REMEDIAL ACTION WORK PLAN

FOR

245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
EL PROJECT NUMBER 23-0001

NYSDEC SITE NO.: C231157

REVISED APRIL 2026

CERTIFICATION

I, Matthew Carroll, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Remedial Action Workplan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and Green Remediation (DER-31).



Matthew Carroll, P.E.

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LIST OF ACRONYMS	
AGV	NYSDOH Air Guidance Value
AOC	area of concern
AS	air sparging
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bs	below basement slab
bg	below sidewalk/surface grade
ECL	Environmental Conservation Law
BTEX	benzene, toluene, ethylbenzene and xylenes
CAMP	Community Air Monitoring Program
C&D	construction and demolition
CDS	construction dewatering system
Class GA Standards	NYSDEC TOGS 1.1.1 Class GA Ambient Water Quality Standards and Guidance Values
CEQR	City Environmental Quality Review
CFR	Code of Federal Regulations
CID	Contained In Determination
COC	Certificate of Completion
CPP	Citizen Participation Plan
cVOC	chlorinated volatile organic compound
CY	Cubic Yards
DCE	dichloroethylene
DER-10	NYSDEC Division of Environmental Remediation (DER), DER-10 / Technical Guidance for Site Investigation and Remediation
DER-31	NYSDEC Division of Environmental Remediation (DER), DER-31 / Green Remediation
DRO	diesel range organics
DOC	dissolved organic carbon
DPT	direct push technology drilling method
DUSR	Data Usability Summary Report
EC	engineering control
EISD	Enhanced In-Situ Dechlorination
ESA	Environmental Site Assessment
EZ	exclusion zone
FB	field blanks
FER	Final Engineering Report
FSAP	Field Sampling and Analysis Plan
ft-bs	feet below building slab

LIST OF ACRONYMS	
ft-bg	feet below sidewalk grade
ft-msl	feet above mean sea level
GAC	Granular Activated Carbon
HASP	Health and Safety Plan
HSA	Hollow Stem Auger
HSO	Health and Safety Officer
IC	institutional control
In-wc	inches of water column
ISCO	in-situ chemical oxidation
IRM	Interim Remedial Measure
Matrices	New York State Department of Health (NYSDOH) Soil Vapor/Indoor Air (SV/IA) decision matrices
MDL	Method Detection Limit
MG/KG	Milligram per kilogram
MW	monitoring well
NGVD	National Geodetic Vertical Datum
NIOSH	National Institute for Occupational Safety and Health
NYCDEP	New York City Department of Environmental Protection
NYCDOB	New York City Department of Buildings
NYCDOT	New York City Department of Transportation
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOH-ELAP	NYSDOH Environmental Laboratory Approval Program
OSHA	Occupational Safety and Health Association
PCB	polychlorinated biphenyl
PCE	perchloroethylene, aka tetrachloroethylene
PFAS	Per- and Polyfluoroalkyl Substances
PGWSCO	6 NYCRR 375-6.8(b) – Protection of Groundwater Soil Cleanup Objectives
PID	photoionization detector
PP Metals	Priority Pollutant Metals
PPE	personal protective equipment
QA/QC	quality assurance / quality control
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCNY	Rules of the City of New York
RMO	Remedial Measure Objective

LIST OF ACRONYMS	
RE	Remedial Engineer
RI	remedial investigation
RIWP	Remedial Investigation Work Plan
RL	Reporting Limit
RSCOs	Recommended Soil Cleanup Objectives
RRUSCOs	6 NYCRR 375-6.8(b) – Restricted-Residential Use Soil Cleanup Objectives
SB	soil boring
SCGs	Standards, Criteria and Guidance
SMP	Site Management Plan
SMMP	Soil/Material Management Plan
SSDS	sub-slab depressurization system
SV	soil vapor
SVE	Soil vapor extraction
SVI	soil vapor intrusion
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TAGM 4046	NYSDEC Technical and Administrative Guidance Memorandum #4046
TB	trip blanks
TCE	trichloroethylene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCLP Limits	USEPA Maximum Concentrations of Contaminants for the Toxicity Characteristic
TOC	total organic carbon
µg/kg	micrograms per kilogram
µg/m3	micrograms per cubic meter
UIC	Underground Injection Control
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	underground storage tank
UUSCOs	6 NYCRR 375-6.8(a) Track 1 Unrestricted Use Soil Cleanup Objectives
VOC	volatile organic compound

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1.0 INTRODUCTION

This Remedial Action Workplan (RAWP) has been prepared on behalf of 245 WEST 55TH ST LLC, for the proposed remedial actions for the property located at 245 West 55th Street, New York, New York (herein referred to as the "Site"). This report has been certified by Matthew Carroll, PE in accordance with the requirements of the Technical Guidance for Site Investigation and Remediation (DER-10) and Green Remediation (DER-31). Matthew Carroll was retained by 245 WEST 55TH LLC in December 2024 to provide engineering services and serve as the Remedial Engineer (RE) for the project. Verification of this arrangement was provided to NYSDEC on December 17, 2024. A copy of that verification is included as **Attachment A**. The scope of work detailed herein has been prepared by the certifying Professional Engineer (PE) and will be implemented under the direction of the RE.

245 WEST 55TH ST LLC applied to and was accepted into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as a Volunteer. A Brownfield Cleanup Agreement (BCA) was executed by the NYSDEC and 245 WEST 55TH ST LLC (the "Volunteer") on February 24, 2024 (BCP Site No. C231157).

245 WEST 55TH ST LLC is currently redeveloping the existing 12 story, 6,000 square foot commercial building on Site. Construction activities include the demolition of the existing 12th story and bulkhead, construction of an additional six stories to the 11 stories and altering the building to future residential use.

This RAWP summarizes the nature and extent of contamination present on Site, as determined from data gathered during Remedial Investigation (RI) activities conducted between November 2024 and April 2025, as well as vapor intrusion investigations conducted in October 2022 and April 2024. The results of the sampling are summarized in a May 2025 Remedial Investigation Report (RIR). Site compounds of concern include chlorinated volatile organic compounds (cVOCs) in groundwater and sub-slab soil vapor as well as select metals in groundwater and soil. Impacts associated with former Site activities are mostly observed in the southeastern portion of the Site and confined to shallow groundwater and overburden soils.

This RAWP addresses the specific requirements of the BCP catalogued in Part 375-3 of Title 6 of the Official Compilation of New York Codes, Rules and Regulations (NYCRR). This document

provides a proposed remedy selection for Track 4 restricted-residential use with the generic soil cleanup objectives (SCOs) based on the intended future use of the property for multifamily residential use where there will be common control of the property and all soils will be capped by the building slab. The overall objective of this RAWP is to implement a remedial alternative that satisfies the remedial action objectives (RAOs) established for the Site.

2.0 SITE INFORMATION

2.1 Site Location and Setting

The Site is a rectangle-shaped parcel comprised of 0.14 acres and identified on the New York City tax map as Block 1027, Lot 7. The Site is located in a C6-4/C6-6 Commercial District in Manhattan, approximately 1,000 feet southwest of Central Park. The C6-4 commercial zoning district allows for the conversion of existing commercial buildings to residential use.

The Site is bordered to the north, east, and west by mixed-use commercial/residential properties, and is bordered to the south by West 55th Street followed by additional mixed-use commercial/residential properties. A United States Geological Survey (USGS) 7.5-minute topographic map showing the Site location and surrounding area is provided on **Figure 1**.

2.2 Site Geology and Hydrogeology

The mapped bedrock underlying the site consists of the Hartland Formation, which is comprised of a dark grey, medium- to coarse-grained muscovite-biotite-garnet (mica) schist and grey fine-grained quartz feldspar granulite biotite and garnet, with localized concentrations of granite and intrusions of coarse-grained granitic pegmatite.

Based on soil sampling conducted by Environmental Logic (EL) in January/ February 2023 and soil boring installation in November 2024, overburden soils at the consisted of silts, sands and silty sands with clay content increasing with depth. In January/February 2023, one soil boring was advanced to the depth of competent bedrock, encountered approximately 35 feet below the basement floor (i.e., approximately 48 to 50 feet below street/surface grade). Weathered bedrock observed in this boring consisted of weathered schist starting at approximately 29 feet below the basement floor.

In November 2023, a geotechnical investigation was conducted by JZN Engineering, PC of Springfield, New Jersey to evaluate Site geology for the proposed building renovations. The geotechnical report noted completely decomposed rock strata (Stratum III) at depths of approximately 18.5 feet and 23 feet below the existing top of cellar slab. Following the completely decomposed rock strata, bedrock was encountered at depths of approximately 21 feet and 28.5 feet below the existing top of cellar elevation, corresponding to elevations that ranged between approximately Elev. 37.4 feet and Elev. 29.9 feet. Rock cores revealed the presence of mica schist bedrock.

In November 2024, weathered bedrock was observed to be approximately 27.5 feet below the basement floor at the location of monitoring well MW-1D, indicating variations throughout the Site to where top of bedrock is encountered.

Based on groundwater sampling conducted by EL in December 2024, groundwater at the Site was encountered at 10 feet below the basement slab (ft-bs), or approximately 24 feet below grade (street level).

Groundwater flows within overburden aquifer on Site to the south based on groundwater elevations collected during the RI activities (described below in Sections 3.5 and 3.6), as shown on **Figure 6**.

No surface water bodies are in the vicinity of the Site. Storm water runoff from the surrounding area typically drains through catch basins into the NYC Municipal sewer system.

2.3 Site Features and Use

The Site is fully developed with a 12-story commercial and office building with a basement. The Site is currently vacant and is undergoing renovation for future residential use. A Site Map is included as **Figure 2A**.

The Site was formerly owned and utilized by DuArt Media Services/DuArt Film Labs (DuArt) for cinematographic film cleaning and film processing from approximately 1922 through 2011. Film production including voiceover work, audio recording, and film editing continued to take place at the Site until 2021. Past operations included cinematographic film cleaning operations which utilized cleaning and degreasing compounds including the cVOCs tetrachloroethene (PCE) and 1,1,1-trichloroethane (1,1,1-TCA) to remove dirt, grease, and minor scratches from film negatives prior to print. A Site Map of the cellar level associated with these operations is included as **Figure 2B**.

2.4 Proposed Site Redevelopment

245 WEST 55TH ST LLC is currently redeveloping the existing 12 story, 6,000 square foot commercial building on Site. The proposed redevelopment of the Site building will consist of the rehabilitation of the existing vacant building into residential housing, including the removal of the existing top floor and the construction of six additional floors. The rehabilitation of the existing building, including the construction of additional floors, is expected to be completed in approximately four years.

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS

3.1 Due Diligence

Due diligence investigations were conducted on behalf of a former potential purchaser and the current owner of the Site prior to the current property owner purchasing the site and entering into the BCP as a Volunteer.

Due diligence environmental investigations were initiated in July 2022 for a potential purchaser of the Site. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan) of New York performed a Phase I Environmental Site Assessment (ESA) which identified a former PCE aboveground storage tank (AST) that was reportedly used at the Site from January 1969 until August 2005. The Phase I ESA also indicated that, based on a review of an environmental database search, records of disposal of spent solvents, including PCE, were identified associated with the Site.

Based on these findings, the former property owner (DuArt) contracted HydroTech Environmental Engineering and Geology, DPC (HydroTech) of New York in October 2022, to conduct a Phase II investigation consisting of sub-slab soil vapor and indoor air sampling conducted within the Site building.

Between January and February 2023, Environmental Logic conducted additional Phase II soil and groundwater sampling at the Site prior to the purchase of the property by the current owner. The results of these due diligence investigations are summarized below and were documented in the following reports previously submitted to NYSDEC:

- *Vapor Intrusion Work Plan,* 245 West 55th Street, New York, NY, prepared by Environmental Logic. (March 2024);
- *Remedial Investigation Work Plan* - 245 West 55th Street, New York, NY, prepared by Environmental Logic (Revised October 2024); and
- *Vapor Intrusion Investigation Summary Report* - 245 West 55th Street, New York, NY, prepared by Environmental Logic (Revised November 2024).

3.2 Vapor Intrusion Sampling – October 2022

In October 2022, DuArt contracted HydroTech to perform a Phase II Vapor Intrusion investigation. The October 2022 HydroTech Phase II consisted of the installation and sampling of five (5) sub-slab vapor probes, identified as samples SSB-1 through SSB-5, and the sampling of five (5) indoor air samples and one (1) ambient air sample, identified as samples IA-1 through IA-5 and OA-1. All sub-slab vapor and indoor air samples were collected in the basement of the building.

CVOCs were detected in all sub-slab soil vapor samples and all indoor air samples collected across the entirety of the Site. The compound 1,1,1-TCA was the VOC detected at the highest concentrations. In sample SSB-1, 1,1,1-TCA was detected at a concentration of 77,000 micrograms per cubic meter (ug/m3); with 1,1,1-TCA present in indoor air at a concentration of 310 ug/m3. 1,1,1-TCA is a standard compound associated with the cleaning of photographic films, and the presence of this compound in soil vapor and indoor air is likely due to historical Site usage.

Based on the results as compared to the New York State Department of Health (NYSDOH) Soil Vapor/Indoor Air (SV/IA) decision matrices (Matrices), vapor intrusion mitigation is required. Installation of a sub-slab depressurization (SSDS) is proposed. See Section 9.

3.2.1 Soil and Groundwater Sampling – January 2023

On January 23, 2023, initial due diligence soil and groundwater sampling was conducted by Hydrotech and EL. The scope of work included the installation of six (6) soil borings within the basement of the Site building. The basement floor was observed to be 13 to 15 feet below surface grade. Soil borings were advanced from basement floor grade until groundwater was observed to be encountered between 9 and 10 feet below the basement floor. Soil from each boring location was screened with a photoionization detector (PID) and samples were collected from the interval with the highest PID reading. Samples were analyzed for volatile organic compounds (VOCs).

While VOCs were detected in soil, all contaminant concentrations were below the NYSDEC Part 375 Unrestricted Use SCOs.

To investigate groundwater, soil borings SP-1 through SP-3 were advanced down to 15 feet below the basement floor and converted to temporary well points (TWP-1 through TWP-3). The temporary well points were screened from approximately 10-15 feet below the basement floor. Groundwater samples were collected from each temporary well point and analyzed for VOCs.

Results of the due diligence groundwater sampling were previously reported to NYSDEC in the Remedial Investigation Work Plan (REV 2024) and are also discussed below.

3.2.2 Groundwater Sampling – February 2023

On February 3, 2023, Hydrotech and EL returned to the Site to complete groundwater sampling activities. A temporary well point (TWP-4) was installed at sample location SP-6, and a groundwater sample was collected and analyzed for VOCs. Additionally, as the cVOCs identified at the Site are denser than water and have the potential to sink, boring SP-1A was advanced until weathered bedrock was observed to be encountered at 25 feet below the basement floor. A soil sample was collected from just above the weathered bedrock at this location for VOCs analysis.

A temporary well point (TWP-5) was installed at boring location SP-1A. This temporary well point was screened just above bedrock (i.e., the well was screened from 25 to 35 feet below the basement floor). A groundwater sample was collected and analyzed for VOCs.

3.2.3 Due Diligence Groundwater Sampling Results

As previously reported to NYSDEC, the results of the due diligence groundwater sampling showed that groundwater contained contaminants of concern at concentrations that exceed the AWQS. The 2023 groundwater sampling results are summarized below.

Compound	GW Standard (AWQS) (µg/l)	TWP-1 (µg/l)	TWP-2 (µg/l)	TWP-3 (µg/l)	TWP-4 (µg/l)	TWP-5 (µg/l)
1,1,1-Trichloroethane	5	**88**	2.3 J	1.5 J	1.4 J	ND
Tetrachloroethene	5	**20**	**6**	**8.4**	2.3	1.1
1,1-Dichloroethane	5	**14**	**12**	ND	ND	ND
Vinyl Chloride	2	**2.8**	**9.6**	ND	ND	0.5 J
Trichloroethene	5	2.4	**8.9**	2.6	0.42 J	0.39 J
trans-1,2-Dichloroethene	5	1.3 J	**39**	ND	ND	ND
cis-1,2-Dichloroethene	5	**7.5**	**41**	3.7	ND	ND

- Concentration Exceeds NY GW Standard (AWQS)
J - The concentration was detected at a value equal to or below the Reporting Limit (RL), but greater than the Method Detection Limit (MDL).

3.3 Vapor Intrusion Investigation 2024

Following entry to the BCP, a Vapor Intrusion Investigation Workplan (VIWP) was prepared and submitted to NYSDEC in March 2024 detailing a scope of work to conduct an additional soil vapor intrusion (SVI) investigation. The VIWP included prior due diligence sampling locations as well as additional locations requested by NYSDEC and NYSDOH. NYSDEC approved the VIWP on March 22, 2024, via email, and the SVI sampling was conducted in April 2024. A copy of the VIWP and approval are included as **Attachment B**.

In accordance with the approved VIWP, paired building indoor air samples were collected concurrently (over the same 8-hour period) and collocated with the sub-slab soil vapor sample points. This included the sample pairs SSG-1 and IA-1, SSG-2 and IA-2, SSG-3 and IA-3, SSG-4 and IA-4, SSG-5 and IA-5, and SSG-6 and IA-6.

Ambient air samples, collocated with the exterior soil vapor samples, were also collected over the same eight (8)-hour period as the indoor air and sub-slab samples. Sample locations SSG-7 and AA-7 are located outdoors in the courtyard located in the rear of the Site building. Sample locations SSG-8 and AA-8 are located outside immediately in front of the Site building

Results of the April 2024 VI sampling were documented within the VI Investigation Summary Report (Revised November 2024) and approved by NYSDEC in a letter dated November 25, 2024. All compounds detected were below the NYSDOH Air Guideline Values (AGV) for all indoor air samples.

The April 2024 sub-slab soil gas and indoor/ambient air samples results are included as **Table 1**. The results compared to the NYSDOH SV/IA decision matrices is presented as **Table 2**. Sample locations and results are shown in **Figure 3**.

EL reviewed the decision matrices and the results comparison. Based on the decision matrices, no further action is required for the following compounds:

Matrix A	Carbon tetrachloride
Matrix D	1,2,4-Trimethylbenzene (1,2,4-TMB); 1,3,5-Trimethylbenzene (1,3,5-TMB); 2,2,4-Trimethylpentane (2,2,4-TMP); Benzene; Cyclohexane; Ethylbenzene; Naphthalene; *o*-Xylene
Matrix E	Heptane; *p/m*-Xylene
Matrix F	Toluene

Based on the decision matrices, the analytical results for one compound (Hexane) at one sample location (SSG-5/IA-5) would trigger the requirement for ongoing monitoring. Hexane was detected at 287 $\mu g/m^3$ in soil vapor (SSG-5) and 6.34 $\mu g/m^3$ in indoor air (IA-5).

Based on the decision matrices, the analytical results at two locations (SSG-1/IA-1 and SSG-6/IA-6) trigger the recommendation for mitigation with respect to the following five (5) compounds: as detailed below.

Matrix A	1,1-Dichloroethene (1,1-DCE); cis-1,2-dichloroethene (cis-1,2-DCE); Trichloroethene (TCE)
Matrix B	1,1,1-Trichloroethane
Matrix C	Vinyl Chloride (VC)

<u>1,1-Dichloroethene (1,1-DCE)</u>

1,1-DCE was detected in four sub-slab soil gas samples at concentrations ranging from 1.2 $\mu g/m^3$ at SSG-2 to 440 $\mu g/m^3$ at SSG-1. However, 1,1-DCE was not detected in any of the indoor or ambient air samples. Based on the soil vapor concentration of 440 $\mu g/m^3$, the decision matrix from NYSDOH guidance indicates this location (SSG-1/IA-1) would require mitigation.

Cis-1,2-dichloroethene (cis-1,2-DCE)

Cis-1,2-DCE was detected in four sub-slab soil gas samples at concentrations ranging from 1.28 μg/m^3 at SSG-5 to 4,200 μg/m^3 at SSG-6. Cis-1,2-DCE was also detected in the exterior courtyard soil vapor sample (SSG-7) at a concentration of 1.39 μg/m^3. Cis-1,2-DCE was detected in two of the indoor air samples at concentrations of 0.091 μg/m^3 at IA-1 and 0.079 μg/m^3 at IA-2. Based on the soil vapor concentrations of 82.5 μg/m^3 at SSG-1 and 4,200 μg/m^3 at SSG-6, the decision matrix indicates these two locations (SSG-1/IA-1 and SSG-6/IA-6) would require mitigation.

Trichloroethene (TCE)

TCE was detected in three sub-slab soil gas samples at concentrations ranging from 5.24 μg/m^3 at SSG-2 to 161 μg/m^3 at SSG-1. TCE was detected in seven (7) of the indoor/ambient air samples at concentrations ranging from 0.107 μg/m^3 at AA-7 (outdoor ambient sample) to 0.167 μg/m^3 at IA-2. Based on the soil vapor concentrations of 161 μg/m^3 at SSG-1 and 90.8 μg/m^3 at SSG-6, the decision matrix indicates these two locations (SSG-1/IA-1 and SSG-6/IA-6) would require mitigation.

1,1,1-Trichloroethane (1,1,1-TCA)

1,1,1-TCA was detected in six sub-slab soil gas samples at concentrations ranging from 1.1 μg/m^3 at SSG-7 to 19,600 μg/m^3 at SSG-1. 111-TCA was also detected in the exterior courtyard soil vapor sample (SSG-7) at a concentration of 1.1 μg/m^3.1,1,1-TCA was detected in all eight (8) indoor/ambient air samples at concentrations ranging from 0.333 μg/m^3 at AA-8 (outdoor ambient sample) to 0.917 μg/m^3 at basement indoor air sample IA-1. Based on the soil vapor concentrations of 19,600 μg/m^3 at SSG-1 and 1,190 μg/m^3 at SSG-6, the decision matrix indicates these two locations (SSG-1/IA-1 and SSG-6/IA-6) would require mitigation.

Vinyl Chloride (VC)

VC was detected in one sub-slab soil gas sample, SSG-6, at a concentration of 85.9 μg/m^3. However, VC was not detected in any of the indoor or ambient air samples. Based on the soil vapor concentration at SSG-6, the decision matrix indicates this location (SSG-6/IA-6) would require mitigation.

In conclusion, the decision matrices from NYSDOH guidance indicate that based on the results of samples SSG-1/IA-1 and SSG-6/IA-6, the Site requires mitigation for soil vapor intrusion.

3.4 Remedial Investigation Soil Sampling – November 2024 and January 2025

As reported in the May 2025 RIR submitted to NYSDEC, between November 18 and 21, 2024, seven (7) soil borings (SB-1, SB-1D, SB-3 through SB-7) were installed within the basement of the building on Site. Due to Site constraints of scaffolding and barricades associated with the building's demolition and renovation, SB-2 was later installed in the southeast corner of the building, on January 30, 2025, downgradient of MW-1/MW-1D and down/side gradient of MW-7. Although

SB-2 is located within the basement area, this soil boring is located off-Site, as it's located beyond the property line in a utility vault.

Soil samples were collected in accordance with the NYSDEC approved RIWP for laboratory analysis of VOCs, semi-volatile organic compounds (SVOCs), Target Analyte List (TAL) metals, mercury, hexavalent chromium, trivalent chromium, cyanide, polychlorinated biphenyls (PCBs), pesticides, 1,4-dioxane, and Per- and Polyfluoroalkyl Substances (PFAS). Upon completion of the soil sampling activities, monitoring well installation (MW-1, MW-1D, MW-2 through MW-7) was completed at each soil boring location. Groundwater sampling activities are described below in Section 3.5.

Analytical results from the RI soil samples are summarized in **Table 3A through 3E**. Sample locations and results are shown on **Figures 4** and **5**. Results were compared to Part 375 6.8(a): Unrestricted Use Soil Cleanup Objectives (UUSCOs), Part 375-6.8(b): Restricted-Residential Use Soil Clean up Objectives (RRUSCOs) and Protection of Groundwater Soil Cleanup Objectives (PGWSCOs). Based on the intended future use of the Site, the Restricted-Residential Use Soil Cleanup Objectives (RRUSCOs) are the appropriate use-based SCOs for evaluating soil results.

Examination of the RI data shows select compounds including metals (lead, mercury, nickel, and trivalent chromium), n-propylbenzene, dibenzofuran, and 4,4-DDE were detected above UUSCOs, but below RRUSCOs. The petroleum VOC n-propylbenzene was detected above the AWQS in MW-7 but was not detected above the AWQS in subsequent sampling rounds.

The following detections of phenanthrene, silver, hexavalent chromium, barium, and manganese were detected at concentrations exceeding the RRUSCOs as follows:

- SB-1 (4-6) - hexavalent chromium was detected at a concentration of 1.08 mg/kg, above the RRUSCO (1 mg/kg)
- SB-1 (6-8) - hexavalent chromium was detected at a concentration of 1.03 mg/kg, above the RRUSCO (1 mg/kg)
- SB-1D (0-2) - manganese was detected at 2,020 mg/kg, above the RRUSCO (2,000 mg/kg)
- SB-2 (4-6) - phenanthrene was detected at 9.7 mg/kg, above the RRUSCO (4.9 mg/kg)
- SB-2 (6-8) - phenanthrene was detected at 12 mg/kg, above the RRUSCO (4.9 mg/kg)
- SB-2 (8-10) - phenanthrene was detected at 11 mg/kg, above the RRUSCO (4.9 mg/kg)

- SB-4 (0-2) - barium was detected at 500 mg/kg, above the RRUSCO (410 mg/kg), and manganese was detected at 3,160 mg/kg, above the RRUSCO (2,000 mg/kg)

- SB-4 (2-4) – barium was detected at 498 mg/kg above RRUSCO (410 mg/kg), and manganese was detected at 2,700 mg/kg, above RRUSCO (2,000 mg/kg)

- SB-7 (6-8) - phenanthrene was detected at 24 mg/kg, above the RRUSCO (4.9 mg/kg)

- SB-7 (8-10) –phenanthrene was detected at 20 mg/kg, above the RRUSCO (4.9 mg/kg) and silver was detected at 148 mg/kg above the RRUSCO (110 mg/kg)

Additionally, Perfluorooctanesulfonic Acid (PFOS) was detected above the Anticipated Guidance Values for Anticipated Site Use - Restricted-Residential (44 ug/kg) at 45.4 ug/kg and 64.8 ug/kg, at SB-1 (4-6 ft-bs) and SB-1D (6-8 ft-bs), respectively.

3.5 Remedial Investigation Groundwater Sampling – December 2024 and February 2025

A total of seven permanent monitoring wells (MW-1, MW-1D, MW-3, MW-4, MW-5, MW-6, and MW-7) were installed in the basement of the building in December 2024 accordance with the approved RIWP. MW-2 was slated to be installed in the sidewalk but could not be completed during the 2024 well installation mobilization.

Due to Site constraints of scaffolding and barricades associated with the building's demolition and renovation, in January 2025, MW-2 was installed in the southeast corner of the building, downgradient of MW-1/MW-1D and down/side gradient of MW-7. Although MW-2 is located within the basement area, this monitoring well is located off-Site. MW-2 is situated beyond the property line in the adjacent utility vault.

Based on well survey data and synoptic groundwater level measurements, groundwater flow was calculated to be to the southeast. See **Figure 6.**

Consistent with the approved RIWP, the monitoring wells were initially sampled for VOCs, semi-SVOCs, TAL metals, mercury, hexavalent chromium, trivalent chromium, cyanide, PCBs, pesticides, 1,4-dioxane, and PFAS via low flow purge procedures in accordance with the NYSDEC approved RIWP. The Site monitoring wells (MW-1, MW-1D, MW-3 through MW-7) were sampled for VOCs again in February 2025, following installation and initial sampling of MW-2.

Groundwater results are summarized in **Table 4A through 4E.** VOC results are shown on **Figure 7**. Consistent with previous investigations (described above), select cVOCs including but not limited to 1,1,1-TCA, PCE, 1-1-DCE, vinyl chloride, TCE, trans-1,2-DCE, and cis-1,2-DCE were detected above AWQS in Site monitoring wells MW-1, MW-1D, MW-2, MW-6, and MW-7.

3.6 Additional Monitoring Well Installation and Groundwater Sampling – March and April 2025

During a conference call on February 28, 2025, NYSDEC requested an additional monitoring well be installed off-site in the sidewalk beyond the southwest corner of the property boundary, to complete the remedial investigation. This well, MW-8, was installed on March 28, 2025, in the southwest corner of the sidewalk, located off-Site.

A synoptic round of water levels was collected on April 11, 2025, from all monitoring wells installed as part of the RI activities (MW-1D and MW-1 through MW-8). The contour map is provided as **Figure 6.** Consistent with the approved RIWP, MW-8 was sampled for VOCs, SVOCs, TAL metals, mercury, hexavalent chromium, trivalent chromium, cyanide, PCBs, pesticides, 1,4-dioxane, and PFAS.

Results are summarized on **Tables 4A through 4E.** VOC results are shown on **Figure 7**. Consistent with the results from other Site monitoring wells, select cVOCs, including cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride were detected above AWQS.

3.7 Summary of Remedial Investigation Findings

Based on the results of soil sampling conducted to date, select compounds including metals (barium, manganese, lead, mercury, nickel, silver, and trivalent and hexavalent chromium), n-propylbenzene, dibenzofuran, phenanthrene, and 4-4-DDE were detected above UUSCOs. Silver was detected above the PWGSCO was not detected above AWQS. The petroleum VOC n-propylbenzene was detected above the AWQS in one round but not in the latest sampling event in February 2025.

Phenanthrene, silver and hexavalent chromium as well as barium and manganese, two naturally occurring compounds, were detected above RRUSCOs. The proposed remedy for soils includes institutional and engineering controls detailed within this RAWP.

The findings of environmental investigations, summarized above, indicate the presence of cVOCs in indoor air, soil vapor, and groundwater above regulatory levels at the Site. Concentrations of 1,1,1-TCA, PCE, 1-1-DCE, chloroethane, vinyl chloride, TCE, trans-1,2-DCE, and cis-1,2-DCE were identified in groundwater above standards. The proposed remedy for groundwater includes injection of Enhanced In-Situ Dechlorination (EISD) amendments to the groundwater to and post verification sampling, as described within this RAWP.

The concentrations of 1,1-DCE, cis-1,2-DCE, and 1,1,1-TCA detected in soil vapor and indoor air will be mitigated through the installation of a SSDS, detailed herein.

3.8 Conceptual Site Model

Contaminants of concern at the Site are chlorinated VOCs in groundwater, including PCE and 1,1,1-TCA that are present in the central portion of the Site (MW-1) at higher concentrations, while daughter products including TCE, cis-1,2-DCE, 1,1-DCA, and vinyl chloride occur at elevated levels downgradient. The downgradient detections, particularly at MW-7, align with the observed southeast groundwater flow direction, indicating migration of the plume away from the source area. The spatial distribution of parent and daughter compounds reflects ongoing reductive dechlorination, with daughter products accumulating along the flow path and resulting in exceedances of groundwater quality standards in the downgradient portion of the Site. These impacts are associated with former Site activities and are mostly observed in the southeastern portion of the Site. Impacts are confined to shallow groundwater and overburden soils. Naturally-occurring metals are also present in soil above the RRUSCOs. Current data indicates off-Site migration of Site-related VOCs in groundwater based on the results of off-Site monitoring wells MW-2 and MW-8. However, as a volunteer in the BCP, it is beyond the scope of this investigation to determine the extent of off-Site migration.

The compound n-propylbenzene was detected in one soil boring (SB-7) at the downgradient, southeast corner of the property at a concentration exceeding the UUSCO and PGWSCO but below the RRUSCO. This compound was detected above AWQS in MW-7 during the first round of sampling but was not detected in subsequent sampling. N-propylbenzene was detected in the off-Site monitoring well, MW-2, but at a concentration lower than the AWQS. This compound does not appear to be migrating off-Site.

Per- and polyfluoroalkyl substances (PFAS) were detected in both soil and groundwater at the Site. The compounds PFOS and PFOA were detected above relevant SCGs.

In groundwater, PFOS and PFOA were consistently detected above the AWQS. PFOS concentrations ranged from 0.0196 µg/L in off-Site well MW-8 to 4.96 µg/L in MW-1 exceeding the AWQS of 0.0027 µg/L. PFOA concentrations ranged from 0.0127 µg/L in MW-8 to 0.272 µg/L in MW-1 exceeding the AWQS of 0.0067 µg/L.

Importantly, PFOS and PFOA were detected in upgradient wells, including MW-3 and MW-4, at concentrations above the AWQS (PFOS up to 0.338 µg/L, PFOA up to 0.254 µg/L). Because these wells are located hydraulically upgradient of the Site, their detections suggest the presence of an off-Site or regional PFAS source, in addition to any on-Site source areas. PFOS and PFOA were both detected at higher concentrations in MW-1. PFOS was detected at a concentration of 4.96 ug/L in this well. However, PFOA concentrations in MW-1 (0.272 ug/L) were not significantly higher than the upgradient concentration of PFOA in MW-4 (0.254 ug/L).

In soil, PFOA was detected above relevant Guidance Values for Anticipated Site Use, including Unrestricted Use (UUGV) and Protection of GW (PGWGV) at two soil boing locations and one

upgradient post excavation sample. The maximum PFOA concentration of 1.62 µg/kg was detected in SB-8, an off-Site side gradient boring location above the UUGV and PGWGV. The greatest soil PFOS concentrations were detected in SB-1D (64.8 µg/kg) and nearby SB-1 (45.4 µg/kg). PFOS was also detected in soil above the Guidance Values for Anticipated Unrestricted Use and Protection of Groundwater in one (1) post-excavation sample location near the upgradient property boundary and in eight (8) of the nine (9) total soil boring locations including the two off-Site soil boings and two upgradient soil borings. PFOS was detected in soil above the Guidance Values for Anticipated Restricted-Residential Use in two soil borings SB-1 and SB-1D.

The analytical data shows an apparent source of PFAS to groundwater is present on Site; however, data from upgradient wells appears to indicate that regional PFAS contamination in groundwater is also present. Monitoring wells at the downgradient edge of the property have PFAS concentrations similar to the concentrations at the upgradient property boundary indicating that any potential Site contribution to the regional PFAS plume is likely not significant. Current data indicates that limited off-Site migration of PFAS in groundwater may be possible; however, it was not within the scope of this investigation to determine the extent of off-Site migration.

Additionally, soil vapor/sub-slab soil gas and indoor air results from the vapor intrusion investigation indicate mitigation is required when sample concentrations are compared to the NYSDOH Decision Matrices. These compounds include 1,1,1-TCA, 1,1-DCE, cis-1,2-DCE, TCE, and vinyl chloride. The sample locations where results indicate that mitigation is required (SSG-1/IA-1 and SSG-6/IA-6) are both located in the southern portion of the Site.

4.0 QUALITIATIVE HUMAN HEALTH EXPOSURE ASSESSMENT AND REMEDIAL ACTION OBJECTIVES

4.1 Qualitative Human Health Exposure Assessment

Based upon the information collected to date, a qualitative human health exposure assessment (QHHEA) has been completed in accordance with Section 3.3(c)4 of DER-10 and the NYSDOH guidance for performing a qualitative exposure assessment (EA) (NYSDEC DER-10; Technical Guidance for Site Investigation and Remediation; Appendix 3B). The overall purpose of the Qualitative Human Health Exposure Assessment (or the exposure assessment) is to evaluate and document how people might be exposed to Site-related contaminants, and to identify and characterize the potentially exposed population(s) now and under the reasonably anticipated future use of the Site.

In accordance with DER-10, the EA evaluates the following five elements associated with exposure pathways and describes how each of these elements pertains to the Site.

1. A description of the contaminant source(s) including the location of the contaminant release to the environment (any waste disposal area or point of discharge) or if the original source is unknown, the contaminated environmental medium (soil, indoor or outdoor air, biota, water) at the point of exposure;
2. An explanation of the contaminant release and transport mechanisms to the exposed population;
3. Identification of all potential exposure point(s) where actual or potential human contact with a contaminated medium may occur;
4. Description(s) of the route(s) of exposure (i.e., ingestion, inhalation, dermal absorption); and
5. Characterization of the receptor populations who may be exposed to contaminants at a point of exposure.

4.2 Site Description

The Site is fully developed with a 12-story building with a basement. The Site is currently vacant and is undergoing renovation for future residential use. The footprint of the property is entirely covered by the existing 12 story, 6,000 square foot (approximate) building on Site. Construction activities include the demolition of the existing 12th story and bulkhead, construction of an additional six stories to the 11 stories, and altering the building for future residential use.

The Site was formerly owned and utilized by DuArt for cinematographic film cleaning and film processing from approximately 1922 through 2011. Film production including voiceover work, audio recording, and film editing continued to take place at the Site until 2021. Past operations

included cinematographic film cleaning operations which likely utilized cleaning and degreasing compounds including cVOCs PCE and 1,1,1-TCA to remove dirt, grease, and minor scratches from film negatives prior to print.

4.3 Contaminated Media

Based on the results of due diligence investigations and the RI, contamination at the Site consists of the following:

- Groundwater impacted with VOCs (primarily 1,1,1-TCA, PCE, TCE, 1,1-DCA, cis-1,2-DCE, trans-1,2-DCE, chloroethane, and VC) at concentrations exceeding the NY Ambient Water Quality Standards.
- Sub-slab soil vapor and indoor air (primarily 1,1,1-TCA, TCE, 1,1-DCE, cis-1,2-DCE and VC) at concentrations where mitigation is required based on the NYSDOH vapor intrusion matrices.
- Soils impacted with select compounds including metals (lead, mercury, nickel, and trivalent chromium), n-propylbenzene, dibenzofuran, and 4,4-DDE at concentrations detected above UUSCOs but below the RRUSCOs. Two of these compounds were detected above PWGSCO (n-propylbenzene and silver); however, these compounds were not detected above AWQS in the latest sampling event conducted in February 2025.
- Soils with concentrations of phenanthrene, silver and hexavalent chromium as well as two naturally occurring background metals, manganese and barium, were detected at concentrations exceeding the RRUSCOs.

