMITATION OF SELLER'S LIABILITY AND LIMITATION OF BUYER'S REMEDY.** Seller's liability on any claim of any kind, including negligence, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair or use of any goods or performance of any services covered by or furnished hereunder, shall in no case exceed the lesser of (1) the cost of repairing or replacing goods and repeating the services failing to conform to the foregoing warranty or the price of the goods and/or services or part thereof which gives rise to the claim. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, OR FOR DAMAGES IN THE NATURE OF PENALTIES.
7. **INDEMNIFICATION.** Buyer agrees to defend and indemnify seller of and from any and all claims or liabilities asserted against seller in connection with the manufacture, sale, delivery, resale or repair or use of any goods, and performance of any services, covered by or furnished hereunder arising in whole or in part out of or by reason of the failure of buyer, its agents, servants, employees or customers to follow instructions, warnings or recommendations furnished by seller in connection with such goods and services, by reason of the failure of buyer, its agents, servants, employees or customers to comply with all federal, state and local laws applicable to such goods and services, or the use thereof, including the Occupational Safety and Health Act of 1970, or by reason of the negligence or misconduct of buyer, its agents, servants, employees or customers.

8. **EXPENSES OF ENFORCEMENT.** In the event seller undertakes any action to collect amounts due from buyer, or otherwise enforce its rights hereunder, Buyer agrees to pay and reimburse Seller for all such expenses, including, without limitation, all attorneys and collection fees.
9. **TAXES.** Liability for all taxes and import or export duties, imposed by any city, state, federal or other governmental authority, shall be assumed and paid by buyer. Buyer further agrees to defend and indemnify seller against any and all liabilities for such taxes or duties and legal fees or costs incurred by seller in connection therewith.
10. **ASSISTANCE AND ADVICE.** Upon request, seller in its discretion will furnish as an accommodation to buyer such technical advice or assistance as is available in reference to the goods and services. Seller assumes no obligation or liability for the advice or assistance given or results obtained, all such advice or assistance being given and accepted at buyer's risk.
11. **SITE SAFETY.** Buyer shall provide a safe working environment at the site of services and shall comply with all applicable provisions of federal, state, provincial and municipal safety laws, building codes, and safety regulations to prevent accidents or injuries to persons on, about or adjacent to the site.
12. **INDEPENDENT CONTRACTOR.** Seller and Buyer are independent contractors and nothing shall be construed to place them in the relationship of partners, principal and agent, employer/employee or joint ventures. Neither party will have the power or right to bind or obligate the other party except as may be expressly agreed and delegated by other party, nor will it hold itself out as having such authority.
13. **REIMBURSEMENT.** Seller shall provide the products and services in reliance upon the data and professional judgments provided by or on behalf of buyer. The fees and charges associated with the products and services thus may not conform to billing guidelines, constraints or other limits on fees. Seller does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where seller may serve as a supplier or subcontractor to an entity that seeks reimbursement from the Government for all or part of the services performed or products provided by seller, it is the sole responsibility of the buyer or other entity seeking reimbursement to ensure the products and services and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity that seeks reimbursement from the Government, seller does not knowingly present or cause to be presented any claim for payment to the Government.
14. **APPLICABLE LAW/JURISDICTION AND VENUE.** The rights and duties of the parties shall be governed by, construed, and enforced in accordance with the laws of the State of California (excluding its conflict of laws rules which would refer to and apply the substantive laws of another jurisdiction). Any suit or proceeding hereunder shall be brought exclusively in state or federal courts located in Orange County, California. Each party consents to the personal jurisdiction of said state and federal courts and waives any objection that such courts are an inconvenient forum.
15. **ENTIRE AGREEMENT.** This agreement constitutes the entire contract between buyer and seller relating to the goods or services identified herein. No modifications hereof shall be binding upon the seller unless in writing and signed by seller's duly authorized representative, and no modification shall be effected by seller's acknowledgment or acceptance of buyer's purchase order forms containing different provisions. Trade usage shall neither be applicable nor relevant to this agreement, nor be used in any manner whatsoever to explain, qualify or supplement any of the provisions hereof. No waiver by either party of default shall be deemed a waiver of any subsequent default.

Detailed Design Tables



PetroFix Application Summary Grid Estimate 445 Gerard Avenue RMW14



PetroFix Amount	200 lb
Electron Acceptor Amount	10 lb
Treatment Surface Area	80 ft ²
Injection Points	1
Point Spacing	8.0 ft
Top of Treatment Interval	17.0 ft bgs
Bottom of Treatment Interval	27.0 ft bgs
Treatment Volume	30 yd ³
PetroFix Dose	6.8 lb/yd ³

Total Volume	1,024 gal
Product Volume	20 gal
Water Volume	1,003 gal
Injection Volume Per Point	1,024 gal
Injection Volume Per Vertical Foot	102 gal
Product/Point	20.5 gal
Water/Point	1,003.1 gal
Soil Type	Coarse >75% Sand/Gravel
Effective Pore Volume Fill %	68%

Mix Tank Volume*	275 gal
Dilution Factor	50.0 x
PetroFix per Mix Tank	5.5 gal
Water Per Mix Tank	269.5 gal
Electron Acceptor per Mix Tank	2.7 lb
Number of Batches Required	3.7

**Adjust tank volume to that used in field.*

Reported Groundwater Concentrations (mg/L)	
Benzene	0.001
Toluene	0.007
Ethylbenzene	0.200
Xylenes	0.015
Trimethylbenzenes	0.075
Butylbenzene	0.005

AREA NOTES

Isopropylbenzene	0.100
Naphthalenes	0.049
MTBE	0.000
TPH-GRO	1.079
TPH-DRO	0.000
TPH-ORO	0.000

PetroFix Application Summary
Grid Estimate
445 Gerard Avenue
OMW-01

PetroFix Amount	200 lb
Electron Acceptor Amount	10 lb
Treatment Surface Area	80 ft ²
Injection Points	1
Point Spacing	8.0 ft
Top of Treatment Interval	13.0 ft bgs
Bottom of Treatment Interval	28.0 ft bgs
Treatment Volume	44 yd ³
PetroFix Dose	4.5 lb/yd ³

Total Volume	1,024 gal
Product Volume	20 gal
Water Volume	1,003 gal
Injection Volume Per Point	1,024 gal
Injection Volume Per Vertical Foot	68 gal
Product/Point	20.5 gal
Water/Point	1,003.1 gal
Soil Type	Coarse >75% Sand/Gravel
Effective Pore Volume Fill %	46%

Mix Tank Volume*	275 gal
Dilution Factor	50.0 x
PetroFix per Mix Tank	5.5 gal
Water Per Mix Tank	269.5 gal
Electron Acceptor per Mix Tank	2.7 lb
Number of Batches Required	3.7

**Adjust tank volume to that used in field.*

Reported Groundwater Concentrations (mg/L)

Benzene	0.001
Toluene	0.007
Ethylbenzene	0.200
Xylenes	0.015
Trimethylbenzenes	0.075
Butylbenzene	0.005

AREA NOTES

Isopropylbenzene	0.100
Naphthalenes	0.049
MTBE	0.000
TPH-GRO	0.435
TPH-DRO	0.000
TPH-ORO	0.000

PetroFix Application Summary
Grid Estimate
445 Gerard Avenue
OMW-02

PetroFix Amount	400 lb
Electron Acceptor Amount	20 lb
Treatment Surface Area	80 ft ²
Injection Points	1
Point Spacing	8.0 ft
Top of Treatment Interval	15.0 ft bgs
Bottom of Treatment Interval	30.0 ft bgs
Treatment Volume	44 yd ³
PetroFix Dose	9.0 lb/yd ³

Total Volume	2,047 gal
Product Volume	41 gal
Water Volume	2,006 gal
Injection Volume Per Point	2,047 gal
Injection Volume Per Vertical Foot	136 gal
Product/Point	40.9 gal
Water/Point	2,006.1 gal
Soil Type	Coarse >75% Sand/Gravel
Effective Pore Volume Fill %	91%

Mix Tank Volume*	275 gal
Dilution Factor	50.0 x
PetroFix per Mix Tank	5.5 gal
Water Per Mix Tank	269.5 gal
Electron Acceptor per Mix Tank	2.7 lb
Number of Batches Required	7.4

**Adjust tank volume to that used in field.*

Reported Groundwater Concentrations (mg/L)

Benzene	0.005
Toluene	0.003
Ethylbenzene	0.730
Xylenes	0.071
Trimethylbenzenes	1.510
Butylbenzene	0.017

AREA NOTES

Isopropylbenzene	0.150
Naphthalenes	0.960
MTBE	0.000
TPH-GRO	7.932
TPH-DRO	0.000
TPH-ORO	0.000

CALCIUM CHLORIDE FLUSHING STEPS

For Monitoring Well RW14

STEP 1: Surge well with a surge block then inject water

29 gallons of water

STEP 2: Inject the the CaCl₂ solution

33 gallons of water mixed with CaCl₂

16.6 lb CaCl₂

0.5 Rule-of-thumb dosing: lb CaCl₂ per gallon water

STEP 3: Low-Volume Flood of CaCl₂ out of well

29 Gallons of water

91 Total water needed

16.6 Total CaCl₂ needed

CALCIUM CHLORIDE FLUSHING STEPS

For Monitoring Well OMW-01

STEP 1: Surge well with a surge block then inject water

26 gallons of water

STEP 2: Inject the the CaCl₂ solution

29 gallons of water mixed with CaCl₂

14.7 lb CaCl₂

0.5 Rule-of-thumb dosing: lb CaCl₂ per gallon water

STEP 3: Low-Volume Flood of CaCl₂ out of well

26 Gallons of water

81 Total water needed

14.7 Total CaCl₂ needed

CALCIUM CHLORIDE FLUSHING STEPS

For Monitoring Well OMW-02

STEP 1: Surge well with a surge block then inject water

32 gallons of water

STEP 2: Inject the the CaCl₂ solution

37 gallons of water mixed with CaCl₂

18.6 lb CaCl₂

0.5 Rule-of-thumb dosing: lb CaCl₂ per gallon water

STEP 3: Low-Volume Flood of CaCl₂ out of well

32 Gallons of water

102 Total water needed

18.6 Total CaCl₂ needed

Injection Point	Date Started	Date Finished	Time Start	Time Finish	Rate (Gallons/min.)	Pressure (PSI)	Volume (Gallons)	Total Injection Amounts	Injection Depth
OMW-02 (Day 1)	2/24/2025	2/25/2025	8:30	2:00	5 gpm	10-15 PSI	1,000	400 lb PetroFix, Water Volume - 2,006 gal, Total Volume 2,047 gal	15-30
OMW-02 (Day 2)	2/24/2025	2/25/2025	7:40	2:30	5 gpm	10-15 PSI	1,047		
OMW-01	2/26/2025	2/26/2025	7:45	1:50	5 gpm	10-15 PSI	1,024	200 lb PetroFix, Water Volume - 1,003 gal, Total Volume 1,024 gal	13-28
RMW14 (Day 1)	2/27/2025	2/28/2025	10:00	-	~2.0-2.5 gpm	5-10 PSI	600	200 lb PetroFix, Water Volume - 1,003 gal, Total Volume 1,024 gal	17-27
RMW14 (Day 2)	2/27/2025	2/28/2025	6:20	9:30	5 gpm	10-15 PSI	424		