Based on the intended future use of the Site, the RRUSCOs are the appropriate and applicable SCOs for evaluating soil results.

4.3.1 Soil Exposure

Based on the results of soil sampling conducted to date, described in Section 3.0, select compounds including metals (barium, manganese, lead, mercury, nickel, silver, and trivalent and hexavalent chromium), n-propylbenzene, dibenzofuran, phenanthrene, and 4-4-DDE were detected above UUSCOs and, for compounds detected above the AWQS in groundwater, PGWSCOs. However, none of these compounds exceeded the RRUSCOs in any sample.

Soils with concentrations of phenanthrene, silver and hexavalent chromium as well two naturally occurring background metals, manganese and barium, were detected at concentrations exceeding the RRUSCOs.

The Site is currently undergoing redevelopment and is not occupied. Site access is controlled with a fence and locked gate. The Site building is currently vacant. Potential contact with Site

soil that may have elevated contaminants of concern, is restricted to remediation and construction contract workers working in the basement, and potential trespassers. The public will not be exposed to direct contact with Site soil. Appropriate monitoring, controls and personal protective equipment (PPE) will be utilized during any intrusive Site work to minimize contaminant exposure in accordance with the Construction Health and Safety Plan (HASP).

The proposed plan for Site redevelopment consists of the demolition of the existing 12th story and bulkhead, construction of an additional six stories to the 11 stories and altering the building to residential use. The Site will be completely capped by the proposed redevelopment activities. A new floor slab will be installed in the basement limiting future exposure to Site soils after conclusion of redevelopment activities.

4.3.2 Groundwater Exposure

Groundwater is not used for drinking or other potable purposes (the Site and all buildings in the area are connected to the New York City public water supply), and there is no direct contact with or ingestion of groundwater by the general public (on or off-Site). Potable water for the Site and surrounding properties is from the New York City water supply system which consists of three individual water supplies. There are no public water supply wells located in the area surrounding the Site. Once redeveloped, the building will continue to be serviced by the public water supply.

Groundwater is located approximately 10 feet below the basement level of the building and approximately 25 feet below the ground surface at street level. While no dewatering is expected during building renovation activities, individuals who perform intrusive work (i.e., utility construction and/or repair), perform groundwater sampling or remediation activities may come into contact with contaminated groundwater. In adherence to the Construction HASP, proper PPE and personal hygiene measures will be utilized as necessary to prevent dermal contact and the potential for incidental ingestion of these compounds during such activities. There is no potential for the general population to ingest or have direct contact with contaminated groundwater.

4.3.3 Soil Vapor Exposure

Individuals who perform groundwater or soil vapor sampling, remediation and construction activities may come into contact with contaminated soil vapor. Potential worker exposure to contaminated soil vapor during these activities will be mitigated through the implementation of the Site-Specific HASP, use of PPE as necessary, and required worker training. While off-site properties have not been tested as the remedial party is a Volunteer, the potential for soil vapor intrusion in off-site properties exists.

A sub-slab depressurization system (SSDS) and vapor barrier will be installed as part of the building renovation activities to mitigate potential vapor intrusion following the completion of redevelopment

activities. To address potential off-site soil vapor migration, a perimeter soil vapor extraction (SVE) system will be installed.

4.3.4 Exposure Assessment Summary

The following table summarizes the exposure assessment, based on the RI samples collected to date.

Environmental Media and Exposure Route	Human Exposure Assessment
Direct contact with surface soils (and incidental ingestion)	• No active soil remediation is proposed. Demolition and construction contractors have the potential to come into contact with soil if there is ground intrusive work at the Site, during construction-related activities. Proper PPE will be utilized in accordance with the health and safety plan as necessary to prevent exposure during construction activities. • The general population will not come into contact with soils because access to the Site is restricted by a fence and locked gate. • The Site will be capped with a new concrete slab at the completion of redevelopment activities. This engineering control will prevent future building occupants from contacting soils at the Site.
Direct contact with subsurface soils (and incidental ingestion)	• No active soil remediation is proposed. Demolition and construction contractors have the potential to come into contact with soil during any construction related ground intrusive work at the Site. Proper PPE will be utilized as necessary in accordance with the health and safety plan as necessary to prevent exposure during construction activities. • The general population will not come into contact with soils because access to the Site is restricted by a fence and locked gate. • The Site will be capped with a new concrete slab at the completion of redevelopment activities. This engineering control will prevent future

Environmental Media and Exposure Route	Human Exposure Assessment
	building occupants from contacting soils at the Site.
Ingestion of groundwater	• Contaminated groundwater is not being used for drinking water, as the area is served by the public water supply.
Direct contact with groundwater (and incidental ingestion)	• Groundwater is located approximately 10 feet below the basement slab and will not be encountered by construction workers or during the installation of the SSDS. • While not expected, demolition, construction contractors, environmental professionals, and utility workers have the potential come into contact with impacted groundwater should activities extend at least 10 feet bs. • Proper PPE will be utilized as necessary in accordance with the Site health and safety plan to prevent exposure during construction activities.
Inhalation of air (exposures related to soil vapor intrusion)	• Individuals who perform groundwater or soil vapor sampling, remediation and construction activities have the potential to come into contact with contaminated soil vapor. Potential worker exposure to contaminated soil vapor during these activities will be mitigated through the implementation of the Site-Specific HASP, use of PPE as necessary, and required worker training. • Occupants of off-Site properties if a soil vapor intrusion condition is present (and which was not tested). • An SSDS and vapor barrier will be installed as part of the building renovation activities to mitigate potential vapor intrusion following the completion of redevelopment activities. • A SVE system will be installed during building renovation activities to mitigate the potential for soil vapor intrusion at off-site properties. • This pathway will be reevaluated following completion installation of the SSDS. It is assumed that the potential for vapor exposure will remain and an SSDS, vapor barrier and SVE will be

Environmental Media and Exposure Route	Human Exposure Assessment
	sufficient to mitigate future exposure from this pathway.

4.4 Remedial Action Objectives

The goals of the proposed remedial actions (RAs) are to reduce the concentrations of contaminants in groundwater to levels below applicable Standards, Criteria and Guidance (SCGs) and to prevent exposure to impacted soil, groundwater and soil vapor that will remain. Based on the results of the remedial investigations conducted at the Site, the Remedial Action Objectives (RAOs) for the Site are summarized below.

4.4.1 Soil

Based on the results of the RI, select compounds including metals (barium, manganese, lead, mercury, nickel, silver, and trivalent and hexavalent chromium), n-propylbenzene, dibenzofuran, phenanthrene, and 4-4-DDE were detected above UUSCOs and/or PGWSCOs. However, no compounds of concern exceeded the RRUSCOs in the samples except for the following: phenanthrene, silver and hexavalent chromium as well as two naturally occurring background metals, manganese and barium.

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

4.4.2 Groundwater

CVOCs (primarily 1,1,1-TCA, PCE, TCE, 1,1-DCA, cis-1,2-DCE, trans-1,2-DCE and VC) were detected in groundwater in the unconsolidated overburden aquifer across the Site above applicable SCGs. One petroleum-related VOC, n-propylbenzene, was detected above the applicable SCG in one monitoring well located in the southeast corner of the Site. Metals (iron, manganese, and sodium) attributable to the natural conditions of the aquifer, have also been detected above applicable SCGs.

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore the groundwater aquifer to pre-release conditions, to the extent practicable.
- Remove the source of groundwater contamination.

4.4.3 Soil Vapor

Comparison of the results to the NYSDOH SV/IA Matrices indicated mitigation was required for 1,1-DCE, cis-1,2-DCE, TCE, 1,1,1-TCA, and VC.

RAOs for Public Health Protection

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

5.0 REMEDIAL ACTION SELECTION

5.1 Evaluation of Remedial Alternatives

The alternatives considered to address contamination in soil, soil vapor and groundwater are discussed below.

5.1.1 Track 1 Remediation

A remedy pursuant to this track must achieve compliance with the UUSCOs and allow for use of the Site for any purpose without restrictions. This alternative would involve the complete removal and/or remediation of the impacted soils above the bedrock at the Site and treatment of impacted groundwater through a dewatering system to support removal of the soil and address dissolved VOC and PFAS concentrations.

Based on previous investigations, this alternative would include excavation in the basement, at depths up to 10 ft-bs to address detections of select compounds including metals (barium, manganese, lead, mercury, nickel, silver, and trivalent and hexavalent chromium), dibenzofuran, phenanthrene, n-propylbenzene and 4-4-DDE above the UUSCOs as well as to at least 18 ft-bs to excavate PFAS above the Guidance Values for Anticipated Site Use - Unrestricted. A figure showing the minimum remedial excavation depths is included as **Figure 8**.

This includes the following minimum remedial excavation depths to achieve the UUSCOs:

- 10 feet in the area of SB-1, SB-1D and SB-6 to address hexavalent chromium, manganese and PFAS;
- 8 feet in the area of SB-4 to address barium, manganese, 4,4'-DDE and PFAS;
- 8 feet in the courtyard (SB-3, PE-1 and PE-2) to address mercury, trivalent chromium and PFAS; and,
- 18 feet in the area of SB-7 to address dibenzofuran, phenanthrene, nickel, silver, trivalent chromium, and PFAS.

Excavation to these depths would not be practical given the locations in and around building foundation elements for the on-Site and off-Site structures, which are over 100 years old, as well as the logistics of reaching these depths given the Site layout (i.e., working within a basement with limited access). A total of at least 1,203 cubic yards of material would need to be removed. Redevelopment of the Site would be implemented concurrently with the remediation, with additional dewatering to support the excavation and after backfilling the additional excavated volume.

The Track 1 remediation would remove all sources of contamination at the Site, including groundwater exceedances through the dewatering, treatment and off-Site disposal under a New

York City Department of Environmental Protection (NYCDEP) permit. VOCs would not remain at the Site at concentrations requiring engineering controls to address potential soil vapor intrusion conditions.

5.1.2 Track 4 Remediation

A Track 4 remedy for a Restricted-Residential Use requires that the top two feet of exposed soil meets the RRUSCOs or otherwise is covered by a Site cover system. Short and long-term institutional and engineering controls are allowed to achieve protection of public health and the environment.

This Track is the preferred track for the proposed future residential use of the Site, as select compounds (barium, manganese, hexavalent chromium, silver, and phenanthrene) were detected above RRUSCOs and will be managed under a Site cover system. A Track 4 cleanup at a restricted-residential Site requires a Site Management Plan (SMP) to ensure that any post-Certificate of Completion (COC) institutional and engineering controls are maintained. The preferred Track 4 remedy is described below by each media.

Soil

As part of construction activities, limited excavations will be conducted for various building foundation elements including footings, pile caps, trenches, and elevator pits. These excavation activities are further described in Section 7.0. A CAMP (**Attachment C**) and Soil/Materials Management Plan (**Attachment D**) will be implemented during the invasive Site activities to prevent or minimize potential impacts to human health and the environment.

No source materials (i.e. cVOCs) were identified in soils at concentrations above the UUSCOs or RRUSCOs throughout the RI. The VOC n-propylbenzene was detected in one on-Site boring above the PGWSCO and in one groundwater sample (although not in subsequent sampling rounds). As further described below, a perimeter SVE system will be installed predominantly to address the potential for contamination remaining in groundwater and soil vapor to impact off-Site soil vapor; however, the radius of influence of the SVE will encompass the location of the PGWSCO exceedance for n-propylbenzene. Based on the analytical results, the majority of compounds were below RRUSCOs. Four metals (hexavalent chromium, silver, barium and manganese) and one SVOC (phenanthrene) were detected above RRUSCOs, which will be addressed by a Site cover system. The proposed remedy for Site soils includes an environmental easement to manage these concentrations under a Site cover system.

As part of the redevelopment activities, a new basement slab will be constructed. The current basement elevation is being raised by a minimum of 1 foot. The new basement slab and gravel sub-base, along with the existing sub-grade walls, will be the composite cover system used to prevent exposure to soils.

Groundwater

The proposed remedial action to address groundwater impacts includes EISD which applies a combination of both biotic (biodegradation by bacteria) and abiotic (chemical reactions without bacteria) processes to effectively degrade cVOCs in groundwater. The groundwater remediation is described in Section 8.0.

Following completion of the redevelopment, post-remedial groundwater sampling will be conducted at Site monitoring well locations, as described in Section 8.2

Soil Vapor

An SSDS is proposed to minimize the potential for vapor intrusion. The design and implementation of the SSDS is included in Section 9.0. Following SSDS installation, confirmatory indoor air sampling and pressure differential testing will be conducted. A perimeter SVE system will be installed to address potential soil vapor intrusion at off-site locations; the design of the SVE will be provided in a Design Document following implementation of a pilot test. Long term operation and maintenance procedures for the SSDS and SVE will be documented in the Site Management Plan (SMP).

5.2 Standards, Criteria and Guidance (SCGs)

The Site Standards, Criteria, and Guidance (SCGs) for the remedial actions are listed below.

SCG	Scope / Application
NYSDEC Brownfield Cleanup Program Guidance	General program guidance
NYSDEC Division of Environmental Remediation (DER) Program Policy: Technical Guidance for Site Investigation and Remediation (DER-10)	Guidance for Remedial Actions
NYSDEC Division of Environmental Remediation (DER) Program Policy: Green Remediation (DER-31)	Green remediation components
NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (1998)	Class GA Standards for groundwater
NYSDOH Guidance for Evaluating Soil Vapor Intrusions in the State of New York (2006) and updated Soil Vapor/Indoor Air (SV/IA) decision matrices May 2017 and February 2024	Soil vapor guidance
NYSDOH Generic Community Air Monitoring Plan	Plan for monitoring dust and volatile organics

SCG	Scope / Application
New York State Codes, Rules and Regulations (NYCRR) Title 6 Part 360 – Solid Waste Management Facilities	Off-site disposal of waste
New York State Codes, Rules and Regulations (NYCRR) Title 6 Part 364 – Waste Transporter Permits	Transporter requirements for off-site disposal of waste
6 NYCRR Part 370 – Hazardous Waste Management System and/or 6 NYCRR Part 376 – Land Disposal Restrictions	Disposal of hazardous waste, if encountered
6 NYCRR Part 375 – Environmental Remediation Programs (December 2006)	General administrative guidance
40 CFR Parts 144 and 146 – Underground Injection Control Program	Injection of chemicals into the groundwater
Code of Federal Regulations (CFR) Title 29 Part 1910.120 - Hazardous Waste Operations and Emergency Response Standard	Worker safety
29 CFR Title 29 Part 1926 - Safety and Health Regulations for Construction	Worker safety

5.3 Evaluation of Alternatives

The Track 1 and Track 4 remedial alternatives for soil, groundwater and soil vapor are discussed below. Each alternative was evaluated based on the following remedy selection factors (as defined in DER-10, Section 4.2):

- Protection of human health and the environment
- Conformance with standards, criteria and guidelines
- Short-term effectiveness and performance
- Long-term effectiveness and performance
- Reduction in toxicity, mobility or volume
- Implementability
- Cost effectiveness
- Community acceptance
- Land use

5.3.1 Protection of Human Health and the Environment

Each alternative would be protective of human health and the environment. The Track 1 and Track 4 remedies with respect to protection of human health are detailed below.

Track 1

The Track 1 remedy will remove impacted soils and groundwater exceeding applicable cleanup criteria such that no engineering controls will be required for soil and all impacts to the groundwater will have been removed. Potential exposure pathways associated with soil vapor will be eliminated by the removal of all potential source material in soil and groundwater.

Dewatering, and treatment prior to discharge, will facilitate the excavation of soil with exceedances of the UUSCOs below the groundwater and remove all dissolved groundwater contamination.

Track 4

Under a Track 4 remedy, residual contaminated soil remains in place beneath a composite cover system which will be installed and managed under an SMP, consistent with the proposed future residential use of the Site. The cover system will eliminate the potential for direct contact exposure to impacted soils and will prevent disturbance of remaining contamination.

Residual groundwater contaminants will be treated through Enhanced In-Situ Dechlorination (EISD). Groundwater in New York City is not used as a source of drinking water, and potential future use will be restricted under an environmental easement, thereby eliminating the potential for ingestion exposure. Groundwater conditions will be monitored and addressed through the remedial program and managed as necessary under the SMP.

Potential soil vapor intrusion exposure will be mitigated through the implementation of engineering controls, including a building slab/vapor barrier, a sub-slab depressurization system (SSDS), and a perimeter soil vapor extraction (SVE) system. These systems will be installed above the groundwater interface and will minimize the potential for vapor migration into indoor air at on- and off-Site structures.

Following remediation and building renovations and prior to occupancy, additional soil vapor intrusion evaluation will be conducted, including post-remedial indoor air sampling under the RAWP and Site Management Plan. If impacts are detected in indoor air, actions must be implemented to reduce contaminant concentrations to below background levels. Any such mitigative measures and post implementation confirmatory sampling will be submitted to NYSDEC and NYSDOH for review and approval.

A Health and Safety Plan (HASP), included as **Attachment E**, will be implemented during remedial activities to ensure worker safety. A CAMP (**Attachment C**) including monitoring/management for particulates and volatiles will be implemented during ground intrusive activities with the potential to generate dust or release VOC contaminants.

5.3.2 Conformance of SCGs

Each alternative would conform to applicable standards, criteria, and guidance (SCGs). The Track 1 and Track 4 remedies with respect to conformance with SCGs are summarized below.

Track 1

The Track 1 remedy would remove all impacted soils exceeding Unrestricted Use Soil Cleanup Objectives (UUSCOs) and remove all impacted groundwater. No soil vapor source material will remain. This remedy would achieve unrestricted use of the Site and full compliance with applicable SCGs.

Track 4

Under the Track 4 remedy, some exceedances of the Restricted-Residential Use Soil Cleanup Objectives (RRUSCOs) will remain; however, the concentrations will not be source material to the groundwater or soil vapor. Groundwater will be treated with a goal to decrease the concentrations to pre-release aquifer conditions. Given the potential for residual impacts, an SSDS and perimeter SVE system will be installed to mitigate the potential for soil vapor intrusion at on- and off-Site properties. As such, the Track 4 remedy would achieve compliance with SCGs for the proposed restricted residential use of the Site through the implementation of institutional and engineering controls, including an environmental easement and an SMP, in accordance with NYSDEC requirements.

On-Site construction activities will be conducted in accordance with the Health and Safety Plan (HASP), which incorporates applicable Occupational Safety and Health Administration (OSHA) requirements.

5.3.3 Short-Term Effectiveness and Performance

Each alternative would be effective over a short-term time and is compatible with the proposed future use of the Site. The Track 1 and Track 4 remedies with respect to short-term effectiveness and performance are summarized below.

Track 1

The Track 1 remedy would involve extensive excavation and dewatering activities and, as such, is associated with greater short-term impacts. These impacts include increased potential for particulate emissions and volatilization of contaminants, as well as increased truck traffic due to the volume of material to be removed and transported off-site.

These short-term impacts would be managed through the implementation of appropriate control measures, including the CAMP and other procedures outlined in the SMMP, to minimize potential impacts to on-site workers, the surrounding community, and the environment.

Track 4

The Track 4 remedy would involve less extensive soil disturbance and a shorter duration of intrusive activities, including groundwater injections, compared to the Track 1 remedy. As a result, short-term impacts, including potential particulate emissions, volatilization, and truck traffic, would be more limited in magnitude and duration.

As with the Track 1 remedy, these potential impacts will be effectively managed through the implementation of the control measures specified in this RAWP, including the CAMP, SMMP and Health and Safety Plan (HASP).

5.3.4 Long-Term Effectiveness and Performance

Each alternative would provide long-term effectiveness and be consistent with the proposed future use of the Site. The Track 1 and Track 4 remedies with respect to long-term effectiveness and performance are summarized below.

Track 1

The Track 1 remedy would involve the excavation and off-site disposal of all impacted soil exceeding Unrestricted Use Soil Cleanup Objectives (UUSCOs), thereby permanently removing impacted soils and eliminating potential exposure pathways associated with soil contamination. The Track 1 remedy would remove all impacted soils exceeding Unrestricted Use Soil Cleanup Objectives (UUSCOs) and remove all impacted groundwater. No soil vapor source material will remain.

As a result, no long-term engineering or institutional controls would be required and no ongoing site management or monitoring for soil would be necessary. Accordingly, the Track 1 remedy would provide a high level of long-term effectiveness and permanence.

Track 4

Under the Track 4 remedy, some contaminated soil and groundwater impacts may remain in place following implementation of the proposed remedial program, including EISD. As such, long-term effectiveness will be achieved through a combination of engineering controls (ECs), and institutional controls (ICs).

Groundwater impacts will be addressed through the proposed EISD remedy, which is intended to reduce contaminant concentrations over time with a goal of meeting the pre-release aquifer conditions. The duration of groundwater treatment will depend on site-specific conditions and contaminant distribution but will be evaluated and monitored under the SMP.

Long-term protection of human health with respect to potential soil vapor intrusion will be achieved through the installation and operation of an SSDS, in conjunction with a vapor barrier, and a perimeter SVE system. These systems will be operated and maintained as necessary to ensure continued effectiveness.

Institutional and engineering controls, including an environmental easement, composite cover system, and SMP, will be required to manage residual contamination and prevent exposure to the underlying soil. These controls will remain in place for as long as contamination exceeds applicable cleanup criteria and will be subject to periodic inspection, certification, and reporting to NYSDEC.

While the Track 4 remedy relies on long-term management and monitoring, it will be protective of public health and the environment over time when properly implemented and maintained according to the SMP.

5.3.5 Reduction in Toxicity, Mobility, or Volume

Each alternative would reduce the toxicity, mobility, and/or volume of contaminants present at the Site through different mechanisms. The Track 1 and Track 4 remedies with respect to reduction in toxicity, mobility, and volume are summarized below.

Track 1

The Track 1 remedy would achieve a reduction in toxicity, mobility, and volume through the excavation and off-site disposal of impacted soils exceeding Unrestricted Use Soil Cleanup Objectives (UUSCOs), as well as the removal, treatment and off-Site disposal of all contaminated groundwater.

Excavation would remove all contamination above the UUSCOs. As such, excavation would result in a reduction in contaminant mass (volume) and eliminate potential exposure pathways associated with impacted soils.

Groundwater impacts, which are not considered to be associated with an ongoing on-site soil source, will be addressed through dewatering, which will also support the removal of soil impacts above the UUSCOs. As such, the Track 1 remedy would substantially reduce contaminant mass in both soil and groundwater.

Track 4

Under the Track 4 remedy, reductions in toxicity, mobility, and volume will be achieved through a combination of active treatment and engineering controls.

The proposed EISD remedy will reduce the toxicity and volume of organic contaminants in soil and groundwater through chemical destruction. This treatment will decrease contaminant concentrations over time and reduce the overall mass of contaminants present at the Site.

Mobility of residual contaminants will be controlled through the implementation of engineering controls, including a composite cover system, which will limit infiltration and prevent the migration of contaminants, and a vapor mitigation system consisting of an SSDS and a perimeter SVE system, which will control the migration of soil vapor and capture (and, as needed, treat) contaminants in soil vapor.

Some contaminants will remain in soil, soil vapor and groundwater at concentrations exceeding applicable criteria and will be managed through the implementation of institutional and engineering controls, including an environmental easement and an SMP, to prevent exposure and limit migration.

5.3.6 Implementability

All alternatives are considered implementable; however, the Track 1 remedy would require a significantly greater level of effort and complexity to implement relative to the Track 4 remedy. The Track 1 and Track 4 remedies with respect to implementability are summarized below.

Track 1

The Track 1 remedy would be more complex to implement due to the extent and depth of excavation required, particularly within the building basement. Implementation would require support of excavation (SOE), dewatering, and management of excavated materials from below-grade areas. In addition, the volume of soil to be excavated and transported off-Site would result in increased logistical complexity, including staging constraints and significant truck traffic.

These factors increase the overall difficulty of construction, coordination, and material handling, making the Track 1 remedy more challenging to implement relative to the Track 4 alternative.

Track 4

The Track 4 remedy would be more readily implementable and can be integrated with planned site development activities. The required remedial elements, including enhanced in-situ dechlorination (EISD), installation of a composite cover system, and implementation of vapor mitigation systems (SSDS and perimeter SVE), can be constructed using standard environmental and construction means and methods.

Because the Track 4 remedy involves less intrusive soil disturbance and reduced material handling requirements, it presents fewer logistical challenges and can be implemented more efficiently within the constraints of the Site.

5.3.7 Cost Effectiveness

The Track 1 and Track 4 remedies with respect to cost effectiveness are summarized below. The estimated costs for implementation of the Track 1 and Track 4 remedies are presented in **Table 5**.

Track 1

The costs to implement a Track 1 remedy would be significantly higher than those for the Track 4 remedy due to the extent and depth of excavation required to remove soils exceeding the UUSCOs. Implementation would include support of excavation (SOE), dewatering, handling and staging of soils from the basement level to grade, and transportation and disposal of large volumes of material off-site. These factors substantially increase overall construction and disposal costs. The SOE in particular would be extensive given the depths and the age of the Site building and adjoining buildings.

While the Track 1 remedy would remove more contaminant mass, the incremental benefit relative to the Track 4 remedy is limited.

Track 4

As shown in **Table 5**, the Track 4 remedy can be implemented at a lower overall cost while still achieving protection of human health and the environment. This approach reduces the need for extensive excavation and off-Site disposal and instead relies on a combination of targeted treatment (EISD), engineering controls, and institutional controls.

Accordingly, the Track 4 remedy represents a more cost-effective alternative for achieving the remedial objectives of the Site.

5.3.8 Community Acceptance

Community acceptance of the remedial alternatives will be evaluated based on public input received during the remedial process. The Track 1 and Track 4 remedies with respect to community acceptance are summarized below.

Track 1

The Track 1 remedy would eliminate potential exposure pathways associated with subsurface contamination and would be protective of human health and the environment. However, as discussed in Section 5.3.3, implementation of the Track 1 remedy would result in greater short-term impacts to the surrounding community due to the increased duration and intensity of construction activities, including excavation, truck traffic, and associated disturbances.

Track 4

The Track 4 remedy would also eliminate or control potential exposure pathways and would be protective of human health and the environment. In addition, the reduced extent of excavation and shorter duration of intrusive activities would minimize short-term impacts to the surrounding community.

The selected Track 4 remedy will be subject to a 45-day public comment period in accordance with the Citizen Participation Plan (CPP). Any substantive public comments received during this period will be addressed prior to final remedy approval by NYSDEC.

5.3.9 Land Use

Each of the proposed alternatives is compatible with the proposed land use at the Site. The following findings, based on a review of previous environmental and public documents, support the compatibility of the proposed Site land use with that of the surrounding area:

1. The proposed use of the Site conforms to applicable zoning laws and maps, as well as the reasonably anticipated future use of the Site.
2. The proposed use conforms to historical and/or recent development patterns in the area.
3. The Site does not fall within the boundaries of an existing Brownfield Opportunity Area (BOA).
4. According to the New York City Planning Commission Zoning Map, the Site is located in a C6-4/C6-6 Commercial District in Manhattan, approximately 1,000 feet southwest of Central Park. The C6-4 commercial zoning district allows for the conversion of existing

commercial buildings to residential use. The Site is bordered to the north, east, and west by mixed-use commercial/residential properties, and is bordered to the south by West 55th Street and additional mixed-use commercial/residential properties.

5. The Site is located in an urban setting characterized by residential and commercial uses. There are no areas zoned for agricultural use in the proximity of the Site.
6. According to the NYSDEC database for environmental justice concerns, the Site is not located in a Potential Environmental Justice Area (PEJA).
7. There are no federal or state land use designations associated with the Site.
8. Population growth patterns and projections support the proposed land use.
9. The Site is accessible to existing infrastructure.
10. The Site is not located in close proximity to important federal, state or local natural resources, including waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species.
11. Municipal water supply wells are not present in this area of New York City; therefore, groundwater from the Site cannot affect municipal water supply wells or recharge areas.
12. The Federal Emergency Management Agency (FEMA) flood insurance rate maps for the Site (Map number 3604970088F) indicate that the Site is located within an area of minimal flood hazard (Zone X). The closes floodplain is 0.65 miles (3,430 feet) to the west.

5.4 Selection of the Preferred Remedial Actions

The preferred Track 4 remedy, intended to address all environmental issues associated with the Site, consists of the following:

- Site mobilization involving equipment mobilization, and utility mark outs.
- Soils removal in limited areas during installation of building foundation elements during redevelopment activities.
- Installation of an SSDS prior to pouring of a new floor slab.
- Capping of soils with new concrete basement slab and maintenance of the existing sub-grade walls.
- Groundwater impacts will be addressed via EISD which applies a combination of both biotic (biodegradation by bacteria) and abiotic (chemical reactions without bacteria) processes to effectively degrade cVOCs in groundwater.
- Import of materials to be used for backfill to raise the elevation of the basement slab in compliance with: (1) the Part 375-6.7(d) and (2) all Federal, State and local rules and regulations for handling and transport of material.
- Before the building is occupied, the indoor air will be sampled to confirm the efficacy of the remedial action. If post-remediation vapor intrusion sampling indicates impacts to indoor air, additional actions will be implemented to reduce contaminant concentrations to below regulatory concern. Any such mitigative measures and post-implementation confirmatory sampling results will be submitted as a work plan that would require approval by NYSDEC and NYSDOH.

- Preparation of a Final Engineering Report (FER) to document the implemented remedial actions.
- Development of an SMP for long term management of residual contamination as required by an Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, and (3) reporting.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP and the NYSDEC-issued Decision Document. All deviations from the RAWP and/or Decision Document will be promptly reported to NYSDEC for approval and fully explained in the FER. An SSDS will be installed during Site redevelopment activities. Potential soil vapor impacts will be evaluated by post-remediation indoor air sampling as part of the SMP and prior to occupancy.

The following land-use factors were considered in selecting these remedial measures. Land Use Factor	Remedy Evaluation Result
Zoning	Remedy is consistent
Applicable comprehensive community master plans or land use plans	Remedy is consistent (not within a Brownfield Opportunity Area)
Surrounding property uses	Remedy is consistent
Citizen participation	Remedy is consistent; CPP requirements implemented regardless of selected remedy
Environmental justice concerns	None identified
Land use designations	Remedy is consistent
Populations growth patterns	Remedy is consistent
Accessibility to existing infrastructure	Remedy is consistent
Proximity to cultural resources	None identified
Proximity to natural resources	None identified
Off-Site groundwater impacts	Groundwater will be monitored on-Site following implementation of the remedy.
Proximity to floodplains	Site is outside the 500-year flood zone.
Geography and geology of the Site	Remedy is consistent
Current Institutional Controls	None currently present

5.5 Green and Sustainable Remediation Principles

Green remediation and construction principles and techniques will be implemented to the extent feasible and practicable in the design, implementation, and site management of the remedy as per DER-31. The major green remediation concepts are as follows:

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

Green remediation and construction techniques will be implemented in all phases of the remedial program, including the design, construction, implementation, and site management of the remedy. Major green remediation techniques include the following:

- Install a vapor barrier and waterproofing membrane on the foundation at the Site, to the extent feasible, which may improve energy efficiency.
- Minimize vehicle idling whenever possible for all vehicles, both on and off road, and including construction and drilling equipment.
- Design cover systems, to the extent possible, to require minimal maintenance and be integrated with the current intended and future use of the Site.
- Prevent unintended soil compaction during construction and remediation activities.
- Minimize freshwater consumption and maximize water reuse during daily operations and treatment processes.
- Evaluate if a remediation system could be protective with an intermittent or passive energy supply (e.g. venting or pumping only during daytime or with adequate winds).
- Encourage the use of remediation technologies that permanently degrade or destroy contamination to reduce impacts associated with long-term site management.
- Encourage development and evaluation of low energy alternatives, such as enhanced bioremediation, enhanced attenuation of chlorinated organics, and remedies which can be driven to monitored natural attenuation (MNA) or monitoring only (e.g. remedies which may not need external power indefinitely).
- Reuse existing buildings and infrastructure to reduce waste.
- Reuse and recycle construction and demolition (C&D) debris and other materials, as practicable, to maximize beneficial use of materials that would otherwise be considered a waste.
- Evaluate the possibility of utilizing renewable energy sources either directly (generated on Site, off-grid, or grid-tied) or indirectly through a utility (green power purchase program).
- Integrate remedial design with anticipated reuse of the Site.
- Incorporate green building design.

- Improve reliability to reduce operations and maintenance (O&M) visit frequency.
- Incorporate sustainability into periodic reviews to identify opportunities to reduce energy and other impacts.

As part of this RAW environmental footprint analysis was completed using SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), which is a NYSDEC-accepted tool. SEFA spreadsheets have been prepared for the Track 1 and Track 4 remedial alternatives (see **Attachment F**). As part of the remedial design program, to evaluate the final remedy with respect to green and sustainable remediation principles, an updated environmental footprint analysis will be completed and included in the Final Engineering Report (FER).

Goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, are incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the FER, including a comparison to the goals established during the remedial design program.

The remedial design program also includes a Climate Screening to evaluate the impact of potential changes in climate hazards on the project Site and the proposed remedy. If the screening identifies potential exposure to climate hazards, a Climate Vulnerability Assessment will be conducted to identify adaptation measures to account for projected climate hazard exposures. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress, and drought), flooding, and sea level rise will be identified, and the remedial design program may incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

Climate change is not expected to have a significant impact on the remedial systems or engineering controls/institutional controls (ECs/ICs) at the Site. There are two mechanical ECs proposed for the Site; an SSDS and SVE system. There is also a non-mechanical EC proposed for the Site; the composite cover system, consisting of a concrete slab within the onsite building footprint and the existing sub-grade walls. These ECs are not anticipated to be affected by climate change.

The primary threat from climate change is likely to be associated with sea level rise. However, since sea level rise is estimated to be approximately 1.4 inches per decade, and the Site is located at an elevation of 27 feet above mean sea level, flooding does not appear to be a likely threat. If the frequency and intensity of storm events increase due to climate change, it is possible that heavy rain could occur more frequently at the Site. However, the Site and surrounding area are generally level and significant amounts of surface water are not known to have accumulated on the ground surface at or in the vicinity of the Site. As the potential exposure to climate hazards

at the Site is minimal, an additional Climate Vulnerability Assessment is not necessary to incorporate adaptations for climate hazards.

6.0 REMEDIAL ACTION PROGRAM

6.1 Site Specific Documents

6.1.1 Site Specific Health and Safety Plan

A Site-Specific HASP is included in **Attachment E**. Field activities will be conducted using Modified Level D personal protective equipment. All personnel who work in areas where they may be exposed to site contaminants will be trained as required. Health and safety procedures will be compliant with applicable regulations and guidance. The HASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

6.1.2 Quality Assurance Project Plan

A Field Sampling and Analysis Plan/Quality Assurance Project Plan (FSAP/QAPP) has been created for the Site to address quality control and quality assurance procedures for Site sampling, including performance evaluation groundwater sampling, and is included in **Attachment G.**

6.1.3 Soils/Materials Management Plan

Soil excavation is proposed as part of general building construction activities including excavation for pile caps, an elevator pit and injector pit. These excavations are not remedial in nature and for development purposes. These locations are shown on **Figure 9**. Drawings showing the foundation details are also included with the Soil/Materials Management Plan (SMMP) described below.

Following completion of the construction activities, a new basement slab will be poured. A Soil/Materials Management Plan (SMMP) has been prepared for these activities and is included within **Attachment D**. The SMMP includes procedures for excavation, handling, storage, and transport and disposal.

6.1.4 Community Air Monitoring Plan

CAMP activities will be conducted during ground intrusive construction activities (i.e. drilling of piles, excavation for pile caps and elevator pit, etc.). CAMP will also be implemented during ground intrusive activities related groundwater remediation (i.e., drilling of EISD injection points). A CAMP will also be implemented during the loading and disposal activities of soils generated from the aforementioned construction and remediation activities (i.e., pile, pile cap, elevator pit and injection well installation). CAMP activities will be conducted in accordance with the CAMP included within the NYSDEC approved RIWP. A copy is provided in **Attachment C**.

6.1.5 Citizen Participation Plan

The Citizen Participation Plan (CPP) enables citizens to participate more fully in decisions that affect their health, environment and social well-being. The CPP will be updated throughout the RA in response to any community feedback. The current NYSDEC approved CPP is included in **Attachment H**.

6.2 General Remedial Information

6.2.1 Remedial Engineer

The Remedial Engineer (RE) for this project will be Matthew M. Carroll, P.E.:

Remedial Engineer:
Matthew M. Carroll, PE
Tenen Environmental, LLC
(646) 606-2332
mcarroll@tenen-env.com

The RE is a registered professional engineer (PE) licensed by the State of New York. The RE will have primary direct responsibility for implementation of the remedial program for the 245 West 55th Street Site (NYSDEC Site No. C231157). The RE will also directly oversee work completed by the QEP, Environmental Logic, related to the CAMP, HASP, and the FSAP/QAPP. The RE will certify in the FER that the remedial actions were performed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the RAWP were met.

The PE will review all pre-remedial plans submitted by contractors for compliance with this RAWP and will certify compliance in the FER.

6.2.2 Qualified Environmental Professional (QEP)

All work will be conducted under the direction of the Professional Engineer (PE). Day-to-day activities may be observed and monitored by the Qualified Environmental Professional (QEP), Mr. Gary Weissberger of Environmental Logic, LLC, under direction of the Professional Engineer (PE):

Gary Weissberger
Environmental Logic
15 Princess Road, Suite K
Lawrenceville, NJ 08648
Phone (609) 910-0451
gweissberger@env-logic.com

6.2.3 Remedial Party

Mr. Lou Madigan, of Madigan Development, LLC, represents the Site owner and is managing the redevelopment efforts at the Site. As such, he will be responsible for overseeing project activities at the Site.

Lou Madigan
MADIGAN DEVELOPMENT LLC
250 West 55th Street 17th Floor
New York, NY 10019
T: 917.880.7182
lmadigan@madigandevelopment.com

Resumes of key personnel involved in the Remedial Action are presented in the FSAP/QAPP, included as **Attachment G.**

6.2.4 Subcontractors

Laboratory
PACE/Alpha Analytical (Alpha), of Massachusetts, will perform analysis of the samples collected during the RA. Alpha is a NYSDOH Certified Laboratory (NY Certifications #11148 and #11627). The laboratory project manager for PACE/Alpha is:

Nadine Yakes, Supervisor - Project Management
PACE LABs
Westborough, MA
O: 201-812-9037
Nadine.Yakes@pacelabs.com

Groundwater Remedy Design and Implementation:
ISOTEC will conduct ground remediation (chemical injections) with EL and the Remedial Engineer (Section 6.2.2) oversight.

ISOTEC Remediation Technologies
11 Princess Road, Suite A
Lawrenceville, NJ 08648
609-275-8500

Drillers:
The following drillers may be used for groundwater remediation:

Coastal Environmental Solutions, Inc.
1150 Lincoln Ave, Unit 4, Holbrook, NY 11741
(631) 256-6974
www.Coastalenvsolutions.com

AARCO Environmental Services
50 Gear Ave
Lindenhurst, NY 11757
(631) 586-5900
www.aarcoenvironmental.com/

Sub-Slab Depressurization System (SSDS) Contractor
Clean Vapor, LLC
148 State Route 94, PO Box 688
Blairstown, NJ 07825
(908) 362-5616
www.cleanvapor.com

Soil Vapor Extraction (SVE) System Contractor
AWT Environmental Services, Inc
32 Birch Street
Old Bridge, NJ 08857
(732) 613-1660
www.awtenv.com

Data Validation
Jeri L. Rossi
(908) 370-3431
richjerirossi513@gmail.com

6.2.5 Remedial Action Schedule

A general estimated remedial action (RA) construction schedule is included as **Table 6**.

6.2.6 Work Hours

The RA work hours will conform to applicable Local, State, and Federal code requirements or according to specific variances issued by the appropriate governing agency including the New York City Department of Buildings. NYSDEC will be notified by the Volunteer of any variances issued for change of work hours.

6.2.7 Mobilization

Following NYSDEC approval of this RAWP, the remedial design team will complete a Site walk with the property owner and the groundwater remedy contractor to establish work zones and staging areas for the reagents. Locations of the proposed injection locations will also be inspected and verified with the property owner and general contractor.

6.2.8 Equipment and Material Staging

Equipment and materials for the RA will be stored and staged in a manner that complies with applicable laws and regulations. There will be no specific material or equipment staging area; any staging will be in areas where space permits.

6.2.9 Utility Markout

The groundwater remediation contractor is responsible for the identification of utilities that might be affected by work under the RA and implementation of all required, appropriate, or necessary health and safety measures during performance of work under this RA.

6.2.10 Required Permits

Injection of remedial reagents/amendments falls under the requirements of United States Environmental Protection Agency's (USEPA) Underground Injection Control (UIC) program. Prior to the start of remedial activities, EL or the RA contractor will submit the UIC permit application and injection inventory spreadsheet to USEPA Region 2.

A complete list of all local, regional and national governmental permits, certificates or other approvals or authorizations required to perform the remedial and development work will be included with the FER. Prior to implementation of the remedy, these permits will be provided to NYSDEC in the Site Operations Plan (SOP).

6.2.11 Site Security and Signage

The security fencing/gate at the Site building is maintained as required throughout the RA. Sidewalks adjacent to the Site will be maintained with barriers, as necessary, to protect the public.

6.2.12 Pre-Construction Meeting with NYSDEC

The NYSDEC project manager will be invited to attend a pre-remedial action meeting at the Site with all parties involved in the remedial process prior to implementation of the RAWP.

6.2.13 Estimated Remedial Action Costs

The estimated cost to implement the Remedial Action is $921,800. An itemized summary of estimated costs is included as **Table 5**. This table will be revised based on actual costs and included in the FER.

6.2.14 Deviations from the Remedial Action Work Plan

During the implementation of the RAWP, any significant deviation will be noted and immediately brought to the attention of the RE. The RE or his/her representative will contact the NYSDEC Project Manager, and a formal RA modification will be submitted for NYSDEC approval. Any deviation, significant or minor, will be noted in the Site reports and explained in the FER.

6.3 Reporting

Daily and Monthly progress reports will be submitted to NYSDEC & NYSDOH throughout the RA, as described below. Copies will be provided in the Final Engineering Report (FER).

6.3.1 Daily Reports

Daily reports will be prepared and submitted to the NYSDEC and NYSDOH project managers within 24 hours after the reporting period and will include the following:

- An update of progress made during the reporting day;
- Photographic documentation of the activities completed during the reporting day;
- Identification of samples collected during the reporting day, if applicable;
- A summary of CAMP data, including elevated concentrations and response actions, if any;
- A summary of issues or concerns; and
- Public interactions/interest.

6.3.2 Monthly Reports

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10th of each month as required by the BCA. Monthly reports will include the following:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period.
- Any approved activity modifications (changes of work, scope and/or schedule).
- Results of sampling, tests and data received or generated by or on behalf of Applicant, in the previous reporting period.
- An update of the project schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.
- Information regarding any activities undertaken in support of the Citizen Participation Plan during the previous reporting period and those anticipated for the next reporting period.

7.0 REMEDIAL ACTION IMPLEMENTATION: SOIL REMEDY – COVER SYSTEM

The components of the remedial action for soils include a cover system to be installed at the Site. The proposed cover system will be a permanent engineering control for the Site, consisting of a new concrete basement floor slab with an underlying vapor barrier and the maintenance of the existing sub-grade walls.

The Site building is currently undergoing redevelopment for future residential use. As part of the building construction activities, soils excavation and removal (i.e. developmental excavations) will occur as required for building foundation elements. These excavation activities are not remedial in nature. No remedial excavations are proposed.

Any developmental excavations and soil disposal proposed to occur during the remedial program will be presented in NYSDEC in the form of a Change of Use Notification for acceptance. To date, the following activities were conducted under accepted Change of Use Notifications:

- August 20, 2024— NYSDEC provided acceptance via e-mail for the soil excavation and disposal of soils in the former northeastern courtyard area.
- March 26, 2025 – NYSDEC accepted the Change of Use for drilling of steel pipe piles and caissons.
- June 26, 2025 – NYSDEC accepted the Change of Use for installation of four (4) pile caps and grade beams along the northern property boundary.
- September 22, 2025 – NYSDEC partially accepted the Change of Use application for the installation of support of excavation (SOE) caissons. The approval was specifically for the installation of eight (8) of caissons in the northern portion of the new elevator area.
- December 12, 2025 – NYSDEC accepted a Change of Use Notification related to construction activities for foundation elements including support of excavation piles (SOE), excavation and pouring of pile caps, excavation of new elevator pit including the installation of gravel bed and vapor barrier for future SSDS beneath the elevator pit.

Proper disposal procedures and documentation will be completed for any soil or fill removed from the site. As part of Site development, the basement grade is being raised, and no excavation will be required for the installation for the SSDS piping (see Section 9). Areas depicting developmental excavations are shown in **Figure 9.**

7.1 Materials Transport and Disposal Offsite

A Soils/Materials Management Plan (SMMP) is included as **Attachment D**. Soils generated during developmental excavation activities will be transported under manifest to an approved disposal facility. All transport and disposal of materials will be performed in accordance with

appropriate local, state, and federal regulations and copies of all disposal manifests will be included in the FER.

7.2 Cover System

Exposure to residual contaminated soil and groundwater will be prevented by the installation and maintenance of an engineered cover system. The cover system will be permanent Engineering controls for the Site. The cover system will consist of a new five-inch thick (minimum) basement slab to be installed as part of building renovation activities and maintaining the existing sub-grade walls. The lateral extents of the cover system are shown on **Figure 10**. Cross sections of the new basement slab cover system are shown on **Figure 11**.

Prior to construction, the basement slab sat an average elevation of 58.3'. As part of development activities (i.e. drilling of structural piles, installation of a new elevator pit, excavation for subsurface utilities), the majority of the basement slab will be removed: however smaller sections may still remain.

As noted in Section 9, an appropriate permeable gravel bed will be placed above the slab remnants to ensure proper depressurization of the sub-slab. The former slab sections that were removed as part of construction were properly disposed of along with soils as part of the accepted Change of Use activities referenced above.

As part of renovation and construction activities, the majority of the basement floor is being raised to the final elevations shown in **Attachment I**. In certain locations (i.e. elevator pits, sewerage ejector pits, etc.) the elevations will be lower than pre-renovation conditions. The elevations of these locations are also shown in **Attachment I**.

Beneath the new building concrete slab, a vapor barrier, SSDS, and associated gravel bed will be installed. See Section 9.0 for details on the SSDS.

As discussed above, no remedial excavations are proposed. Any developmental excavations and soil disposal proposed to occur during the remedial program will be presented in NYSDEC in the form of a Change of Use Notification for acceptance.

7.3 Dewatering and Fluids Management

Groundwater at the Site was observed to be encountered 9 to 10 ft-bs. No dewatering is anticipated as part of building renovation/developmental activities and groundwater is not anticipated to be encountered in a way requiring management or disposal during the course of the RA activities. If localized dewatering is needed to install the elevator pit for the new building, it will be implemented in accordance with all federal, state, and local regulations.

7.4 Import of Materials

Import of material to the Site is anticipated as part of building renovation activities. As noted in the SMMP (**Attachment D**) imported stone (from a NYSDEC permitted mine or quarry) is anticipated to be used as the backfill to raise the basement slab elevation. Areas of fill placement are shown in **Figure 9.** Per NYSDEC guidance, virgin stone will not require analytical data, unless required by NYSDEC.

All materials received for import to the Site will be approved by New York State PE and will comply with applicable City, State and Federal laws and requirements.

8.0 REMEDIAL ACTION IMPLEMENTATION: GROUNDWATER REMEDY – ENHANCED IN-SITU DECHLORINATION

The proposed remedial action to address groundwater impacts includes EISD, which applies a combination of both biotic (biodegradation by bacteria) and abiotic (chemical reactions without bacteria) processes to effectively degrade cVOCs in groundwater. The goal of the in-situ chemical treatment for the Site is to reduce cVOC contaminants in groundwater. The remediation approach consists of a combination of EISD amendments designed to apply short-term, aggressive treatment to groundwater, incorporate abiotic dechlorination mechanisms to reduce the generation of harmful daughter products, and include persistent reagents for long-term treatment (3 to 5+ years) to minimize the potential for rebound.

The reagents will be injected via the installation of injection wells or temporary injection points advanced using direct push Geoprobe® rig in the southern portion of the Site.

8.1 EISD Design and Implementation – In-Situ Aquifer Amendments

The proposed treatment area (1,950 SF) was selected to target the area of the cVOC concentrations observed in the overburden groundwater in the southeastern portion of the Site during the RI activities conducted between December 2024 and April 2025. The EISD treatment will include chemical injections applied via temporary injection points (see Section 8.1.1) or injection wells (see Section 8.1.2) installed by a direct push drilling methodology.

A total of 14 injection points are proposed in the target treatment area, spaced up to 15 feet apart. See **Figure 12**.

The target injection interval is from the soil groundwater interface to top of bedrock. Based on field observations from pile installation activities related to building redevelopment, the depth to bedrock in the treatment area ranges from 17-30 ft-bs. A total volume of 5,100 gallons of the amendment mixture is proposed to be injected in the target treatment area. The selected reagents comprising the amendment mixture are listed below. These reagents provide a combination of reductive dechlorination methods using both biotic (biodegradation by bacteria) and abiotic (chemical reactions without bacteria) reactions processes.

- Sodium lactate
    - This water-soluble substrate provides a quick-release carbon substrate electron donor to accelerate generation of conditions favorable for reductive dechlorination bacteria.
- Small Droplet Emulsified Vegetable Oil (EVO)
    - The amendment includes additional sodium lactate (4–5%) as a quick-release carbon substrate electron donor.

    - Nutrients and Vitamin B12 are also included to enhance the growth of dechlorinating bacteria.
    - EVO has been demonstrated to support conditions favorable for enhanced reductive dechlorination for 3 to 5 years following injection into the aquifer.
- Zero Valent Iron (ZVI):
- ZVI directly reduces CVOCs via rapid abiotic mechanisms, minimizing formation of lesser chlorinated products (e.g., cis-1,2-DCE, vinyl chloride, 1,1-DCA, chloroethane).
- Bioaugmentation Cultures
    - Consortium of microorganisms that contain multiple strains of *Dehalococcoides* (DHC) and *Dehalobactor* (DHB) for effective degradation of both ethenes and ethanes, when appropriate reducing conditions are established.
    - An additional novel bacterial consortium, which has been observed to dechlorinate DCA and chloroethane will also be used.
- Custom blend of nutrients and additives, including nitrogen, phosphorus, and soluble sulfate
    - Nitrogen and phosphorus will accelerate in-situ bioremediation. Sulfate will dissolve into the EVO solution, migrate with groundwater, and be distributed with the injection solution.
    - As reducing conditions are established, sulfate will precipitate as iron sulfide minerals, further enhancing abiotic reductive dechlorination of CVOCs.

Direct-push probe Geoprobe® unit will be used to advance temporary injection points or permanent injection wells, in the proposed treatment area. Potential impacts from various exposure routes will be mitigated through the implementation of a HASP and CAMP as described above in Section 6.1.

The application of chemical injection is considered a Class V Well under the Environmental Protection Agency (EPA) Underground Injection Control (UIC) Program. Class V Wells are “used to inject non-hazardous fluids underground.” EPA will be notified of the construction, operation and decommissioning of the Class V injection wells. As discussed above in Section 6.2.8., a UIC Permit will be obtained prior to application of the EISD amendments.

8.1.1 Direct Push Injection Approach

Each direct push technology (DPT) injection point will be designed for a treatment interval starting from the top of the water table (9 to 10 ft bs) to the top of bedrock, which varies across the treatment area. A bottom-up injection approach will be used, such that at each injection point the DPT rig will advance 1.5-inch diameter threaded steel rods to the maximum depth at each location (anticipated to be a maximum depth of 30 ft-bs). An ISOTEC designed injection screen will be lowered to the bottom of the rod string. While the injection screen is held in place, the rod string will be retracted to expose the screen to aquifer in the target treatment interval. The EISD

amendments will then be injected through the temporary injection screen and into the subsurface while the rod is slowly raised through the vertical treatment zone.

Temporary DPT injection points will be abandoned the same day injection activities have been completed.

8.1.2 Injection Well Approach

An alternative to deliver EISD solutions is through permanently installed PVC injection wells. Similar to the temporary injection points, injection intervals will range from 17 feet to 30 feet, depending on the depth to bedrock at each location. Permanent injection wells (if used) will be constructed of 2-inch diameter injection well screens at each injection location. Individual injection well screens would range from above the water table to the top of bedrock, with well screen length determined for each location based on overburden thickness and geology.

8.2 Remedial Performance Evaluation (Post-Remedial Groundwater Sampling)

Post-remedial groundwater sampling will be performed at the Site following the completion of the RA. The first round of post-remedial groundwater sampling will occur 30 days after the completion of the injections and is expected to continue quarterly for a minimum of five quarters. Post-remedial groundwater samples will be collected from a total of five existing on-Site monitoring wells: one upgradient monitoring well (MW-5) and the four on-Site monitoring wells within the groundwater plume (MW-1, MW-1D, MW-6, and MW-7). The need for additional monitoring wells in the post-treatment monitoring well network will be evaluated in consultation with NYSDEC.

Post RA Groundwater samples will be analyzed for VOCs. Proposed post-remedial groundwater monitoring well locations are shown on **Figure 12**. Quarterly groundwater sampling will continue until VOC concentrations have decreased below applicable standards or reached asymptotic levels that are acceptable to NYSDEC and NYSDEC has approved discontinuation of the monitoring.

Samples will be collected in accordance with the FSAP/QAPP and results will be reported in quarterly monitoring reports to NYSDEC and in any Annual Report required by NYSDEC.

8.3 Data Usability Summary Report (DUSR)

A qualified data validator will prepare a Data Usability Report (DUSR) for all post-remedial groundwater samples collected. The DUSR will be prepared according to the guidelines contained in Appendix 2B of DER-10. Applicable resumes are included in the Field Sampling Analysis Plan/ Quality Assurance Project Plan included as **Attachment G**.

8.4 Monitoring Well Decommissioning

Existing monitoring wells that are not proposed for inclusion in the long-term monitoring program may be proposed for decommissioning by the Remedial Party. Decommissioning of any Site monitoring wells shall not be conducted unless and until a written request has been submitted to and approved by NYSDEC.

9.0 ON-SITE SOIL VAPOR REMEDY – SUB-SLAB DEPRESSURIZATION (SSDS)

An active SSDS will be installed to minimize the potential for vapor intrusion. The system is designed to achieve lower sub-slab air pressure relative to indoor air pressure by using vent pipes routed beneath the basement sub-slab and connecting the sub-slab area with outdoor air, thereby relying on the convective flow of air upward in the vent to draw air from beneath the slab.

The principal components of the active SSDS are a network of perforated piping and vent mats beneath the slab, a continuous vapor barrier below the slab, a riser pipe from the sub-grade to the roof, a blower, and sampling ports/pressure-monitoring points (PB-1 through PB-5) situated below the vapor barrier.

Portions of the existing slab will remain in place and the active SSDS, and associated venting material (i.e. piping, stone, etc.) will be installed on top of any existing slab remaining as part of building renovations. As discussed in Section 7.2, as part of building renovations, a new slab will be poured, and the elevation of the basement will be raised from current elevation. Because the basement grade is being raised, no excavation will be required for the installation for the SSDS piping.

Several minor areas of slab will remain and are limited in aerial extent. A stone bed, a minimum thickness of 5 inches, will be placed beneath the entire new slab, including over the slab remnants. Pressure differential measurements will be collected from this new stone bed in order to alleviate complications from the areas with double slab

The SSDS design layout drawings are included as **Attachment J**.

The sub-contractor will complete the SSDS installation and construction activities within the basement area as follows:

- Installation of a geotextile woven fabric across the existing compacted basement slab/soils.
- Placement of minimum five inches of a gravel bed of washed/clean ASTM #5 or similar 1/2" to 1-1/2" poorly graded gravel with less than 10% passing through a 1/2" sieve across the existing basement floor.
- Installation of the Land Science TerraVent (a low-profile, trenchless, flexible, sub-slab vapor collection system) and SSDS network of 3” and 4” perforated Schedule 40 PVC piping into the gravel bed as shown. Configuration of the piping is shown on Sheet V-1.0 in **Attachment J**.
- Installation of dual purpose (sampling and vacuum monitoring) points (PB-1 though PB-5). Locations are shown on Sheet V-1.0 in **Attachment J.** These points will be installed within the layer of stone placed directly below the vapor barrier. Each point will be connected to 1/4" nylon tubing that will terminate in a monitoring panel located in the

basement of the building. The nylon tubing will be run in 3/4" PVC electrical conduit (max. 4 tubes per conduit) for protection and will be sealed at the floor level. In the monitoring panel, the tubes will be terminated to brass or stainless steel shut off valves that can be opened for purging and sampling and measuring vacuum.

- A continuous Land Science TerraShield® vapor barrier will then be installed between the ASTM #5 gravel/network of SSDS piping and the concrete slab. TerraShield is a spray-on laminate vapor barrier system consisting of a TerraBase layer, 40 mils of spray-on NitraCore, and then a protective layer of TerraShield.
- The vapor barrier will be installed by a Land Science licensed applicator and will be smoke tested and certified concurrent with and following the installation.
- A new basement slab with a minimum thickness of 5 inches, will be poured. Note: The basement slab will be at a higher elevation than the existing slab and no excavation will be conducted as part of the SSDS installation. The elevation of the new basement slab will vary. See **Attachment I** for proposed finished elevations.
- One six-inch riser pipe constructed of cast iron, or NYC building code permitted equivalent, will be installed on the interior building, centrally located, and connected to cast iron exhaust stack leading up to the roof. The discharge stack will extend a minimum of 2 feet above the roof line, will have a varmint guard. The discharge points will be located a minimum of 10 feet from any adjoining or adjacent buildings, HVAC air inlets and windows. Labeling of riser pipe will be conducted as per NYSDOH guidance.
- Installation of one fan blower on the stack to activate the risers and induce negative pressure differential beneath the building. Fan specification will be based on diagnostic testing, and these specifications will be provided to NYSDOH/NYSDEC prior to system start-up.
- A Vapor Dynamic Guardian telemetry panel will be installed that will monitor pressure differentials below the slab and notify key personnel in the case an anomalous condition is identified and requires maintenance/repair.
- A Magnasense pressure gauge and Vapor Dynamics control system will be added to the panel for real time vacuum sensing.
- A vapor pressure probe monitoring panel will be installed for the pressure monitoring ports. The probes will allow for the collection of sub-slab soil vapor, if needed, without damaging the vapor barrier, and allow for the assessment of pressure differentials beneath the slab.

Upon completion of SSDS installation and installation of the new floor slab, any expansion strips in the concrete slab, visible expansion joints or slab cracks (1/16 inch or greater opening), and expansion joints at the floor/wall interface will be sealed with gun-grade urethane caulk sealant to enhance system effectiveness.

Pressure field extension testing will be completed following SSDS start-up to document adequate vacuum across the entire building slab prior to occupancy. Confirmatory indoor air samples will

be taken after the HVAC system for the development is installed and running in accordance with Section 9.1.1 below.

9.1 SSDS Commissioning, Pressure Field Testing, and Confirmatory Air Sampling

After the installation of the SSDS, the following testing will be performed to verify that the SSDS is operating optimally:

- Verification that the system fan is operating within manufacturer's specifications (i.e. not exceeding maximum operating pressure, etc.). If not, the fan selection will be modified and a new fan will be installed.
- Verification that system switches and gauges are operating correctly by turning off system fans and observing results.
- Performance of the sub-slab to room differential pressure testing using a digital micro-manometer at the permanent sub-slab pressure monitoring ports to verify pressure field extension throughout the area of influence.
- The SSDS will be considered to be operating effectively when the minimum sub-slab to room differential pressure of -0.004 inches of water column can be continuously demonstrated throughout the building.
- Documentation of static vacuum and flowrates with the riser.

9.1.1 Confirmatory Indoor Air Samples

Within 30 days after completion of the system, indoor air and exterior ambient air samples will be collected in accordance with the NYSDOH Guidance for USEPA TO-15 analysis to evaluate the post-SSDS indoor air conditions. A total of seven indoor air samples and one exterior ambient air samples are proposed in this work plan. Locations are shown on **Figure 13**. Sample analysis will be conducted in accordance with the detailed procedures outlined in the Field Sampling and Analysis Plan / Quality Assurance Project Plan (FSAP-QAPP) included as **Attachment G**.

Prior to sampling activities, a building survey and Site reconnaissance will be completed. The purpose of the survey and reconnaissance will be to document Site conditions such as potential sources of background contamination. Reconnaissance information will be used in evaluating the confirmatory sampling results. Field personnel will complete the NYSDOH Structure Sampling Questionnaire and Building Inventory (included as **Attachment K**) prior to conducting the indoor air sampling. As part of this, field personnel will evaluate/assess slab perforations, obtain information on building space use, evaluate the operating conditions of the heating/ventilation/air conditioning system, and identify the type and location of chemical products that could influence indoor air results. Field personnel will inspect the SSDS and identify and document any preferential pathways (cracks, perforations, sumps, drains, etc.) in the basement walls and building slab.

A photoionization detector (PID), equipped with a 11.7 electron volt lamp, will be used to complete a real-time vapor survey to screen for the presence of detectable vapor-phase chemicals within the basement. Any products identified during the survey that could impact the results of the indoor air sampling will be removed from the area prior to sampling, if possible.

In accordance with the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Soil Vapor Guidance, October 2006 with May 2017 updates), seven indoor air samples (IA-1 through IA-7) will be collected to evaluate the post-SSDS indoor air conditions. One background ambient air (AA-1) sample will also be collected. Proposed indoor air sample locations are shown on **Figure 13**. The ambient air sample location will be determined during the sampling event so that it will be secure.

Indoor air and ambient air samples will be collected in laboratory-supplied six-liter Summa canisters using 24-hour flow regulators, consistent with the proposed residential use of the Site building. All samples will be sealed, labeled, and placed in a secure container for delivery to a NYSDOH ELAP-certified analytical laboratory. An independent sub-consultant will validate sample results and prepare a Data Usability Summary Report (DUSR). Quality assurance and quality control (QA/QC) procedures are detailed in the Quality Assurance Project Plan (QAPP) included as **Attachment G**. One blind duplicate indoor air sample will be collected.

All indoor air and ambient air samples will be analyzed for volatile organic compounds (VOCs) by EPA Method TO-15. EPA Method TO-15 Selected Ion Monitoring (SIM) will be used for the following five compounds in indoor and ambient air samples: trichloroethene; cis-1,2-dichloroethene; 1,1-dichloroethene; carbon tetrachloride and vinyl chloride, which require a minimum laboratory reporting limit of 0.20 micrograms per cubic meter (mcg/m3) or less.

9.1.2 Laboratory Analysis, Data Validation, and Results Evaluation

Indoor air samples will be collected using batch-certified, pre-cleaned 6-liter Summa canisters with calibrated regulators and analyzed by Pace Analytical, Mansfield, MA a NYSDOH Environmental Laboratory Approval Program (ELAP ID 11627) certified laboratory using USEPA Analytical Method TO-15 for VOCs.

All data will be produced in accordance with NYSDEC ASP Category B deliverables. All analytical data will be reviewed by an independent data validator, and a DUSR will be prepared.

A letter report documenting the indoor air sampling, along with the completed Building Questionnaire will be sent to NYSDEC and the NYSDOH, once the DUSR has been received validating the results.

9.2 Waste Disposal from SSDS Installation Activities

Soils removal is not anticipated during installation of the SSDS. A Soils/Materials Management Plan (SMMP) is included as **Attachment D**. If excess soils are generated during remediation activities, they will be transported under manifest to an approved disposal facility. A Contained-In Determination (CID) will first be obtained from NYSDEC. All transport and disposal of materials will be performed in accordance with appropriate local, state, and federal regulations and copies of all disposal manifests will be included in the FER.

9.3 Materials Load Out, Transportation, and Disposal

Soils and other construction and demolition (C&D) debris generated during SSDS installation will be handled, transported, and disposed of by a licensed hauler in accordance with applicable 6 NYCRR Part 360 and Part 364 regulations and other applicable federal, state, and local regulations. A CID has been obtained for the disposal of soils anticipated to be generated during the planned construction activities. Copies of the soils/materials manifests and/or bills of lading will be provided in the FER.

9.4 Materials Reuse On-Site

Reuse of soil excavated during remedial activities is not proposed.

9.5 Import of Clean Fill

All materials proposed for import onto the Site will be approved by the PE prior to importation. The PE will review the facility information including facility name, address, permit/registration, and Site history, if necessary, pursuant to DER-10.

Imported stone (from a NYSDEC permitted mine or quarry) is anticipated to be used as the backfill to raise the basement slab elevation. Virgin stone (ASTM #5 or similar 1/2" to 1-1/2" poorly graded gravel with less than 10% passing through a 1/2" sieve) imported from compliant facilities will not require analytical data, unless otherwise required by NYSDEC. A Request to Import/Reuse Fill or Soil will be provided to the NYSDEC prior to any material import.

9.6 Operations, Maintenance and Monitoring (OM&M) Plan

The SSDS operation, maintenance, and monitoring (OM&M) will be incorporated into the Site Management Plan (SMP) for the Site. Recommendations for minimum OM&M activities associated with specific mitigation methods are provided in the following subsections.

9.6.1 Routine Maintenance Inspections

Routine maintenance should commence within 18 months after the system becomes operational, and will occur every 12 months thereafter, to ensure that the system continues to operate as designed. A checklist will be completed for each inspection. During each inspection, the following will be conducted:

a) a visual inspection of the complete system (e.g. piping, vapor pressure probe monitoring panel, labeling on systems, fan blower and pressure differentials beneath the slab, etc);
b) identification and repair of leaks; and
c) inspection of the exhaust or discharge point to verify no air intakes have been located nearby.

The basement floor will be inspected for cracks to prevent the loss of vacuum through short-circuiting and to ensure that there are no pathways for vapors to enter the building. Any significant cracks or breaches discovered will be documented and repaired.

9.6.2 Non-Routine Inspections

Non-routine inspections, such as in the event of an emergency or a suspected failure of the engineering control, will be performed in accordance with the SMP. Unscheduled inspections and/or sampling may take place when a suspected failure of the SSD system has been reported or an emergency occurs that is deemed likely to affect the operation of the system.

Non-routine maintenance may be required during the operation of the SSD system, including, but not limited to, the following situations:

a) the building's owners or occupants report that the warning device or indicator indicates the mitigation system is not operating properly;
b) the mitigation system becomes damaged; or
c) the building has undergone renovations that may reduce the effectiveness of the mitigation system

10.0 OFF-SITE SOIL VAPOR REMEDY – PERIMETER SOIL VAPOR EXTRACTION (SVE) SYSTEM

A perimeter soil vapor extraction (SVE) system is proposed to prevent soil vapor migration off Site, if occurring from contaminated groundwater. As detailed in the RI no significant VOC soil contamination was identified at the Site. The goal of the SVE system is strictly a preventive measure and is not intended to treat soil contamination. The SVE system will consist of a network of extraction wells, a blower, treatment units, if needed, and an exhaust stack.

The design vacuum goal is 0.01 inches of water column (in-wc) at the perimeter of the Site. Based on the geology of the Site, a radius of influence (ROI) is assumed to be 25 ft and will be confirmed with a pilot test and final vacuum extraction wells will be spaced as needed to achieve the design goal. The extraction wells will be constructed of 2 or 4-inch diameter PVC with five feet of 0.010-inch slot pipe. The wells will be screened from 3 to 7 feet below the basement slab. The upper limit provides sufficient separation to allow for a bentonite seal (18 inches) and prevent air intrusion from the SSDS gravel bed, while the lower limit is set 2 feet above the water table (measured at 10 ft-bs in the area of the proposed wells) to prevent groundwater from being drawn into the SVE system. The contaminated vapor extracted from the extraction wells will be treated using granular activated carbon (GAC) medium, if required, and subsequently discharged to the atmosphere in accordance with the emission requirements set forth in 6NYCRR Part 212. Spent GAC will be disposed of off-site by a licensed facility in compliance with all rules and regulations.

Based on the contaminant distribution at the site and groundwater flow direction, the area proposed for on Site depressurization is shown on **Figure 14**. A pilot test will be conducted to determine radius of influence, vacuum, and flow rate for final system design. Following pilot test implementation, the results will be submitted to NYSDEC within a final Design Document which will include the full-scale design including the SVE extraction well parameters, blower vacuum, flow rates and treatment units for the full-scale SVE system. As-built drawings, diagrams, calculations and manufacturer documentation for the SVE system will be presented in the FER. System inspection and maintenance instructions will be included in the SMP.

11.0 RESIDUAL CONTAMINATION TO REMAIN ON SITE

The successful implementation of the RA will result in the following:

- Soil will be managed in place beneath a cover system installed across the Site. The cover system will prevent direct contact with residual concentrations of select compounds, including metals (lead, mercury, nickel, silver, and trivalent and hexavalent chromium), dibenzofuran, n-propylbenzene, and 4,4'-DDE, that exceed the UUSCOs. Concentrations of hexavalent chromium, phenanthrene, silver, and naturally occurring manganese and barium detected in soils will also remain at levels exceeding the RRUSCOs beneath the cover system.

- Residual contamination may remain in groundwater, but the bulk of the cVOC contaminant mass will be reduced utilizing the aquifer amendments proposed herein.

- An SSDS and vapor barrier will address the potential for vapor intrusion into the Site building from any remaining groundwater contamination.

- An SVE system will address the potential for off-Site migration of soil vapor.

- Since residual contaminated soil, soil vapor and groundwater may remain after the remedy is complete, Engineering and Institutional Controls (ECs and ICs) are required to protect human health and the environment. Long-term management of ECs/ICs and of residual contamination will be executed under a Site-specific SMP that will be developed and included in the FER.

ECs will be implemented to protect public health and the environment by appropriately managing residual contamination. The Controlled Property (the Site) will have four primary EC systems. This is:

- Cover System,
- SSDS,
- Perimeter SVE, and
- Post-Remedial Groundwater Monitoring.

The cover system, SSDS, and SVE system will be a long-term ECs. While post-remedial groundwater monitoring is part of the selected remedy, it is presented as an EC because it may continue after the FER and SMP are submitted. The FER will report residual contamination on the Site in tabular and map form, including any exceedances of the Class GA Standards.

12.0 ENGINEERING CONTROLS

As described in Section 11.0, four ECs will be utilized at the Site: a cover system, SSDS, SVE, and post-remedial groundwater monitoring. The ECs will be memorialized in an Environmental Easement assigned to the property by the titleholder and will be implemented under a SMP. The post-remedial groundwater monitoring is being considered an EC only because it may be implemented following submittal of the FER. The conceptual approach, general system design, maintenance and monitoring (OM&M) requirements and criteria for termination of each of these systems are described below.

12.1 Cover System

The Site will require a Site cover system that will serve as permanent, long-term engineering control for the Site to allow for restricted-residential use. The cover system will consist of a new 5-inch concrete slab to be poured in the basement as part of building renovation activities. A Soil Management Plan will be included in the SMP and will outline the procedures to be followed in the event that the cover system or underlying residual contamination are disturbed after the RA is complete. Maintenance of these engineering controls will be described in the Site Management Plan as noted below.

12.2 Sub-Slab Depressurization System (SSDS)

Beneath the new cover system (basement slab), an SSDS will also be installed to minimize the potential for vapor intrusion. The design and implementation of the SSDS is discussed above in Section 9.0. The principal components of the SSDS are a network of perforated piping and Terravent® flexible vapor collection matting beneath the slab, a continuous vapor barrier below the slab, a riser pipe from the sub-grade to the roof, and dual-purpose sampling ports/pressure-monitoring points situated below the vapor barrier. A new basement slab (the Cover System) will be poured, and the elevation of the basement will be raised from current elevation. The SSDS operation, maintenance, and monitoring (OM&M) will be incorporated into the Site Management Plan (SMP) for the Site.

12.3 Soil Vapor Extraction (SVE) System

Also beneath the cover system will be a perimeter SVE system in the southern portion of the Site to prevent the potential migration of vapor off-Site. The design and implementation of the SVE is discussed above in Section 10. The principal components are a network of extraction wells, a blower, vapor treatment units (if needed) and an exhaust stack. A new basement slab (the Cover System) will be poured, and the elevation of the basement will be raised from current elevation. The SVE operation, maintenance, and monitoring (OM&M) will be incorporated into the Site Management Plan (SMP) for the Site.

12.4 Post-Remedial Groundwater Monitoring

As described above in Section 8.2, post-remedial groundwater sampling will be completed in accordance with a SMP. Post-remedial groundwater sampling will be performed at the Site following the completion of the RA. The first round of post-remedial groundwater sampling will occur 30 days after the completion of the injections and is expected to continue quarterly for a minimum of five quarters.

Post-remedial groundwater samples will be collected from a total of five existing on-Site monitoring wells: one upgradient monitoring well (MW-5) and the four on-Site monitoring wells within the groundwater plume (MW-1, MW-1D, MW-6, and MW-7). The need for additional monitoring wells in the post-treatment monitoring well network will be evaluated in consultation with NYSDEC.

Based upon the results of previous sampling conducted as part of the RI, groundwater samples will be analyzed for VOCs. Proposed post-remedial groundwater monitoring well locations are shown on **Figure 12**. Quarterly groundwater sampling will continue until VOC concentrations have decreased below applicable standards or reached asymptotic levels that are acceptable to NYSDEC, and NYSDEC has approved discontinuation of the monitoring.

12.5 Criteria for Termination of Remedial Systems

12.5.1 Cover System

The cover system is a long-term EC and will be maintained throughout the life of the building. Any breaches of the cover system will be repaired in accordance with the SMP.

12.5.2 SSDS Operation

SSDS is a long-term EC and will be maintained throughout the life of the building. Routine inspections, maintenance, and sampling will be conducted in accordance with the SMP.

12.5.3 SVE System

The SVE system will not be discontinued without written approval by NYSDEC and NYSDOH. A proposal to discontinue the system may be submitted by the property owner after residual contamination concentrations in groundwater: (1) are cleaned up to levels below NYSDEC standards, (2) have become asymptotic over an extended period of time as mandated by the NYSDEC and the NYSDOH, or (3) if NYSDEC has determined that the SVE system has reached the limit of its effectiveness. Routine inspections, maintenance, and sampling will be conducted in accordance with the SMP.

12.5.4 Post-Remedial Groundwater Monitoring

Quarterly groundwater sampling to assess the efficacy of the Remedial Action will be conducted and continue until VOC concentrations have decreased below applicable standards or reached asymptotic levels that are acceptable to NYSDEC, and NYSDEC has approved discontinuation of the monitoring. Monitoring activities will be outlined in the SMP.

13.0 INSTITUTIONAL CONTROLS

An Institutional Control (IC) will be required to manage residual contamination on-Site and to ensure that the Site ECs remain protective of public health and the environment. The ICs consist of two elements designed to ensure continual and proper management of residual contamination in perpetuity: an Environmental Easement and a Site Management Plan.

A Site-specific Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, will be recorded with New York City Office of the City Register, to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC. It requires that the grantor of the Environmental Easement and the grantor's successors and assigns adhere to all Engineering and Institutional Controls (ECs/ICs) placed on this Site by this NYSDEC-approved remedy. ICs provide restrictions on Site usage and mandate operation, maintenance, monitoring, and reporting measures for all ECs and ICs. The SMP describes appropriate methods and procedures to ensure compliance with all ECs and ICs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

13.1 Environmental Easement

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the New York City Office of the City Register before the Certificate of Completion can be issued by NYSDEC. A series of institutional Control are required under this remedy to implement, maintain, and monitor these Engineering Control systems, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to residential only. Institutional Controls are requirements for the restrictions placed on the Site that are listed in, and required by, the Environmental Easement.