Batch Log - OMW-02

Overall Batch #	Date	Daily Batch #	Petrofix (gallons)	Water (gallons)	Electron Acceptor (lb)
1	2/24/2025	1	1	49	0.49
2	2/24/2025	2	1	49	0.49
3	2/24/2025	3	1	49	0.49
4	2/24/2025	4	1	49	0.49
5	2/24/2025	5	1	49	0.49
6	2/24/2025	6	1	49	0.49
7	2/24/2025	7	1	49	0.49
8	2/24/2025	8	1	49	0.49
9	2/24/2025	9	1	49	0.49
10	2/24/2025	10	1	49	0.49
11	2/24/2025	11	1	49	0.49
12	2/24/2025	12	1	49	0.49
13	2/24/2025	13	1	49	0.49
14	2/24/2025	14	1	49	0.49
15	2/24/2025	15	1	49	0.49
16	2/24/2025	16	1	49	0.49
17	2/24/2025	17	1	49	0.49
18	2/24/2025	18	1	49	0.49
19	2/24/2025	19	1	49	0.49
20	2/24/2025	20	1	49	0.49
21	2/25/2025	1	1	49	0.49
22	2/25/2025	2	1	49	0.49
23	2/25/2025	3	1	49	0.49
24	2/25/2025	4	1	49	0.49
25	2/25/2025	5	1	49	0.49
26	2/25/2025	6	1	49	0.49
27	2/25/2025	7	1	49	0.49
28	2/25/2025	8	1	49	0.49
29	2/25/2025	9	1	49	0.49
30	2/25/2025	10	1	49	0.49
31	2/25/2025	11	1	49	0.49
32	2/25/2025	12	1	49	0.49
33	2/25/2025	13	1	49	0.49
34	2/25/2025	14	1	49	0.49
35	2/25/2025	15	1	49	0.49
36	2/25/2025	16	1	49	0.49
37	2/25/2025	17	1	49	0.49
38	2/25/2025	18	1	49	0.49
39	2/25/2025	19	1	49	0.49
40	2/25/2025	20	1	49	0.49
41	2/25/2025	21	0.94	46	0.46

Batch Log - OMW-01

Overall Batch #	Date	Daily Batch #	Petrofix (gallons)	Water (gallons)	Electron Acceptor (lb)
1	2/26/2025	1	1	49	0.49
2	2/26/2025	2	1	49	0.49
3	2/26/2025	3	1	49	0.49
4	2/26/2025	4	1	49	0.49
5	2/26/2025	5	1	49	0.49
6	2/26/2025	6	1	49	0.49
7	2/26/2025	7	1	49	0.49
8	2/26/2025	8	1	49	0.49
9	2/26/2025	9	1	49	0.49
10	2/26/2025	10	1	49	0.49
11	2/26/2025	11	1	49	0.49
12	2/26/2025	12	1	49	0.49
13	2/26/2025	13	1	49	0.49
14	2/26/2025	14	1	49	0.49
15	2/26/2025	15	1	49	0.49
16	2/26/2025	16	1	49	0.49
17	2/26/2025	17	1	49	0.49
18	2/26/2025	18	1	49	0.49
19	2/26/2025	19	1	49	0.49
20	2/26/2025	20	1	49	0.49
21	2/26/2025	21	0.48	23.5	0.23

Batch Log - RMW14

Overall Batch #	Date	Daily Batch #	Petrofix (gallons)	Water (gallons)	Electron Acceptor (lb)
1	2/27/2025	1	1	49	0.49
2	2/27/2025	2	1	49	0.49
3	2/27/2025	3	1	49	0.49
4	2/27/2025	4	1	49	0.49
5	2/27/2025	5	1	49	0.49
6	2/27/2025	6	1	49	0.49
7	2/27/2025	7	1	49	0.49
8	2/27/2025	8	1	49	0.49
9	2/27/2025	9	1	49	0.49
10	2/27/2025	10	1	49	0.49
11	2/27/2025	11	1	49	0.49
12	2/27/2025	12	1	49	0.49
13	2/28/2025	13	1	49	0.49
14	2/28/2025	14	1	49	0.49
15	2/28/2025	15	1	49	0.49
16	2/28/2025	16	1	49	0.49
17	2/28/2025	17	1	49	0.49
18	2/28/2025	18	1	49	0.49
19	2/28/2025	19	1	49	0.49
20	2/28/2025	20	1	49	0.49
21	2/28/2025	21	0.48	23.5	0.23



Colloidal Activated Carbon (CAC) Groundwater Sampling Guidance Document

Best Practices for Collecting Samples Following CAC Applications





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Introduction



Figure 1 - Image of groundwater with suspended colloidal carbon poured into a bucket. The groundwater appears quite dark but once tested was safe to send to an analytical laboratory for accurate samples.

During injection, PlumeStop® or PetroFix® may flow into nearby monitoring wells, as evidenced by sampling the well and finding the watercolor to be black. This occurrence is not uncommon and is simply the result of the colloidal activated carbon (CAC) of the product transported through the natural flux zones of the aquifer. In most situations, the observance of PlumeStop or PetroFix in monitoring wells, or even in collected soils samples, is desired because this tells us that we are getting proper distribution at a site. At most sites, groundwater treated with PlumeStop or PetroFix will clarify to safe sampling concentrations by the first quarter after injection.

Most sites can be sampled by 3 months post application even if darkened water is present because CAC concentrations have fallen to safe sampling concentrations.

REGENESIS' rule-of-thumb is to sample your site no earlier than 3 months post application.

However, we recognize that some situations may require sampling sooner or at a minority of sites, PlumeStop or PetroFix may stay suspended longer than normal (> 3 months) at concentrations not considered safe for sampling. This document is intended to give our customers a comprehensive evaluation of techniques to help attain good groundwater samples at any phase of the project.

Table 1 and Table 2 (next pages) summarize best practices to prevent PlumeStop or PetroFix from interfering with commercial analytical methods and the specific techniques are described in order in this document.



Figure 2 - Image of groundwater samples in a VOA bottle and exactly at 100 mg/L with some visible light coming through. Anything at this concentration or lower is safe to send to an analytical laboratory.

PetroFix can be safely and accurately sampled at concentrations below 100 mg/L which is still dark. A person can just see through 100 mg/L of colloidal carbon in groundwater when in a 40mL VOA bottle. Very little colloidal carbon is needed to darken the water. **DO NOT** evaluate the ability to sample with only visual observations of groundwater in large plastic drink containers, buckets, etc. because larger volumes of PetroFix appear darker than in 40mL VOAs.

Always use 40mL VOA bottles to begin the evaluation of sampling appropriateness. Field concentration test kits are available from REGENESIS for PlumeStop projects or shipped with each PetroFix order.

Table 1: Guidance for Sampling <Q1

Category	Time Frame	Technique	Importance
Prevent PlumeStop® or PetroFix® in samples	Prior or during application	Standard well sampling practice ¹	Recommended
		Over purge wells or points during sampling	Recommended
		Rehabilitate and desilt wells if low-flow sampling cannot be used	Recommended
		<i>In situ</i> flocculation, CaCl ₂ parking around wells	Recommended
		Passive diffusion bags (collect baseline before injection) ²	Recommended
		Install and develop temporary sentinel piezometer	Optional
Treat PlumeStop® or PetroFix® in samples	After Application	Standard well sampling practice ¹	Recommended
		Over purge wells or points during sampling	Recommended
		Rehabilitate and desilt wells if low-flow sampling cannot be used	Recommended
		<i>In situ</i> flocculation, CaCl ₂ parking around wells	Recommended
		Wait and sample when colloidal carbon <100 ppm	Optional
		Passive diffusion bags (PDBs) ²	Optional
		Filter (<0.4 micron) ³	Optional
		VOA sample clarification with alum ⁴	Optional

1. Remove tubing and bailers between events, keep wells watertight, use standard development methods, allow post-purge recovery time, gently lower bailers/meters, and don't allow any sampling equipment to touch the bottom of the well.
2. Take baseline before CAC injection; Not all analytes can be measured with PDBs (see acceptable analytes on page 14)
3. State and analyte-specific – would need to be pre-approved by state and client.
4. Modified lab technique would need to be pre-approved by state and client.

Table 2: Guidance for Sampling >Q1

Category	Time Frame	Technique	Importance
Prevent PlumeStop® or PetroFix® in samples	Prior or during application	Standard well sampling practice ¹	Recommended
		Over purge wells or points during sampling	Recommended
		Rehabilitate and desilt wells if low-flow sampling cannot be used	Recommended
		<i>In situ</i> flocculation, CaCl ₂ parking around wells	Optional
		Passive diffusion bags (collect baseline before injection) ²	Optional
		Install and develop temporary sentinel piezometer	Optional
Treat PlumeStop® or PetroFix® in samples	After Application	Standard well sampling practice ¹	Recommended
		Over purge wells or points during sampling	Recommended
		Rehabilitate and desilt wells if low-flow sampling cannot be used	Recommended
		<i>In situ</i> flocculation, CaCl ₂ parking around wells	Recommended
		Wait and sample when colloidal carbon <100 ppm	Recommended
		Passive diffusion bags (PDBs) ²	Optional
		Filter (<0.4 micron) ³	Optional
		VOA sample clarification with alum ⁴	Optional

1. Remove tubing and bailers between events, keep wells watertight, use standard development methods, allow post-purge recovery time, gently lower bailers/meters, and don't allow any sampling equipment to touch the bottom of the well.
2. Take baseline before CAC injection; Not all analytes can be measured with PDBs (see acceptable analytes on page 14)
3. State and analyte-specific – would need to be pre-approved by state and client.
4. Modified lab technique would need to be pre-approved by state and client.