Institutional Controls can, generally, be subdivided between controls and support Engineering Controls, and those that place general restrictions on Site usage or other requirements. Institutional Controls in both of these groups are closely integrated with the Site Management Plan, which provides all of the methods and procedures to be followed to comply with this remedy.

The Institutional Controls that support Engineering Controls are:

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required;
- All Engineering Controls must be operated and maintained as specified in the SMP;

- All Engineering Controls on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP;

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

- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

- Onsite environmental monitoring devices, including but not limited to groundwater monitoring wells, must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP; and

- Engineering Controls may not be discontinued without an amendment or extinguishment of the Environmental Easement.

Adherence to the Institutional Controls for the Site will be mandated by the Environmental Easement and will be implemented under the Site Management Plan (discussed in the next section). The Controlled Property (Site) will also have a series of Institutional Controls in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- The use of groundwater underlying the controlled 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 groundwater user must first notify and obtain written approval to do so from NYSDEC;

- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the Site Management Plan;

- The Controlled Property may be used for residential use, provided the long-term Engineering and Institutional Controls included in the Site Management Plan are employed;

- The Controlled Property may not be used for a higher level of use, such as unrestricted use without an amendment or extinguishment of the Environmental Easement;

- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitutes a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted

annually, or at an alternate period of time that NYSDEC may allow. This annual statement must be certified by an expert that the NYSDEC finds acceptable.

The Environmental Easement will incorporate the ICs required to implement, maintain, and monitor the ECs, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restrict the use of the Site to commercial, industrial, and restricted residential use only, unless discontinued or modified with the approval of NYSDEC.

The Environmental Easement for the Controlled Property will include the following requirements:

- Requires the remedial party or Site owner to complete and submit to NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- Allow the use and development of the Controlled Property for commercial and industrial uses as defined in Part 375-1.8(g), although land use is subject to local zoning laws;
- The use of groundwater underlying the controlled 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 groundwater user must first notify and obtain written approval to do so from NYSDEC; and
- Require compliance with the NYSDEC-approved SMP.

13.2 Site Management Plan

Site Management is the last phase of remediation will begin with the approval of the Final Engineering Report and issuance of the Certificate of Completion (COC) for the Remedial Action. The SMP will be submitted along with the FER but will be written as a complete and independent document. Site management requirements continue in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site management responsibilities defined in the Environmental Easement and SMP are performed.

The SMP will include methods to incorporate and track any Green Site Remediation (GSR) initiatives. Measures to maintain a cost-effective, protective remedy that remains conscious of the Site's environmental footprint will be evaluated. At a minimum, the following will be assessed: waste generation, energy usage, emissions, and water usage.

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where

appropriate, preparation of an Operation and Maintenance Manual; and (3) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communications of Site information to NYSDEC.

To address these needs, this SMP will include four plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site monitoring; (3) an Operation and Maintenance (O&M) Plan for the SSDS and SVE system; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. The certification period will be annually. The Periodic Review Report (PRR) submitted under the SMP will be based on a calendar year. The first PRR will be submitted to the NYSDEC within 15 months after the date of COC issuance. Any lapses in the engineering or institutional controls noted in the PRR will be required to be corrected expeditiously and the NYSDEC notified of the correction. The SMP will include the following:

1. Introduction with purpose, summary of remediation, and Site conditions;
2. Institutional and Engineering Control Plan;
3. O&M Plan;
4. Site Monitoring Plan;
5. Site maintenance requirements;
6. Citizen Participation Plan;
7. Personnel organization and responsibilities;
8. Health and Safety Plan;
9. Records and forms;
10. Emergency Contingency Plan; and
11. Copies of Environmental Easement and applicable Site plans, including electronic versions.

The Institutional and Engineering Control Plan will include, but is not limited to:

- Descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- A provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the Site, including a provision for implementing actions recommended to address exposures related to soil vapor intrusion;

- Provisions for the management and inspection of the identified engineering controls; and
- Maintaining Site access controls and NYSDEC notification; and the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

The O&M Plan will include, but is not limited to:

- Compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
- Maintaining Site access controls for Department notification; and
- Providing NYSDEC access to the Site and O&M records.

The Site Monitoring Plan will include, but is not limited to:

- Monitoring of groundwater to assess the performance and effectiveness of the remedy; and
- A schedule of monitoring and frequency of submittals to NYSDEC.

The Site Management Reporting Plan will include, but is not limited to:

- Details regarding post-COC reporting requirements, including a schedule; and
- The contents of the annual report; including:
    - An evaluation of the ECs/ICs, EC/IC certifications, results of periodic Site inspections and deliverable to be generated;
    - Frequency and type of the EC/IC and Site inspections;
    - Inspection forms, sampling data, and maintenance reports;
    - An evaluation of records and reporting; and
    - Corrective measure plans.

14.0 FINAL ENGINEERING REPORT

A Final Engineering Report (FER) will be submitted to the NYSDEC Project Manager within approximately 180 days of completing the remedial action. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The Final Engineering Report will include as-built drawings for all constructed elements, calculation and manufacturer documentation for treatment systems, certifications, manifests, bills of lading, as well as the complete Site Management Plan (SMP). The FER will provide a description of any changes in the Remedial Action from the elements proposed in the RAWP. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling and chemical analysis performed as part of the Remedial Action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. The FER will be prepared in conformance with DER-10.

The FER will include an itemized tabular description of actual costs incurred during all aspects of the Remedial Action.

The FER will provide a thorough summary of all remaining contamination left on the Site after the remedy is complete. Remaining contamination includes all contamination that exceeds the Track 1 UUSCOs in 6NYCRR Part 375-6. A table that shows exceedances of the above referenced SCOs for all soil/fill remaining at the Site after the Remedial Action and a map that shows the location and summarizes the exceedances for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

The FER will include an accounting of all imported fill materials and their source information, as well as the accounting of and destination of all material removed from the Site, including excavated contaminated soil, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

The FER will include the following:

1. Certification by the RE that the data generated is useable and meets the remedial requirements;
2. Certification by the RE that any financial assurance mechanisms required by the NYSDEC have been executed;
3. Certification by the RE that the remedial work conformed to the RAWP;
4. Certification by the RE that dust, odor, and vapor control measures were implemented, if required, during invasive work and conformed with the RAWP;
5. Certification by the RE that all the remedial waste was transported and disposed in accordance with the RAWP;

6. Certification by the RE that the source approval and sampling of imported acceptable fill was completed in a manner consistent with the methodology of the RAWP;
7. Summary of the remedy and all remedial actions completed;
8. Description of any problems encountered and their resolutions;
9. Description of the deviations from the approved RAWP;
10. Listing of waste streams, quantity of materials disposed, and where they were disposed;
11. Analytical QA/QC completed for the environmental media sampling during the remedial activities, including DUSR or other data validation;
12. List of the remediation standards applied to the remedial actions;
13. List of all applicable local, regional, and national governmental permits, certificates, or other approvals required for the remedial and development work;
14. Tables and figures containing all pre- and post-remedial data, including volumes of soil removed (as applicable);
15. Description of source and quality of fill (as applicable);
16. “As-built” drawings including remediation areas;
17. Air quality and dust monitoring data, including any supporting documentation on the decisions made based on the data;
18. Copies of all the submitted periodic reports; and
19. Copies of all manifests of off-site transport of waste material.

Before approval of a FER and issuance of a Certificate of Completion, all documents and reports will be submitted to the NYSDEC will be in both hard copy and in digital format on CD. These digital documents shall be in PDF form and, where appropriate, supplemented by photos and Microsoft Excel files. Laboratory analytical data will be submitted in an electronic data deliverable (EDD) format that complies with the NYSDEC’s electronic data warehouse standards.

TABLES

TABLE 1
245 West 55th Street
New York, New York
NYSDEC Site No. C231157

Summary of Vapor Intrusion Sampling Results - April 2024

SAMPLE ID:	SSG-1			SSG-2			SSG-3			SSG-4			SSG-5			SSG-6			SSG-7			SSG-8		
LAB ID:	L2419731-09			L2419731-10			L2419731-11			L2419731-12			L2419731-13			L2419731-14			L2419731-15			L2419731-16		
COLLECTION DATE:	4/10/2024			4/10/2024			4/10/2024			4/10/2024			4/10/2024			4/10/2024			4/10/2024			4/10/2024		
SAMPLE MATRIX:	SUB-SLAB SOIL GAS			SUB-SLAB SOIL GAS			SUB-SLAB SOIL GAS			SUB-SLAB SOIL GAS			SUB-SLAB SOIL GAS			SUB-SLAB SOIL GAS			SOIL VAPOR			SOIL VAPOR		
	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
VOLATILE ORGANICS IN AIR																								
1,1,1-Trichloroethane	19600		79.1	105		1.09	109		1.09	9.71		1.09	94.9		1.09	1190		15.1	1.1		1.09	ND		1.09
1,1,2,2-Tetrachloroethane	ND		99.6	ND		1.37	ND		1.37	ND		1.37	ND		1.37	ND		19	ND		1.37	ND		1.37
1,1,2-Trichloroethane	ND		79.1	ND		1.09	ND		1.09	ND		1.09	ND		1.09	ND		15.1	ND		1.09	ND		1.09
1,1-Dichloroethane	2360		58.7	5.18		0.809	ND		0.809	ND		0.809	11.8		0.809	94.3		11.2	ND		0.809	ND		0.809
1,1-Dichloroethene	440		57.5	1.2		0.793	ND		0.793	ND		0.793	4		0.793	45.2		10.9	ND		0.793	ND		0.793
1,2,4-Trichlorobenzene	ND		108	ND		1.48	ND		1.48	ND		1.48	ND		1.48	ND		20.5	ND		1.48	ND		1.48
1,2,4-Trimethylbenzene	ND		71.3	3.78		0.983	2.87		0.983	3.73		0.983	23.4		0.983	ND		13.6	1.69		0.983	3.55		0.983
1,2-Dibromoethane	ND		111	ND		1.54	ND		1.54	ND		1.54	ND		1.54	ND		21.2	ND		1.54	ND		1.54
1,2-Dichlorobenzene	ND		87.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		16.6	ND		1.2	ND		1.2
1,2-Dichloroethane	ND		58.7	ND		0.809	ND		0.809	ND		0.809	1.15		0.809	ND		11.2	ND		0.809	1.82		0.809
1,2-Dichloropropane	ND		67	ND		0.924	ND		0.924	ND		0.924	ND		0.924	ND		12.8	ND		0.924	ND		0.924
1,3,5-Trimethylbenzene	ND		71.3	1.07		0.983	ND		0.983	1.01		0.983	5.95		0.983	ND		13.6	ND		0.983	1.16		0.983
1,3-Butadiene	ND		32.1	ND		0.442	ND		0.442	ND		0.442	ND		0.442	ND		6.11	ND		0.442	ND		0.442
1,3-Dichlorobenzene	ND		87.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		16.6	ND		1.2	ND		1.2
1,4-Dichlorobenzene	ND		87.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		16.6	ND		1.2	ND		1.2
1,4-Dioxane	ND		52.3	ND		0.721	ND		0.721	ND		0.721	ND		0.721	ND		9.95	ND		0.721	ND		0.721
2,2,4-Trimethylpentane	ND		67.7	ND		0.934	ND		0.934	ND		0.934	ND		0.934	ND		12.9	ND		0.934	ND		0.934
2-Butanone	ND		107	4.93		1.47	4.95		1.47	5.6		1.47	8.52		1.47	ND		20.4	3.6		1.47	31.9		1.47
2-Hexanone	ND		59.4	ND		0.82	ND		0.82	ND		0.82	ND		0.82	ND		11.3	ND		0.82	ND		0.82
3-Chloropropene	ND		45.4	ND		0.626	ND		0.626	ND		0.626	ND		0.626	ND		8.64	ND		0.626	ND		0.626
4-Ethyltoluene	ND		71.3	ND		0.983	ND		0.983	ND		0.983	3.57		0.983	ND		13.6	ND		0.983	0.993		0.983
4-Methyl-2-pentanone	ND		149	ND		2.05	ND		2.05	ND		2.05	ND		2.05	ND		28.3	ND		2.05	ND		2.05
Acetone	340		173	268		2.38	266		2.38	259		2.38	261		2.38	349		32.8	193		2.38	591		2.38
Benzene	ND		46.3	0.76		0.639	0.652		0.639	0.677		0.639	0.978		0.639	ND		8.82	0.652		0.639	6.77		0.639
Benzyl chloride	ND		75.1	ND		1.04	ND		1.04	ND		1.04	ND		1.04	ND		14.3	ND		1.04	ND		1.04
Bromodichloromethane	ND		97.1	ND		1.34	ND		1.34	ND		1.34	ND		1.34	ND		18.5	ND		1.34	ND		1.34
Bromoform	ND		150	ND		2.07	ND		2.07	ND		2.07	ND		2.07	ND		28.5	ND		2.07	ND		2.07
Bromomethane	ND		56.3	ND		0.777	ND		0.777	ND		0.777	ND		0.777	ND		10.7	ND		0.777	ND		0.777
Carbon disulfide	ND		45.2	ND		0.623	ND		0.623	ND		0.623	ND		0.623	ND		8.59	0.841		0.623	2.53		0.623
Carbon tetrachloride	ND		91.2	ND		1.26	ND		1.26	ND		1.26	ND		1.26	ND		17.4	ND		1.26	ND		1.26
Chlorobenzene	ND		66.8	ND		0.921	ND		0.921	ND		0.921	ND		0.921	ND		12.7	ND		0.921	ND		0.921
Chloroethane	47.2		38.3	ND		0.528	ND		0.528	ND		0.528	1.9		0.528	9.97		7.28	ND		0.528	ND		0.528
Chloroform	ND		70.8	4.83		0.977	1.61		0.977	ND		0.977	19.3		0.977	77.2		13.5	ND		0.977	ND		0.977
Chloromethane	ND		29.9	ND		0.413	ND		0.413	ND		0.413	ND		0.413	ND		5.7	ND		0.413	1.11		0.413
cis-1,2-Dichloroethene	82.5		57.5	56.3		0.793	ND		0.793	ND		0.793	1.28		0.793	4200		10.9	1.39		0.793	ND		0.793
cis-1,3-Dichloropropene	ND		65.8	ND		0.908	ND		0.908	ND		0.908	ND		0.908	ND		12.5	ND		0.908	ND		0.908
Cyclohexane	ND		49.9	0.75		0.688	0.971		0.688	0.967		0.688	11.6		0.688	ND		9.5	ND		0.688	2.39		0.688
Dibromochloromethane	ND		124	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		23.5	ND		1.7	ND		1.7
Dichlorodifluoromethane	ND		71.7	2.13		0.989	2.26		0.989	2.08		0.989	2.01		0.989	ND		13.6	2.21		0.989	2.1		0.989
Ethanol	ND		684	39.6		9.42	40.1		9.42	38.1		9.42	43.3		9.42	ND		130	328		9.42	416		9.42
Ethyl Acetate	ND		131	ND		1.8	ND		1.8	2.45		1.8	ND		1.8	ND		24.9	1.83		1.8	8.32		1.8
Ethylbenzene	ND		63	ND		0.869	ND		0.869	ND		0.869	3.62		0.869	ND		12	ND		0.869	2.22		0.869
Freon-113	706		111	7.23		1.53	ND		1.53	1.74		1.53	11.3		1.53	90.4		21.2	ND		1.53	ND		1.53
Freon-114	ND		101	ND		1.4	ND		1.4	ND		1.4	ND		1.4	ND		19.3	ND		1.4	ND		1.4
Heptane	ND		59.4	0.881		0.82	0.873		0.82	1		0.82	1.57		0.82	ND		11.3	ND		0.82	2.51		0.82
Hexachlorobutadiene	ND		155	ND		2.13	ND		2.13	ND		2.13	ND		2.13	ND		29.4	ND		2.13	ND		2.13
Isopropanol	ND		89.2	5.68		1.23	4.74		1.23	5.41		1.23	5.01		1.23	ND		17	5.85		1.23	14.9		1.23
Methyl tert butyl ether	ND		52.3	ND		0.721	ND		0.721	ND		0.721	ND		0.721	ND		9.95	ND		0.721	ND		0.721
Methylene chloride	ND		126	ND		1.74	ND		1.74	ND		1.74	ND		1.74	ND		24	ND		1.74	2.15		1.74
n-Hexane	ND		51.1	4.09		0.705	3.74		0.705	5.67		0.705	287		0.705	15.2		9.73	2.3		0.705	23.5		0.705
Naphthalene	ND		76	ND		1.05	ND		1.05	ND		1.05	1.17		1.05	ND		14.5	ND		1.05	ND		1.05
o-Xylene	ND		63	1.55		0.869	1.21		0.869	1.55		0.869	7.64		0.869	ND		12	ND		0.869	3.41		0.869
p/m-Xylene	ND		126	3.46		1.74	2.82		1.74	3.37		1.74	15.6		1.74	ND		24	ND		1.74	8.56		1.74
Styrene	ND		61.7	ND		0.852	ND		0.852	ND		0.852	ND		0.852	ND		11.8	ND		0.852	ND		0.852
Tertiary butyl Alcohol	ND		110	ND		1.52	ND		1.52	ND		1.52	ND		1.52	ND		20.9	1.73		1.52	11.3		1.52
Tetrachloroethene	652		98.3	10.3		1.36	5.24		1.36	1.48		1.36	1.65		1.36	110		18.7	ND		1.36	ND		1.36
Tetrahydrofuran	ND		107	5.84		1.47	5.75		1.47	5.69		1.47	6.4		1.47	ND		20.4	3.83		1.47	10.6		1.47
Toluene	ND		54.6	2.13		0.754	1.81		0.754	2.05		0.754	3.44		0.754	ND		10.4	1.41		0.754	7.35		0.754
trans-1,2-Dichloroethene	ND		57.5	1.55		0.793	ND		0.793	ND		0.793	ND		0.793	89.2		10.9	ND		0.793	ND		0.793
trans-1,3-Dichloropropene	ND		65.8	ND		0.908	ND		0.908	ND		0.908	ND		0.908	ND		12.5	ND		0.908	ND		0.908
Trichloroethene	161		77.9	5.24		1.07	ND		1.07	ND		1.07	ND		1.07	90.8		14.8	ND		1.07	ND		1.07
Trichlorofluoromethane	ND		81.5	1.44		1.12	1.43		1.12	1.33		1.12	1.51		1.12	ND		15.5	1.56		1.12	1.42		1.12
Vinyl bromide	ND		63.4	ND		0.874	ND		0.874	ND		0.874	ND		0.874	ND		12.1	ND		0.874	ND		0.874
Vinyl chloride	ND		37.1	ND		0.511	ND		0.511	ND		0.511	ND		0.511	85.9		7.06	ND		0.511	ND		0.511

Notes:

- Highlighted analytes are Compounds of Concern for the Site based on groundwater results.
BOLD - Bolded analytes are included in the NYSDOH Decision Matrices.
Result - Bolded results indicate compounds detected above NYSDOH Air Guideline Value. Applies to indoor air and ambient air sample results only
ND - Non-detect
NV - No Air Guideline Value
* - Indicates a concentration is not a contaminant of concern and is attributed to a background source
Q - Laboratory Qualifier
RL - Reporting Limit
($\mu g/m^3$) - Micrograms per meter cubed

TABLE 2

245 West 55th Street
New York, New York
NYSDEC Site No. C231157

Vapor Intrusion Sampling Results and Decision Matrix Comparison - April 2024

Sample ID	Parameter	Soil Vapor Concentrations ($\mu g/m^3$)	Indoor/Ambient Air Concentrations ($\mu g/m^3$)	NYSDOH Matrices Decision
Matrix A 1,1-Dichloroethene (1,1-DCE); Carbon tetrachloride; cis-1,2-dichloroethene (cis-1,2-DCE); Trichloroethene (TCE)				
SSG-1/IA-1	1,1-DCE	440	ND	**Mitigate**
	Carbon tet.	ND	0.528	No further action
	cis-1,2-DCE	82.5	0.091	**Mitigate**
	TCE	161	0.145	**Mitigate**
SSG-2/IA-2	1,1-DCE	1.2	ND	No further action
	Carbon tet.	ND	0.484	No further action
	cis-1,2-DCE	56.3	0.079	No further action
	TCE	5.24	0.167	No further action
SSG-3/IA-3	1,1-DCE	ND	ND	No further action
	Carbon tet.	ND	0.51	No further action
	cis-1,2-DCE	ND	ND	No further action
	TCE	ND	0.118	No further action
SSG-4/IA-4	1,1-DCE	ND	ND	No further action
	Carbon tet.	ND	0.465	No further action
	cis-1,2-DCE	ND	ND	No further action
	TCE	ND	0.113	No further action
SSG-5/IA-5	1,1-DCE	4	ND	No further action
	Carbon tet.	ND	0.497	No further action
	cis-1,2-DCE	1.28	ND	No further action
	TCE	ND	0.113	No further action
SSG-6/IA-6	1,1-DCE	45.2	ND	No further action
	Carbon tet.	ND	0.516	No further action
	cis-1,2-DCE	4200	ND	**Mitigate**
	TCE	90.8	0.15	**Mitigate**
SSG-7/AA-7	1,1-DCE	ND	ND	Not applicable
	Carbon tet.	ND	0.465	Not applicable
	cis-1,2-DCE	1.39	ND	Not applicable
	TCE	ND	ND	Not applicable
SSG-8/AA-8	1,1-DCE	ND	ND	Not applicable
	Carbon tet.	ND	0.503	Not applicable
	cis-1,2-DCE	ND	ND	Not applicable
	TCE	ND	0.107	Not applicable
Matrix B 1,1,1- Trichloroethane (1,1,1-TCA); Methylene Chloride (MC); Tetrachloroethylene (PCE)				
SSG-1/IA-1	1,1,1-TCA	19600	0.917	**Mitigate**
	MC	ND	ND	No further action
	PCE	652	1.38	No further action
SSG-2/IA-2	1,1,1-TCA	105	0.78	No further action
	MC	ND	ND	No further action
	PCE	10.3	1.47	No further action
SSG-3/IA-3	1,1,1-TCA	109	0.687	No further action
	MC	ND	ND	No further action
	PCE	5.24	0.929	No further action
SSG-4/IA-4	1,1,1-TCA	9.71	0.72	No further action
	MC	ND	ND	No further action
	PCE	1.48	1.09	No further action
SSG-5/IA-5	1,1,1-TCA	94.9	0.742	No further action
	MC	ND	ND	No further action
	PCE	1.65	1.13	No further action
SSG-6/IA-6	1,1,1-TCA	1190	0.818	**Mitigate**
	MC	ND	ND	No further action
	PCE	110	1.31	No further action
SSG-7/AA-7	1,1,1-TCA	1.1	0.376	Not applicable
	MC	ND	ND	Not applicable
	PCE	ND	0.671	Not applicable
SSG-8/AA-8	1,1,1-TCA	ND	0.333	Not applicable
	MC	2.15	ND	Not applicable
	PCE	ND	1.02	Not applicable
Matrix C Vinyl Chloride (VC)				
SSG-1/IA-1	VC	ND	ND	No further action
SSG-2/IA-2	VC	ND	ND	No further action
SSG-3/IA-3	VC	ND	ND	No further action
SSG-4/IA-4	VC	ND	ND	No further action
SSG-5/IA-5	VC	ND	ND	No further action
SSG-6/IA-6	VC	85.9	ND	**Mitigate**
SSG-7/AA-7	VC	ND	ND	Not applicable
SSG-8/AA-8	VC	ND	ND	Not applicable

TABLE 2

245 West 55th Street
New York, New York
NYSDEC Site No. C231157

Vapor Intrusion Sampling Results and Decision Matrix Comparison - April 2024

Sample ID	Parameter	Soil Vapor Concentrations ($\mu g/m^3$)	Indoor/Ambient Air Concentrations ($\mu g/m^3$)	NYSDOH Matrices Decision
Matrix D 1,2,4-Trimethylbenzene (1,2,4-TMB); 1,3,5-Trimethylbenzene (1,3,5-TMB); 2,2,4-Trimethylpentane (2,2,4-TMP); Benzene; Cyclohexane; Ethylbenzene; Naphthalene; *o*- xylene				
SSG-1/IA-1	1,2,4-TMB	ND	4.57	No further action
	1,3,5-TMB	ND	1.17	No further action
	2,2,4-TMP	ND	ND	No further action
	Benzene	ND	0.875	No further action
	Cyclohexane	ND	0.709	No further action
	Ethylbenzene	ND	0.943	No further action
	Naphthalene	ND	ND	No further action
	o -xylene	ND	1.75	No further action
SSG-2/IA-2	1,2,4-TMB	3.78	3.42	No further action
	1,3,5-TMB	1.07	ND	No further action
	2,2,4-TMP	ND	ND	No further action
	Benzene	0.76	0.882	No further action
	Cyclohexane	0.75	ND	No further action
	Ethylbenzene	ND	ND	No further action
	Naphthalene	ND	ND	No further action
	o -xylene	1.55	1.44	No further action
SSG-3/IA-3	1,2,4-TMB	2.87	2.19	No further action
	1,3,5-TMB	ND	ND	No further action
	2,2,4-TMP	ND	ND	No further action
	Benzene	0.652	0.85	No further action
	Cyclohexane	0.971	ND	No further action
	Ethylbenzene	ND	ND	No further action
	Naphthalene	ND	ND	No further action
	o -xylene	1.21	1.26	No further action
SSG-4/IA-4	1,2,4-TMB	3.73	3.17	No further action
	1,3,5-TMB	1.01	ND	No further action
	2,2,4-TMP	ND	ND	No further action
	Benzene	0.677	0.872	No further action
	Cyclohexane	0.967	ND	No further action
	Ethylbenzene	ND	ND	No further action
	Naphthalene	ND	ND	No further action
	o -xylene	1.55	1.43	No further action
SSG-5/IA-5	1,2,4-TMB	23.4	4.15	No further action
	1,3,5-TMB	5.95	1.15	No further action
	2,2,4-TMP	ND	ND	No further action
	Benzene	0.978	0.895	No further action
	Cyclohexane	11.6	0.723	No further action
	Ethylbenzene	3.62	0.986	No further action
	Naphthalene	1.17	ND	No further action
	o -xylene	7.64	1.79	No further action
SSG-6/IA-6	1,2,4-TMB	ND	3.33	No further action
	1,3,5-TMB	ND	ND	No further action
	2,2,4-TMP	ND	ND	No further action
	Benzene	ND	0.856	No further action
	Cyclohexane	ND	ND	No further action
	Ethylbenzene	ND	ND	No further action
	Naphthalene	ND	ND	No further action
	o -xylene	ND	1.38	No further action
SSG-7/AA-7	1,2,4-TMB	1.69	3.09	Not applicable
	1,3,5-TMB	ND	ND	Not applicable
	2,2,4-TMP	ND	ND	Not applicable
	Benzene	0.652	0.946	Not applicable
	Cyclohexane	ND	ND	Not applicable
	Ethylbenzene	ND	ND	Not applicable
	Naphthalene	ND	ND	Not applicable
	o -xylene	ND	1.35	Not applicable
SSG-8/AA-8	1,2,4-TMB	3.55	5.01	Not applicable
	1,3,5-TMB	1.16	1.33	Not applicable
	2,2,4-TMP	ND	1.36	Not applicable
	Benzene	6.77	1.11	Not applicable
	Cyclohexane	2.39	ND	Not applicable
	Ethylbenzene	2.22	1.22	Not applicable
	Naphthalene	ND	ND	Not applicable
	o -xylene	3.41	1.98	Not applicable

TABLE 2

245 West 55th Street
New York, New York
NYSDEC Site No. C231157

Vapor Intrusion Sampling Results and Decision Matrix Comparison - April 2024

Sample ID	Parameter	Soil Vapor Concentrations ($\mu g/m^3$)	Indoor/Ambient Air Concentrations ($\mu g/m^3$)	NYSDOH Matrices Decision
Matrix E Heptane; Hexane; *p/m*- Xylene				
SSG-1/IA-1	Heptane	ND	0.926	No further action
	Hexane	ND	6.45	No further action
	p/m -Xylene	ND	3.75	No further action
SSG-2/IA-2	Heptane	0.881	0.865	No further action
	Hexane	4.09	6.34	No further action
	p/m -Xylene	3.46	3.27	No further action
SSG-3/IA-3	Heptane	0.873	0.861	No further action
	Hexane	3.74	5.5	No further action
	p/m -Xylene	2.82	2.83	No further action
SSG-4/IA-4	Heptane	1	0.861	No further action
	Hexane	5.67	7.96	No further action
	p/m -Xylene	3.37	3.1	No further action
SSG-5/IA-5	Heptane	1.57	0.934	No further action
	Hexane	287	6.34	**Monitor**
	p/m -Xylene	15.6	4.04	No further action
SSG-6/IA-6	Heptane	ND	0.877	No further action
	Hexane	15.2	6.2	No further action
	p/m -Xylene	ND	2.98	No further action
SSG-7/AA-7	Heptane	ND	ND	Not applicable
	Hexane	2.3	2.99	Not applicable
	p/m -Xylene	ND	3.38	Not applicable
SSG-8/AA-8	Heptane	2.51	1.08	Not applicable
	Hexane	23.5	2.27	Not applicable
	p/m -Xylene	8.56	4.78	Not applicable
Matrix F Toluene				
SSG-1/IA-1	Toluene	ND	2.06	No further action
SSG-2/IA-2	Toluene	2.13	1.99	No further action
SSG-3/IA-3	Toluene	1.81	1.91	No further action
SSG-4/IA-4	Toluene	2.05	1.9	No further action
SSG-5/IA-5	Toluene	3.44	2.05	No further action
SSG-6/IA-6	Toluene	ND	1.85	No further action
SSG-7/AA-7	Toluene	1.41	1.88	Not applicable
SSG-8/AA-8	Toluene	7.35	2.51	Not applicable

Notes:

All results are reported in micrograms per cubic meter (ug/m^3)

ND - Not Detected

NYSDOH - New York State Department of Health

1,400 - Results Exceed the applicable NYSDOH Soil Vapor or Indoor Air Matrices for Mitigation

1,400 - Results Exceed the applicable NYSDOH Soil Vapor or Indoor Air Matrices for Monitoring

NYSDOH decisions presented in this table are based on the May 2017 and February 2024 NYSDOH Decision Matrices.

Mitigate: NYSDOH recommends mitigation to minimize the current or potential exposures associated with soil vapor intrusion. Most common mitigation methods include sealing of preferential pathways in conjunction with installation of a sub-slab depressurization system, changing the pressurization of a building, as well as monitoring. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusions until the source of contamination is identified and remediated.

Monitor: NYSDOH recommends monitoring (sampling on a recurring basis) to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or whether existing building conditions are maintaining the desired mitigation endpoint. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

TABLE 3A

245 West 55th Street
New York, New York

Summary of Volatile Organic Compound Results in Soil

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-1 L2468433-01 11/20/2024 0-0.5'				SB-1 L2468433-02 11/20/2024 1-1.5'				SB-1 L2468433-03 11/20/2024 3-3.5'				DUP-3 (SB-1) L2468433-12 11/20/2024 3-3.5'				SB-1 L2468433-04 11/20/2024 5-5.5'				SB-1 L2468433-05 11/20/2024 7-7.5'				SB-1 L2468433-06 11/20/2024 9-9.5'				SB-1D L2468433-14 11/20/2024 0-0.5'				SB-1D L2468433-15 11/20/2024 1-1.5'				SB-1D L2468433-16 11/20/2024 3-3.5'				SB-1D L2468433-17 11/20/2024 5-5.5'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
VOLATILE ORGANICS																																											
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	ND		0.00042	0.00011	ND		0.00045	0.00012	ND		0.0006	0.00016	ND		0.00053	0.00014	ND		0.00063	0.00016	ND		0.00061	0.00016	ND		0.00053	0.00014	ND		0.00053	0.00014	ND		0.00055	0.00014	ND		0.00066	0.00017
1,1,1-Trichloroethane	71-55-6	0.68	100	0.68	0.027		0.00042	0.00014	0.01		0.00045	0.00015	0.0045		0.0006	0.0002	0.034		0.00053	0.00018	0.0046		0.00063	0.00021	0.0021		0.00061	0.0002	0.005		0.00053	0.00018	0.035		0.00053	0.00018	0.015		0.00055	0.00018	0.0043		0.00053	0.00018	0.0012		0.00066	0.00022
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	NS	ND		0.00042	0.00014	ND		0.00045	0.00015	ND		0.0006	0.0002	ND		0.00053	0.00018	ND		0.00063	0.00021	ND		0.00061	0.0002	ND		0.00053	0.00018	ND		0.00053	0.00018	ND		0.00055	0.00018	ND		0.00053	0.00018	ND		0.00066	0.00022
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	ND		0.00085	0.00023	ND		0.0009	0.00024	ND		0.0012	0.00032	ND		0.001	0.00028	ND		0.0012	0.00033	ND		0.0012	0.00033	ND		0.0011	0.00028	ND		0.0011	0.00028	ND		0.0011	0.00029	ND		0.0011	0.00028	ND		0.0013	0.00035
1,1-Dichloroethane	75-34-3	0.27	47	0.27	0.0057		0.00085	0.00012	0.002		0.0009	0.00013	0.00082	J	0.0012	0.00017	0.0061		0.001	0.00015	0.00094	J	0.0012	0.00018	0.00071	J	0.0012	0.00018	0.00044	J	0.0011	0.00015	0.0054		0.0011	0.00015	0.0025		0.0011	0.00016	0.00059	J	0.0011	0.00015	0.00024	J	0.0013	0.00019
1,1-Dichloroethene	75-35-4	0.24	0.98	0.33	ND		0.00085	0.0002	ND		0.0009	0.00021	ND		0.0012	0.00028	0.00025	J	0.001	0.00025	ND		0.0012	0.0003	ND		0.0012	0.00029	ND		0.0011	0.00025	ND		0.0011	0.00025	ND		0.0011	0.00026	ND		0.0011	0.00025	ND		0.0013	0.00031
1,1-Dichloropropene	563-58-6	NS	NS	NS	ND		0.00042	0.00013	ND		0.00045	0.00014	ND		0.0006	0.00019	ND		0.00053	0.00017	ND		0.00063	0.0002	ND		0.00061	0.0002	ND		0.00053	0.00017	ND		0.00053	0.00017	ND		0.00055	0.00018	ND		0.00053	0.00017	ND		0.00066	0.00021
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	ND		0.0017	0.00027	ND		0.0018	0.00029	ND		0.0024	0.00038	ND		0.0021	0.00034	ND		0.0025	0.0004	ND		0.0024	0.0004	ND		0.0021	0.00034	ND		0.0021	0.00034	ND		0.0022	0.00036	ND		0.0021	0.00034	ND		0.0026	0.00042
1,2,3-Trichloropropane	96-18-4	NS	NS	NS	ND		0.0017	0.00011	ND		0.0018	0.00011	ND		0.0024	0.00015	ND		0.0021	0.00013	ND		0.0025	0.00016	ND		0.0024	0.00016	ND		0.0021	0.00014	ND		0.0021	0.00014	ND		0.0022	0.00014	ND		0.0021	0.00014	ND		0.0026	0.00017
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	ND		0.0017	0.00016	ND		0.0018	0.00017	ND		0.0024	0.00023	ND		0.0021	0.0002	ND		0.0025	0.00024	ND		0.0024	0.00023	ND		0.0021	0.0002	ND		0.0021	0.0002	ND		0.0022	0.00021	ND		0.0021	0.0002	ND		0.0026	0.00025
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.0017	0.00023	ND		0.0018	0.00024	ND		0.0024	0.00032	ND		0.0021	0.00029	ND		0.0025	0.00034	ND		0.0024	0.00033	ND		0.0021	0.00029	ND		0.0021	0.00029	ND		0.0022	0.0003	ND		0.0021	0.00029	ND		0.0026	0.00036
1,2,4-Trimethylbenzene	95-63-6	5.9	100	5.9	ND		0.0017	0.00028	ND		0.0018	0.0003	ND		0.0024	0.0004	ND		0.0021	0.00035	ND		0.0025	0.00042	ND		0.0024	0.00041	ND		0.0021	0.00036	ND		0.0021	0.00036	ND		0.0022	0.00037	ND		0.0021	0.00036	ND		0.0026	0.00044
1,2-Dibromo-3-chloropropane	96-12-8	NS	NS	NS	ND		0.0025	0.00084	ND		0.0027	0.0009	ND		0.0036	0.0012	ND		0.0032	0.001	ND		0.0038	0.0012	ND		0.0037	0.0012	ND		0.0032	0.0011	ND		0.0032	0.0011	ND		0.0033	0.0011	ND		0.0032	0.0011	ND		0.0039	0.0013
1,2-Dibromoethane	106-93-4	NS	NS	NS	ND		0.00085	0.00024	ND		0.0009	0.00025	ND		0.0012	0.00033	ND		0.001	0.0003	ND		0.0012	0.00035	ND		0.0012	0.00034	ND		0.0011	0.0003	ND		0.0011	0.0003	ND		0.0011	0.00031	ND		0.0011	0.0003	ND		0.0013	0.00037
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.0017	0.00012	ND		0.0018	0.00013	ND		0.0024	0.00017	ND		0.0021	0.00015	ND		0.0025	0.00018	ND		0.0024	0.00018	ND		0.0021	0.00015	ND		0.0021	0.00015	ND		0.0022	0.00016	ND		0.0021	0.00015	ND		0.0026	0.00019
1,2-Dichloroethane	107-06-2	0.02	5.8	0.02	ND		0.00085	0.00022	ND		0.0009	0.00023	ND		0.0012	0.00031	ND		0.001	0.00027	ND		0.0012	0.00032	ND		0.0012	0.00032	ND		0.0011	0.00027	ND		0.0011	0.00027	ND		0.0011	0.00028	ND		0.0011	0.00027	ND		0.0013	0.00034
1,2-Dichloroethene, Total	540-59-0	NS	NS	NS	0.00026	J	0.00085	0.00012	ND		0.0009	0.00012	ND		0.0012	0.00016	0.00042	J	0.001	0.00014	ND		0.0012	0.00017	ND		0.0012	0.00017	0.00093	J	0.0011	0.00015	ND		0.0011	0.00015	ND		0.0011	0.00015	ND		0.0011	0.00015	ND		0.0013	0.00018
1,2-Dichloropropane	78-87-5	NS	NS	NS	ND		0.00085	0.0001	ND		0.0009	0.00011	ND		0.0012	0.00015	ND		0.001	0.00013	ND		0.0012	0.00016	ND		0.0012	0.00015	ND		0.0011	0.00013	ND		0.0011	0.00013	ND		0.0011	0.00014	ND		0.0011	0.00013	ND		0.0013	0.00016
1,3,5-Trimethylbenzene	108-67-8	3.1	100	3.1	ND		0.0017	0.00016	ND		0.0018	0.00017	ND		0.0024	0.00023	ND		0.0021	0.0002	ND		0.0025	0.00024	ND		0.0024	0.00024	ND		0.0021	0.0002	ND		0.0021	0.0002	ND		0.0021	0.00021	ND		0.0021	0.0002	ND		0.0026	0.00025
1,3-Dichlorobenzene	541-73-1	2.6	38	2.6	ND		0.0017	0.00012	ND		0.0018	0.00013	ND		0.0024	0.00018	ND		0.0021	0.00016	ND		0.0025	0.00018	ND		0.0024	0.00018	ND		0.0021	0.00016	ND		0.0021	0.00016	ND		0.0022	0.00016	ND		0.0021	0.00016	ND		0.0026	0.00019
1,3-Dichloropropane	142-28-9	NS	NS	NS	ND		0.0017	0.00014	ND		0.0018	0.00015	ND		0.0024	0.0002	ND		0.0021	0.00018	ND		0.0025	0.00021	ND		0.0024	0.0002	ND		0.0021	0.00018	ND		0.0021	0.00018	ND		0.0022	0.00018	ND		0.0021	0.00018	ND		0.0026	0.00022
1,3-Dichloropropene, Total	542-75-6	NS	NS	NS	ND		0.00042	0.00013	ND		0.00045	0.00014	ND		0.0006	0.00019	ND		0.00053	0.00017	ND		0.00063	0.0002	ND		0.00061	0.00019	ND		0.00053	0.00017	ND		0.00053	0.00017	ND		0.00055	0.00017	ND		0.00053	0.00017	ND		0.00066	0.00021
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.0017	0.00014	ND		0.0018	0.00015	ND		0.0024	0.0002	ND		0.0021	0.00018	ND		0.0025	0.00021	ND		0.0024	0.00021	ND		0.0021	0.00018	ND		0.0021	0.00018	ND		0.0022	0.00019	ND		0.0021	0.00018	ND		0.0026	0.00022
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.068	0.03	ND		0.072	0.032	ND		0.095	0.042	ND		0.085	0.037	ND		0.1	0.044	ND		0.098	0.043	ND		0.085	0.037	ND		0.086	0.038	ND		0.088	0.039	ND		0.085	0.037	ND		0.1	0.046
2,2-Dichloropropane	594-20-7	NS	NS	NS	ND		0.0017	0.00017	ND		0.0018	0.00018	ND		0.0024	0.00024	ND		0.0021	0.00021	ND		0.0025	0.00025	ND		0.0024	0.00025	ND		0.0021	0.00022	ND		0.0021	0.00022	ND		0.0022	0.00022	ND		0.0021	0.00022	ND		0.0026	0.00026
2-Butanone	78-93-3	0.1	100	0.1	ND		0.0085	0.0019	ND		0.009	0.002	ND		0.012	0.0026	ND		0.01	0.0023	ND		0.012	0.0028	ND		0.012	0.0027	ND		0.011	0.0024	ND		0.011	0.0024	ND		0.011	0.0024	ND		0.011	0.0024	ND		0.013	0.0029
2-Hexanone	591-78-6	NS	NS	NS	ND		0.0085	0.001	ND		0.009	0.0011	ND		0.012	0.0014	ND		0.01	0.0012	ND		0.012	0.0015	ND		0.012	0.0014	ND		0.011	0.0012	ND		0.011	0.0013	ND		0.011	0.0013	ND		0.011	0.0012	ND		0.013	0.0016
4-Methyl-2-pentanone	108-10-1	NS	NS	NS	ND		0.0085	0.0011	ND		0.009	0.0012	ND		0.012	0.0015	ND		0.01	0.0014	ND		0.012	0.0016	ND		0.012	0.0016	ND		0.011	0.0014	ND		0.011	0.0014	ND		0.011	0.0014	ND		0.011	0.0014	ND		0.013	0.0017
Acetone	67-64-1	0.03	100	0.03	ND		0.0085	0.0041	ND		0.009	0.0043	ND		0.012	0.0057	ND		0.01	0.0051	ND		0.012	0.006	ND		0.012	0.0059	ND		0.011	0.0051	ND		0.011	0.0051	ND		0.011	0.0053	ND		0.011	0.0051	ND		0.013	0.0063
Acrylonitrile	107-13-1	NS	NS	NS	ND		0.0034	0.00097	ND		0.0036	0.001	ND		0.0048	0.0014	ND		0.0042	0.0012	ND		0.005	0.0014	ND		0.0049	0.0014	ND		0.0043	0.0012	ND		0.0043	0.0012	ND		0.0044	0.0013	ND		0.0043	0.0012	ND		0.0053	0.0015
Benzene	71-43-2	0.06	3.7	0.06	ND		0.00042	0.00014	ND		0.00045	0.00015	ND		0.0006	0.0002	ND		0.00053	0.00018	ND		0.00063	0.00021	ND		0.00061	0.0002	ND		0.00053	0.00018	ND		0.00053	0.00018	ND		0.00055	0.00018	ND		0.00053	0.00018	ND		0.00066	0.00022
Bromobenzene	108-86-1	NS	NS	NS	ND		0.0017	0.00012	ND		0.0018	0.00013	ND		0.0024	0.00017	ND		0.0021	0.00015	ND		0.0025	0.00018	ND		0.0024	0.00018	ND		0.0021	0.00015	ND		0.0021	0.00015	ND		0.0022	0.00016	ND		0.0021	0.00015	ND		0.0026	0.00019
Bromochloromethane	74-97-5	NS	NS	NS	ND		0.0017	0.00017	ND		0.0018	0.00018	ND		0.0024	0.00024	ND		0.0021	0.00022	ND		0.0025	0.00026	ND		0.0024	0.00025	ND		0.0021	0.00022	ND		0.0021	0.00022	ND		0.0022	0.00023	ND		0.0021	0.00022	ND		0.0026	0.00027
Bromodichloromethane	75-27-4	NS	NS	NS	ND		0.00042	0.00009	ND		0.00045	0.0001	ND		0.0006	0.00013	ND		0.00053	0.00012	ND		0.00063	0.00014	ND		0.00061	0.00013	ND		0.00053	0.00012	ND		0.00053	0.00012	ND		0.00055	0.00012	ND		0.00053	0.00012	ND		0.00066	0.00014
Bromoform	75-25-2	NS	NS	NS	ND		0.0034	0.00021	ND		0.0036	0.00022	ND		0.0048	0.00029	ND		0.0042	0.00026	ND		0.005	0.00031	ND		0.0049	0.0003	ND		0.0043	0.00026	ND		0.0043	0.00026	ND		0.0044	0.00027	ND		0.0043	0.00026	ND		0.0053	0.00032
Bromomethane	74-83-9	NS	NS	NS	ND		0.0017	0.00049	ND		0.0018	0.00052	ND		0.0024	0.00069	ND		0.0021	0.00061	ND		0.0025	0.00073	ND		0.0024	0.00071	ND		0.0021	0.00062	ND		0.0021	0.00062	ND		0.0022	0.00064	ND		0.0021	0.00062	ND		0.0026	0.00076
Carbon disulfide	75-15-0	NS	NS	NS	ND		0.0085	0.0038	ND		0.009	0.0041	ND		0.012	0.0054	ND		0.01	0.0048	ND		0.012	0.0057	ND		0.012	0.0056	ND		0.011	0.0048	ND		0.011	0.0049	ND		0.011	0.005	ND		0.011	0.0048	ND		0.013	0.006
Carbon tetrachloride	56-23-5	0.76	7.1	0.76	ND		0.00085	0.00019	ND		0.0009	0.00021	ND		0.0012	0.00027	ND		0.001	0.00024	ND		0.0012	0.00029	ND		0.0012	0.00028	ND		0.0011	0.00024	ND		0.0011	0.00024	ND		0.0011	0.00025	ND		0.0011	0.00024	ND		0.0013	0.0003
Chlorobenzene	108-90-7	4.5	100	4.5	ND		0.00042	0.00011	ND		0.00045	0.00011	ND		0.0006	0.00015	ND		0.00053	0.00013	ND		0.00063	0.00016	ND		0.00061	0.00016	ND		0.00053	0.00014	ND		0.00053	0.00014	ND		0.00055	0.00014	ND		0.00053	0.00014	ND		0.00066	0.00017
Chloroethane	75-00-3	NS	NS	NS	ND		0.0017	0.00038	ND		0.0018	0.00041	ND		0.0024	0.00054	ND		0.0021	0.00048	ND		0.0025	0.00057	ND		0.0024	0.00056	ND		0.0021	0.00048	ND		0.0021	0.00048	ND		0.0022	0.0005	ND		0.0021	0.00048	ND		0.0026	0.0006
Chloroform	67-66-3	0.37	24	0.37	0.00022	J	0.0013	0.00012	ND		0.0014	0.00013	ND		0.0018	0.00017	0.00018	J	0.0016	0.00015	ND		0.0019	0.00018	ND		0.0018	0.00017	0.0014	J	0.0016	0.00015	0.00024	J	0.0016	0.00015	ND		0.0016	0.00015	ND		0.0016	0.00015	ND		0.002	0.00018
Chloromethane	74-87-3	NS	NS	NS	ND		0.0034	0.00079	ND		0.0036	0.00084	ND		0.0048	0.0011	ND		0.0042	0.00099	ND		0.005	0.0012	ND		0.0049	0.0011	ND		0.0043	0.00099	ND		0.0043	0.001	ND		0.0044	0.001	ND		0.0043	0.00099	ND		0.0053	0.0012
cis-1,2-Dichloroethene	156-59-2	0.19	41	0.19	0.00026	J	0.00085	0.00015	ND		0.0009	0.00016	ND		0.0012	0.00021	0.00042	J	0.001	0.00018	ND		0.0012	0.00022	ND		0.0012	0.00022	0.00093	J	0.0011	0.00019	ND		0.0011	0.00019	ND		0.0011	0.00019	ND		0.0011	0.00019	ND		0.0013	0.00023
cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	ND		0.00042	0.00013	ND		0.0009	0.00013	ND		0.0012	0.00017	ND		0.00053	0.00017	ND		0.00063	0.0002	ND		0.00061	0.00019	ND		0.00053	0.00017	ND		0.00053	0.00017	ND		0.00055	0.00017	ND		0.00053	0.00017	ND		0.00066	0.00021
Dibromochloromethane	124-48-1	NS	NS	NS	ND		0.00085	0.00012	ND		0.0009	0.00013	ND		0.0012	0.00017	ND		0.001	0.00015	ND		0.0012	0.00018	ND		0.0012	0.00017	ND		0.0011	0.00015	ND		0.0011	0.00015	ND		0.0011	0.00015	ND		0.0011	0.00015	ND		0.0013	0.00018
Dibromomethane	74-95-3	NS	NS	NS	ND		0.0017	0.0002	ND		0.0018	0.00021	ND		0.0024	0.00028	ND		0.0021	0.00025	ND		0.0025	0.0003	ND		0.0024	0.00029	ND		0.0021	0.00025	ND		0.0021	0.00025	ND		0.0022	0.00026	ND		0.0021	0.00025	ND		0.0026	0.00031
Dichlorodifluoromethane	75-71-8	NS	NS	NS	ND		0.0085	0.00077	ND		0.009	0.00082	ND		0.012	0.0011	ND		0.01	0.00097	ND		0.012	0.0011	ND		0.012	0.0011	ND		0.011	0.00098	ND		0.011	0.00098	ND		0.011	0.001	ND		0.011	0.00098	ND		0.013	0.0012
Ethyl ether	60-29-7	NS	NS	NS	ND		0.0017	0.00029	ND		0.0018	0.00031	ND		0.0024	0.00041	ND		0.0021	0.00036	ND		0.0025	0.00043	ND		0.0024	0.00042	ND		0.0021	0.00036	ND		0.0021	0.00036	ND		0.0022	0.00038	ND		0.0021	0.00036	ND		0.0026	0.00045
Ethylbenzene	100-41-4	1	76	1	ND		0.00085	0.00012	ND		0.0009	0.00013	ND		0.0012	0.00017	ND		0.001	0.00015	ND		0.0012	0.00018	ND		0.0012	0.00017	ND		0.0011	0.00015	ND		0.0011	0.00015	ND		0.0011	0.00016	ND		0.0011	0.00015	ND		0.0013	0.00018
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.0034	0.00014	ND		0.0036	0.00015	ND		0.0048	0.0002	ND		0.0042	0.00018	ND		0.005	0.00021	ND		0.0049	0.00021	ND		0.0043	0.00018	ND		0.0043	0.00018	ND		0.0044	0.00019	ND		0.0043	0.00018	ND		0.0053	0.00022
Isopropylbenzene	98-82-8	NS	NS	NS	ND		0.00085	0.00009	ND		0.0009	0.0001	ND		0.0012	0.00013	ND		0.001	0.00012	ND		0.0012	0.00014	ND		0.0012	0.00013	ND		0.0011	0.00012	ND		0.0011	0.00012	ND		0.0011	0.00012	ND		0.0011	0.00012	ND		0.0013	0.00014
Methyl tert butyl ether	1634-04-4	0.1	100	0.1	ND		0.0017	0.00017	ND		0.0018	0.00018	ND		0.0024	0.00024	ND		0.0021	0.00021	ND		0.0025	0.00025	ND		0.0024	0.00025	ND		0.0021	0.00021	ND		0.0021	0.00021	ND		0.0022	0.00022	ND		0.0021	0.00021	ND		0.0026	0.00026
Methylene chloride	75-09-2	0.05	81	0.05	ND		0.0042	0.0019	ND		0.0045	0.0021	ND		0.006	0.0027	ND		0.0053	0.0024	ND		0.0063	0.0029	ND		0.0061	0.0028	ND		0.0053	0.0024	ND		0.0053	0.0024	ND		0.0055	0.0025	ND		0.0053	0.0024	ND		0.0066	0.003
n-Butylbenzene	104-51-8	18	100	18	ND		0.00085	0.00014	ND		0.0009	0.00015	ND		0.0012	0.0002	ND		0.001	0.00018	ND		0.0012	0.00021	ND		0.0012	0.0002	ND		0.0011	0.00018	ND		0.0011	0.00018	ND		0.0011	0.00018	ND		0.0011	0.00018	ND		0.0013	0.00022
n-Propylbenzene	103-65-1	5	100	5	ND		0.00085	0.00014	ND		0.0009	0.00015	ND		0.0012	0.0002	ND		0.001	0.00018	ND		0.0012	0.00021	ND		0.0012	0.00021	ND		0.0011	0.00018	ND		0.0011	0.00018	ND		0.0011	0.00019	ND		0.0011	0.00018	ND		0.0013	0.00022
Naphthalene	91-20-3	12	100	12	ND		0.0034	0.00055	ND		0.0036	0.00059	ND		0.0048	0.00077	ND		0.0042	0.00069	ND		0.005	0.00081	ND		0.0049	0.0008	ND		0.0043	0.00069	ND		0.0043	0.00069	ND		0.0044	0.00072	ND		0.0043	0.00069	ND		0.0053	0.00086
o-Chlorotoluene	95-49-8	NS	NS	NS	ND		0.0017	0.00016	ND		0.0018	0.00017	ND		0.0024	0.00023	ND		0.0021	0.0002	ND		0.0025	0.00024	ND		0.0024	0.00023	ND		0.0021	0.0002	ND		0.0021	0.0002	ND		0.0022	0.00021	ND		0.0021	0.0002	ND		0.0026	0.00025
o-Xylene	95-47-6	NS	NS	NS	ND		0.00085	0.00025	ND		0.0009	0.00026	ND		0.0012	0.00035	ND		0.001	0.00031	ND		0.0012	0.00036	ND		0.0012	0.00036	ND		0.0011	0.00031	ND		0.0011	0.00031	ND		0.0011	0.00032	ND		0.0011	0.00031	ND		0.0013	0.00038
p-Chlorotoluene	106-43-4	NS	NS	NS	ND		0.0017	0.00009	ND		0.0018	0.0001	ND		0.0024	0.00013	ND		0.0021	0.00011	ND		0.0025	0.00014	ND		0.0024	0.00013	ND		0.0021	0.00012	ND		0.0021	0.00012	ND		0.0022	0.00012	ND		0.0021	0.00012	ND		0.0026	0.00014
p-Diethylbenzene	105-05-5	NS	NS	NS	ND		0.0017	0.00015	ND		0.0018	0.00016	ND		0.0024	0.00021	ND		0.0021	0.00019	ND		0.0025	0.00022	ND		0.0024	0.00022	ND		0.0021	0.00019	ND		0.0021	0.00019	ND		0.0022	0.0002	ND		0.0021	0.00019	ND		0.0026	0.00023
p-Ethyltoluene	622-96-8	NS	NS	NS	ND		0.0017	0.00032	ND		0.0018	0.00035	ND		0.0024	0.00046	ND		0.0021	0.00041	ND		0.0025	0.00048	ND		0.0024	0.00047	ND		0.0021	0.00041	ND		0.0021	0.00041	ND		0.0022	0.00042	ND		0.0021	0.00041	ND		0.0026	0.0005
p-Isopropyltoluene	99-87-6	NS	NS	NS	ND		0.00085	0.00009	ND		0.0009	0.0001	ND		0.0012	0.00013	ND		0.001	0.00012	ND		0.0012	0.00014	ND		0.0012	0.00013	ND		0.0011	0.00012	ND		0.0011	0.00012	ND		0.0011	0.00012	ND		0.0011	0.00012	ND		0.0013	0.00014
p/m-Xylene	179601-23-1	NS	NS	NS	ND		0.0017	0.00047	ND		0.0018	0.0005	ND		0.0024	0.00067	ND		0.0021	0.00059	ND		0.0025	0.0007	ND		0.0024	0.00069	ND		0.0021	0.0006	ND		0.0021	0.0006	ND		0.0022	0.00062	ND		0.0021	0.0006	ND		0.0026	0.00074
sec-Butylbenzene	135-98-8	25	100	25	ND		0.00085	0.00012	ND		0.0009	0.00013	ND		0.0012	0.00017	ND		0.001	0.00015	ND		0.0012	0.00018	ND		0.0012	0.00018	ND		0.0011	0.00016	ND		0.0011	0.00016	ND		0.0011	0.00016	ND		0.0011	0.00016	ND		0.0013	0.00019
Styrene	100-42-5	NS	NS	NS	ND		0.00085	0.00017	ND		0.0009	0.00018	ND		0.0012	0.00023	ND		0.001	0.00021	ND		0.0012	0.00024	ND		0.0012	0.00024	ND		0.0011	0.00021	ND		0.0011	0.00021	ND		0.0011	0.00022	ND		0.0011	0.00021	ND		0.0013	0.00026
tert-Butylbenzene	98-06-6	11	100	11	ND		0.0017	0.0001	ND		0.0018	0.00011	ND		0.0024	0.00014	ND		0.0021	0.00012	ND		0.0025	0.00015	ND		0.0024	0.00014	ND		0.0021	0.00012	ND	

TABLE 3A

245 West 55th Street
New York, New York

Summary of Volatile Organic Compound Results in Soil

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-1D L2468433-18 11/20/2024 7-7.5'			SB-1D L2468433-19 11/20/2024 9-9.5'			SB-2 L2505323-07 1/30/2025 0-0.5'			SB-2 L2505323-08 1/30/2025 1-1.5'			SB-2 (EPA 5035 HIGH) L2505323-08 1/30/2025 1-1.5'			SB-2 L2505323-09 1/30/2025 3-3.5'			SB-2 L2505323-10 1/30/2025 5-5.5'			SB-2 L2505323-11 1/30/2025 7-7.5'			DUP (SB-2) L2505323-06 1/30/2025 7-7.5'			DUP (SB-2) L2505323-06 R1 1/30/2025 7-7.5'			SB-2 L2505323-14 1/30/2025 9.5-10'		
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
VOLATILE ORGANICS																																							
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	ND		0.00064	0.00017	ND		0.0005	0.00013	ND		0.00069	0.00018	ND		0.0007	0.00018	ND		0.04	0.01	ND		0.00059	0.00016	ND		0.036	0.0096	ND		0.033	0.0086	ND		0.00049	0.00013	ND		0.00048	0.00012	ND		0.00057	0.00015
1,1,1-Trichloroethane	71-55-6	0.68	100	0.68	0.0034		0.00064	0.00021	0.018		0.0005	0.00017	ND		0.00069	0.00023	ND		0.0007	0.00023	ND		0.04	0.013	ND		0.00059	0.0002	ND		0.036	0.012	ND		0.033	0.011	ND		0.00049	0.00016	ND		0.00048	0.00016	ND		0.00057	0.00019
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	NS	ND		0.00064	0.00021	ND		0.0005	0.00016	ND		0.00069	0.00023	ND		0.0007	0.00023	ND		0.04	0.013	ND		0.00059	0.0002	ND		0.036	0.012	ND		0.033	0.011	ND		0.00049	0.00016	ND		0.00048	0.00016	ND		0.00057	0.00019
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	ND		0.0013	0.00034	ND		0.001	0.00027	ND		0.0014	0.00037	ND		0.0014	0.00038	ND		0.08	0.021	ND		0.0012	0.00031	ND		0.073	0.019	ND		0.066	0.017	ND		0.00098	0.00026	ND		0.00095	0.00025	ND		0.0011	0.0003
1,1-Dichloroethane	75-34-3	0.27	47	0.27	0.00046	J	0.0013	0.00018	0.0011		0.001	0.00014	ND		0.0014	0.0002	ND		0.0014	0.0002	ND		0.08	0.012	0.00066	J	0.0012	0.00017	ND		0.073	0.01	ND		0.066	0.0095	0.00021	J	0.00098	0.00014	0.0003	J	0.00095	0.00014	ND		0.0011	0.00016
1,1-Dichloroethene	75-35-4	0.24	0.98	0.33	ND		0.0013	0.0003	0.00042	J	0.001	0.00024	ND		0.0014	0.00033	ND		0.0014	0.00033	ND		0.08	0.019	ND		0.0012	0.00028	ND		0.073	0.017	ND		0.066	0.016	ND		0.00098	0.00023	ND		0.00095	0.00023	ND		0.0011	0.00027
1,1-Dichloropropene	563-58-6	NS	NS	NS	ND		0.00064	0.0002	ND		0.0005	0.00016	ND		0.00069	0.00022	ND		0.0007	0.00022	ND		0.04	0.013	ND		0.00059	0.00019	ND		0.036	0.012	ND		0.033	0.01	ND		0.00049	0.00016	ND		0.00048	0.00015	ND		0.00057	0.00018
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	ND		0.0025	0.00041	ND		0.002	0.00032	ND		0.0028	0.00045	ND		0.0028	0.00045	ND		0.16	0.026	ND		0.0024	0.00038	ND		0.14	0.023	ND		0.13	0.021	ND		0.002	0.00032	ND		0.0019	0.00031	ND		0.0023	0.00037
1,2,3-Trichloropropane	96-18-4	NS	NS	NS	ND		0.0025	0.00016	ND		0.002	0.00013	ND		0.0028	0.00018	ND		0.0028	0.00018	ND		0.16	0.01	ND		0.0024	0.00015	ND		0.14	0.0093	ND		0.13	0.0083	ND		0.002	0.00012	ND		0.0019	0.00012	ND		0.0023	0.00014
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	ND		0.0025	0.00024	ND		0.002	0.00019	0.014		0.0028	0.00026	0.36		0.0028	0.00027	2.2		0.16	0.015	ND		0.0024	0.00022	3.5		0.14	0.014	14		0.13	0.012	ND		0.002	0.00019	ND		0.0019	0.00018	0.23		0.0023	0.00022
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.0025	0.00035	ND		0.002	0.00027	ND		0.0028	0.00038	ND		0.0028	0.00038	ND		0.16	0.022	ND		0.0024	0.00032	ND		0.14	0.02	ND		0.13	0.018	ND		0.002	0.00027	ND		0.0019	0.00026	ND		0.0023	0.00031
1,2,4-Trimethylbenzene	95-63-6	5.9	100	5.9	ND		0.0025	0.00042	ND		0.002	0.00033	ND		0.0028	0.00046	ND		0.0028	0.00047	ND		0.16	0.027	ND		0.0024	0.00039	ND		0.14	0.024	ND		0.13	0.022	ND		0.002	0.00033	ND		0.0019	0.00032	ND		0.0023	0.00038
1,2-Dibromo-3-chloropropane	96-12-8	NS	NS	NS	ND		0.0038	0.0013	ND		0.003	0.001	ND		0.0042	0.0014	ND		0.0042	0.0014	ND		0.24	0.08	ND		0.0035	0.0012	ND		0.22	0.073	ND		0.2	0.065	ND		0.003	0.00098	ND		0.0029	0.00095	ND		0.0034	0.0011
1,2-Dibromoethane	106-93-4	NS	NS	NS	ND		0.0013	0.00036	ND		0.001	0.00028	ND		0.0014	0.00039	ND		0.0014	0.00039	ND		0.08	0.022	ND		0.0012	0.00033	ND		0.073	0.02	ND		0.066	0.018	ND		0.00098	0.00027	ND		0.00095	0.00027	ND		0.0011	0.00032
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.0025	0.00018	ND		0.002	0.00014	ND		0.0028	0.0002	ND		0.0028	0.0002	ND		0.16	0.012	ND		0.0024	0.00017	ND		0.14	0.01	ND		0.13	0.0094	ND		0.002	0.00014	ND		0.0019	0.00014	0.00023	J	0.0023	0.00016
1,2-Dichloroethane	107-06-2	0.02	5.8	0.02	ND		0.0013	0.00033	ND		0.001	0.00026	ND		0.0014	0.00036	ND		0.0014	0.00036	ND		**0.08**	0.02	ND		0.0012	0.0003	ND		**0.073**	0.019	ND		**0.066**	0.017	ND		0.00098	0.00025	ND		0.00095	0.00024	ND		0.0011	0.00029
1,2-Dichloroethene, Total	540-59-0	NS	NS	NS	ND		0.0013	0.00017	0.0012		0.001	0.00014	ND		0.0014	0.00019	ND		0.0014	0.00019	ND		0.08	0.011	ND		0.0012	0.00016	ND		0.073	0.01	ND		0.066	0.009	ND		0.00098	0.00013	ND		0.00095	0.00013	ND		0.0011	0.00016
1,2-Dichloropropane	78-87-5	NS	NS	NS	ND		0.0013	0.00016	ND		0.001	0.00012	ND		0.0014	0.00017	ND		0.0014	0.00018	ND		0.08	0.01	ND		0.0012	0.00015	ND		0.073	0.0091	ND		0.066	0.0082	ND		0.00098	0.00012	ND		0.00095	0.00012	ND		0.0011	0.00014
1,3,5-Trimethylbenzene	108-67-8	3.1	100	3.1	ND		0.0025	0.00024	ND		0.002	0.00019	ND		0.0028	0.00027	0.00031	J	0.0028	0.00027	ND		0.16	0.015	ND		0.0024	0.00023	ND		0.14	0.014	ND		0.13	0.013	ND		0.002	0.00019	ND		0.0019	0.00018	ND		0.0023	0.00022
1,3-Dichlorobenzene	541-73-1	2.6	38	2.6	ND		0.0025	0.00019	ND		0.002	0.00015	ND		0.0028	0.0002	ND		0.0028	0.00021	ND		0.16	0.012	ND		0.0024	0.00017	ND		0.14	0.011	ND		0.13	0.0097	ND		0.002	0.00014	ND		0.0019	0.00014	ND		0.0023	0.00017
1,3-Dichloropropane	142-28-9	NS	NS	NS	ND		0.0025	0.00021	ND		0.002	0.00017	ND		0.0028	0.00023	ND		0.0028	0.00023	ND		0.16	0.013	ND		0.0024	0.0002	ND		0.14	0.012	ND		0.13	0.011	ND		0.002	0.00016	ND		0.0019	0.00016	ND		0.0023	0.00019
1,3-Dichloropropene, Total	542-75-6	NS	NS	NS	ND		0.00064	0.0002	ND		0.0005	0.00016	ND		0.00069	0.00022	ND		0.0007	0.00022	ND		0.04	0.013	ND		0.00059	0.00018	ND		0.036	0.012	ND		0.033	0.01	ND		0.00049	0.00016	ND		0.00048	0.00015	ND		0.00057	0.00018
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.0025	0.00022	ND		0.002	0.00017	ND		0.0028	0.00024	ND		0.0028	0.00024	ND		0.16	0.014	ND		0.0024	0.0002	ND		0.14	0.012	ND		0.13	0.011	ND		0.002	0.00017	ND		0.0019	0.00016	ND		0.0023	0.0002
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.1	0.045	ND		0.08	0.035	ND		0.11	0.049	ND		0.11	0.049	ND		**6.4**	**2.8**	ND		0.094	0.041	ND		**5.8**	**2.6**	ND		**5.2**	**2.3**	ND		0.079	0.034	ND		0.076	0.034	ND		0.091	0.04
2,2-Dichloropropane	594-20-7	NS	NS	NS	ND		0.0025	0.00026	ND		0.002	0.0002	ND		0.0028	0.00028	ND		0.0028	0.00028	ND		0.16	0.016	ND		0.0024	0.00024	ND		0.14	0.015	ND		0.13	0.013	ND		0.002	0.0002	ND		0.0019	0.00019	ND		0.0023	0.00023
2-Butanone	78-93-3	0.1	100	0.1	ND		0.013	0.0028	ND		0.01	0.0022	ND		0.014	0.0031	ND		0.014	0.0031	ND		**0.8**	**0.18**	ND		0.012	0.0026	ND		**0.73**	**0.16**	ND		**0.66**	**0.14**	ND		0.0098	0.0022	ND		0.0095	0.0021	ND		0.011	0.0025
2-Hexanone	591-78-6	NS	NS	NS	ND		0.013	0.0015	ND		0.01	0.0012	ND		0.014	0.0016	ND		0.014	0.0016	ND		0.8	0.094	ND		0.012	0.0014	ND		0.73	0.086	ND		0.66	0.077	ND		0.0098	0.0012	ND		0.0095	0.0011	ND		0.011	0.0013
4-Methyl-2-pentanone	108-10-1	NS	NS	NS	ND		0.013	0.0016	ND		0.01	0.0013	ND		0.014	0.0018	ND		0.014	0.0018	ND		0.8	0.1	ND		0.012	0.0015	ND		0.73	0.093	ND		0.66	0.084	ND		0.0098	0.0013	ND		0.0095	0.0012	ND		0.011	0.0015
Acetone	67-64-1	0.03	100	0.03	ND		0.013	0.0061	ND		0.01	0.0048	ND		0.014	0.0067	ND		0.014	0.0068	ND		**0.8**	**0.38**	ND		0.012	0.0056	ND		**0.73**	**0.35**	ND		**0.66**	**0.32**	ND		0.0098	0.0047	ND		0.0095	0.0046	0.012		0.011	0.0055
Acrylonitrile	107-13-1	NS	NS	NS	ND		0.0051	0.0015	ND		0.004	0.0011	ND		0.0055	0.0016	ND		0.0056	0.0016	ND		0.32	0.092	ND		0.0047	0.0014	ND		0.29	0.084	ND		0.26	0.075	ND		0.0039	0.0011	ND		0.0038	0.0011	ND		0.0046	0.0013
Benzene	71-43-2	0.06	3.7	0.06	ND		0.00064	0.00021	ND		0.0005	0.00016	ND		0.00069	0.00023	ND		0.0007	0.00023	ND		0.04	0.013	ND		0.00059	0.0002	ND		0.036	0.012	ND		0.033	0.011	ND		0.00049	0.00016	ND		0.00048	0.00016	ND		0.00057	0.00019
Bromobenzene	108-86-1	NS	NS	NS	ND		0.0025	0.00018	ND		0.002	0.00014	ND		0.0028	0.0002	ND		0.0028	0.0002	ND		0.16	0.012	ND		0.0024	0.00017	ND		0.14	0.01	ND		0.13	0.0095	ND		0.002	0.00014	ND		0.0019	0.00014	ND		0.0023	0.00016
Bromochloromethane	74-97-5	NS	NS	NS	ND		0.0025	0.00026	ND		0.002	0.0002	ND		0.0028	0.00028	ND		0.0028	0.00029	ND		0.16	0.016	ND		0.0024	0.00024	ND		0.14	0.015	ND		0.13	0.013	ND		0.002	0.0002	ND		0.0019	0.0002	ND		0.0023	0.00023
Bromodichloromethane	75-27-4	NS	NS	NS	ND		0.00064	0.00014	ND		0.0005	0.00011	ND		0.00069	0.00015	ND		0.0007	0.00015	ND		0.04	0.0087	ND		0.00059	0.00013	ND		0.036	0.008	ND		0.033	0.0071	ND		0.00049	0.00011	ND		0.00048	0.0001	ND		0.00057	0.00012
Bromoform	75-25-2	NS	NS	NS	ND		0.0051	0.00031	ND		0.004	0.00024	ND		0.0055	0.00034	ND		0.0056	0.00034	ND		0.32	0.02	ND		0.0047	0.00029	ND		0.29	0.018	ND		0.26	0.016	ND		0.0039	0.00024	ND		0.0038	0.00023	ND		0.0046	0.00028
Bromomethane	74-83-9	NS	NS	NS	ND		0.0025	0.00074	ND		0.002	0.00058	ND		0.0028	0.0008	ND		0.0028	0.00082	ND		0.16	0.046	ND		0.0024	0.00068	ND		0.14	0.042	ND		0.13	0.038	0.00066	J	0.002	0.00057	ND		0.0019	0.00055	ND		0.0023	0.00066
Carbon disulfide	75-15-0	NS	NS	NS	ND		0.013	0.0058	ND		0.01	0.0045	ND		0.014	0.0063	ND		0.014	0.0064	ND		0.8	0.36	ND		0.012	0.0053	ND		0.73	0.33	ND		0.66	0.3	ND		0.0098	0.0045	ND		0.0095	0.0043	ND		0.011	0.0052
Carbon tetrachloride	56-23-5	0.76	7.1	0.76	ND		0.0013	0.00029	ND		0.001	0.00023	ND		0.0014	0.00032	ND		0.0014	0.00032	ND		0.08	0.018	ND		0.0012	0.00027	ND		0.073	0.017	ND		0.066	0.015	ND		0.00098	0.00023	ND		0.00095	0.00022	ND		0.0011	0.00026
Chlorobenzene	108-90-7	4.5	100	4.5	ND		0.00064	0.00016	ND		0.0005	0.00013	ND		0.00069	0.00018	ND		0.0007	0.00018	ND		0.04	0.01	ND		0.00059	0.00015	ND		0.036	0.0093	ND		0.033	0.0083	ND		0.00049	0.00012	ND		0.00048	0.00012	ND		0.00057	0.00014
Chloroethane	75-00-3	NS	NS	NS	ND		0.0025	0.00058	ND		0.002	0.00045	ND		0.0028	0.00063	ND		0.0028	0.00064	ND		0.16	0.036	ND		0.0024	0.00053	ND		0.14	0.033	ND		0.13	0.03	ND		0.002	0.00044	ND		0.0019	0.00043	ND		0.0023	0.00052
Chloroform	67-66-3	0.37	24	0.37	ND		0.0019	0.00018	0.0011	J	0.0015	0.00014	ND		0.0021	0.0002	ND		0.0021	0.0002	ND		0.12	0.011	0.00033	J	0.0018	0.00016	ND		0.11	0.01	ND		0.098	0.0092	ND		0.0015	0.00014	ND		0.0014	0.00013	ND		0.0017	0.00016
Chloromethane	74-87-3	NS	NS	NS	ND		0.0051	0.0012	ND		0.004	0.00093	ND		0.0055	0.0013	ND		0.0056	0.0013	ND		0.32	0.074	ND		0.0047	0.0011	ND		0.29	0.068	ND		0.26	0.061	ND		0.0039	0.00092	ND		0.0038	0.00089	ND		0.0046	0.0011
cis-1,2-Dichloroethene	156-59-2	0.19	41	0.19	ND		0.0013	0.00022	0.0012		0.001	0.00017	ND		0.0014	0.00024	ND		0.0014	0.00024	ND		0.08	0.014	ND		0.0012	0.0002	ND		0.073	0.013	ND		0.066	0.011	ND		0.00098	0.00017	ND		0.00095	0.00017	ND		0.0011	0.0002
cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	ND		0.00064	0.0002	ND		0.0005	0.00016	ND		0.00069	0.00022	ND		0.0007	0.00022	ND		0.04	0.013	ND		0.00059	0.00018	ND		0.036	0.012	ND		0.033	0.01	ND		0.00049	0.00016	ND		0.00048	0.00015	ND		0.00057	0.00018
Dibromochloromethane	124-48-1	NS	NS	NS	ND		0.0013	0.00018	ND		0.001	0.00014	ND		0.0014	0.00019	ND		0.0014	0.0002	ND		0.08	0.011	ND		0.0012	0.00016	ND		0.073	0.01	ND		0.066	0.0092	ND		0.00098	0.00014	ND		0.00095	0.00013	ND		0.0011	0.00016
Dibromomethane	74-95-3	NS	NS	NS	ND		0.0025	0.0003	ND		0.002	0.00024	ND		0.0028	0.00033	ND		0.0028	0.00033	ND		0.16	0.019	ND		0.0024	0.00028	ND		0.14	0.017	ND		0.13	0.016	ND		0.002	0.00023	ND		0.0019	0.00023	ND		0.0023	0.00027
Dichlorodifluoromethane	75-71-8	NS	NS	NS	ND		0.013	0.0012	ND		0.01	0.00091	ND		0.014	0.0013	ND		0.014	0.0013	ND		0.8	0.073	ND		0.012	0.0011	ND		0.73	0.067	ND		0.66	0.06	ND		0.0098	0.0009	ND		0.0095	0.00087	ND		0.011	0.001
Ethyl ether	60-29-7	NS	NS	NS	ND		0.0025	0.00043	ND		0.002	0.00034	ND		0.0028	0.00047	ND		0.0028	0.00048	ND		0.16	0.027	ND		0.0024	0.0004	ND		0.14	0.025	ND		0.13	0.022	ND		0.002	0.00034	ND		0.0019	0.00032	ND		0.0023	0.00039
Ethylbenzene	100-41-4	1	76	1	ND		0.0013	0.00018	ND		0.001	0.00014	ND		0.0014	0.0002	ND		0.0014	0.0002	ND		0.08	0.011	ND		0.0012	0.00016	ND		0.073	0.01	ND		0.066	0.0092	ND		0.00098	0.00014	ND		0.00095	0.00013	ND		0.0011	0.00016
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.0051	0.00022	ND		0.004	0.00017	ND		0.0055	0.00023	ND		0.0056	0.00024	ND		0.32	0.014	ND		0.0047	0.0002	ND		0.29	0.012	ND		0.26	0.011	ND		0.0039	0.00017	ND		0.0038	0.00016	ND		0.0046	0.00019
Isopropylbenzene	98-82-8	NS	NS	NS	ND		0.0013	0.00014	ND		0.001	0.00011	ND		0.0014	0.00015	ND		0.0014	0.00015	ND		0.08	0.0087	ND		0.0012	0.00013	0.2		0.073	0.008	1.5		0.066	0.0071	ND		0.00098	0.00011	ND		0.00095	0.0001	0.023		0.0011	0.00012
Methyl tert butyl ether	1634-04-4	0.1	100	0.1	ND		0.0025	0.00026	ND		0.002	0.0002	ND		0.0028	0.00028	ND		0.0028	0.00028	ND		0.16	0.016	ND		0.0024	0.00024	ND		0.14	0.015	ND		0.13	0.013	ND		0.002	0.0002	ND		0.0019	0.00019	ND		0.0023	0.00023
Methylene chloride	75-09-2	0.05	81	0.05	ND		0.0064	0.0029	ND		0.005	0.0023	ND		0.0069	0.0032	ND		0.007	0.0032	ND		**0.4**	**0.18**	ND		0.0059	0.0027	ND		**0.36**	**0.17**	ND		**0.33**	**0.15**	ND		0.0049	0.0022	ND		0.0048	0.0022	ND		0.0057	0.0026
n-Butylbenzene	104-51-8	18	100	18	ND		0.0013	0.00021	ND		0.001	0.00017	ND		0.0014	0.00023	ND		0.0014	0.00023	ND		0.08	0.013	ND		0.0012	0.0002	0.82		0.073	0.012	5.6		0.066	0.011	ND		0.00098	0.00016	ND		0.00095	0.00016	0.06		0.0011	0.00019
n-Propylbenzene	103-65-1	5	100	5	ND		0.0013	0.00022	ND		0.001	0.00017	ND		0.0014	0.00024	ND		0.0014	0.00024	ND		0.08	0.014	ND		0.0012	0.0002	0.46		0.073	0.012	4		0.066	0.011	ND		0.00098	0.00017	ND		0.00095	0.00016	0.06		0.0011	0.0002
Naphthalene	91-20-3	12	100	12	ND		0.0051	0.00083	ND		0.004	0.00065	0.0025	J	0.0055	0.0009	0.0086		0.0056	0.00091	0.38		0.32	0.052	ND		0.0047	0.00076	0.38		0.29	0.047	0.41		0.26	0.042	ND		0.0039	0.00064	ND		0.0038	0.00062	0.0091		0.0046	0.00074
o-Chlorotoluene	95-49-8	NS	NS	NS	ND		0.0025	0.00024	ND		0.002	0.00019	ND		0.0028	0.00026	ND		0.0028	0.00027	ND		0.16	0.015	ND		0.0024	0.00022	ND		0.14	0.014	ND		0.13	0.012	ND		0.002	0.00019	ND		0.0019	0.00018	ND		0.0023	0.00022
o-Xylene	95-47-6	NS	NS	NS	ND		0.0013	0.00037	ND		0.001	0.00029	ND		0.0014	0.0004	ND		0.0014	0.00041	ND		0.08	0.023	ND		0.0012	0.00034	ND		0.073	0.021	0.038	J	0.066	0.019	ND		0.00098	0.00029	ND		0.00095	0.00028	0.00056	J	0.0011	0.00033
p-Chlorotoluene	106-43-4	NS	NS	NS	ND		0.0025	0.00014	ND		0.002	0.00011	ND		0.0028	0.00015	ND		0.0028	0.00015	ND		0.16	0.0086	ND		0.0024	0.00013	ND		0.14	0.0079	ND		0.13	0.0071	ND		0.002	0.00011	ND		0.0019	0.0001	ND		0.0023	0.00012
p-Diethylbenzene	105-05-5	NS	NS	NS	ND		0.0025	0.00022	ND		0.002	0.00018	0.0011	J	0.0028	0.00024	0.054		0.0028	0.00025	0.24		0.16	0.014	ND		0.0024	0.00021	0.97		0.14	0.013	3.8		0.13	0.012	ND		0.002	0.00017	ND		0.0019	0.00017	0.047		0.0023	0.0002
p-Ethyltoluene	622-96-8	NS	NS	NS	ND		0.0025	0.00049	ND		0.002	0.00038	ND		0.0028	0.00053	ND		0.0028	0.00054	ND		0.16	0.031	ND		0.0024	0.00045	ND		0.14	0.028	ND		0.13	0.025	ND		0.002	0.00038	ND		0.0019	0.00037	ND		0.0023	0.00044
p-Isopropyltoluene	99-87-6	NS	NS	NS	ND		0.0013	0.00014	ND		0.001	0.00011	0.00015	J	0.0014	0.00015	0.0047		0.0014	0.00015	0.018	J	0.08	0.0087	ND		0.0012	0.00013	ND		0.073	0.008	ND		0.066	0.0071	ND		0.00098	0.00011	ND		0.00095	0.0001	0.00015	J	0.0011	0.00012
p/m-Xylene	179601-23-1	NS	NS	NS	ND		0.0025	0.00071	ND		0.002	0.00056	ND		0.0028	0.00078	0.00093	J	0.0028	0.00079	ND		0.16	0.045	ND		0.0024	0.00066	ND		0.14	0.041	ND		0.13	0.037	ND		0.002	0.00055	ND		0.0019	0.00053	ND		0.0023	0.00064
sec-Butylbenzene	135-98-8	25	100	25	ND		0.0013	0.00018	ND		0.001	0.00014	ND		0.0014	0.0002	0.00077	J	0.0014	0.0002	ND		0.08	0.012	ND		0.0012	0.00017	0.82		0.073	0.011	4.2		0.066	0.0096	ND		0.00098	0.00014	ND		0.00095	0.00014	0.046		0.0011	0.00017
Styrene	100-42-5	NS	NS	NS	ND		0.0013	0.00025	ND		0.001	0.0002	ND		0.0014	0.00027	ND		0.0014	0.00028	ND		0.08	0.016	ND		0.0012	0.00023	ND		0.073	0.014	ND		0.066	0.013	ND		0.00098	0.00019	ND		0.00095	0.00019	ND		0.0011	0.00022
tert-Butylbenzene	98-06-6	11	100	11	ND		0.0025	0.00015	ND		0.002	0.00012	ND		0.0028	0.00016	0.0044		0.0028	0.00016	0.014	J	0.16	0.0094	ND		0.0024	0.00014	0.1	J	0.14	0.0086	0.36		0.13	0.0077	ND		0.002	0.00012	ND		0.0019	0.00011	0.0041		0.0023	0.00013
Tetrachloroethene	127-18-4	1.3	18	1.3	0.015		0.00064	0.00025	0.14		0.0005	0.0002	ND		0.00069	0.00027	0.0032		0.0007	0.00028	ND		0.04	0.016	0.0006		0.00059	0.00023	ND		0.036	0.014	ND		0.033	0.013	ND		0.00049	0.00019	ND		0.00048	0.00019	ND		0.00