Well Housekeeping

Standard Practices



Figure 3 - Image of tubing left in well and coated with PetroFix

At various remediation sites, the age of the wells or poor maintenance practices can affect PlumeStop or PetroFix sampling. One example is the accumulation of settled fines in the bottom that may have colloidal carbon attachment and that churn up or re-suspend in a monitoring well during normal groundwater sampling activities. The resuspension of darkened fines is often mistaken for *in situ* colloidal carbon suspensions. This section is intended to provide remediation practitioners with solutions to overcome sampling issues related to monitoring wells during groundwater sampling.

Good well-keeping practices go a long way in ensuring good samples are collected from monitoring wells. Here is a list of minimum practices that should be observed for every site.

1. Keeping monitoring well plugs (aka, J-Plugs), monitoring well covers, bolts, and gaskets water-tight. Loosely fitting plugs and well covers permit stormwater and sediments to enter the monitoring well.
2. Remove all tubing, bailers, and rope from monitoring wells after each sampling event (i.e., dedicated sampling tubing should not be used since colloidal carbon can coat tubing).
3. Utilize industry-wide well development and purging methods before sampling.
4. After purging, allow wells proper recovery time before sampling. Where there are concerns with colloidal carbon affecting the sampling, we recommend waiting at least 4 hours, but up to 24 hours where necessary, between purging and sampling.
5. Sampling should be performed by gently lowering the bailer into the well.
6. Water level meter probes should be gently lowered into the well.
7. Bailers, tubing, or sampling equipment should not contact the bottom of the well at any time during the sampling process

Over Purging



Figure 4 - Dark water pulled from a well and indicating that over purging or other well rehabilitation may be necessary.

Where colloidal carbon is present near a monitoring well, over purging may help to restore the monitoring well to a representative sampling point. Typically, purging conducted before sampling will remove approximately 1-3 well pore volumes or about 2-5 gallons from a 2" internal diameter (ID) monitoring well. During over purging, 5-10 pore volumes or more are recommended to be removed. Over purging can be completed using a downhole well pump or a bailer. The colloidal carbon in the monitoring well should begin to decline during the purging process. If over purging is effective, purge water may still be relatively turbid; however, the dark carbon color should fade and become gray or translucent.

The purge water in a 5-gallon bucket can be misleading (see Figure 1) and is not recommended to determine effectiveness because turbidity can affect the color. To determine if the over purging is adequate, we recommend looking at occasional samples of the purge water in a clear 40 ml vial or similar clear containers. We recommend waiting at least 24 hours before performing groundwater sampling upon over purging. As a cautionary note, we recommend stopping if the purge water from the well during the over purging process does not appear to become clearer after ten pore volumes. We also recommend stopping if over purging needs to be conducted on more than two events. Alternatively, the well may require rehabilitation, or a Calcium Chloride flush, as discussed in later sections.

Well Rehabilitation

In some cases, standard housekeeping practices and over purging are ineffective because there are more significant problems with the monitoring well itself. Occasionally, fine silts can build up at the base of the well screen and surrounding well pack. These fine silts are often coated with colloidal carbon following a PlumeStop or PetroFix injection, and these particles can cause a persistent problem for groundwater sampling. Being mobilized by the typical well purging and sampling processes, these fine silts can carry contaminants into the monitoring well, otherwise not present in the dissolved phase groundwater remediation with PlumeStop. For the scenario just described, well rehabilitation may be the solution.

Surge blocks, well pumps, and vac-trucks are all equipment options for well rehabilitation. Whether a well pump or vac truck is used is up to the prescriber. The process to rehabilitate a well can take between 1-4 hours, depending upon the severity of the problem and the size of the well. Each of these methods and their effectiveness are discussed below.

A vac truck is ideal where a significant amount of silt and sediment is present on the bottom of a well. Vac trucks can place a stinger tube down the well and rapidly remove the silt and sediment, along with purge water. Vac trucks are limited in subsurface reach and, depending upon barometric conditions, generally struggle to draw water/sediment from deeper than 35 feet.

A downhole well development pump can be used for deeper wells or where a vac truck is not suitable. Not all downhole pumps effectively remove sediments at the base of a well, and the process can damage some. It's best to make sure to know how much sediment might be present at the bottom of the well and select the right pump for the job.

Along with extracting purge water and sediments, surging the well with a surge block is highly recommended because it will enhance the quality of the well rehabilitation. The surging process quickly moves water in and out of the well screen, reordering and recompacting the filter pack. Surge blocks for shallow 2" diameter wells can be easily operated by hand. A well development truck with a lift might be needed for deeper wells or larger diameter wells to work the surge block. It's ideal to alternate the surging process with purging using the development pump or vac truck. Adding clear potable water down the well will also help enhance the well rehabilitation process, especially at sites where the hydraulic conductivity may be low, and the wells don't naturally produce much water.

As described in Over Purging methods, using a clear glass 40 ml vial to view the water quality changes during well rehabilitation is highly recommended. Upon completing the well rehabilitation process, it is advisable to flush the well with a CaCl_2 solution (see next section for specific recommendations). The CaCl_2 flush will help the residual colloidal carbon flocculate and remain in the aquifer.

In Situ Flocculation for Aquifer Clarification

Some practitioners wish to prevent colloidal suspensions near key wells because they know they want to sample soon after an injection or increase the likelihood that groundwater will be in a safe sampling range at any point post-injection. With extra work, practitioners can “park” PlumeStop or PetroFix colloidal suspensions through chemical flocculation techniques. The primary infield flocculation technique that we recommend is the injection or flooding of Calcium Chloride (CaCl_2) **separate from the PetroFix application**. CaCl_2 can flocculate and destabilize PlumeStop or PetroFix which results in improved aquifer clarification within a few days to weeks.

Here are usage examples of parking:

- Flood CaCl_2 into monitoring wells and a very limited distance from those wells immediately after PetroFix applications to “park” colloidal carbon. This accelerates the clarification of the aquifer near those wells and aids in sampling.
- Inject CaCl_2 post-injection into the formation in critical sampling areas or areas where one wishes to minimize the initial flux of PetroFix.

PLEASE NOTE: the use of CaCl_2 should only be used post-injection and carefully.

DO NOT CO-MIX or CO-INJECT CaCl_2 with PlumeStop or PetroFix and only apply in a separate application.

Site-wide parking of PlumeStop or PetroFix will deleteriously affect the distribution of the product. One should decide if they want to use, or have the option, of using CaCl_2 so that it can be included in the Underground Injection Control (UIC) application.

Calcium Chloride (CaCl₂) Parking

Health and Safety



Figure 5 - Example of 83% CaCl₂ flakes.

CaCl₂ is non-toxic and, generally, is safe to use when handled properly. However, CaCl₂ can generate enough heat to cause burns and equipment damage when mixed in water at high concentrations. This section is intended to give technical and safety guidance on CaCl₂ use as a PlumeStop or PetroFix parking agent. To that end, the following mixing threshold is established, which will alleviate most safety concerns.

- CaCl₂ should never be mixed at a concentration above 1 lb CaCl₂/ gal water.
- CaCl₂ should always be added to the total volume of water to minimize heat generation and ensure higher concentrations are not created.
- Please read and follow all material handling and safety instructions on supplier packaging.

Calcium Chloride Mixing

Standard Calcium Chloride Solution:

- 0.5 lb CaCl₂/gallon of water equivalent to 150 lb per 300-gallon mix tank.
- The purity of the calcium chloride should be 85% or higher.
- Calcium chloride flakes are recommended over pellets because they will dissolve faster.
- The volume of calcium chloride solution to be injected should be equivalent to 4 saturated well volumes.

Recommended Procedure for Applying Calcium Chloride Well Flush



Figure 6 - Client performing a well flush.

1. Calculate the saturated well volume:

$$V = \pi r^2 \text{ saturated length where "r" is the radius of the borehole.}$$

2. Multiply this volume by 4. Four well volumes will provide a good flush of the surrounding aquifer material.
3. Use a 55-gallon drum or supplementary poly tank if available and fill it with the requisite volume.
4. Slowly add the CaCl_2 amount calculated above and mix with a drill mixer. Mix until all CaCl_2 is dissolved.
5. Secure expansion plug with bypass (see table and links below) to well and attach hosing and pump. Expansion plugs with bypass are the simplest way to pump with pressure into wells of various sizes.
6. Make sure hosing and fittings match and are rated for appropriate psi tolerance. Rating should be greater than the max PSI of the pump.
7. Pump recommendations: pool pump, trash pump, air diaphragm pump, Hydracell, Moyno.
8. See expansion plug information and links below.
9. Pump the required amount of CaCl_2 mixture into the well.

REGENESIS recommends flushing the well at 3-5 gallons per minute or higher without going above a pressure equivalent to 1 psi per foot of well depth.

Expansion Plugs with Bypass



Use the bypass tube on these plugs to add air, water, and other fluid to your pipeline or to relieve pressure while testing. Maximum air back pressure is the amount of pressure a plug can withstand without moving. Maximum water back pressure refers to the pressure resulting from the height of the water above the plug.

Size	For Pipe ID	Max. Back Pressure		O'all Ht.	Temp. Range, °F	Material		Bypass			Each	
		Air, psi	Water, ft. of head			Seal	Bypass Cap	Pipe Size	Thread Type	Gender		
Style C Iron Stem												
1/2	0.47"-0.50"	Not Rated	46	4 1/4"	30° to 150°	Natural Rubber	Metal	1/16	NPT	Male	2644K15	\$18.37
3/4	0.72"-0.75"	Not Rated	46	5 1/8"	30° to 150°	Natural Rubber	Metal	1/8	NPT	Male	2644K16	21.13
1	0.97"-1.00"	Not Rated	46	5"	30° to 150°	Natural Rubber	Metal	1/4	NPT	Male	2644K18	22.70
2	1.75"-2.00"	Not Rated	34	10 3/8"	30° to 150°	Natural Rubber	Metal	1/2	NPT	Male	2644K21	18.37
3	2.75"-3.00"	Not Rated	34	10 1/2"	30° to 150°	Natural Rubber	Metal	1/2	NPT	Male	2644K22	23.87
4	3.63"-4.00"	Not Rated	23	10 1/8"	30° to 150°	Natural Rubber	Metal	1/2	NPT	Male	2644K23	27.60
5	4.50"-5.00"	Not Rated	23	12 5/8"	30° to 150°	Natural Rubber	Metal	1/2	NPT	Male	2644K24	57.74
6	5.50"-6.00"	Not Rated	23	12 1/2"	30° to 150°	Natural Rubber	Metal	1/2	NPT	Male	2644K25	40.69
8	7.50"-8.00"	Not Rated	4	14 3/4"	30° to 150°	Natural Rubber	Metal	1/2	NPT	Male	2644K26	91.31
10	9.50"-10.00"	Not Rated	4	14 7/8"	30° to 150°	Natural Rubber	Metal	1/2	NPT	Male	2644K31	132.05
12	11.50"-12.00"	Not Rated	4	14 5/8"	30° to 150°	Natural Rubber	Metal	1	NPT	Male	2644K32	232.86

Expansion plug link: <https://www.mcmaster.com/expansion-plugs-with-bypass/expansion-plugs-with-bypass/>

Adapter link: <https://www.mcmaster.com/pipe-fittings/thick-wall-plastic-pipe-fittings-for-water/>

Passive Diffusion Bags



Figure 7 – Example passive diffusion sampler.

Passive diffusion bag (PDB) samplers can sample groundwater where PlumeStop or PetroFix is present because it cannot diffuse through these bags, so the groundwater collected will be free of PlumeStop or PetroFix.

The significant advantage of PDBs is the confidence that you can sample groundwater for VOCs at any time post-injection based on your desired sampling time frames and without interference from any suspended PlumeStop or PetroFix. Furthermore, according to the Interstate Technology Regulatory Council (ITRC), PDB sampling is cost-effective and a viable alternative to standard or low-flow purge and sample techniques for collecting volatile organic compound (VOC) data at monitoring wells. PDB samplers, typically low-density polyethylene bags filled with water, have been shown in multiple studies to provide accurate groundwater VOC measurements.

PDBs come in 1-to-4-foot lengths and are filled with clean water and hung into a well for a minimum of two weeks. PDB sampling is achieved as VOCs in groundwater diffuse through the wall of the bag and into the bag water, which eventually comes to equilibrium with the surrounding well water.



Figure 8 - Sample pulled from a PDB bag and free of suspended carbon.

PDB Implementation Tips

- **Take Baseline PDB samples before injection.** State regulatory agencies might ask you to compare PDB's to standard groundwater samples (i.e., low-flow sampling or bailing) to prove that they correlate. With this in mind, **we recommend you take baseline samples alongside PDB samples before any PlumeStop or PetroFix application, where time-critical monitoring will begin shortly afterward.**
- **Hang PDBs from the same vertical interval that you have historically sampled from.** To get accurate groundwater VOC values compared to past or present results, it is critical to hang a PDB from the same vertical sampling interval in a monitoring well used from other sampling efforts. This is because groundwater contamination can stratify in an aquifer, and a plume may have different vertical groundwater concentrations intersecting a monitoring well screen. Those differences can be detected by PDBs hanging in a well. This phenomenon also is true for standard low-flow sampling. For example, at a hydrocarbon site, it is common for higher groundwater concentrations to be present in the aquifer near the surface of the aquifer where the smear zone resides versus at the bottom of a well where it is not likely present. However, multiple studies show that when PDBs are hung in the same zone that you usually collect standard or low-flow purge samples, they will correlate and provide accurate VOC concentrations.

PDB Analyte Limitations

Please note that PDBs are unsuitable for monitoring certain organic compounds (MTBE, TBA) or ionic species (nitrate, sulfate). They are currently only effective for early VOC measurements and not the entire suite of parameters you may use need to sample. Non-VOC parameters may need to be measured using standard sampling techniques after the PlumeStop or PetroFix suspension has mostly been clarified from groundwater. We recommend you become familiar with available resources on PDBs (the first ITRC FAQ listed left) and guidelines from the suppliers of PDBs.

Here are some helpful links:

PDB References

- ITRC FAQ On PDBs And List Of VOC's Showing Good Sample Correlation:
<https://www.itrcweb.org/Documents/PDBFAQs2.pdf>
- Users Guide for Polyethylene-Based PDBs:
<https://www.itrcweb.org/GuidanceDocuments/DSP-1a.pdf>
- USEPA Clu-In.org Guidance On Diffusion Samplers:
[https://clu-in.org/characterization/technologies/default.focus/sec/Passive\(nopurge\)Samplers/cat/DiffusionSamplers/](https://clu-in.org/characterization/technologies/default.focus/sec/Passive(nopurge)Samplers/cat/DiffusionSamplers/)

PDB Suppliers

- ALS:
<https://www.alsglobal.com/en-us/services-and-products/environmental/sampling/passive-diffusion-bags-pdbs>
- EON Products Incorporated:
<https://store.eonpro.com/store/c/71-Water-Sampling-Pumping.aspx>

Compounds Showing Good Correlation in Laboratory Tests (Average differences in concentration of 11 percent or less between diffusion sampler water and test vessel water)			
Benzene	1,3-Dichlorobenzene	Naphthalene	
Bromodichloromethane	1,4-Dichlorobenzene	1,1,2,2-Tetrachloroethane	
Bromoform	Dichlorodifluoromethane	Tetrachloroethene	
Chlorobenzen	1,2-Dichloroethane	Toluene	
Carbon tetrachloride	1,1-Dichloroethene	1,1,1-Trichloroethane	
Chloroethane	cis-1,2-Dichloroethene	1,1,2-Trichloroethane	
Chloroform	trans-1,2-Dichloroethene	Trichloroethene	
Chloromethane	1,2-Dichloropropane	Trichlorofluoromethane	
2-Chlorovinyl ether	cis-Dichloropropene	1,2,3-Trichloropropane	
Dibromochloromethane	Dibromochloromethane	Vinyl chloride	
Dibromomethane	trans-1,3-dichloropropene	Total xylenes	
1,2-Dichlorobenzene	Ethyl benzene		

Compounds Showing Poor Correlation in Laboratory Tests (average differences in concentration greater than 20 percent between diffusion sampler water and test vessel water)			
Acetone*	Methyl-tert-butyl ether	MIBK*	Styrene

Source: Compounds tested under laboratory conditions for use with passive diffusion bag samplers (Vroblesky and Campbell, 2001).

*T.M. Sivavec and S. S. Baghel, 2000, General Electric Company, written communication.

Table 3 - ITRC FAQ document on passive diffusion bags analytes showing good correlation with PDBs

Install and Develop Sentinel Piezometers

Sentinel piezometers can be installed to detect the spread of PlumeStop or PetroFix before reaching a monitoring well or another sensitive receptor. By performing real-time observations of the sentinel well, the remediation practitioner should have sufficient time for a response to be implemented during the injection to maximize or minimize the appearance of PlumeStop or PetroFix at that well or receptor. The main reasons for using sentinel wells are to fine-tune PlumeStop or PetroFix dilutions to achieve proper ROI when there are not enough nearby monitoring wells for the same observations, to detect that lateral or vertical spread to unwanted zones or receptors, and finally, in some circumstances to aid in the minimization of PlumeStop or PetroFix in nearby wells to aid in early sampling.

The location of the piezometer is determined based on the existing grid or barrier injection layout, the groundwater flow direction and the groundwater flow velocity, and the need for the sentinel well. If sentinel piezometers are installed, we recommend that multiple units be installed to measure spread at different locations. For example, multiple piezometers can help document sufficient distribution at the site while also helping to minimize spread at other sensitive areas.

Sentinel Wells to Monitor Distribution

If sentinel wells are used within a grid to manage and monitor the spread of PlumeStop or PetroFix, we recommend placing them equidistant within the grid and where monitoring well coverage is insufficient. While injections are being performed, these piezometers should be monitored for PlumeStop or PetroFix. Ideally, CAC concentrations of several hundred to several thousand mg/L should be observed if distribution and injection overlap is achieved. If such concentrations are not observed during the injection, the remediation practitioners should re-evaluate injection volumes (by increasing injection dilutions), boost pressure, re-evaluate injection tooling used, adjust the spacing, or a combination of all. More on this subject is discussed in the direct push application instructions for PetroFix www.petrofix.com/resources

Sentinel Wells to Minimize Distribution to a Critical Receptor

The remediation practitioner may seek to minimize suspended carbon's impact at a critical well or receptor. In the case of the monitoring well, groundwater results may be needed relatively soon after injection and it is essential to minimize the concentration of CAC flowing through and around that monitoring well. As a cautionary note, minimizing the spread of PlumeStop or PetroFix by using sentinel wells may interfere with the performance by limiting the beneficial spread of CAC at densities that would offer better performance. Please use sentinel wells and concentration adjustments judiciously.

We recommend that sentinel wells be placed 1 to 2 feet directly between injection points and the monitoring well where you want to minimize impact, or at least 5 feet from a critical receptor (i.e., water body). By monitoring real-time, the pumping of CAC can be stopped or slowed once the sentinel piezometers show detections of materials. We feel that it is appropriate to allow the sentinel piezometer to reach concentrations of up to a few hundred mg/L, which would attenuate in concentration to the nearby well or receptor.

Sentinel wells can be effectively used with CaCl_2 parking efforts by verifying parking zones.

Wait and Sample When CAC <100 PPM



Figure 9 - Client periodically sampled wells and used field concentration test kit (next section) to evaluate when sampling was safe. In this case, groundwater sampling was delayed.