TABLE 3A

245 West 55th Street
New York, New York

Summary of Volatile Organic Compound Results in Soil

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-2 (EPA 5035 HIGH) L2505323-14 1/30/2025 9.5-10'			SB-3 L2468036-01 11/19/2024 0-0.5'			SB-3 L2468036-02 11/19/2024 1-1.5'			SB-3 L2468036-03 11/19/2024 3-3.5'			SB-3 L2468036-04 11/19/2024 5-5.5'			SB-3 L2468036-05 11/19/2024 7-7.5'			SB-3 L2468036-06 11/19/2024 9-9.5'			SB-4 L2467646-02 11/18/2024 0-0.5'			SB-4 L2468036-42 11/19/2024 1-1.5'			SB-4 L2467646-03 11/18/2024 3-3.5'			SB-4 L2467646-04 11/18/2024 5-5.5'		
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
VOLATILE ORGANICS																																						
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	ND		0.032	0.0086	ND		0.00051	0.00014	ND		0.0005	0.00013	ND		0.00053	0.00014	ND		0.0005	0.00013	ND		0.00053	0.00014	ND		0.00057	0.00015	ND		0.00052	0.00014	ND		0.00051	0.00013	ND		0.0005	0.00013	ND		0.00059	0.00015
1,1,1-Trichloroethane	71-55-6	0.68	100	0.68	ND		0.032	0.011	ND		0.00051	0.00017	ND		0.0005	0.00017	ND		0.00053	0.00018	ND		0.0005	0.00016	ND		0.00053	0.00018	ND		0.00057	0.00019	ND		0.00052	0.00017	ND		0.00051	0.00017	ND		0.0005	0.00017	ND		0.00059	0.0002
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	NS	ND		0.032	0.011	ND		0.00051	0.00017	ND		0.0005	0.00016	ND		0.00053	0.00018	ND		0.0005	0.00016	ND		0.00053	0.00018	ND		0.00057	0.00019	ND		0.00052	0.00017	ND		0.00051	0.00017	ND		0.0005	0.00017	ND		0.00059	0.00019
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	ND		0.065	0.017	ND		0.001	0.00027	ND		0.00099	0.00026	ND		0.001	0.00028	ND		0.00099	0.00026	ND		0.001	0.00028	ND		0.0011	0.0003	ND		0.001	0.00028	ND		0.001	0.00027	ND		0.001	0.00027	ND		0.0012	0.00031
1,1-Dichloroethane	75-34-3	0.27	47	0.27	ND		0.065	0.0094	ND		0.001	0.00015	ND		0.00099	0.00014	ND		0.001	0.00015	ND		0.00099	0.00014	ND		0.001	0.00015	ND		0.0011	0.00017	ND		0.001	0.00015	ND		0.001	0.00015	ND		0.001	0.00015	ND		0.0012	0.00017
1,1-Dichloroethene	75-35-4	0.24	0.98	0.33	ND		0.065	0.016	ND		0.001	0.00024	ND		0.00099	0.00024	ND		0.001	0.00025	ND		0.00099	0.00024	ND		0.001	0.00025	ND		0.0011	0.00027	ND		0.001	0.00024	ND		0.001	0.00024	ND		0.001	0.00024	ND		0.0012	0.00028
1,1-Dichloropropene	563-58-6	NS	NS	NS	ND		0.032	0.01	ND		0.00051	0.00016	ND		0.0005	0.00016	ND		0.00053	0.00017	ND		0.0005	0.00016	ND		0.00053	0.00017	ND		0.00057	0.00018	ND		0.00052	0.00016	ND		0.00051	0.00016	ND		0.0005	0.00016	ND		0.00059	0.00019
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	ND		0.13	0.021	ND		0.002	0.00033	ND		0.002	0.00032	ND		0.0021	0.00034	ND		0.002	0.00032	ND		0.0021	0.00034	ND		0.0023	0.00037	ND		0.0021	0.00033	ND		0.002	0.00033	ND		0.002	0.00032	ND		0.0023	0.00038
1,2,3-Trichloropropane	96-18-4	NS	NS	NS	ND		0.13	0.0083	ND		0.002	0.00013	ND		0.002	0.00013	ND		0.0021	0.00013	ND		0.002	0.00013	ND		0.0021	0.00013	ND		0.0023	0.00014	ND		0.0021	0.00013	ND		0.002	0.00013	ND		0.002	0.00013	ND		0.0023	0.00015
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	1.8		0.13	0.012	ND		0.002	0.0002	ND		0.002	0.00019	ND		0.0021	0.0002	ND		0.002	0.00019	ND		0.0021	0.0002	ND		0.0023	0.00022	ND		0.0021	0.0002	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.0023	0.00022
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.13	0.018	ND		0.002	0.00028	ND		0.002	0.00027	ND		0.0021	0.00029	ND		0.002	0.00027	ND		0.0021	0.00029	ND		0.0023	0.00031	ND		0.0021	0.00028	ND		0.002	0.00028	ND		0.002	0.00027	ND		0.0023	0.00032
1,2,4-Trimethylbenzene	95-63-6	5.9	100	5.9	ND		0.13	0.022	ND		0.002	0.00034	ND		0.002	0.00033	ND		0.0021	0.00035	ND		0.002	0.00033	ND		0.0021	0.00035	ND		0.0023	0.00038	ND		0.0021	0.00034	ND		0.002	0.00034	ND		0.002	0.00034	ND		0.0023	0.00039
1,2-Dibromo-3-chloropropane	96-12-8	NS	NS	NS	ND		0.2	0.065	ND		0.0031	0.001	ND		0.003	0.00099	ND		0.0032	0.001	ND		0.003	0.00099	ND		0.0032	0.001	ND		0.0034	0.0011	ND		0.0031	0.001	ND		0.003	0.001	ND		0.003	0.001	ND		0.0035	0.0012
1,2-Dibromoethane	106-93-4	NS	NS	NS	ND		0.065	0.018	ND		0.001	0.00029	ND		0.00099	0.00028	ND		0.001	0.00029	ND		0.00099	0.00028	ND		0.001	0.0003	ND		0.0011	0.00032	ND		0.001	0.00029	ND		0.001	0.00028	ND		0.001	0.00028	ND		0.0012	0.00033
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.13	0.0094	ND		0.002	0.00015	ND		0.002	0.00014	ND		0.0021	0.00015	ND		0.002	0.00014	ND		0.0021	0.00015	ND		0.0023	0.00016	ND		0.0021	0.00015	ND		0.002	0.00015	ND		0.002	0.00014	ND		0.0023	0.00017
1,2-Dichloroethane	107-06-2	0.02	5.8	0.02	ND		**0.065**	0.017	ND		0.001	0.00026	ND		0.00099	0.00026	ND		0.001	0.00027	ND		0.00099	0.00026	ND		0.001	0.00027	ND		0.0011	0.00029	ND		0.001	0.00026	ND		0.001	0.00026	ND		0.001	0.00026	ND		0.0012	0.0003
1,2-Dichloroethene, Total	540-59-0	NS	NS	NS	ND		0.065	0.0089	ND		0.001	0.00014	ND		0.00099	0.00014	ND		0.001	0.00014	ND		0.00099	0.00014	ND		0.001	0.00014	ND		0.0011	0.00016	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.0012	0.00016
1,2-Dichloropropane	78-87-5	NS	NS	NS	ND		0.065	0.0081	ND		0.001	0.00013	ND		0.00099	0.00012	ND		0.001	0.00013	ND		0.00099	0.00012	ND		0.001	0.00013	ND		0.0011	0.00014	ND		0.001	0.00013	ND		0.001	0.00013	ND		0.001	0.00013	ND		0.0012	0.00015
1,3,5-Trimethylbenzene	108-67-8	3.1	100	3.1	ND		0.13	0.012	ND		0.002	0.0002	ND		0.002	0.00019	ND		0.0021	0.0002	ND		0.002	0.00019	ND		0.0021	0.0002	ND		0.0023	0.00022	ND		0.0021	0.0002	ND		0.002	0.0002	ND		0.002	0.00019	ND		0.0023	0.00023
1,3-Dichlorobenzene	541-73-1	2.6	38	2.6	ND		0.13	0.0096	ND		0.002	0.00015	ND		0.002	0.00015	ND		0.0021	0.00016	ND		0.002	0.00015	ND		0.0021	0.00016	ND		0.0023	0.00017	ND		0.0021	0.00015	ND		0.002	0.00015	ND		0.002	0.00015	ND		0.0023	0.00017
1,3-Dichloropropane	142-28-9	NS	NS	NS	ND		0.13	0.011	ND		0.002	0.00017	ND		0.002	0.00017	ND		0.0021	0.00018	ND		0.002	0.00016	ND		0.0021	0.00018	ND		0.0023	0.00019	ND		0.0021	0.00017	ND		0.002	0.00017	ND		0.002	0.00017	ND		0.0023	0.0002
1,3-Dichloropropene, Total	542-75-6	NS	NS	NS	ND		0.032	0.01	ND		0.00051	0.00016	ND		0.0005	0.00016	ND		0.00053	0.00017	ND		0.0005	0.00016	ND		0.00053	0.00017	ND		0.00057	0.00018	ND		0.00052	0.00016	ND		0.00051	0.00016	ND		0.0005	0.00016	ND		0.00059	0.00018
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.13	0.011	ND		0.002	0.00018	ND		0.002	0.00017	ND		0.0021	0.00018	ND		0.002	0.00017	ND		0.0021	0.00018	ND		0.0023	0.0002	ND		0.0021	0.00018	ND		0.002	0.00017	ND		0.002	0.00017	ND		0.0023	0.0002
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		**5.2**	**2.3**	ND		0.082	0.036	ND		0.08	0.035	ND		0.084	0.037	ND		0.079	0.035	ND		0.085	0.037	ND		0.092	0.04	ND		0.082	0.036	ND		0.082	0.036	ND		0.081	0.035	ND		0.094	0.041
2,2-Dichloropropane	594-20-7	NS	NS	NS	ND		0.13	0.013	ND		0.002	0.00021	ND		0.002	0.0002	ND		0.0021	0.00021	ND		0.002	0.0002	ND		0.0021	0.00021	ND		0.0023	0.00023	ND		0.0021	0.00021	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.0023	0.00024
2-Butanone	78-93-3	0.1	100	0.1	ND		**0.65**	**0.14**	ND		0.01	0.0023	ND		0.0099	0.0022	ND		0.01	0.0023	ND		0.0099	0.0022	ND		0.01	0.0023	ND		0.011	0.0025	ND		0.01	0.0023	ND		0.01	0.0023	ND		0.01	0.0022	ND		0.01	0.0022	ND		0.012	0.0026
2-Hexanone	591-78-6	NS	NS	NS	ND		0.65	0.077	ND		0.01	0.0012	ND		0.0099	0.0012	ND		0.01	0.0012	ND		0.0099	0.0012	ND		0.01	0.0012	ND		0.011	0.0014	ND		0.01	0.0012	ND		0.01	0.0012	ND		0.01	0.0012	ND		0.012	0.0014
4-Methyl-2-pentanone	108-10-1	NS	NS	NS	ND		0.65	0.083	ND		0.01	0.0013	ND		0.0099	0.0013	ND		0.01	0.0014	ND		0.0099	0.0013	ND		0.01	0.0014	ND		0.011	0.0015	ND		0.01	0.0013	ND		0.01	0.0013	ND		0.01	0.0013	ND		0.012	0.0015
Acetone	67-64-1	0.03	100	0.03	ND		**0.65**	**0.31**	ND		0.01	0.0049	ND		0.0099	0.0048	ND		0.01	0.0051	ND		0.0099	0.0048	ND		0.01	0.0051	ND		0.011	0.0055	ND		0.01	0.005	ND		0.01	0.0049	ND		0.01	0.0048	ND		0.012	0.0056
Acrylonitrile	107-13-1	NS	NS	NS	ND		0.26	0.075	ND		0.0041	0.0012	ND		0.004	0.0011	ND		0.0042	0.0012	ND		0.004	0.0011	ND		0.0042	0.0012	ND		0.0046	0.0013	ND		0.0041	0.0012	ND		0.0041	0.0012	ND		0.004	0.0012	ND		0.0047	0.0013
Benzene	71-43-2	0.06	3.7	0.06	ND		0.032	0.011	ND		0.00051	0.00017	ND		0.0005	0.00016	ND		0.00053	0.00018	ND		0.0005	0.00016	ND		0.00053	0.00018	ND		0.00057	0.00019	ND		0.00052	0.00017	ND		0.00051	0.00017	ND		0.0005	0.00017	ND		0.00059	0.00019
Bromobenzene	108-86-1	NS	NS	NS	ND		0.13	0.0094	ND		0.002	0.00015	ND		0.002	0.00014	ND		0.0021	0.00015	ND		0.002	0.00014	ND		0.0021	0.00015	ND		0.0023	0.00017	ND		0.0021	0.00015	ND		0.002	0.00015	ND		0.002	0.00015	ND		0.0023	0.00017
Bromochloromethane	74-97-5	NS	NS	NS	ND		0.13	0.013	ND		0.002	0.00021	ND		0.002	0.0002	ND		0.0021	0.00022	ND		0.002	0.0002	ND		0.0021	0.00022	ND		0.0023	0.00023	ND		0.0021	0.00021	ND		0.002	0.00021	ND		0.002	0.00021	ND		0.0023	0.00024
Bromodichloromethane	75-27-4	NS	NS	NS	ND		0.032	0.0071	ND		0.00051	0.00011	ND		0.0005	0.00011	ND		0.00053	0.00012	ND		0.0005	0.00011	ND		0.00053	0.00012	ND		0.00057	0.00012	ND		0.00052	0.00011	ND		0.00051	0.00011	ND		0.0005	0.00011	ND		0.00059	0.00013
Bromoform	75-25-2	NS	NS	NS	ND		0.26	0.016	ND		0.0041	0.00025	ND		0.004	0.00024	ND		0.0042	0.00026	ND		0.004	0.00024	ND		0.0042	0.00026	ND		0.0046	0.00028	ND		0.0041	0.00025	ND		0.0041	0.00025	ND		0.004	0.00025	ND		0.0047	0.00029
Bromomethane	74-83-9	NS	NS	NS	ND		0.13	0.038	ND		0.002	0.0006	ND		0.002	0.00058	ND		0.0021	0.00061	ND		0.002	0.00058	ND		0.0021	0.00061	ND		0.0023	0.00066	ND		0.0021	0.0006	ND		0.002	0.00059	ND		0.002	0.00059	ND		0.0023	0.00068
Carbon disulfide	75-15-0	NS	NS	NS	ND		0.65	0.3	ND		0.01	0.0047	ND		0.0099	0.0045	ND		0.01	0.0048	ND		0.0099	0.0045	ND		0.01	0.0048	ND		0.011	0.0052	ND		0.01	0.0047	ND		0.01	0.0046	ND		0.01	0.0046	ND		0.012	0.0053
Carbon tetrachloride	56-23-5	0.76	7.1	0.76	ND		0.065	0.015	ND		0.001	0.00024	ND		0.00099	0.00023	ND		0.001	0.00024	ND		0.00099	0.00023	ND		0.001	0.00024	ND		0.0011	0.00026	ND		0.001	0.00024	ND		0.001	0.00023	ND		0.001	0.00023	ND		0.0012	0.00027
Chlorobenzene	108-90-7	4.5	100	4.5	ND		0.032	0.0083	ND		0.00051	0.00013	ND		0.0005	0.00013	ND		0.00053	0.00013	ND		0.0005	0.00013	ND		0.00053	0.00013	ND		0.00057	0.00014	ND		0.00052	0.00013	ND		0.00051	0.00013	ND		0.0005	0.00013	ND		0.00059	0.00015
Chloroethane	75-00-3	NS	NS	NS	ND		0.13	0.029	ND		0.002	0.00046	ND		0.002	0.00045	ND		0.0021	0.00048	ND		0.002	0.00045	ND		0.0021	0.00048	ND		0.0023	0.00052	ND		0.0021	0.00047	ND		0.002	0.00046	ND		0.002	0.00046	ND		0.0023	0.00053
Chloroform	67-66-3	0.37	24	0.37	ND		0.098	0.0091	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0016	0.00015	ND		0.0015	0.00014	ND		0.0016	0.00015	ND		0.0017	0.00016	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0018	0.00016
Chloromethane	74-87-3	NS	NS	NS	ND		0.26	0.061	ND		0.0041	0.00096	ND		0.004	0.00093	ND		0.0042	0.00098	ND		0.004	0.00092	ND		0.0042	0.00099	ND		0.0046	0.0011	ND		0.0041	0.00096	ND		0.0041	0.00095	ND		0.004	0.00094	ND		0.0047	0.0011
cis-1,2-Dichloroethene	156-59-2	0.19	41	0.19	ND		0.065	0.011	ND		0.001	0.00018	ND		0.00099	0.00017	ND		0.001	0.00018	ND		0.00099	0.00017	ND		0.001	0.00018	ND		0.0011	0.0002	ND		0.001	0.00018	ND		0.001	0.00018	ND		0.001	0.00018	ND		0.0012	0.0002
cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	ND		0.032	0.01	ND		0.00051	0.00016	ND		0.0005	0.00016	ND		0.00053	0.00017	ND		0.0005	0.00016	ND		0.00053	0.00017	ND		0.00057	0.00018	ND		0.00052	0.00016	ND		0.00051	0.00016	ND		0.0005	0.00016	ND		0.00059	0.00018
Dibromochloromethane	124-48-1	NS	NS	NS	ND		0.065	0.0091	ND		0.001	0.00014	ND		0.00099	0.00014	ND		0.001	0.00015	ND		0.00099	0.00014	ND		0.001	0.00015	ND		0.0011	0.00016	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.0012	0.00016
Dibromomethane	74-95-3	NS	NS	NS	ND		0.13	0.016	ND		0.002	0.00024	ND		0.002	0.00024	ND		0.0021	0.00025	ND		0.002	0.00024	ND		0.0021	0.00025	ND		0.0023	0.00027	ND		0.0021	0.00024	ND		0.002	0.00024	ND		0.002	0.00024	ND		0.0023	0.00028
Dichlorodifluoromethane	75-71-8	NS	NS	NS	ND		0.65	0.06	ND		0.01	0.00094	ND		0.0099	0.00091	ND		0.01	0.00097	ND		0.0099	0.00091	ND		0.01	0.00097	ND		0.011	0.001	ND		0.01	0.00094	ND		0.01	0.00093	ND		0.01	0.00092	ND		0.012	0.0011
Ethyl ether	60-29-7	NS	NS	NS	ND		0.13	0.022	ND		0.002	0.00035	ND		0.002	0.00034	ND		0.0021	0.00036	ND		0.002	0.00034	ND		0.0021	0.00036	ND		0.0023	0.00039	ND		0.0021	0.00035	ND		0.002	0.00035	ND		0.002	0.00034	ND		0.0023	0.0004
Ethylbenzene	100-41-4	1	76	1	ND		0.065	0.0092	ND		0.001	0.00014	ND		0.00099	0.00014	ND		0.001	0.00015	ND		0.00099	0.00014	ND		0.001	0.00015	ND		0.0011	0.00016	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.0012	0.00016
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.26	0.011	ND		0.0041	0.00017	ND		0.004	0.00017	ND		0.0042	0.00018	ND		0.004	0.00017	ND		0.0042	0.00018	ND		0.0046	0.00019	ND		0.0041	0.00017	ND		0.0041	0.00017	ND		0.004	0.00017	ND		0.0047	0.0002
Isopropylbenzene	98-82-8	NS	NS	NS	0.15		0.065	0.0071	ND		0.001	0.00011	ND		0.00099	0.00011	ND		0.001	0.00012	ND		0.00099	0.00011	ND		0.001	0.00012	ND		0.0011	0.00012	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.0012	0.00013
Methyl tert butyl ether	1634-04-4	0.1	100	0.1	ND		0.13	0.013	ND		0.002	0.00021	ND		0.002	0.0002	ND		0.0021	0.00021	ND		0.002	0.0002	ND		0.0021	0.00021	ND		0.0023	0.00023	ND		0.0021	0.00021	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.0023	0.00024
Methylene chloride	75-09-2	0.05	81	0.05	ND		**0.32**	**0.15**	ND		0.0051	0.0023	ND		0.005	0.0023	ND		0.0053	0.0024	ND		0.005	0.0023	ND		0.0053	0.0024	ND		0.0057	0.0026	ND		0.0052	0.0024	ND		0.0051	0.0023	ND		0.005	0.0023	ND		0.0059	0.0027
n-Butylbenzene	104-51-8	18	100	18	0.52		0.065	0.011	ND		0.001	0.00017	ND		0.00099	0.00017	ND		0.001	0.00018	ND		0.00099	0.00016	ND		0.001	0.00018	ND		0.0011	0.00019	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.0012	0.0002
n-Propylbenzene	103-65-1	5	100	5	0.42		0.065	0.011	ND		0.001	0.00018	ND		0.00099	0.00017	ND		0.001	0.00018	ND		0.00099	0.00017	ND		0.001	0.00018	ND		0.0011	0.0002	ND		0.001	0.00018	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.0012	0.0002
Naphthalene	91-20-3	12	100	12	0.2	J	0.26	0.042	ND		0.0041	0.00067	ND		0.004	0.00065	ND		0.0042	0.00069	ND		0.004	0.00064	ND		0.0042	0.00069	ND		0.0046	0.00074	ND		0.0041	0.00067	ND		0.0041	0.00066	ND		0.004	0.00066	ND		0.0047	0.00076
o-Chlorotoluene	95-49-8	NS	NS	NS	ND		0.13	0.012	ND		0.002	0.0002	ND		0.002	0.00019	ND		0.0021	0.0002	ND		0.002	0.00019	ND		0.0021	0.0002	ND		0.0023	0.00022	ND		0.0021	0.0002	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.0023	0.00022
o-Xylene	95-47-6	NS	NS	NS	ND		0.065	0.019	ND		0.001	0.0003	ND		0.00099	0.00029	ND		0.001	0.00031	ND		0.00099	0.00029	ND		0.001	0.00031	ND		0.0011	0.00033	ND		0.001	0.0003	ND		0.001	0.0003	ND		0.001	0.00029	ND		0.001	0.00029	ND		0.0012	0.00034
p-Chlorotoluene	106-43-4	NS	NS	NS	ND		0.13	0.007	ND		0.002	0.00011	ND		0.002	0.00011	ND		0.0021	0.00011	ND		0.002	0.00011	ND		0.0021	0.00011	ND		0.0023	0.00012	ND		0.0021	0.00011	ND		0.002	0.00011	ND		0.002	0.00011	ND		0.002	0.00011	ND		0.0023	0.00013
p-Diethylbenzene	105-05-5	NS	NS	NS	0.36		0.13	0.012	ND		0.002	0.00018	ND		0.002	0.00018	ND		0.0021	0.00019	ND		0.002	0.00018	ND		0.0021	0.00019	ND		0.0023	0.0002	ND		0.0021	0.00018	ND		0.002	0.00018	ND		0.002	0.00018	ND		0.002	0.00018	ND		0.0023	0.00021
p-Ethyltoluene	622-96-8	NS	NS	NS	ND		0.13	0.025	ND		0.002	0.00039	ND		0.002	0.00038	ND		0.0021	0.0004	ND		0.002	0.00038	ND		0.0021	0.00041	ND		0.0023	0.00044	ND		0.0021	0.0004	ND		0.002	0.00039	ND		0.002	0.00039	ND		0.002	0.00039	ND		0.0023	0.00045
p-Isopropyltoluene	99-87-6	NS	NS	NS	ND		0.065	0.0071	ND		0.001	0.00011	ND		0.00099	0.00011	ND		0.001	0.00012	ND		0.00099	0.00011	ND		0.001	0.00012	ND		0.0011	0.00012	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.0012	0.00013
p/m-Xylene	179601-23-1	NS	NS	NS	ND		0.13	0.036	ND		0.002	0.00057	ND		0.002	0.00056	ND		0.0021	0.00059	ND		0.002	0.00056	ND		0.0021	0.00059	ND		0.0023	0.00064	ND		0.0021	0.00058	ND		0.002	0.00057	ND		0.002	0.00056	ND		0.002	0.00056	ND		0.0023	0.00066
sec-Butylbenzene	135-98-8	25	100	25	0.38		0.065	0.0095	ND		0.001	0.00015	ND		0.00099	0.00014	ND		0.001	0.00015	ND		0.00099	0.00014	ND		0.001	0.00015	ND		0.0011	0.00017	ND		0.001	0.00015	ND		0.001	0.00015	ND		0.001	0.00015	ND		0.001	0.00015	ND		0.0012	0.00017
Styrene	100-42-5	NS	NS	NS	ND		0.065	0.013	ND		0.001	0.0002	ND		0.00099	0.00019	ND		0.001	0.00021	ND		0.00099	0.00019	ND		0.001	0.00021	ND		0.0011	0.00022	ND		0.001	0.0002	ND		0.001	0.0002	ND		0.001	0.0002	ND		0.001	0.0002	ND		0.0012	0.00023
tert-Butylbenzene	98-06-6	11	100	11	0.03	J	0.13	0.0077	ND		0.002	0.00012	ND		0.002	0.00012	ND		0.0021	0.00012	ND		0.002	0.00012	ND		0.0021	0.00012	ND		0.0023	0.00014	ND		0.0021	0.00012	ND		0.002	0.00012	ND		0.002	0.00012	ND		0.002	0.00012	ND		0.0023	0.00014
Tetrachloroethene	127-18-4	1.3	18	1.3	ND		0.032	0.013	ND		0.00051	0.0002	0.00021	J	0.0005	0.00019	0