If a well is impacted, the best solution is to delay sampling and analysis until PlumeStop or PetroFix has had more time to deposit onto the soil, resulting in clarified groundwater samples. **Two to three months is enough at many sites, although it can take longer at some sites.** The time to equilibrate in the subsurface is correlated with soil clay and silt content. Generally, increased clay and silt content will decrease the time for PlumeStop or PetroFix to sorb and equilibrate. Divalent cations (ex. calcium or magnesium) in groundwater also speed up the clarification process.

If PlumeStop or PetroFix is observed in a groundwater well during the application, the well can be flushed with clear water (i.e., no reagent). The “PetroFix Well Flushing” Technical Bulletin provides more information on clear water well flushing. If sampling at least four weeks post-PlumeStop or PetroFix application, extended low flow purging of the monitoring well may improve the water clarity.

As a rule of thumb, if a sample is placed in a 40-mL VOA vial and you can see through the vial, it is probably safe to sample. The inability to effectively see through a vial is approximately 100 mg/L of PlumeStop or PetroFix (see the following figure of various PlumeStop or PetroFix concentrations for reference).

If you are interested in independent research on showing when suspended carbon from PlumeStop or PetroFix interferes with laboratory samples, please view the webinar entitled [“Remediation of Chlorinated Solvents in Groundwater with PlumeStop: Analytical Challenges and Solutions”](#) which was given by Heather Lord, Ph.D., who at the time was the Environmental Research and Development Manager for Maxxam Labs (now Bureau Veritas Labs). At roughly 15 minutes, Heather begins discussing the ranges where PlumeStop (or PetroFix) does not cause significant lab interference (around 100 mg/L) and positive results from passive diffusion bag samplers.

Unfortunately, no commercial laboratory prep procedures can easily remove PlumeStop or PetroFix from samples before analysis without deviating from standard methods. Filtering the 1 to 2-micrometer diameter particles from suspension is possible (see later section), although difficult and not always an accepted approach by every regulatory agency.

While centrifuging is possible, commercial labs typically do not have the necessary centrifuges to separate PlumeStop or PetroFix effectively.

If you need further technical assistance addressing the interference of PlumeStop or PetroFix when sampling, please get in touch with REGENESIS at info@REGENESIS.com or info@petrofix.com.

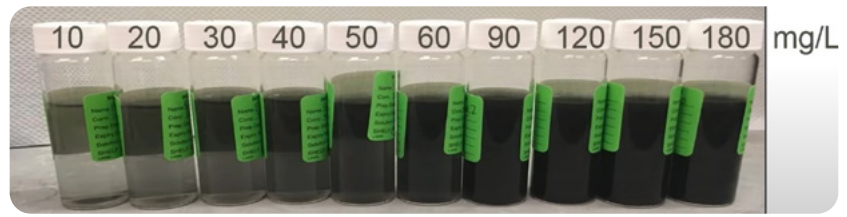


Figure 10 - PlumeStop or PetroFix concentrations in 40 mL VOA vials. If a vial can be seen through (~<100 mg/L), sending the sample to the lab is safe.

CAC Field Concentration Test Kit

Kit Contents:

- 50 mg C/L standard
- Tall test vial
- Small dosing syringe
- Large dilution syringe

NOTE: you will need a source of clean water. Tap or bottled drinking water is acceptable.

REGENESIS does provide simple in-field PlumeStop or PetroFix testing kits to semi-quantitatively determine the activated carbon concentration in groundwater samples following the injection of PlumeStop or PetroFix. The kit is meant to aid in deciding if a well requires flushing, judging the influence of an injection event, and following the change in suspended carbon well over time. Using the kit as described below will resolve activated carbon concentrations of 0-5000 mg C/L.

All PetroFix shipments come with one (1) field concentration test kit taped to the top of a drum or tote in the shipment. For PlumeStop projects which are injected turnkey by REGENESIS, the field crews will have available kits. The instructions in the kit explain how to dilute the sample and how to calculate CAC concentrations. Please contact REGENESIS at info@REGENESIS.com or 949-366-8000 if you need to replace a test kit.

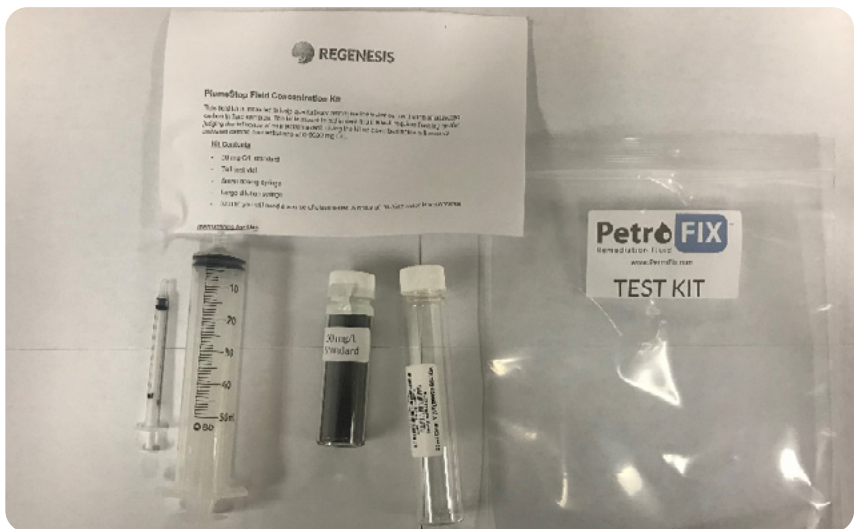


Figure 11 - Image of a field concentration test kit.

Filtering PlumeStop or PetroFix From Samples

In some instances, filtration as a step to remove low levels of CAC may be considered. Of the various methods available to remove CAC from water samples, filtration is the least recommended and most likely to receive pushback from regulators. Filtration is difficult because the filters rapidly become clogged by the CAC at higher concentrations, 300 mg/L or above. This filter cake build-up can also bias low concentration aqueous analytical results because of the high CAC layer that filtered water must travel through as it reaches the filter membrane. Additional issues with filtration include sorption of target analytes to the filter membrane and potential volatilization of lighter organic compounds such as BTEX.

Notes on best practices when filtering:

- Only attempt filtration to remove low levels of CAC (approximately 300 mg/L or lower)
- To avoid sorption of analytes to the filter, use glass fiber filter membranes (GFF) or other polar, low-affinity type materials.
- Minimize the headspace on both sides of a filtration setup. Volatilization of many VOCs is rapid and will bias the results

If filtration is being considered, it is strongly recommended to first consult with the regulating agency receiving the data to decide if the proposed sampling method will be acceptable.

In VOA Sample Clarification With Alum

A final option to obtain groundwater samples if additional fieldwork, waiting, or other methods are not desired or otherwise not successful, then groundwater samples can be safely sampled when treated with a powerful flocculant known as aluminum sulfate (alum). Field treatment of VOA samples with alum will remove CAC from the water matrix within hours while maintaining the integrity of any desired analysis. As stated throughout this document the presence of CAC above approximately 100 mg/L can have a negative impact on the methods and instruments used to quantify volatile organic compounds (VOCs) in water by standard methods like EPA 8260. This method is compatible with analytical methods used to measure VOCs, cVOCs, TPH-G and TPH-D.

Note, given this new approach clients or regulators may have questions about adding alum to samples and the potential to affect results. REGENESIS has confirmed with our own labs and through independent, outside lab testing that the use of alum does not bias results. Additional information on the subject can be found in a separate technical bulletin at www.REGENESIS.com or www.PetroFix.com website and doing a keyword search for **“CAC Alum Flocculation Method Validation”** which will identify the latest copy of this document which we anticipate may be updated in the future.

Alum Approach

For standard volatile organic carbon analysis by EPA 8260, this is achievable by adding a small amount (approx. 1 g/L) of alum (potassium aluminum sulfate, a food additive) to the sample at the time of collection. The addition of alum will promote the flocculation and settling of the suspended CAC, thus clarifying the sample, and allowing a clear aliquot to be taken for workup and analysis by the standard purge and trap method commonly performed as a part of EPA 8260. Because the carbon and water have reached equilibrium by the time of collection, there is slight to no bias between the before and after contaminant groundwater concentration following removal of the suspended CAC from the sample. Alum is commonly used in municipal water supplies to reduce turbidity before distribution in public water utilities.

Alum Settling Agent Kit

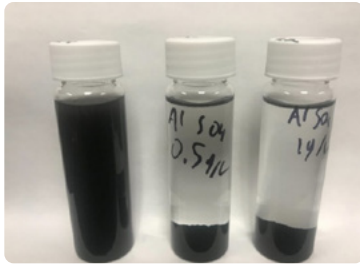


Figure 12 - Before and after alum treatment of suspended CAC in VOA vials.

Settling Agent Dosing Guide

Sample Volume	40 mL
---------------	-------

Settling agent	40 mg
----------------	-------

Settling agent	2 scoops
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Alum kits are provided by request and are used for settling suspended colloidal activated carbon (CAC) in 40mL VOA vials so that the remaining clear solution (supernatant) can be analyzed for contaminants by instrumental methods. Once the settling agent is added to the sample of black water, the carbon will begin to settle rapidly and be ready for analysis in roughly an hour. This method is appropriate for water samples containing around 5000 mg/L of CAC or less.

The lab receiving an alum-treated sample must allow the vials to stand undisturbed after receipt until the CAC has settled by an acceptable amount. If vials are set aside immediately after receipt by the lab, there will be adequate time for settling to occur within the method hold time. The lab requires no other special action.

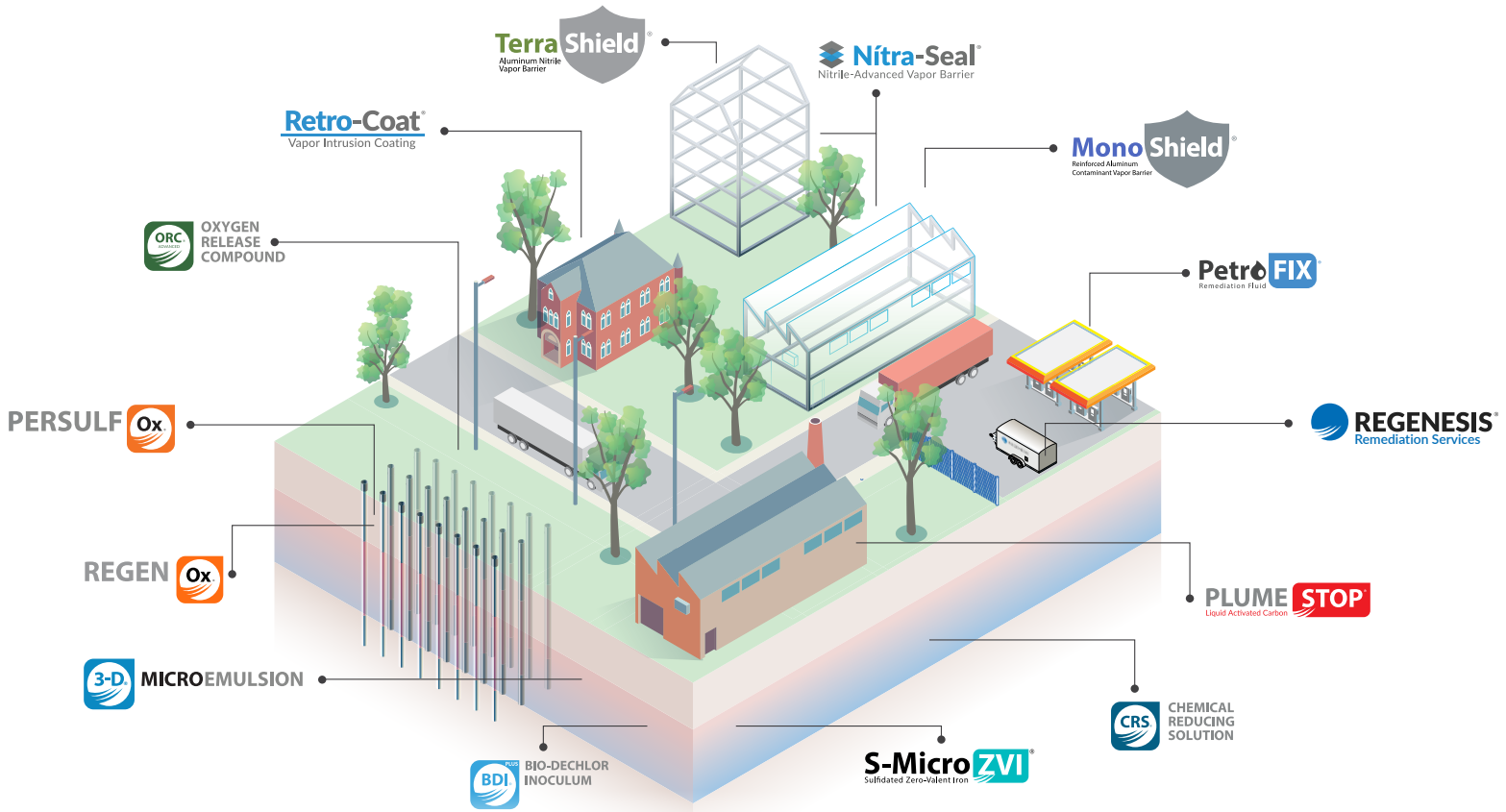
Kits can be obtained by emailing info@REGENESIS.com or info@petrofix.com and referencing your project. Alum can be sourced separately as well and applied per the kit directions below.

Contents:

- 1x Vial of 10 g settling agent (aluminum sulfate hydrate, alum)
- Dosing spoon to deliver 20-40 mg of alum

Procedure:

1. Obtain 40 mL of water to be tested in a 40 mL VOA vial.
2. Deposit 2 scoops of the settling agent into the vial.
3. Shake the vial for 30 seconds.
4. Allow at least 1 hour for carbon to completely settle before testing clear water



About REGENESIS

At REGENESIS we value innovation, technology, expertise and people which together form the unique framework we operate in as an organization. We see innovation and technology as inseparably linked with one being born out of the other.

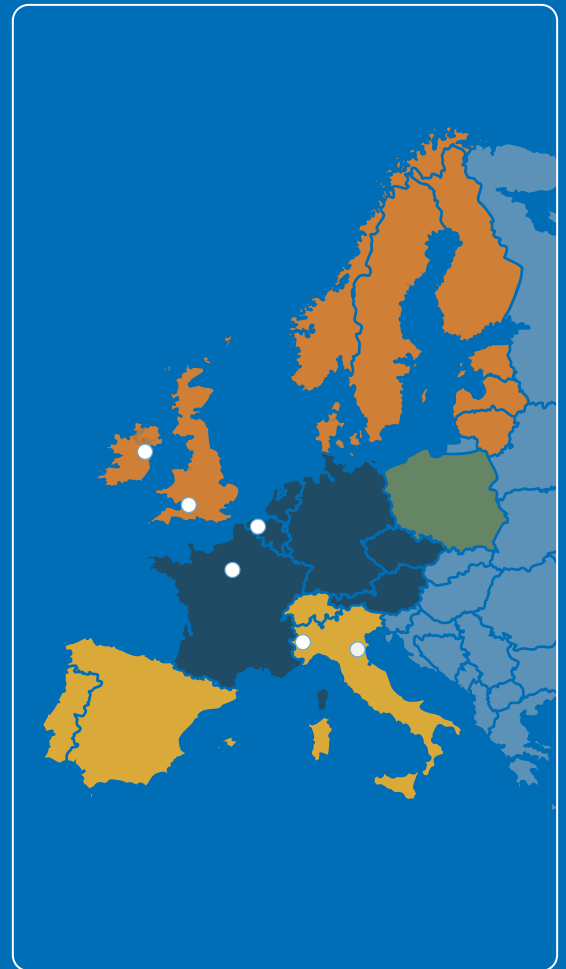
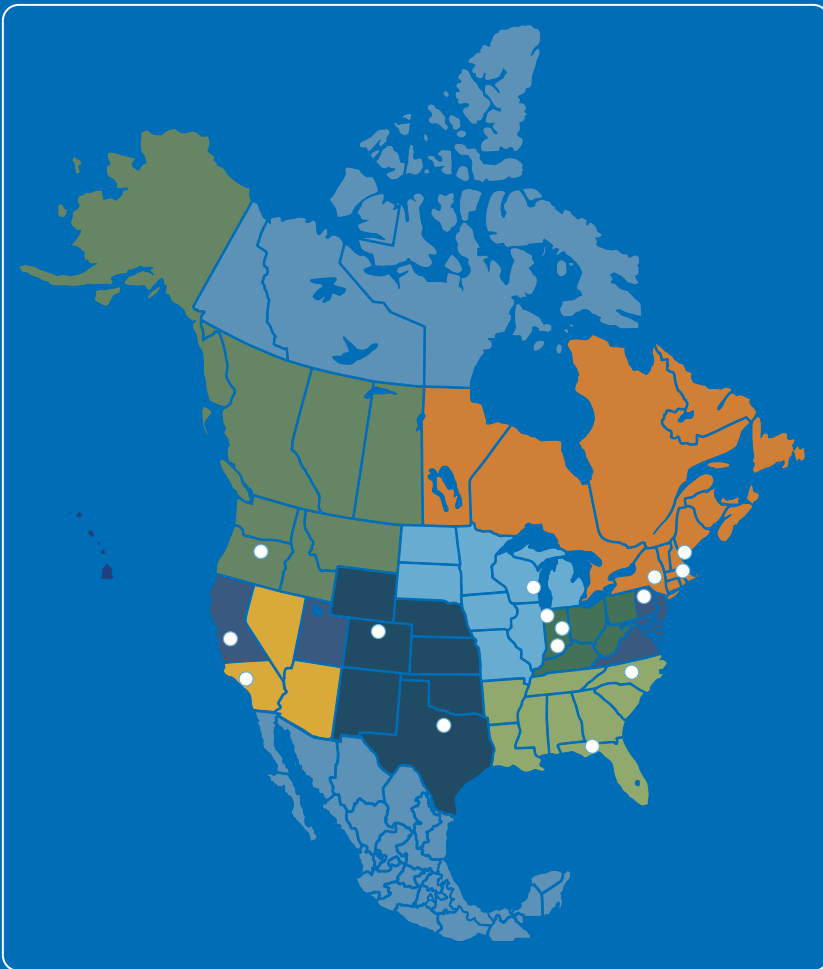
Inherently, innovation imparts new and better ways of thinking and doing. For us this means delivering expert environmental solutions in the form of the most advanced and effective technologies and services available today.

We value expertise, both our customers' and our own. We find that when our experienced staff collaborates directly with customers on complex problems there is a high potential for success including savings in time, resources and cost.

At REGENESIS we are driven by a strong sense of responsibility to the people charged with managing the complex environmental problems we encounter and to the people involved in developing and implementing our technology-based solutions. We are committed to investing in lasting relationships by taking time to understand the people we work with and their circumstances. We believe this is a key factor in achieving successful project outcomes.

We believe that by acting under this set of values, we can work with our customers to achieve a cleaner, healthier, and more prosperous world.

We're Ready to Help You Find the Right Solution For Your Site



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Visit www.REGENESIS.com to learn more.





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Colloidal Suspension Sampling Guidance Document 4122022-v9



REGENESIS[®]

www.REGENESIS.com



1. Identification

Product identifier PetroFix
Other means of identification None.
Recommended use Remediation of contaminants in soil and groundwater.
Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Company Name Regenesis
Address 1011 Calle Sombra
 San Clemente, CA 92673 USA
General information 949-366-8000
E-mail CustomerService@regenesis.com

Emergency phone number For Hazardous Materials Incidents ONLY (spill, leak, fire, exposure or accident), call CHEMTREC 24/7 at:
USA, Canada, Mexico 1-800-424-9300
International 1-703-527-3887

2. Hazard(s) identification

Physical hazards Not classified.
Health hazards Not classified.
OSHA defined hazards Not classified.

Label elements

Hazard symbol None.
Signal word None.
Hazard statement The mixture does not meet the criteria for classification.