TABLE 3A

245 West 55th Street
New York, New York

Summary of Volatile Organic Compound Results in Soil

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-4 L2467646-05 11/18/2024 7-7.5'				SB-5 L2467646-10 11/18/2024 0-0.5'				SB-5 L2468036-43 11/19/2024 1-1.5'				SB-5 L2467646-11 11/18/2024 3-3.5'				SB-5 L2467646-12 11/18/2024 5-5.5'				SB-5 L2467646-13 11/18/2024 7-7.5'				DUP-1 (SB-5) L2467646-18 11/18/2024 7-7.5'				SB-6 L2468036-12 11/19/2024 0-0.5'				SB-6 L2468036-13 11/19/2024 1-1.5'				SB-6 L2468036-14 11/19/2024 3-3.5'				SB-6 L2468036-15 11/19/2024 5-5.5'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
VOLATILE ORGANICS																																														
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	ND		0.00056	0.00015	ND		0.0004	0.00011	ND		0.00052	0.00014	ND		0.00042	0.00011	ND		0.00068	0.00018	ND		0.00059	0.00016	ND		0.00064	0.00017	ND		0.00053	0.00014	ND		0.00052	0.00014	ND		0.00065	0.00017	ND		0.00046	0.00012
1,1,1-Trichloroethane	71-55-6	0.68	100	0.68	ND		0.00056	0.00018	0.00034	J	0.0004	0.00013	ND		0.00052	0.00017	ND		0.00042	0.00014	ND		0.00068	0.00022	ND		0.00059	0.0002	ND		0.00064	0.00021	0.0025		0.00053	0.00018	0.0012		0.00052	0.00017	0.00056	J	0.00065	0.00022	0.0092		0.00046	0.00016
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	NS	ND		0.00056	0.00018	ND		0.0004	0.00013	ND		0.00052	0.00017	ND		0.00042	0.00014	ND		0.00068	0.00022	ND		0.00059	0.0002	ND		0.00064	0.00021	ND		0.00053	0.00018	ND		0.00052	0.00017	ND		0.00065	0.00021	ND		0.00046	0.00015
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	ND		0.0011	0.0003	ND		0.00081	0.00022	ND		0.001	0.00028	ND		0.00084	0.00022	ND		0.0014	0.00036	ND		0.0012	0.00032	ND		0.0013	0.00034	ND		0.0011	0.00028	ND		0.001	0.00028	ND		0.0013	0.00034	ND		0.00093	0.00025
1,1-Dichloroethane	75-34-3	0.27	47	0.27	ND		0.0011	0.00016	ND		0.00081	0.00012	ND		0.001	0.00015	ND		0.00084	0.00012	ND		0.0014	0.0002	ND		0.0012	0.00017	ND		0.0013	0.00018	0.00035	J	0.0011	0.00015	0.00022	J	0.001	0.00015	ND		0.0013	0.00019	0.0011		0.00093	0.00013
1,1-Dichloroethene	75-35-4	0.24	0.98	0.33	ND		0.0011	0.00026	ND		0.00081	0.00019	ND		0.001	0.00025	ND		0.00084	0.0002	ND		0.0014	0.00032	ND		0.0012	0.00028	ND		0.0013	0.0003	ND		0.0011	0.00025	ND		0.001	0.00025	ND		0.0013	0.00031	ND		0.00093	0.00022
1,1-Dichloropropene	563-58-6	NS	NS	NS	ND		0.00056	0.00018	ND		0.0004	0.00013	ND		0.00052	0.00016	ND		0.00042	0.00013	ND		0.00068	0.00022	ND		0.00059	0.00019	ND		0.00064	0.0002	ND		0.00053	0.00017	ND		0.00052	0.00017	ND		0.00065	0.0002	ND		0.00046	0.00015
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	ND		0.0022	0.00036	ND		0.0016	0.00026	ND		0.0021	0.00033	ND		0.0017	0.00027	ND		0.0027	0.00044	ND		0.0024	0.00038	ND		0.0026	0.00041	ND		0.0021	0.00034	ND		0.0021	0.00034	ND		0.0026	0.00042	ND		0.0018	0.0003
1,2,3-Trichloropropane	96-18-4	NS	NS	NS	ND		0.0022	0.00014	ND		0.0016	0.0001	ND		0.0021	0.00013	ND		0.0017	0.00011	ND		0.0027	0.00017	ND		0.0024	0.00015	ND		0.0026	0.00016	ND		0.0021	0.00014	ND		0.0021	0.00013	ND		0.0026	0.00016	ND		0.0018	0.00012
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	ND		0.0022	0.00021	ND		0.0016	0.00015	ND		0.0021	0.0002	ND		0.0017	0.00016	ND		0.0027	0.00026	ND		0.0024	0.00022	ND		0.0026	0.00024	ND		0.0021	0.0002	ND		0.0021	0.0002	ND		0.0026	0.00025	ND		0.0018	0.00018
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.0022	0.0003	ND		0.0016	0.00022	ND		0.0021	0.00028	ND		0.0017	0.00023	ND		0.0027	0.00037	ND		0.0024	0.00032	ND		0.0026	0.00035	ND		0.0021	0.00029	ND		0.0021	0.00028	ND		0.0026	0.00035	ND		0.0018	0.00025
1,2,4-Trimethylbenzene	95-63-6	5.9	100	5.9	ND		0.0022	0.00037	ND		0.0016	0.00027	ND		0.0021	0.00034	ND		0.0017	0.00028	ND		0.0027	0.00045	ND		0.0024	0.00039	ND		0.0026	0.00043	ND		0.0021	0.00036	ND		0.0021	0.00035	ND		0.0026	0.00043	ND		0.0018	0.00031
1,2-Dibromo-3-chloropropane	96-12-8	NS	NS	NS	ND		0.0033	0.0011	ND		0.0024	0.0008	ND		0.0031	0.001	ND		0.0025	0.00084	ND		0.004	0.0014	ND		0.0035	0.0012	ND		0.0038	0.0013	ND		0.0032	0.0011	ND		0.0031	0.001	ND		0.0039	0.0013	ND		0.0028	0.00093
1,2-Dibromoethane	106-93-4	NS	NS	NS	ND		0.0011	0.00031	ND		0.00081	0.00022	ND		0.001	0.00029	ND		0.00084	0.00024	ND		0.0014	0.00038	ND		0.0012	0.00033	ND		0.0013	0.00036	ND		0.0011	0.0003	ND		0.001	0.00029	ND		0.0013	0.00036	ND		0.00093	0.00026
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.0022	0.00016	ND		0.0016	0.00012	ND		0.0021	0.00015	ND		0.0017	0.00012	ND		0.0027	0.00019	ND		0.0024	0.00017	ND		0.0026	0.00018	ND		0.0021	0.00015	ND		0.0021	0.00015	ND		0.0026	0.00019	ND		0.0018	0.00013
1,2-Dichloroethane	107-06-2	0.02	5.8	0.02	ND		0.0011	0.00028	ND		0.00081	0.00021	ND		0.001	0.00026	ND		0.00084	0.00022	ND		0.0014	0.00035	ND		0.0012	0.0003	ND		0.0013	0.00033	ND		0.0011	0.00027	ND		0.001	0.00027	ND		0.0013	0.00033	ND		0.00093	0.00024
1,2-Dichloroethene, Total	540-59-0	NS	NS	NS	ND		0.0011	0.00015	ND		0.00081	0.00011	ND		0.001	0.00014	ND		0.00084	0.00012	ND		0.0014	0.00018	ND		0.0012	0.00016	ND		0.0013	0.00017	0.034	J	0.0011	0.00015	0.022	J	0.001	0.00014	0.009		0.0013	0.00018	0.044	J	0.00093	0.00013
1,2-Dichloropropane	78-87-5	NS	NS	NS	ND		0.0011	0.00014	ND		0.00081	0.0001	ND		0.001	0.00013	ND		0.00084	0.0001	ND		0.0014	0.00017	ND		0.0012	0.00015	ND		0.0013	0.00016	ND		0.0011	0.00013	ND		0.001	0.00013	ND		0.0013	0.00016	ND		0.00093	0.00012
1,3,5-Trimethylbenzene	108-67-8	3.1	100	3.1	ND		0.0022	0.00021	ND		0.0016	0.00016	ND		0.0021	0.0002	ND		0.0017	0.00016	ND		0.0027	0.00026	ND		0.0024	0.00023	ND		0.0026	0.00025	ND		0.0021	0.0002	ND		0.0021	0.0002	ND		0.0026	0.00025	ND		0.0018	0.00018
1,3-Dichlorobenzene	541-73-1	2.6	38	2.6	ND		0.0022	0.00016	ND		0.0016	0.00012	ND		0.0021	0.00015	ND		0.0017	0.00012	ND		0.0027	0.0002	ND		0.0024	0.00017	ND		0.0026	0.00019	ND		0.0021	0.00016	ND		0.0021	0.00015	ND		0.0026	0.00019	ND		0.0018	0.00014
1,3-Dichloropropane	142-28-9	NS	NS	NS	ND		0.0022	0.00018	ND		0.0016	0.00013	ND		0.0021	0.00017	ND		0.0017	0.00014	ND		0.0027	0.00022	ND		0.0024	0.0002	ND		0.0026	0.00021	ND		0.0021	0.00018	ND		0.0021	0.00017	ND		0.0026	0.00022	ND		0.0018	0.00016
1,3-Dichloropropene, Total	542-75-6	NS	NS	NS	ND		0.00056	0.00018	ND		0.0004	0.00013	ND		0.00052	0.00016	ND		0.00042	0.00013	ND		0.00068	0.00021	ND		0.00059	0.00019	ND		0.00064	0.0002	ND		0.00053	0.00017	ND		0.00052	0.00016	ND		0.00065	0.0002	ND		0.00046	0.00015
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.0022	0.00019	ND		0.0016	0.00014	ND		0.0021	0.00018	ND		0.0017	0.00014	ND		0.0027	0.00023	ND		0.0024	0.0002	ND		0.0026	0.00022	ND		0.0021	0.00018	ND		0.0021	0.00018	ND		0.0026	0.00022	ND		0.0018	0.00016
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.089	0.039	ND		0.064	0.028	ND		0.083	0.036	ND		0.067	0.03	ND		**0.11**	0.047	ND		0.094	0.041	ND		0.1	0.045	ND		0.085	0.037	ND		0.084	0.037	ND		**0.10**	0.045	ND		0.074	0.032
2,2-Dichloropropane	594-20-7	NS	NS	NS	ND		0.0022	0.00022	ND		0.0016	0.00016	ND		0.0021	0.00021	ND		0.0017	0.00017	ND		0.0027	0.00027	ND		0.0024	0.00024	ND		0.0026	0.00026	ND		0.0021	0.00022	ND		0.0021	0.00021	ND		0.0026	0.00026	ND		0.0018	0.00019
2-Butanone	78-93-3	0.1	100	0.1	ND		0.011	0.0025	ND		0.0081	0.0018	ND		0.01	0.0023	ND		0.0084	0.0019	ND		0.014	0.003	ND		0.012	0.0026	ND		0.013	0.0028	ND		0.011	0.0024	ND		0.01	0.0023	ND		0.013	0.0029	ND		0.0093	0.0021
2-Hexanone	591-78-6	NS	NS	NS	ND		0.011	0.0013	ND		0.0081	0.00095	ND		0.01	0.0012	ND		0.0084	0.00099	ND		0.014	0.0016	ND		0.012	0.0014	ND		0.013	0.0015	ND		0.011	0.0012	ND		0.01	0.0012	ND		0.013	0.0015	ND		0.0093	0.0011
4-Methyl-2-pentanone	108-10-1	NS	NS	NS	ND		0.011	0.0014	ND		0.0081	0.001	ND		0.01	0.0013	ND		0.0084	0.0011	ND		0.014	0.0017	ND		0.012	0.0015	ND		0.013	0.0016	ND		0.011	0.0014	ND		0.01	0.0013	ND		0.013	0.0016	ND		0.0093	0.0012
Acetone	67-64-1	0.03	100	0.03	ND		0.011	0.0053	ND		0.0081	0.0039	ND		0.01	0.005	ND		0.0084	0.004	ND		0.014	0.0065	ND		0.012	0.0057	ND		0.013	0.0061	ND		0.011	0.0051	ND		0.01	0.005	ND		0.013	0.0062	0.0054	J	0.0093	0.0045
Acrylonitrile	107-13-1	NS	NS	NS	ND		0.0044	0.0013	ND		0.0032	0.00093	ND		0.0041	0.0012	ND		0.0034	0.00097	ND		0.0054	0.0016	ND		0.0047	0.0014	ND		0.0051	0.0015	ND		0.0043	0.0012	ND		0.0042	0.0012	ND		0.0052	0.0015	ND		0.0037	0.0011
Benzene	71-43-2	0.06	3.7	0.06	ND		0.00056	0.00018	ND		0.0004	0.00013	ND		0.00052	0.00017	ND		0.00042	0.00014	ND		0.00068	0.00022	ND		0.00059	0.0002	ND		0.00064	0.00021	ND		0.00053	0.00018	ND		0.00052	0.00017	ND		0.00065	0.00021	ND		0.00046	0.00015
Bromobenzene	108-86-1	NS	NS	NS	ND		0.0022	0.00016	ND		0.0016	0.00012	ND		0.0021	0.00015	ND		0.0017	0.00012	ND		0.0027	0.0002	ND		0.0024	0.00017	ND		0.0026	0.00018	ND		0.0021	0.00015	ND		0.0021	0.00015	ND		0.0026	0.00019	ND		0.0018	0.00013
Bromochloromethane	74-97-5	NS	NS	NS	ND		0.0022	0.00023	ND		0.0016	0.00016	ND		0.0021	0.00021	ND		0.0017	0.00017	ND		0.0027	0.00028	ND		0.0024	0.00024	ND		0.0026	0.00026	ND		0.0021	0.00022	ND		0.0021	0.00021	ND		0.0026	0.00026	ND		0.0018	0.00019
Bromodichloromethane	75-27-4	NS	NS	NS	ND		0.00056	0.00012	ND		0.0004	0.00009	ND		0.00052	0.00011	ND		0.00042	0.00009	ND		0.00068	0.00015	ND		0.00059	0.00013	ND		0.00064	0.00014	ND		0.00053	0.00012	ND		0.00052	0.00011	ND		0.00065	0.00014	ND		0.00046	0.0001
Bromoform	75-25-2	NS	NS	NS	ND		0.0044	0.00027	ND		0.0032	0.0002	ND		0.0041	0.00025	ND		0.0034	0.00021	ND		0.0054	0.00033	ND		0.0047	0.00029	ND		0.0051	0.00031	ND		0.0043	0.00026	ND		0.0042	0.00026	ND		0.0052	0.00032	ND		0.0037	0.00023
Bromomethane	74-83-9	NS	NS	NS	ND		0.0022	0.00065	ND		0.0016	0.00047	ND		0.0021	0.0006	ND		0.0017	0.00049	ND		0.0027	0.00079	ND		0.0024	0.00069	ND		0.0026	0.00074	ND		0.0021	0.00062	ND		0.0021	0.00061	ND		0.0026	0.00075	ND		0.0018	0.00054
Carbon disulfide	75-15-0	NS	NS	NS	ND		0.011	0.005	ND		0.0081	0.0037	ND		0.01	0.0047	ND		0.0084	0.0038	ND		0.014	0.0062	ND		0.012	0.0054	ND		0.013	0.0058	ND		0.011	0.0048	ND		0.01	0.0048	ND		0.013	0.0059	ND		0.0093	0.0042
Carbon tetrachloride	56-23-5	0.76	7.1	0.76	ND		0.0011	0.00026	ND		0.00081	0.00018	ND		0.001	0.00024	ND		0.00084	0.00019	ND		0.0014	0.00031	ND		0.0012	0.00027	ND		0.0013	0.00029	ND		0.0011	0.00024	ND		0.001	0.00024	ND		0.0013	0.0003	ND		0.00093	0.00021
Chlorobenzene	108-90-7	4.5	100	4.5	ND		0.00056	0.00014	ND		0.0004	0.0001	ND		0.00052	0.00013	ND		0.00042	0.00011	ND		0.00068	0.00017	ND		0.00059	0.00015	ND		0.00064	0.00016	ND		0.00053	0.00014	ND		0.00052	0.00013	ND		0.00065	0.00016	ND		0.00046	0.00012
Chloroethane	75-00-3	NS	NS	NS	ND		0.0022	0.0005	ND		0.0016	0.00036	ND		0.0021	0.00047	ND		0.0017	0.00038	ND		0.0027	0.00061	ND		0.0024	0.00053	ND		0.0026	0.00058	ND		0.0021	0.00048	ND		0.0021	0.00047	ND		0.0026	0.00058	ND		0.0018	0.00042
Chloroform	67-66-3	0.37	24	0.37	ND		0.0017	0.00016	ND		0.0012	0.00011	ND		0.0016	0.00014	ND		0.0013	0.00012	ND		0.002	0.00019	ND		0.0018	0.00016	ND		0.0019	0.00018	0.00032	J	0.0016	0.00015	0.00022	J	0.0016	0.00015	ND		0.0019	0.00018	0.00063	J	0.0014	0.00013
Chloromethane	74-87-3	NS	NS	NS	ND		0.0044	0.001	ND		0.0032	0.00075	ND		0.0041	0.00096	ND		0.0034	0.00078	ND		0.0054	0.0013	ND		0.0047	0.0011	ND		0.0051	0.0012	ND		0.0043	0.00099	ND		0.0042	0.00098	ND		0.0052	0.0012	ND		0.0037	0.00086
cis-1,2-Dichloroethene	156-59-2	0.19	41	0.19	ND		0.0011	0.00019	ND		0.00081	0.00014	ND		0.001	0.00018	ND		0.00084	0.00015	ND		0.0014	0.00024	ND		0.0012	0.00021	ND		0.0013	0.00022	0.034		0.0011	0.00019	0.022		0.001	0.00018	0.009		0.0013	0.00023	0.044		0.00093	0.00016
cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	ND		0.00056	0.00018	ND		0.0004	0.00013	ND		0.00052	0.00016	ND		0.00042	0.00013	ND		0.00068	0.00021	ND		0.00059	0.00019	ND		0.00064	0.0002	ND		0.00053	0.00017	ND		0.00052	0.00016	ND		0.00065	0.0002	ND		0.00046	0.00015
Dibromochloromethane	124-48-1	NS	NS	NS	ND		0.0011	0.00016	ND		0.00081	0.00011	ND		0.001	0.00014	ND		0.00084	0.00012	ND		0.0014	0.00019	ND		0.0012	0.00016	ND		0.0013	0.00018	ND		0.0011	0.00015	ND		0.001	0.00015	ND		0.0013	0.00018	ND		0.00093	0.00013
Dibromomethane	74-95-3	NS	NS	NS	ND		0.0022	0.00026	ND		0.0016	0.00019	ND		0.0021	0.00025	ND		0.0017	0.0002	ND		0.0027	0.00032	ND		0.0024	0.00028	ND		0.0026	0.0003	ND		0.0021	0.00025	ND		0.0021	0.00025	ND		0.0026	0.00031	ND		0.0018	0.00022
Dichlorodifluoromethane	75-71-8	NS	NS	NS	ND		0.011	0.001	ND		0.0081	0.00074	ND		0.01	0.00095	ND		0.0084	0.00077	ND		0.014	0.0012	ND		0.012	0.0011	ND		0.013	0.0012	ND		0.011	0.00098	ND		0.01	0.00096	ND		0.013	0.0012	ND		0.0093	0.00085
Ethyl ether	60-29-7	NS	NS	NS	ND		0.0022	0.00038	ND		0.0016	0.00027	ND		0.0021	0.00035	ND		0.0017	0.00029	ND		0.0027	0.00046	ND		0.0024	0.0004	ND		0.0026	0.00044	ND		0.0021	0.00036	ND		0.0021	0.00036	ND		0.0026	0.00044	ND		0.0018	0.00032
Ethylbenzene	100-41-4	1	76	1	ND		0.0011	0.00016	ND		0.00081	0.00011	ND		0.001	0.00014	ND		0.00084	0.00012	ND		0.0014	0.00019	ND		0.0012	0.00017	ND		0.0013	0.00018	ND		0.0011	0.00015	ND		0.001	0.00015	ND		0.0013	0.00018	ND		0.00093	0.00013
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.0044	0.00019	ND		0.0032	0.00014	ND		0.0041	0.00017	ND		0.0034	0.00014	ND		0.0054	0.00023	ND		0.0047	0.0002	ND		0.0051	0.00022	ND		0.0043	0.00018	ND		0.0042	0.00018	ND		0.0052	0.00022	ND		0.0037	0.00016
Isopropylbenzene	98-82-8	NS	NS	NS	ND		0.0011	0.00012	ND		0.00081	0.00009	ND		0.001	0.00011	ND		0.00084	0.00009	ND		0.0014	0.00015	ND		0.0012	0.00013	ND		0.0013	0.00014	ND		0.0011	0.00012	ND		0.001	0.00011	ND		0.0013	0.00014	ND		0.00093	0.0001
Methyl tert butyl ether	1634-04-4	0.1	100	0.1	ND		0.0022	0.00022	ND		0.0016	0.00016	ND		0.0021	0.00021	ND		0.0017	0.00017	ND		0.0027	0.00027	ND		0.0024	0.00024	ND		0.0026	0.00026	ND		0.0021	0.00021	ND		0.0021	0.00021	ND		0.0026	0.00026	ND		0.0018	0.00019
Methylene chloride	75-09-2	0.05	81	0.05	ND		0.0056	0.0025	ND		0.004	0.0018	ND		0.0052	0.0024	ND		0.0042	0.0019	ND		0.0068	0.0031	ND		0.0059	0.0027	ND		0.0064	0.0029	ND		0.0053	0.0024	ND		0.0052	0.0024	ND		0.0065	0.003	ND		0.0046	0.0021
n-Butylbenzene	104-51-8	18	100	18	ND		0.0011	0.00018	ND		0.00081	0.00013	ND		0.001	0.00017	ND		0.00084	0.00014	ND		0.0014	0.00022	ND		0.0012	0.0002	ND		0.0013	0.00021	ND		0.0011	0.00018	ND		0.001	0.00017	ND		0.0013	0.00022	ND		0.00093	0.00016
n-Propylbenzene	103-65-1	5	100	5	ND		0.0011	0.00019	ND		0.00081	0.00014	ND		0.001	0.00018	ND		0.00084	0.00014	ND		0.0014	0.00023	ND		0.0012	0.0002	ND		0.0013	0.00022	ND		0.0011	0.00018	ND		0.001	0.00018	ND		0.0013	0.00022	ND		0.00093	0.00016
Naphthalene	91-20-3	12	100	12	ND		0.0044	0.00072	ND		0.0032	0.00052	ND		0.0041	0.00067	ND		0.0034	0.00055	ND		0.0054	0.00088	ND		0.0047	0.00077	ND		0.0051	0.00083	ND		0.0043	0.00069	ND		0.0042	0.00068	ND		0.0052	0.00084	ND		0.0037	0.0006
o-Chlorotoluene	95-49-8	NS	NS	NS	ND		0.0022	0.00021	ND		0.0016	0.00015	ND		0.0021	0.0002	ND		0.0017	0.00016	ND		0.0027	0.00026	ND		0.0024	0.00022	ND		0.0026	0.00024	ND		0.0021	0.0002	ND		0.0021	0.0002	ND		0.0026	0.00025	ND		0.0018	0.00018
o-Xylene	95-47-6	NS	NS	NS	ND		0.0011	0.00032	ND		0.00081	0.00023	ND		0.001	0.0003	ND		0.00084	0.00024	ND		0.0014	0.00039	ND		0.0012	0.00034	ND		0.0013	0.00037	ND		0.0011	0.00031	ND		0.001	0.0003	ND		0.0013	0.00038	ND		0.00093	0.00027
p-Chlorotoluene	106-43-4	NS	NS	NS	ND		0.0022	0.00012	ND		0.0016	0.00009	ND		0.0021	0.00011	ND		0.0017	0.00009	ND		0.0027	0.00015	ND		0.0024	0.00013	ND		0.0026	0.00014	ND		0.0021	0.00012	ND		0.0021	0.00011	ND		0.0026	0.00014	ND		0.0018	0.0001
p-Diethylbenzene	105-05-5	NS	NS	NS	ND		0.0022	0.0002	ND		0.0016	0.00014	ND		0.0021	0.00018	ND		0.0017	0.00015	ND		0.0027	0.00024	ND		0.0024	0.00021	ND		0.0026	0.00022	ND		0.0021	0.00019	ND		0.0021	0.00018	ND		0.0026	0.00023	ND		0.0018	0.00016
p-Ethyltoluene	622-96-8	NS	NS	NS	ND		0.0022	0.00043	ND		0.0016	0.00031	ND		0.0021	0.0004	ND		0.0017	0.00032	ND		0.0027	0.00052	ND		0.0024	0.00045	ND		0.0026	0.00049	ND		0.0021	0.00041	ND		0.0021	0.0004	ND		0.0026	0.0005	ND		0.0018	0.00036
p-Isopropyltoluene	99-87-6	NS	NS	NS	ND		0.0011	0.00012	ND		0.00081	0.00009	ND		0.001	0.00011	ND		0.00084	0.00009	ND		0.0014	0.00015	ND		0.0012	0.00013	ND		0.0013	0.00014	ND		0.0011	0.00012	ND		0.001	0.00011	ND		0.0013	0.00014	ND		0.00093	0.0001
p/m-Xylene	179601-23-1	NS	NS	NS	ND		0.0022	0.00062	ND		0.0016	0.00045	ND		0.0021	0.00058	ND		0.0017	0.00047	ND		0.0027	0.00076	ND		0.0024	0.00066	ND		0.0026	0.00071	ND		0.0021	0.0006	ND		0.0021	0.00059	ND		0.0026	0.00072	ND		0.0018	0.00052
sec-Butylbenzene	135-98-8	25	100	25	ND		0.0011	0.00016	ND		0.00081	0.00012	ND		0.001	0.00015	ND		0.00084	0.00012	ND		0.0014	0.0002	ND		0.0012	0.00017	ND		0.0013	0.00019	ND		0.0011	0.00016	ND		0.001	0.00015	ND		0.0013	0.00019	ND		0.00093	0.00014
Styrene	100-42-5	NS	NS	NS	ND		0.0011	0.00022	ND		0.00081	0.00016	ND		0.001	0.0002	ND		0.00084	0.00016	ND		0.0014	0.00026	ND		0.0012	0.00023	ND		0.0013	0.00025	ND		0.0011	0.00021	ND		0.001	0.0002	ND		0.0013	0.00025	ND		0.00093	0.00018
tert-Butylbenzene	98-06-6	11	100	11	ND		0.0022	0.00013	ND		0.0016	0.0001	ND		0.0021	0.00012	ND		0.0017	0.0001	ND		0.0027	0.00016	ND		0.0024	0.00014	ND		0.0026	0.00015	ND		0.0021	0.00012	ND		0.0021

TABLE 3A

245 West 55th Street
New York, New York

Summary of Volatile Organic Compound Results in Soil

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-6 L2468036-16 11/19/2024 7-7.5'				SB-6 L2468036-17 11/19/2024 9-9.5'				SB-7 L2468036-26 11/19/2024 0-0.5'				SB-7 L2468036-27 11/19/2024 1-1.5'				SB-7 L2468036-28 11/19/2024 3-3.5'				SB-7 L2468036-29 11/19/2024 5.5-6'				SB-7 L2468036-30 11/19/2024 7-7.5'				SB-7 (EPA 5035 HIGH) L2468036-30 11/19/2024 7-7.5'				SB-7 L2468036-31 11/19/2024 8.5-9'				SB-7 L2468036-32 11/19/2024 9.5-10'				SB-7 L2468036-33 11/19/2024 16.5-17'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
VOLATILE ORGANICS																																															
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	ND		0.0005	0.00013	ND		0.00055	0.00014	ND		0.00067	0.00018	ND		0.00053	0.00014	ND		0.00053	0.00014	ND		0.00068	0.00018	ND		0.00051	0.00013	ND		0.03	0.008	ND		0.033	0.0086	ND		0.027	0.0072	ND		0.00063	0.00016
1,1,1-Trichloroethane	71-55-6	0.68	100	0.68	0.0063		0.0005	0.00017	0.0029		0.00055	0.00018	ND		0.00067	0.00022	ND		0.00053	0.00018	ND		0.00053	0.00018	ND		0.00068	0.00023	0.00032	J	0.00051	0.00017	ND		0.03	0.01	ND		0.033	0.011	ND		0.027	0.009	ND		0.00063	0.00021
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	NS	ND		0.0005	0.00016	ND		0.00055	0.00018	ND		0.00067	0.00022	ND		0.00053	0.00018	ND		0.00053	0.00018	ND		0.00068	0.00023	ND		0.00051	0.00017	ND		0.03	0.01	ND		0.033	0.011	ND		0.027	0.009	ND		0.00063	0.00021
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	ND		0.001	0.00026	ND		0.0011	0.00029	ND		0.0013	0.00036	ND		0.001	0.00028	ND		0.0011	0.00028	ND		0.0014	0.00036	ND		0.001	0.00027	ND		0.061	0.016	ND		0.065	0.017	ND		0.054	0.014	ND		0.0012	0.00033
1,1-Dichloroethane	75-34-3	0.27	47	0.27	0.00092	J	0.001	0.00014	0.00024	J	0.0011	0.00016	ND		0.0013	0.00019	ND		0.001	0.00015	0.00023	J	0.0011	0.00015	ND		0.0014	0.0002	0.00042	J	0.001	0.00015	ND		0.061	0.0088	ND		0.065	0.0095	ND		0.054	0.0078	0.0027		0.0012	0.00018
1,1-Dichloroethene	75-35-4	0.24	0.98	0.33	ND		0.001	0.00024	ND		0.0011	0.00026	ND		0.0013	0.00032	ND		0.001	0.00025	ND		0.0011	0.00025	ND		0.0014	0.00032	ND		0.001	0.00024	ND		0.061	0.014	ND		0.065	0.016	ND		0.054	0.013	0.00069	J	0.0012	0.0003
1,1-Dichloropropene	563-58-6	NS	NS	NS	ND		0.0005	0.00016	ND		0.00055	0.00017	ND		0.00067	0.00021	ND		0.00053	0.00017	ND		0.00053	0.00017	ND		0.00068	0.00022	ND		0.00051	0.00016	ND		0.03	0.0096	ND		0.033	0.01	ND		0.027	0.0086	ND		0.00063	0.0002
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	ND		0.002	0.00032	ND		0.0022	0.00035	ND		0.0027	0.00043	ND		0.0021	0.00034	ND		0.0021	0.00034	ND		0.0027	0.00044	ND		0.002	0.00033	ND		0.12	0.02	ND		0.13	0.021	ND		0.11	0.017	ND		0.0025	0.0004
1,2,3-Trichloropropane	96-18-4	NS	NS	NS	ND		0.002	0.00013	ND		0.0022	0.00014	ND		0.0027	0.00017	ND		0.0021	0.00013	ND		0.0021	0.00014	ND		0.0027	0.00017	ND		0.002	0.00013	ND		0.12	0.0077	ND		0.13	0.0083	ND		0.11	0.0069	ND		0.0025	0.00016
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	ND		0.002	0.00019	ND		0.0022	0.00021	0.0014	J	0.0027	0.00026	ND		0.0021	0.0002	0.00084	J	0.0021	0.0002	0.0027		0.0027	0.00026	0.42	E	0.002	0.00019	5.9		0.12	0.012	17		0.13	0.012	7.8		0.11	0.01	ND		0.0025	0.00024
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.002	0.00027	ND		0.0022	0.0003	ND		0.0027	0.00036	ND		0.0021	0.00029	ND		0.0027	0.00029	ND		0.0027	0.00037	ND		0.002	0.00028	ND		0.12	0.016	ND		0.13	0.018	ND		0.11	0.015	ND		0.0025	0.00034
1,2,4-Trimethylbenzene	95-63-6	5.9	100	5.9	ND		0.002	0.00033	ND		0.0022	0.00037	0.0021	J	0.0027	0.00045	ND		0.0021	0.00035	ND		0.0021	0.00036	0.0006	J	0.0027	0.00046	ND		0.002	0.00034	ND		0.12	0.02	ND		0.13	0.022	ND		0.11	0.018	ND		0.0025	0.00042
1,2-Dibromo-3-chloropropane	96-12-8	NS	NS	NS	ND		0.003	0.00099	ND		0.0033	0.0011	ND		0.004	0.0013	ND		0.0032	0.001	ND		0.0032	0.0011	ND		0.0041	0.0014	ND		0.003	0.001	ND		0.18	0.06	ND		0.2	0.065	ND		0.16	0.054	ND		0.0038	0.0012
1,2-Dibromoethane	106-93-4	NS	NS	NS	ND		0.001	0.00028	ND		0.0011	0.0003	ND		0.0013	0.00038	ND		0.001	0.0003	ND		0.0011	0.0003	ND		0.0014	0.00038	ND		0.001	0.00028	ND		0.061	0.017	ND		0.065	0.018	ND		0.054	0.015	ND		0.0012	0.00035
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.002	0.00014	ND		0.0022	0.00016	ND		0.0027	0.00019	ND		0.0021	0.00015	ND		0.0021	0.00015	ND		0.0027	0.0002	ND		0.002	0.00015	ND		0.12	0.0087	ND		0.13	0.0094	ND		0.11	0.0078	ND		0.0025	0.00018
1,2-Dichloroethane	107-06-2	0.02	5.8	0.02	ND		0.001	0.00026	ND		0.0011	0.00028	ND		0.0013	0.00034	ND		0.001	0.00027	ND		0.0011	0.00027	ND		0.0014	0.00035	ND		0.001	0.00026	ND		**0.061**	0.016	ND		**0.065**	0.017	ND		**0.054**	0.014	ND		0.0012	0.00032
1,2-Dichloroethene, Total	540-59-0	NS	NS	NS	0.051	J	0.001	0.00014	0.025	J	0.0011	0.00015	ND		0.0013	0.00018	ND		0.001	0.00014	ND		0.0011	0.00014	ND		0.0014	0.00019	ND		0.001	0.00014	ND		0.061	0.0083	ND		0.065	0.009	ND		0.054	0.0074	0.021		0.0012	0.00017
1,2-Dichloropropane	78-87-5	NS	NS	NS	ND		0.001	0.00012	ND		0.0011	0.00014	ND		0.0013	0.00017	ND		0.001	0.00013	ND		0.0011	0.00013	ND		0.0014	0.00017	ND		0.001	0.00013	ND		0.061	0.0076	ND		0.065	0.0082	ND		0.054	0.0068	ND		0.0012	0.00016
1,3,5-Trimethylbenzene	108-67-8	3.1	100	3.1	ND		0.002	0.00019	ND		0.0022	0.00021	0.00078	J	0.0027	0.00026	ND		0.0021	0.0002	ND		0.0021	0.0002	ND		0.0027	0.00026	0.0019	J	0.002	0.0002	ND		0.12	0.012	ND		0.13	0.013	ND		0.11	0.01	ND		0.0025	0.00024
1,3-Dichlorobenzene	541-73-1	2.6	38	2.6	ND		0.002	0.00015	ND		0.0022	0.00016	ND		0.0027	0.0002	ND		0.0021	0.00016	ND		0.0021	0.00016	ND		0.0027	0.0002	ND		0.002	0.00015	ND		0.12	0.009	ND		0.13	0.0097	ND		0.11	0.008	ND		0.0025	0.00018
1,3-Dichloropropane	142-28-9	NS	NS	NS	ND		0.002	0.00017	ND		0.0022	0.00018	ND		0.0027	0.00022	ND		0.0021	0.00018	ND		0.0021	0.00018	ND		0.0027	0.00023	ND		0.002	0.00017	ND		0.12	0.01	ND		0.13	0.011	ND		0.11	0.009	ND		0.0025	0.00021
1,3-Dichloropropene, Total	542-75-6	NS	NS	NS	ND		0.0005	0.00016	ND		0.00055	0.00017	ND		0.00067	0.00021	ND		0.00053	0.00017	ND		0.00053	0.00017	ND		0.00068	0.00022	ND		0.00051	0.00016	ND		0.03	0.0096	ND		0.033	0.01	ND		0.027	0.0086	ND		0.00063	0.0002
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.002	0.00017	ND		0.0022	0.00019	ND		0.0027	0.00023	ND		0.0021	0.00018	ND		0.0021	0.00018	ND		0.0027	0.00023	ND		0.002	0.00017	ND		0.12	0.01	ND		0.13	0.011	ND		0.11	0.0093	ND		0.0025	0.00021
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.08	0.035	ND		0.088	0.038	ND		**0.11**	0.047	ND		0.085	0.037	ND		0.085	0.037	ND		**0.11**	0.048	ND		0.081	0.036	ND		**5.2**	**2.3**	ND		**4.3**	**1.9**	ND		0.1	0.044
2,2-Dichloropropane	594-20-7	NS	NS	NS	ND		0.002	0.0002	ND		0.0022	0.00022	ND		0.0027	0.00027	ND		0.0021	0.00021	ND		0.0021	0.00021	ND		0.0027	0.00028	ND		0.002	0.0002	ND		0.12	0.012	ND		0.13	0.013	ND		0.11	0.011	ND		0.0025	0.00025
2-Butanone	78-93-3	0.1	100	0.1	ND		0.01	0.0022	ND		0.011	0.0024	ND		0.013	0.003	ND		0.01	0.0024	ND		0.011	0.0024	ND		0.014	0.003	ND		0.01	0.0022	ND		**0.61**	**0.13**	ND		**0.65**	**0.14**	ND		**0.54**	0.12	0.02		0.0012	0.0028
2-Hexanone	591-78-6	NS	NS	NS	ND		0.01	0.0012	ND		0.011	0.0013	ND		0.013	0.0016	ND		0.01	0.0012	ND		0.011	0.0012	ND		0.014	0.0016	ND		0.01	0.0012	ND		0.61	0.072	ND		0.65	0.077	ND		0.54	0.064	ND		0.012	0.0015
4-Methyl-2-pentanone	108-10-1	NS	NS	NS	ND		0.01	0.0013	ND		0.011	0.0014	ND		0.013	0.0017	ND		0.01	0.0014	ND		0.011	0.0014	ND		0.014	0.0017	ND		0.01	0.0013	ND		0.61	0.078	ND		0.65	0.084	ND		0.54	0.069	ND		0.012	0.0016
Acetone	67-64-1	0.03	100	0.03	ND		0.01	0.0048	ND		0.011	0.0053	ND		0.013	0.0065	ND		0.01	0.0051	ND		0.011	0.0051	0.0089	J	0.014	0.0066	0.018		0.01	0.0049	ND		**0.61**	**0.29**	ND		**0.65**	**0.31**	ND		**0.54**	**0.26**	0.061		0.012	0.006
Acrylonitrile	107-13-1	NS	NS	NS	ND		0.004	0.0011	ND		0.0044	0.0013	ND		0.0054	0.0015	ND		0.0042	0.0012	ND		0.0042	0.0012	ND		0.0054	0.0016	ND		0.0041	0.0012	ND		0.24	0.07	ND		0.26	0.075	ND		0.22	0.062	ND		0.005	0.0014
Benzene	71-43-2	0.06	3.7	0.06	ND		0.0005	0.00016	ND		0.00055	0.00018	ND		0.00067	0.00022	ND		0.00053	0.00018	ND		0.00053	0.00018	ND		0.00068	0.00023	ND		0.00051	0.00017	ND		0.03	0.01	ND		0.033	0.011	ND		0.027	0.009	ND		0.00063	0.00021
Bromobenzene	108-86-1	NS	NS	NS	ND		0.002	0.00014	ND		0.0022	0.00016	ND		0.0027	0.00019	ND		0.0021	0.00015	ND		0.0021	0.00015	ND		0.0027	0.0002	ND		0.002	0.00015	ND		0.12	0.0088	ND		0.13	0.0095	ND		0.11	0.0078	ND		0.0025	0.00018
Bromochloromethane	74-97-5	NS	NS	NS	ND		0.002	0.0002	ND		0.0022	0.00022	ND		0.0027	0.00028	ND		0.0021	0.00022	ND		0.0021	0.00022	ND		0.0027	0.00028	ND		0.002	0.00021	ND		0.12	0.012	ND		0.13	0.013	ND		0.11	0.011	ND		0.0025	0.00026
Bromodichloromethane	75-27-4	NS	NS	NS	ND		0.0005	0.00011	ND		0.00055	0.00012	ND		0.00067	0.00015	ND		0.00053	0.00012	ND		0.00053	0.00012	ND		0.00068	0.00015	ND		0.00051	0.00011	ND		0.03	0.0066	ND		0.033	0.0071	ND		0.027	0.0059	ND		0.00063	0.00014
Bromoform	75-25-2	NS	NS	NS	ND		0.004	0.00024	ND		0.0044	0.00027	ND		0.0054	0.00033	ND		0.0042	0.00026	ND		0.0042	0.00026	ND		0.0054	0.00034	ND		0.0041	0.00025	ND		0.24	0.015	ND		0.26	0.016	ND		0.22	0.013	ND		0.005	0.00031
Bromomethane	74-83-9	NS	NS	NS	ND		0.002	0.00058	ND		0.0022	0.00064	ND		0.0027	0.00078	ND		0.0021	0.00062	ND		0.0021	0.00062	ND		0.0027	0.00079	ND		0.002	0.00059	ND		0.12	0.035	ND		0.13	0.038	ND		0.11	0.031	ND		0.0025	0.00073
Carbon disulfide	75-15-0	NS	NS	NS	ND		0.01	0.0045	ND		0.011	0.005	ND		0.013	0.0061	ND		0.01	0.0048	ND		0.011	0.0048	ND		0.014	0.0062	ND		0.01	0.0046	ND		0.61	0.28	ND		0.65	0.3	ND		0.54	0.25	ND		0.012	0.0057
Carbon tetrachloride	56-23-5	0.76	7.1	0.76	ND		0.001	0.00023	ND		0.0011	0.00025	ND		0.0013	0.00031	ND		0.001	0.00024	ND		0.0011	0.00024	ND		0.0014	0.00031	ND		0.001	0.00023	ND		0.061	0.014	ND		0.065	0.015	ND		0.054	0.012	ND		0.0012	0.00029
Chlorobenzene	108-90-7	4.5	100	4.5	ND		0.0005	0.00013	ND		0.00055	0.00014	ND		0.00067	0.00017	ND		0.00053	0.00013	ND		0.00053	0.00014	ND		0.00068	0.00017	ND		0.00051	0.00013	ND		0.03	0.0077	ND		0.033	0.0083	ND		0.027	0.0069	ND		0.00063	0.00016
Chloroethane	75-00-3	NS	NS	NS	ND		0.002	0.00045	ND		0.0022	0.0005	ND		0.0027	0.00061	ND		0.0021	0.00048	ND		0.0021	0.00048	ND		0.0027	0.00062	ND		0.002	0.00046	ND		0.12	0.027	ND		0.13	0.03	ND		0.11	0.024	ND		0.0025	0.00057
Chloroform	67-66-3	0.37	24	0.37	0.00049	J	0.0015	0.00014	0.00019	J	0.0016	0.00015	ND		0.002	0.00019	ND		0.0016	0.00015	0.00016	J	0.0016	0.00015	ND		0.002	0.00019	ND		0.0015	0.00014	ND		0.091	0.0085	ND		0.098	0.0092	ND		0.081	0.0076	ND		0.0019	0.00018
Chloromethane	74-87-3	NS	NS	NS	ND		0.004	0.00093	ND		0.0044	0.001	ND		0.0054	0.0012	ND		0.0042	0.00099	ND		0.0042	0.00099	ND		0.0054	0.0013	ND		0.0041	0.00095	ND		0.24	0.056	ND		0.26	0.061	ND		0.22	0.05	ND		0.005	0.0012
cis-1,2-Dichloroethene	156-59-2	0.19	41	0.19	0.05		0.001	0.00017	0.024		0.0011	0.00019	ND		0.0013	0.00024	ND		0.001	0.00018	ND		0.0011	0.00018	ND		0.0014	0.00024	ND		0.001	0.00018	ND		0.061	0.011	ND		0.065	0.011	ND		0.054	0.0095	0.0094		0.0012	0.00022
cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	ND		0.0005	0.00016	ND		0.00055	0.00017	ND		0.00067	0.00021	ND		0.00053	0.00017	ND		0.00053	0.00017	ND		0.00068	0.00022	ND		0.00051	0.00016	ND		0.03	0.0096	ND		0.033	0.01	ND		0.027	0.0086	ND		0.00063	0.0002
Dibromochloromethane	124-48-1	NS	NS	NS	ND		0.001	0.00014	ND		0.0011	0.00015	ND		0.0013	0.00019	ND		0.001	0.00015	ND		0.0011	0.00015	ND		0.0014	0.00019	ND		0.001	0.00014	ND		0.061	0.0085	ND		0.065	0.0092	ND		0.054	0.0076	ND		0.0012	0.00018
Dibromomethane	74-95-3	NS	NS	NS	ND		0.002	0.00024	ND		0.0022	0.00026	ND		0.0027	0.00032	ND		0.0021	0.00025	ND		0.0021	0.00025	ND		0.0027	0.00032	ND		0.002	0.00024	ND		0.12	0.014	ND		0.13	0.016	ND		0.11	0.013	ND		0.0025	0.0003
Dichlorodifluoromethane	75-71-8	NS	NS	NS	ND		0.01	0.00091	ND		0.011	0.001	ND		0.013	0.0012	ND		0.01	0.00097	ND		0.011	0.00097	ND		0.014	0.0012	ND		0.01	0.00093	ND		0.61	0.055	ND		0.65	0.06	ND		0.54	0.05	ND		0.012	0.0011
Ethyl ether	60-29-7	NS	NS	NS	ND		0.002	0.00034	ND		0.0022	0.00037	ND		0.0027	0.00046	ND		0.0021	0.00036	ND		0.0021	0.00036	ND		0.0027	0.00046	ND		0.002	0.00035	ND		0.12	0.021	ND		0.13	0.022	ND		0.11	0.018	ND		0.0025	0.00043
Ethylbenzene	100-41-4	1	76	1	ND		0.001	0.00014	ND		0.0011	0.00015	0.00026	J	0.0013	0.00019	ND		0.001	0.00015	ND		0.0011	0.00015	ND		0.0014	0.00019	ND		0.001	0.00014	ND		0.061	0.0085	0.018	J	0.065	0.0092	ND		0.054	0.0076	ND		0.0012	0.00018
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.004	0.00017	ND		0.0044	0.00018	ND		0.0054	0.00023	ND		0.0042	0.00018	ND		0.0042	0.00018	ND		0.0054	0.00023	ND		0.0041	0.00017	ND		0.24	0.01	ND		0.26	0.011	ND		0.22	0.0092	ND		0.005	0.00021
Isopropylbenzene	98-82-8	NS	NS	NS	ND		0.001	0.00011	ND		0.0011	0.00012	ND		0.0013	0.00015	ND		0.001	0.00012	ND		0.0011	0.00012	ND		0.0014	0.00015	0.62	E	0.001	0.00011	0.54		0.061	0.0066	3.8		0.065	0.0071	1.2		0.054	0.0059	ND		0.0012	0.00014
Methyl tert butyl ether	1634-04-4	0.1	100	0.1	ND		0.002	0.0002	ND		0.0022	0.00022	ND		0.0027	0.00027	ND		0.0021	0.00021	ND		0.0021	0.00021	ND		0.0027	0.00027	ND		0.002	0.0002	ND		0.12	0.012	ND		0.13	0.013	ND		0.11	0.011	ND		0.0025	0.00025
Methylene chloride	75-09-2	0.05	81	0.05	ND		0.005	0.0023	ND		0.0055	0.0025	ND		0.0067	0.0031	ND		0.0053	0.0024	ND		0.0053	0.0024	ND		0.0068	0.0031	ND		0.0051	0.0023	ND		**0.3**	**0.14**	ND		**0.33**	**0.15**	ND		**0.27**	**0.12**	ND		0.0063	0.0029
n-Butylbenzene	104-51-8	12	100	12	ND		0.001	0.00017	ND		0.0011	0.00018	0.00027	J	0.0013	0.00022	ND		0.001	0.00018	0.00018	J	0.0011	0.00018	0.00085	J	0.0014	0.00023	0.5	E	0.001	0.00017	2.4		0.061	0.01	7.9		0.065	0.011	3		0.054	0.009	ND		0.0012	0.00021
n-Propylbenzene	103-65-1	3.9	100	3.9	ND		0.001	0.00017	ND		0.0011	0.00019	0.0003	J	0.0013	0.00023	ND		0.001	0.00018	ND		0.0011	0.00018	0.00036	J	0.0014	0.00023	1.5	E	0.001	0.00017	1.8		0.061	0.01	10		0.065	0.011	3.1		0.054	0.0093	ND		0.0012	0.00021
Naphthalene	91-20-3	12	100	12	ND		0.004	0.00065	ND		0.0044	0.00071	0.0018	J	0.0054	0.00087	ND		0.0042	0.00069	ND		0.0042	0.00069	ND		0.0054	0.00089	0.011		0.0041	0.00066	ND		0.24	0.039	0.33		0.26	0.042	0.22		0.22	0.035	ND		0.005	0.00082
o-Chlorotoluene	95-49-8	NS	NS	NS	ND		0.002	0.00019	ND		0.0022	0.00021	ND		0.0027	0.00026	ND		0.0021	0.0002	ND		0.0021	0.0002	ND		0.0027	0.00026	ND		0.002	0.00019	ND		0.12	0.012	ND		0.13	0.012	ND		0.11	0.01	ND		0.0025	0.00024
o-Xylene	95-47-6	NS	NS	NS	ND		0.001	0.00029	ND		0.0011	0.00032	0.0011	J	0.0013	0.00039	ND		0.001	0.00031	ND		0.0011	0.00031	ND		0.0014	0.0004	0.0024		0.001	0.0003	ND		0.061	0.018	0.026	J	0.065	0.019	ND		0.054	0.016	ND		0.0012	0.00036
p-Chlorotoluene	106-43-4	NS	NS	NS	ND		0.002	0.00011	ND		0.0022	0.00012	ND		0.0027	0.00014	ND		0.0021	0.00011	ND		0.0021	0.00011	ND		0.0027	0.00015	ND		0.002	0.00011	ND		0.12	0.0065	ND		0.13	0.007	ND		0.11	0.0058	ND		0.0025	0.00014
p-Diethylbenzene	105-05-5	NS	NS	NS	ND		0.002	0.00018	ND		0.0022	0.00019	0.0019	J	0.0027	0.00024	ND		0.0021	0.00019	ND		0.0021	0.00019	0.00038	J	0.0027	0.00024	0.36	E	0.002	0.00018	2		0.12	0.011	5.7		0.13	0.012	2.1		0.11	0.0096	ND		0.0025	0.00022
p-Ethyltoluene	622-96-8	NS	NS	NS	ND		0.002	0.00038	ND		0.0022	0.00042	0.0014	J	0.0027	0.00052	ND		0.0021	0.00041	ND		0.0021	0.00041	ND		0.0027	0.00052	ND		0.002	0.00039	ND		0.12	0.023	0.065	J	0.13	0.025	0.025	J	0.11	0.021	ND		0.0025	0.00048
p-Isopropyltoluene	99-87-6	NS	NS	NS	ND		0.001	0.00011	ND		0.0011	0.00012	ND		0.0013	0.00015	ND		0.001	0.00012	ND		0.0011	0.00012	ND		0.0014	0.00015	ND		0.001	0.00011	ND		0.061	0.0066	0.022	J	0.065	0.0071	0.0075	J	0.054	0.0059	ND		0.0012	0.00014
p/m-Xylene	179601-23-1	NS	NS	NS	ND		0.002	0.00056	ND		0.0022	0.00061	0.00098	J	0.0027	0.00075	ND		0.0021	0.00059	ND		0.0021	0.0006	ND		0.0027	0.00076	ND		0.002	0.00057	ND		0.12	0.034	ND		0.13	0.037	ND		0.11	0.03	ND		0.0025	0.0007
sec-Butylbenzene	135-98-8	25	100	25	ND		0.001	0.00014	ND		0.0011	0.00016	ND		0.0013	0.0002	ND		0.001	0.00015	ND		0.0011	0.00016	0.00045	J	0.0014	0.0002	0.83	E	0.001	0.00015	1.8		0.061	0.0088	6.3		0.065	0.0095	2		0.054	0.0079	ND		0.0012	0.00018
Styrene	100-42-5	NS	NS	NS	ND		0.001	0.0002	ND		0.0011	0.00021	ND		0.0013	0.00026	ND		0.001	0.00021	ND		0.0011	0.00021	ND		0.0014	0.00027	ND		0.001	0.0002	ND		0.061	0.012	ND		0.065	0.013	ND		0.054	0.011	ND		0.0012	0.00024
tert-Butylbenzene	98-06-6	11	100	11	ND		0.002	0.00012	ND		0.0022	0.00013	ND		0.0027	0.00016	ND		0.0021	0.00012	ND		0.0021	0.00012	ND		0.0027	0.00016	0.087		0.002	0.00012	0.14		0.12	0.0072	0.6		0.13	0.0077	0.21		0.11	0.0064	0.0017	J	0.0025	0.00015
Tetrachloroethene	127-18-4	1.3	18	1.3	0.038		0.0005	0.0002	0.086		0.00055	0.00021	ND		0.00067	0.00026	ND		0.00053	0.00021	ND		0.00