Precautionary statement

Prevention Observe good industrial hygiene practices.
Response Wash hands after handling.
Storage Store away from incompatible materials.
Disposal Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Activated carbon <10 µm	7440-44-0	>25
Calcium sulfate dihydrate	10101-41-4	<10
Additive	-	<2

Composition comments All concentrations are in percent by weight unless otherwise indicated. Components not listed are either non-hazardous or are below reportable limits. Chemical ingredient identity and/or concentration information withheld for some or all components present is confidential business information (trade secret), and is being withheld as permitted by 29 CFR 1910.1200(i).

4. First-aid measures

Inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact	Rinse with water. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO ₂).
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed. Combustion products may include: carbon oxides, nitrogen oxides, sulfur oxides, calcium oxide.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	This material will not burn until the water has evaporated. Residue can burn. When dry may form combustible dust concentrations in air.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Avoid prolonged exposure. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-3 (29 CFR 1910.1000)

Components	Type	Value	Form
Activated carbon <10 µm (CAS 7440-44-0)	TWA	5 mg/m ³	Respirable fraction.
		15 mg/m ³	Total dust.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Activated carbon <10 µm (CAS 7440-44-0)	TWA	2 mg/m ³	Respirable fraction.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Calcium sulfate dihydrate (CAS 10101-41-4)	TWA	10 mg/m ³	Inhalable fraction.

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.
Skin protection	
Other	Wear suitable protective clothing.
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties**Appearance**

Physical state	Liquid.
Form	Aqueous suspension.
Color	Not available.

Odor Not available.

Odor threshold Not available.

pH 8 - 10

Melting point/freezing point Not available.

Initial boiling point and boiling range 212 °F (100 °C)

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Vapor pressure Not available.

Vapor density Not available.

Relative density Not available.

Solubility(ies)

Solubility (water) Not available.

Partition coefficient (n-octanol/water) Not available.

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Viscosity Not available.

Other information

Explosive properties Not explosive.

Oxidizing properties Not oxidizing.

10. Stability and reactivity

Reactivity The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability Material is stable under normal conditions.

Possibility of hazardous reactions No dangerous reaction known under conditions of normal use.

Conditions to avoid Contact with incompatible materials. Avoid drying out product. May generate combustible dust if material dries.

Incompatible materials Strong oxidizing agents. Acids.

Hazardous decomposition products No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation Spray mist may irritate the respiratory system. For dry material: Dust may irritate respiratory system.

Skin contact Prolonged or repeated exposure may cause minor irritation.

Eye contact Direct contact with eyes may cause temporary irritation.

Ingestion May cause discomfort if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity Not expected to be acutely toxic.

Components	Species	Test Results
------------	---------	--------------

Activated carbon <10 µm (CAS 7440-44-0)

Acute

Oral

LD50	Rat	> 10000 mg/kg
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Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity Not classifiable as to carcinogenicity to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

NTP Report on Carcinogens

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not regulated.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Other adverse effects	None known.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not established.

15. Regulatory information

US federal regulations This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

US. Massachusetts RTK - Substance List

Calcium sulfate dihydrate (CAS 10101-41-4)

US. New Jersey Worker and Community Right-to-Know Act

Not listed.

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

US. Rhode Island RTK

Activated carbon <10 µm (CAS 7440-44-0)

Calcium sulfate dihydrate (CAS 10101-41-4)

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	15-February-2018
Revision date	-
Version #	01
HMIS® ratings	Health: 1 Flammability: 1 Physical hazard: 0

NFPA ratings**Disclaimer**

Regenesis cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

1. Identification

Product identifier PetroFix Electron Acceptor Blend
Other means of identification None.
Recommended use Remediation of soils and groundwater.
Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Company Name RegenesiS
Address 1011 Calle Sombra
 San Clemente, CA 92673 USA
General information 949-366-8000
E-mail CustomerService@regenesiS.com

Emergency phone number For Hazardous Materials Incidents ONLY (spill, leak, fire, exposure or accident), call CHEMTREC 24/7 at:
USA, Canada, Mexico 1-800-424-9300
International 1-703-527-3887

2. Hazard(s) identification

Physical hazards Not classified.
Health hazards Serious eye damage/eye irritation Category 2B
OSHA defined hazards Not classified.
Label elements
Hazard symbol None.
Signal word Warning
Hazard statement Causes eye irritation.
Precautionary statement
Prevention Wash thoroughly after handling.
Response If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Storage Store away from incompatible materials.
Disposal Dispose of waste and residues in accordance with local authority requirements.
Hazard(s) not otherwise classified (HNOC) None known.
Supplemental information None.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Ammonium sulfate	7783-20-2	40 - 60
Sodium nitrate	7631-99-4	40 - 60

Composition comments All concentrations are in percent by weight unless otherwise indicated.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact	Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Irritation of eyes. Exposed individuals may experience eye tearing, redness, and discomfort. Dusts may irritate the respiratory tract, skin and eyes.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Use extinguishing agent suitable for type of surrounding fire.
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed. Combustion products may include: nitrogen oxides, sulfur oxides, ammonia.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Use water spray to cool unopened containers.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Material will not burn.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Avoid the generation of dusts during clean-up. Collect dust using a vacuum cleaner equipped with HEPA filter. Stop the flow of material, if this is without risk. Large Spills: Wet down with water and dike for later disposal. Absorb in vermiculite, dry sand or earth and place into containers. Shovel the material into waste container. Following product recovery, flush area with water. Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Avoid contact with eyes. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store in tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits	No exposure limits noted for ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls	Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. Provide eyewash station.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Unvented, tight fitting goggles should be worn in dusty areas.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.
Skin protection	
Other	Wear suitable protective clothing.
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment. Wear NIOSH approved respirator appropriate for airborne exposure at the point of use. Appropriate respirator selection should be made by a qualified professional. Recommended use: Wear respirator with dust filter.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state Solid.

Form Powder.

Color White.

Odor Not available.

Odor threshold Not available.

pH Not available.

Melting point/freezing point Not available.

Initial boiling point and boiling range Not available.

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) This material will not burn.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Vapor pressure Not available.

Vapor density Not available.

Relative density Not available.

Solubility(ies)

Solubility (water) Not available.

Partition coefficient (n-octanol/water) Not available.

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Viscosity Not available.

Other information

Explosive properties Not explosive.

Oxidizing properties Not oxidizing.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials. Heat.
Incompatible materials	Strong reducing agents. Strong acids.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Dust may irritate respiratory system.
Skin contact	Dust or powder may irritate the skin.
Eye contact	Causes eye irritation.
Ingestion	May cause discomfort if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics Irritation of eyes. Exposed individuals may experience eye tearing, redness, and discomfort. Dusts may irritate the respiratory tract, skin and eyes.

Information on toxicological effects

Acute toxicity	Not expected to be acutely toxic.
Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation	Causes eye irritation.

Respiratory or skin sensitization

Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity Not classifiable as to carcinogenicity to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

NTP Report on Carcinogens

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not regulated.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Further information Nitrate poisoning resulting in methemoglobinemia manifested as cyanosis is rare, but possible for people with specific susceptibility traits.

12. Ecological information

Ecotoxicity	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
Persistence and degradability	The product solely consists of inorganic compounds which are not biodegradable.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Other adverse effects	None known.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT	Not regulated as dangerous goods.
IATA	Not regulated as dangerous goods.
IMDG	Not regulated as dangerous goods.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

15. Regulatory information

US federal regulations	This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
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TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical

Yes

Classified hazard categories Serious eye damage or eye irritation

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Ammonium sulfate	7783-20-2	40 - 60
Sodium nitrate	7631-99-4	40 - 60

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)

Not regulated.

US state regulations

US. Massachusetts RTK - Substance List

Ammonium sulfate (CAS 7783-20-2)

Sodium nitrate (CAS 7631-99-4)

US. New Jersey Worker and Community Right-to-Know Act

Sodium nitrate (CAS 7631-99-4)

US. Pennsylvania Worker and Community Right-to-Know Law

Ammonium sulfate (CAS 7783-20-2)

Sodium nitrate (CAS 7631-99-4)

US. Rhode Island RTK

Ammonium sulfate (CAS 7783-20-2)

Sodium nitrate (CAS 7631-99-4)

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	15-August-2018
Revision date	-
Version #	01
HMIS® ratings	Health: 1 Flammability: 0 Physical hazard: 0

NFPA ratings**Disclaimer**

Regenesis cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

SAFETY DATA SHEET

1. Identification

Product identifier	Oxygen Release Compound Advanced (ORC Advanced®)
Other means of identification	None.
Recommended use	Soil and Groundwater Remediation.
Recommended restrictions	None known.

Manufacturer/Importer/Supplier/Distributor information

Company Name	REGENESIS
Address	1011 Calle Sombra San Clemente, CA 92673 USA
General information	949-366-8000
E-mail	CustomerService@regenesisis.com

Emergency phone number	For Dangerous Goods Incidents ONLY (spill, leak, fire, exposure or accident), call CHEMTREC 24/7 at:
USA, Canada	1-800-424-9300
International	+1 703-741-5970

2. Hazard(s) identification

Physical hazards	Oxidizing solids	Category 2
Health hazards	Skin corrosion/irritation	Category 1
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
OSHA defined hazards	Not classified.	

Label elements



Signal word	Danger
Hazard statement	May intensify fire; oxidizer. Causes severe skin burns and eye damage. Causes serious eye damage. May cause respiratory irritation.

Precautionary statement

Prevention Keep away from heat. Keep/Store away from clothing/combustible materials. Take any precaution to avoid mixing with combustibles. Do not breathe dust. Avoid breathing vapors. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection.

Response If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse. In case of fire: Use appropriate media to extinguish.

Storage Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Calcium peroxide	1305-79-9	≥ 75
Calcium hydroxide	1305-62-0	≤ 25
Dipotassium Phosphate	7758-11-4	< 5
Monopotassium Phosphate	7778-77-0	< 5

Composition comments All concentrations are in percent by weight unless otherwise indicated.

4. First-aid measures

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.
Skin contact	If on clothing: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Rinse skin with water/shower. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.
Eye contact	Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Most important symptoms/effects, acute and delayed	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.
General information	Take off all contaminated clothing immediately. Contact with combustible material may cause fire. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media	Water spray, fog (flooding amounts). Foam. Dry chemical powder. Carbon dioxide (CO ₂).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	Greatly increases the burning rate of combustible materials. Containers may explode when heated. During fire, gases hazardous to health may be formed. Combustion products may include: metal oxides.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers.
Specific methods	Cool containers exposed to flames with water until well after the fire is out.
General fire hazards	May intensify fire; oxidizer. Contact with combustible material may cause fire.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep away from clothing and other combustible materials. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of dust. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
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Methods and materials for containment and cleaning up

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Ventilate the contaminated area. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Minimize dust generation and accumulation. Collect dust using a vacuum cleaner equipped with HEPA filter. Wear appropriate protective equipment and clothing during clean-up. Stop the flow of material, if this is without risk.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS. Avoid discharge into drains, water courses or onto the ground.

Environmental precautions**7. Handling and storage****Precautions for safe handling**

Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Keep away from heat. Provide appropriate exhaust ventilation at places where dust is formed. Take any precaution to avoid mixing with combustibles. Keep away from clothing and other combustible materials. Do not get this material in contact with eyes. Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Avoid contact with water and moisture.

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat. Store in a cool, dry place out of direct sunlight. Store in tightly closed container. Store in a well-ventilated place. Do not store near combustible materials. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection**Occupational exposure limits****US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

Components	Type	Value	Form
Calcium hydroxide (CAS 1305-62-0)	PEL	5 mg/m ³	Respirable fraction.
		15 mg/m ³	Total dust.

US. ACGIH Threshold Limit Values

Components	Type	Value
Calcium hydroxide (CAS 1305-62-0)	TWA	5 mg/m ³

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Calcium hydroxide (CAS 1305-62-0)	TWA	5 mg/m ³

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. Provide eyewash station and safety shower.

Individual protection measures, such as personal protective equipment**Eye/face protection**

Use dust-tight, unvented chemical safety goggles when there is potential for eye contact.

Skin protection**Hand protection**

Recommended gloves include rubber, neoprene, nitrile or viton. Frequent change is advisable.

Other

Wear appropriate chemical resistant clothing.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Recommended use: Wear respirator with dust filter.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Keep from contact with clothing and other combustible materials. Remove and wash contaminated clothing promptly. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state Solid.
Form Powder.
Color White to pale yellow.

Odor Odorless.

Odor threshold Not available.

pH 12.5 (3% suspension/water)

Melting point/freezing point Not applicable, material is a solid.

Initial boiling point and boiling range Not applicable, material is a solid.

Flash point Property has not been measured.

Evaporation rate Not available.

Flammability (solid, gas) Oxidizer.

Upper/lower flammability or explosive limits

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure Not applicable, material is a solid.

Vapor density Not applicable, material is a solid.

Relative density Property has not been measured.

Solubility(ies)

Solubility (water) Slightly soluble

Partition coefficient (n-octanol/water) Not applicable, product is a mixture.
Not applicable, product is a mixture.

Auto-ignition temperature Property has not been measured.

Decomposition temperature 527 °F (275 °C)

Viscosity Not applicable, material is a solid.

Other information

Bulk density 0.5 - 0.9 g/ml

Density Property has not been measured.

Explosive limit Non-explosive.

Explosive properties Not explosive.

Kinematic viscosity Not applicable, material is a solid.

Oxidizing properties May intensify fire; oxidizer.

10. Stability and reactivity

Reactivity Greatly increases the burning rate of combustible materials.

Chemical stability Decomposes on heating. Product may be unstable at temperatures above: 275°C/527°F.

Possibility of hazardous reactions Reacts slowly with water.

Conditions to avoid Moisture. Heat. Avoid temperatures exceeding the decomposition temperature. Contact with incompatible materials.

Incompatible materials Acids. Bases. Combustible material. Reducing agents. Salts of heavy metals.

Hazardous decomposition products Oxygen. Hydrogen peroxide (H2O2). Steam. Heat.

11. Toxicological information

Information on likely routes of exposure

Inhalation Dust may irritate respiratory system.
Skin contact Causes severe skin burns.
Eye contact Causes serious eye damage.
Ingestion Causes digestive tract burns.

Symptoms related to the physical, chemical and toxicological characteristics Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Dusts may irritate the respiratory tract, skin and eyes.

Information on toxicological effects

Acute toxicity Not known.

Components	Species	Test Results
Calcium hydroxide (CAS 1305-62-0)		
Acute		
Dermal		
LD50	Rabbit	> 2500 mg/kg, 24 Hours
Inhalation		
LC50	Rat	6.04 mg/l, 4 hours
Oral		
LD50	Rat	> 2000 mg/kg

Skin corrosion/irritation Causes severe skin burns and eye damage.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity Not classifiable as to carcinogenicity to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

NTP Report on Carcinogens

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components	Species	Test Results	
Calcium hydroxide (CAS 1305-62-0)			
Aquatic			
Algae	EC50	Algae	184.57 mg/l, 72 hours

Persistence and degradability	Decomposes in the presence of water. The product contains inorganic compounds which are not biodegradable.
Bioaccumulative potential	The product does not contain any substances expected to be bioaccumulating.
Mobility in soil	This product has very low solubility in water and low mobility in the environment.
Other adverse effects	None known.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN1457
UN proper shipping name	Calcium peroxide
Transport hazard class(es)	
Class	5.1
Subsidiary risk	-
Label(s)	5.1
Packing group	II
Environmental hazards	
Marine pollutant	No.
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	IB6, IP2, T3, TP33, W100
Packaging exceptions	152
Packaging non bulk	212
Packaging bulk	242

IATA

UN number	UN1457
UN proper shipping name	Calcium peroxide
Transport hazard class(es)	
Class	5.1
Subsidiary risk	-
Packing group	II
Environmental hazards	No.
ERG Code	5L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN1457
UN proper shipping name	CALCIUM PEROXIDE
Transport hazard class(es)	
Class	5.1
Subsidiary risk	-
Packing group	II
Environmental hazards	
Marine pollutant	No.
EmS	F-G, S-Q
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Toxic Substances Control Act (TSCA)

All components of the mixture on the TSCA 8(b) inventory are designated "active".

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

Classified hazard categories

Oxidizer (liquid, solid, or gas)
Skin corrosion or irritation
Serious eye damage or eye irritation
Specific target organ toxicity (single or repeated exposure)

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

US. Massachusetts RTK - Substance List

Calcium hydroxide (CAS 1305-62-0)

US. New Jersey Worker and Community Right-to-Know Act

Calcium hydroxide (CAS 1305-62-0)

Calcium peroxide (CAS 1305-79-9)

US. Pennsylvania Worker and Community Right-to-Know Law

Calcium hydroxide (CAS 1305-62-0)

US. Rhode Island RTK

Calcium hydroxide (CAS 1305-62-0)

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Industrial Chemicals (AICIS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	14-February-2020
Revision date	15-July-2022
Version #	02
HMIS® ratings	Health: 3 Flammability: 0 Physical hazard: 2

NFPA ratings



Disclaimer

Regenesis cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

Caroline Devin

From: region2_uic@epa.gov
Sent: Wednesday, February 19, 2025 1:25 PM
To: cpapamichael@thedomaincos.com
Cc: Meghan Aronica; stanfield.harper@epa.gov
Subject: USEPA UIC notification regarding: (UIC ID 25NY005091022) 445 Gerard Avenue, Bronx, NY 10451

Total Wells: 3

3 - Active - 5B6 Beneficial Use- Subsurface environmental remediation - as of 01/13/2025

February 19, 2025

Chris Papamichael
11 Park Place, Suite 1705
New York, NY 10007

Dear Chris Papamichael:

The U.S. Environmental Protection Agency (EPA) Region 2 Drinking Water and Ground Water Protection Section is in receipt of Underground Injection Control (UIC) inventory information addressing UIC Class V wells that you own or operate. This information was submitted to EPA as required by 40 Code of Federal Regulations (CFR) §144.26, which addresses UIC Class V wells.

This letter is to inform you that your Class V injection activity is “authorized by rule” in accordance with 40 CFR §144.24 and to outline measures that must be taken to prevent contamination of Underground Sources of Drinking Water (USDWs). You must comply with all Class V requirements of the UIC program. Pursuant to 40 CFR §144.12(a) and §144.82(a)(1), your injection activity cannot allow the movement of fluid containing any contaminant into USDWs if the presence of that contaminant may cause a violation of the primary drinking water standards under 40 CFR §141 or other health based standards, or may otherwise adversely affect the health of persons. This prohibition applies to owner/operator well construction, operation, maintenance, conversion, plugging, closure, or any other injection activity. Therefore, as an owner/operator, you must ensure that your activity does not allow movement of contaminated fluid into USDWs if the contaminated fluid could cause any violation of applicable regulations or adversely affect human health.

Whenever any conditions change in the operation of any inventoried wells (e.g., well closure), you as owner/operator must ensure that UIC program requirements are met and inventory information is updated. For work being conducted under a work plan approved by the New York State Department of Environmental Conservation (NYSDEC), it is not necessary to submit inventory with each subsequent injection. Please inform EPA when all injections are complete for this Facility.

To update inventory information, use the Owner or Operator Online Form for Inventory of Injection Wells (7520-16), which is available through the Region 2 UIC website:

<https://www.epa.gov/uic/underground-injection-control-epa-region-2-nj-ny-pr-and-vi>. Enter the UIC ID number in section 2 (Facility ID Number) of the Online Form and use the comments section to specify the information being updated. If the information being updated does not fit in the Online Form (e.g., updating Additional Information as described in the R2 Supplemental Instructions),

submit it separately by email to region2_uic@epa.gov. Be sure to include the UIC ID number referenced above with any email submittals.

All information you submit may be used in an administrative, civil judicial, or criminal action. Making a knowing submission of materially false information to the U.S. Government may be a criminal offense. Please also be advised that you should contact state and local authorities to ensure you have complied with all applicable regulations that may be more stringent than the UIC program.

For questions, contact UIC case handler Harper Stanfield at 212-637-3728 or stanfield.harper@epa.gov.

Sincerely,
UIC Program
Drinking Water and Ground Water Protection Section
EPA Region 2
290 Broadway, New York, NY 10007
Region2_UIC@epa.gov