TABLE 3A

245 West 55th Street
New York, New York

Summary of Volatile Organic Compound Results in Soil

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-7 L2468036-33 R1 11/19/2024 16.5-17'				SB-7 L2468036-34 11/19/2024 19.5-20'				SB-8 L2518818-04 3/28/2025 5-5.5'				SB-8 L2518818-05 3/28/2025 7-7.5'				SB-8 L2518818-08 3/28/2025 9-9.5'				SB-8 L2518818-09 3/28/2025 11-11.5'				SB-8 L2518818-10 3/28/2025 13-13.5'				SB-8 L2518818-17 3/28/2025 15-15.5'				SB-8 L2518818-18 3/28/2025 17-17.5'				SB-8 L2518818-19 3/28/2025 19-19.5'				DUP (SB-8) L2518818-24 3/28/2025 19-19.5'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
VOLATILE ORGANICS																																															
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	~		~	~	~		~	~	ND		0.00048	0.00013	ND		0.0005	0.00013	ND		0.00056	0.00015	ND		0.0007	0.00019	ND		0.00053	0.00014	ND		0.00055	0.00014	ND		0.00057	0.00015	ND		0.00058	0.00015	ND		0.00051	0.00013
1,1,1-Trichloroethane	71-55-6	0.68	100	0.68	~		~	~	~		~	~	ND		0.00048	0.00016	ND		0.0005	0.00017	ND		0.00056	0.00019	ND		0.0007	0.00024	0.00076		0.00053	0.00018	0.003		0.00055	0.00018	ND		0.00057	0.00019	0.00025	J	0.00058	0.00019	0.001		0.00051	0.00017
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	NS	~		~	~	~		~	~	ND		0.00048	0.00016	ND		0.0005	0.00017	ND		0.00056	0.00019	ND		0.0007	0.00023	ND		0.00053	0.00018	ND		0.00055	0.00018	ND		0.00057	0.00019	ND		0.00058	0.00019	ND		0.00051	0.00017
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	~		~	~	~		~	~	ND		0.00096	0.00026	ND		0.001	0.00027	ND		0.0011	0.0003	ND		0.0014	0.00038	ND		0.0011	0.00028	ND		0.0011	0.00029	ND		0.0011	0.00031	ND		0.0012	0.00031	ND		0.001	0.00027
1,1-Dichloroethane	75-34-3	0.27	47	0.27	~		~	~	~		~	~	ND		0.00096	0.00014	ND		0.001	0.00015	ND		0.0011	0.00016	ND		0.0014	0.0002	ND		0.0011	0.00016	ND		0.0011	0.00016	ND		0.0011	0.00017	ND		0.0012	0.00017	ND		0.001	0.00015
1,1-Dichloroethene	75-35-4	0.24	0.98	0.33	~		~	~	~		~	~	ND		0.00096	0.00023	ND		0.001	0.00024	ND		0.0011	0.00027	ND		0.0014	0.00034	ND		0.0011	0.00025	ND		0.0011	0.00026	ND		0.0011	0.00027	ND		0.0012	0.00027	ND		0.001	0.00024
1,1-Dichloropropene	563-58-6	NS	NS	NS	~		~	~	~		~	~	ND		0.00048	0.00015	ND		0.0005	0.00016	ND		0.00056	0.00018	ND		0.0007	0.00022	ND		0.00053	0.00017	ND		0.00055	0.00017	ND		0.00057	0.00018	ND		0.00058	0.00018	ND		0.00051	0.00016
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00031	ND		0.002	0.00032	ND		0.0022	0.00036	ND		0.0028	0.00045	ND		0.0021	0.00034	ND		0.0022	0.00035	ND		0.0023	0.00037	ND		0.0023	0.00037	ND		0.002	0.00033
1,2,3-Trichloropropane	96-18-4	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00012	ND		0.002	0.00013	ND		0.0022	0.00014	ND		0.0028	0.00018	ND		0.0021	0.00014	ND		0.0022	0.00014	ND		0.0023	0.00014	ND		0.0023	0.00015	ND		0.002	0.00013
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00018	ND		0.002	0.00019	ND		0.0022	0.00021	ND		0.0028	0.00027	ND		0.0021	0.0002	ND		0.0022	0.00021	ND		0.0023	0.00022	ND		0.0023	0.00022	ND		0.002	0.0002
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00026	ND		0.002	0.00028	ND		0.0022	0.0003	ND		0.0028	0.00038	ND		0.0021	0.00029	ND		0.0022	0.0003	ND		0.0023	0.00031	ND		0.0023	0.00031	ND		0.002	0.00028
1,2,4-Trimethylbenzene	95-63-6	5.9	100	5.9	~		~	~	~		~	~	ND		0.0019	0.00032	ND		0.002	0.00034	ND		0.0022	0.00038	ND		0.0028	0.00047	ND		0.0021	0.00036	ND		0.0022	0.00037	ND		0.0023	0.00038	ND		0.0023	0.00038	ND		0.002	0.00034
1,2-Dibromo-3-chloropropane	96-12-8	NS	NS	NS	~		~	~	~		~	~	ND		0.0029	0.00096	ND		0.003	0.001	ND		0.0034	0.0011	ND		0.0042	0.0014	ND		0.0032	0.0011	ND		0.0033	0.0011	ND		0.0034	0.0011	ND		0.0035	0.0012	ND		0.0031	0.001
1,2-Dibromoethane	106-93-4	NS	NS	NS	~		~	~	~		~	~	ND		0.00096	0.00027	ND		0.001	0.00028	ND		0.0011	0.00031	ND		0.0014	0.00039	ND		0.0011	0.0003	ND		0.0011	0.00031	ND		0.0011	0.00032	ND		0.0012	0.00032	ND		0.001	0.00028
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	~		~	~	~		~	~	ND		0.0019	0.00014	ND		0.002	0.00014	ND		0.0022	0.00016	ND		0.0028	0.0002	ND		0.0021	0.00015	ND		0.0022	0.00016	ND		0.0023	0.00016	ND		0.0023	0.00017	ND		0.002	0.00015
1,2-Dichloroethane	107-06-2	0.02	5.8	0.02	~		~	~	~		~	~	ND		0.00096	0.00025	ND		0.001	0.00026	ND		0.0011	0.00029	ND		0.0014	0.00036	ND		0.0011	0.00027	ND		0.0011	0.00028	ND		0.0011	0.0003	ND		0.0012	0.0003	ND		0.001	0.00026
1,2-Dichloroethene, Total	540-59-0	NS	NS	NS	~		~	~	~		~	~	ND		0.00096	0.00013	ND		0.001	0.00014	ND		0.0011	0.00015	ND		0.0014	0.00019	0.00037	J	0.0011	0.00015	0.0036		0.0011	0.00015	0.001	J	0.0011	0.00016	0.0016		0.0012	0.00016	0.0027		0.001	0.00014
1,2-Dichloropropane	78-87-5	NS	NS	NS	~		~	~	~		~	~	ND		0.00096	0.00012	ND		0.001	0.00013	ND		0.0011	0.00014	ND		0.0014	0.00018	ND		0.0011	0.00013	ND		0.0011	0.00014	ND		0.0011	0.00014	ND		0.0012	0.00014	ND		0.001	0.00013
1,3,5-Trimethylbenzene	108-67-8	3.1	100	3.1	~		~	~	~		~	~	ND		0.0019	0.00018	ND		0.002	0.0002	ND		0.0022	0.00022	ND		0.0028	0.00027	ND		0.0021	0.00021	ND		0.0022	0.00021	ND		0.0023	0.00022	ND		0.0023	0.00022	ND		0.002	0.0002
1,3-Dichlorobenzene	541-73-1	2.6	38	2.6	~		~	~	~		~	~	ND		0.0019	0.00014	ND		0.002	0.00015	ND		0.0022	0.00017	ND		0.0028	0.00021	ND		0.0021	0.00016	ND		0.0022	0.00016	ND		0.0023	0.00017	ND		0.0023	0.00017	ND		0.002	0.00015
1,3-Dichloropropane	142-28-9	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00016	ND		0.002	0.00017	ND		0.0022	0.00019	ND		0.0028	0.00024	ND		0.0021	0.00018	ND		0.0022	0.00018	ND		0.0023	0.00019	ND		0.0023	0.00019	ND		0.002	0.00017
1,3-Dichloropropene, Total	542-75-6	NS	NS	NS	~		~	~	~		~	~	ND		0.00048	0.00015	ND		0.0005	0.00016	ND		0.00056	0.00018	ND		0.0007	0.00022	ND		0.00053	0.00017	ND		0.00055	0.00017	ND		0.00057	0.00018	ND		0.00058	0.00018	ND		0.00051	0.00016
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	~		~	~	~		~	~	ND		0.0019	0.00016	ND		0.002	0.00017	ND		0.0022	0.00019	ND		0.0028	0.00024	ND		0.0021	0.00018	ND		0.0022	0.00019	ND		0.0023	0.0002	ND		0.0023	0.0002	ND		0.002	0.00017
1,4-Dioxane	123-91-1	0.1	5.7	0.1	~		~	~	~		~	~	ND		0.077	0.034	ND		0.081	0.036	ND		0.09	0.039	ND		**0.11**	0.049	ND		0.086	0.038	ND		0.088	0.038	ND		0.092	0.04	ND		0.092	0.04	ND		0.082	0.036
2,2-Dichloropropane	594-20-7	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00019	ND		0.002	0.0002	ND		0.0022	0.00023	ND		0.0028	0.00028	ND		0.0021	0.00022	ND		0.0022	0.00022	ND		0.0023	0.00023	ND		0.0023	0.00023	ND		0.002	0.00021
2-Butanone	78-93-3	0.1	100	0.1	~		~	~	~		~	~	ND		0.0096	0.0021	ND		0.01	0.0022	ND		0.0111	0.0025	ND		0.014	0.0031	ND		0.011	0.0024	ND		0.011	0.0024	ND		0.011	0.0026	ND		0.012	0.0026	ND		0.01	0.0023
2-Hexanone	591-78-6	NS	NS	NS	~		~	~	~		~	~	ND		0.0096	0.0011	ND		0.01	0.0012	ND		0.011	0.0013	ND		0.014	0.0017	ND		0.011	0.0013	ND		0.011	0.0013	ND		0.011	0.0014	ND		0.012	0.0014	ND		0.01	0.0012
4-Methyl-2-pentanone	108-10-1	NS	NS	NS	~		~	~	~		~	~	ND		0.0096	0.0012	ND		0.01	0.0013	ND		0.011	0.0014	ND		0.014	0.0018	ND		0.011	0.0014	ND		0.011	0.0014	ND		0.011	0.0015	ND		0.012	0.0015	ND		0.01	0.0013
Acetone	67-64-1	0.03	100	0.03	0.045		0.013	0.0061	ND		0.01	0.005	ND		0.0096	0.0046	ND		0.01	0.0049	ND		0.011	0.0054	0.025		0.014	0.0068	ND		0.011	0.0051	ND		0.011	0.0053	ND		0.011	0.0055	ND		0.012	0.0056	ND		0.01	0.0049
Acrylonitrile	107-13-1	NS	NS	NS	~		~	~	~		~	~	ND		0.0038	0.0011	ND		0.004	0.0012	ND		0.0045	0.0013	ND		0.0056	0.0016	ND		0.0043	0.0012	ND		0.0044	0.0013	ND		0.0046	0.0013	ND		0.0046	0.0013	ND		0.0041	0.0012
Benzene	71-43-2	0.06	3.7	0.06	~		~	~	~		~	~	ND		0.00048	0.00016	ND		0.0005	0.00017	ND		0.00056	0.00019	ND		0.0007	0.00023	ND		0.00053	0.00018	ND		0.00055	0.00018	ND		0.00057	0.00019	ND		0.00058	0.00019	ND		0.00051	0.00017
Bromobenzene	108-86-1	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00014	ND		0.002	0.00015	ND		0.0022	0.00016	ND		0.0028	0.0002	ND		0.0021	0.00016	ND		0.0022	0.00016	ND		0.0023	0.00017	ND		0.0023	0.00017	ND		0.002	0.00015
Bromochloromethane	74-97-5	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.0002	ND		0.002	0.00021	ND		0.0022	0.00023	ND		0.0028	0.00029	ND		0.0021	0.00022	ND		0.0022	0.00022	ND		0.0023	0.00024	ND		0.0023	0.00024	ND		0.002	0.00021
Bromodichloromethane	75-27-4	NS	NS	NS	~		~	~	~		~	~	ND		0.00048	0.0001	ND		0.0005	0.00011	ND		0.00056	0.00012	ND		0.0007	0.00015	ND		0.00053	0.00012	ND		0.00055	0.00012	ND		0.00057	0.00012	ND		0.00058	0.00012	ND		0.00051	0.00011
Bromoform	75-25-2	NS	NS	NS	~		~	~	~		~	~	ND		0.0038	0.00024	ND		0.004	0.00025	ND		0.0045	0.00028	ND		0.0056	0.00035	ND		0.0043	0.00026	ND		0.0044	0.00027	ND		0.0046	0.00028	ND		0.0046	0.00028	ND		0.0041	0.00025
Bromomethane	74-83-9	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00056	ND		0.002	0.00059	ND		0.0022	0.00065	ND		0.0028	0.00082	ND		0.0021	0.00062	ND		0.0022	0.00064	ND		0.0023	0.00067	ND		0.0023	0.00067	ND		0.002	0.00059
Carbon disulfide	75-15-0	NS	NS	NS	~		~	~	~		~	~	ND		0.0096	0.0044	ND		0.01	0.0046	ND		0.011	0.0051	ND		0.014	0.0064	ND		0.011	0.0049	ND		0.011	0.005	ND		0.011	0.0052	ND		0.012	0.0052	ND		0.01	0.0046
Carbon tetrachloride	56-23-5	0.76	7.1	0.76	~		~	~	~		~	~	ND		0.00096	0.00022	ND		0.001	0.00023	ND		0.0011	0.00026	ND		0.0014	0.00032	ND		0.0011	0.00024	ND		0.0011	0.00025	ND		0.0011	0.00026	ND		0.0012	0.00026	ND		0.001	0.00024
Chlorobenzene	108-90-7	4.5	100	4.5	~		~	~	~		~	~	ND		0.00048	0.00012	ND		0.0005	0.00013	ND		0.00056	0.00014	ND		0.0007	0.00018	ND		0.00053	0.00014	ND		0.00055	0.00014	ND		0.00057	0.00014	ND		0.00058	0.00015	ND		0.00051	0.00013
Chloroethane	75-00-3	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00043	ND		0.002	0.00046	ND		0.0022	0.00051	ND		0.0028	0.00064	ND		0.0021	0.00048	ND		0.0022	0.0005	ND		0.0023	0.00052	ND		0.0023	0.00052	ND		0.002	0.00046
Chloroform	67-66-3	0.37	24	0.37	~		~	~	~		~	~	ND		0.0014	0.00013	ND		0.0015	0.00014	ND		0.0017	0.00016	ND		0.0021	0.0002	ND		0.0016	0.00015	ND		0.0016	0.00015	ND		0.0017	0.00016	ND		0.0017	0.00016	ND		0.0015	0.00014
Chloromethane	74-87-3	NS	NS	NS	~		~	~	~		~	~	ND		0.0038	0.00089	ND		0.004	0.00094	ND		0.0045	0.001	ND		0.0056	0.0013	ND		0.0043	0.001	ND		0.0044	0.001	ND		0.0046	0.0011	ND		0.0046	0.0011	ND		0.0041	0.00095
cis-1,2-Dichloroethene	156-59-2	0.19	41	0.19	~		~	~	~		~	~	ND		0.00096	0.00017	ND		0.001	0.00018	ND		0.0011	0.0002	ND		0.0014	0.00025	0.00037	J	0.0011	0.00019	0.0036		0.0011	0.00019	0.001	J	0.0011	0.0002	0.0016		0.0012	0.0002	0.0027		0.001	0.00018
cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	~		~	~	~		~	~	ND		0.00048	0.00015	ND		0.0005	0.00016	ND		0.00056	0.00018	ND		0.0007	0.00022	ND		0.00053	0.00017	ND		0.00055	0.00017	ND		0.00057	0.00018	ND		0.00058	0.00018	ND		0.00051	0.00016
Dibromochloromethane	124-48-1	NS	NS	NS	~		~	~	~		~	~	ND		0.00096	0.00013	ND		0.001	0.00014	ND		0.0011	0.00016	ND		0.0014	0.0002	ND		0.0011	0.00015	ND		0.0011	0.00015	ND		0.0011	0.00016	ND		0.0012	0.00016	ND		0.001	0.00014
Dibromomethane	74-95-3	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00023	ND		0.002	0.00024	ND		0.0022	0.00027	ND		0.0028	0.00034	ND		0.0021	0.00025	ND		0.0022	0.00026	ND		0.0023	0.00027	ND		0.0023	0.00027	ND		0.002	0.00024
Dichlorodifluoromethane	75-71-8	NS	NS	NS	~		~	~	~		~	~	ND		0.0096	0.00088	ND		0.01	0.00092	ND		0.011	0.001	ND		0.014	0.0013	ND		0.011	0.00098	ND		0.011	0.001	ND		0.011	0.001	ND		0.012	0.001	ND		0.01	0.00094
Ethyl ether	60-29-7	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00033	ND		0.002	0.00034	ND		0.0022	0.00038	ND		0.0028	0.00048	ND		0.0021	0.00036	ND		0.0022	0.00037	ND		0.0023	0.00039	ND		0.0023	0.00039	ND		0.002	0.00035
Ethylbenzene	100-41-4	1	76	1	~		~	~	~		~	~	ND		0.00096	0.00014	ND		0.001	0.00014	ND		0.0011	0.00016	ND		0.0014	0.0002	ND		0.0011	0.00015	ND		0.0011	0.00015	ND		0.0011	0.00016	ND		0.0012	0.00016	ND		0.001	0.00014
Hexachlorobutadiene	87-68-3	NS	NS	NS	~		~	~	~		~	~	ND		0.0038	0.00016	ND		0.004	0.00017	ND		0.0045	0.00019	ND		0.0056	0.00024	ND		0.0043	0.00018	ND		0.0044	0.00018	ND		0.0046	0.00019	ND		0.0046	0.0002	ND		0.0041	0.00017
Isopropylbenzene	98-82-8	NS	NS	NS	~		~	~	~		~	~	ND		0.00096	0.0001	ND		0.001	0.00011	ND		0.0011	0.00012	ND		0.0014	0.00015	ND		0.0011	0.00012	ND		0.0011	0.00012	ND		0.0011	0.00012	ND		0.0012	0.00012	ND		0.001	0.00011
Methyl tert butyl ether	1634-04-4	0.1	100	0.1	~		~	~	~		~	~	ND		0.0019	0.00019	ND		0.002	0.0002	ND		0.0022	0.00023	ND		0.0028	0.00028	ND		0.0021	0.00021	ND		0.0022	0.00022	ND		0.0023	0.00023	ND		0.0023	0.00023	ND		0.002	0.0002
Methylene chloride	75-09-2	0.05	81	0.05	~		~	~	~		~	~	ND		0.0048	0.0022	ND		0.005	0.0023	ND		0.0056	0.0026	ND		0.007	0.0032	ND		0.0053	0.0024	ND		0.0055	0.0025	ND		0.0057	0.0026	ND		0.0058	0.0026	ND		0.0051	0.0023
n-Butylbenzene	104-51-8	18	100	18	~		~	~	~		~	~	ND		0.00096	0.00016	ND		0.001	0.00017	ND		0.0011	0.00019	ND		0.0014	0.00024	ND		0.0011	0.00018	ND		0.0011	0.00018	ND		0.0011	0.00019	ND		0.0012	0.00019	ND		0.001	0.00017
n-Propylbenzene	103-65-1	5	100	5	~		~	~	~		~	~	ND		0.00096	0.00016	ND		0.001	0.00017	ND		0.0011	0.00019	ND		0.0014	0.00024	ND		0.0011	0.00018	ND		0.0011	0.00019	ND		0.0011	0.0002	ND		0.0012	0.0002	ND		0.001	0.00017
Naphthalene	91-20-3	12	100	12	~		~	~	~		~	~	ND		0.0038	0.00062	ND		0.004	0.00066	ND		0.0045	0.00073	ND		0.0056	0.00092	ND		0.0043	0.0007	ND		0.0044	0.00071	ND		0.0046	0.00075	ND		0.0046	0.00075	ND		0.0041	0.00066
o-Chlorotoluene	95-49-8	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00018	ND		0.002	0.00019	ND		0.0022	0.00021	ND		0.0028	0.00027	ND		0.0021	0.0002	ND		0.0022	0.00021	ND		0.0023	0.00022	ND		0.0023	0.00022	ND		0.002	0.0002
o-Xylene	95-47-6	NS	NS	NS	~		~	~	~		~	~	ND		0.00096	0.00028	ND		0.001	0.00029	ND		0.0011	0.00033	ND		0.0014	0.00041	ND		0.0011	0.00031	ND		0.0011	0.00032	ND		0.0011	0.00033	ND		0.0012	0.00034	ND		0.001	0.0003
p-Chlorotoluene	106-43-4	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.0001	ND		0.002	0.00011	ND		0.0022	0.00012	ND		0.0028	0.00015	ND		0.0021	0.00012	ND		0.0022	0.00012	ND		0.0023	0.00012	ND		0.0023	0.00012	ND		0.002	0.00011
p-Diethylbenzene	105-05-5	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00017	ND		0.002	0.00018	ND		0.0022	0.0002	ND		0.0028	0.00025	ND		0.0021	0.00019	ND		0.0022	0.00019	ND		0.0023	0.0002	ND		0.0023	0.0002	ND		0.002	0.00018
p-Ethyltoluene	622-96-8	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00037	ND		0.002	0.00039	ND		0.0022	0.00043	ND		0.0028	0.00054	ND		0.0021	0.00041	ND		0.0022	0.00042	ND		0.0023	0.00044	ND		0.0023	0.00044	ND		0.002	0.00039
p-Isopropyltoluene	99-87-6	NS	NS	NS	~		~	~	~		~	~	ND		0.00096	0.0001	ND		0.001	0.00011	ND		0.0011	0.00012	ND		0.0014	0.00015	ND		0.0011	0.00012	ND		0.0011	0.00012	ND		0.0011	0.00012	ND		0.0012	0.00012	ND		0.001	0.00011
p/m-Xylene	179601-23-1	NS	NS	NS	~		~	~	~		~	~	ND		0.0019	0.00054	ND		0.002	0.00057	ND		0.0022	0.00063	ND		0.0028	0.00079	ND		0.0021	0.0006	ND		0.0022	0.00061	ND		0.0023	0.00064	ND		0.0023	0.00065	ND		0.002	0.00057
sec-Butylbenzene	135-98-8	25	100	25	~		~	~	~		~	~	ND		0.00096	0.00014	ND		0.001	0.00015	ND		0.0011	0.00016	ND		0.0014	0.0002	ND		0.0011	0.00016	ND		0.0011	0.00016	ND		0.0011	0.00017	ND		0.0012	0.00017	ND		0.001	0.00015
Styrene	100-42-5	NS	NS	NS	~		~	~	~		~	~	ND		0.00096	0.00019	ND		0.001	0.0002	ND		0.0011	0.00022	ND		0.0014	0.00028	ND		0.0011	0.00021	ND		0.0011	0.00022	ND		0.0011	0.00022	ND		0.0012	0.00023	ND		0.001	0.0002
tert-Butylbenzene	98-06-6	11	100	11	~		~	~	~		~	~	ND		0.0019	0.00011	ND		0.002	0.00012	ND		0.0022	0.00013	ND		0.0028	0.00017	ND		0.0021	0.00013	ND		0.0022	0.00013	ND		0.0023	0.00014	ND		0.0023	0.00014	ND		0.002	0.00012
Tetrachloroethene	127-18-4	1.3	18	1.3	~		~	~	~		~	~	0.00051		0.00048	0.00019	0.00057		0.0005	0.0002	0.00079		0.00056	0.00022	0.0016		0.0007	0.00028	0.013		0.00053	0.00021	0.036		0.00055	0.00022	0.014		0.00057	0.00022	0.018		0.00058	0.00023	0.049		0.00051	0.0002
Toluene	108-88-3	0.7	100	0.7	~		~	~	~		~	~	ND		0.00096	0.00052	ND		0.001	0.00055	ND		0.0011	0.00061	ND		0.0014	0.00076	ND		0.0011	0.00058	ND		0.0011	0.0006	ND		0.0011	0.00062	ND		0.0012	0.00063	ND		0.001	0.00056
trans-1,2-Dichloroethene	156-60-5	0.19	100	0.19	~		~	~	~		~	~	ND		0.0014	0.00013	ND		0.0015	0.00014	ND		0.0017	0.00015	ND		0.0021	0.00019	ND		0.0016	0.00015	ND		0.0016	0.00015	ND		0.0017	0.00016	ND

TABLE 3A

245 West 55th Street
New York, New York

Summary of Volatile Organic Compound Results in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-8 L2518818-20 3/28/2025 21-21.5'				SB-8 L2518818-21 3/28/2025 23-23.5'				TRIP BLANK L2518818-02 3/20/2025				TRIP BLANK L2468433-23 11/20/2024				PE-1 L2467646-20 11/18/2024 0-0.5'				PE-2 L2467646-22 11/18/2024 0-0.5'				PE-B L2467646-23 11/18/2024 0-0.5'				DUP-2 (PE-B) L2467646-19 11/18/2024 0-0.5'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
VOLATILE ORGANICS																																						
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	ND		0.00059	0.00015	ND		0.001	0.00027	ND		0.0005	0.00013	ND		0.0005	0.00013	ND		0.0005	0.00013	ND		0.0005	0.00013	ND		0.00049	0.00013	ND		0.00051	0.00014
1,1,1-Trichloroethane	71-55-6	0.68	100	0.68	ND		0.00059	0.0002	0.00071	J	0.001	0.00034	ND		0.0005	0.00017	ND		0.0005	0.00017	ND		0.0005	0.00017	ND		0.0005	0.00017	ND		0.00049	0.00016	ND		0.00051	0.00017
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	NS	ND		0.00059	0.00019	ND		0.001	0.00034	ND		0.0005	0.00017	ND		0.0005	0.00017	ND		0.0005	0.00017	ND		0.0005	0.00017	ND		0.00049	0.00016	ND		0.00051	0.00017
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	ND		0.0012	0.00031	ND		0.002	0.00054	ND		0.001	0.00027	ND		0.001	0.00027	ND		0.001	0.00027	ND		0.001	0.00027	ND		0.00099	0.00026	ND		0.001	0.00027
1,1-Dichloroethane	75-34-3	0.27	47	0.27	ND		0.0012	0.00017	ND		0.002	0.00029	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.00099	0.00014	ND		0.001	0.00015
1,1-Dichloroethene	75-35-4	0.24	0.98	0.33	ND		0.0012	0.00028	ND		0.002	0.00048	ND		0.001	0.00024	ND		0.001	0.00024	ND		0.001	0.00024	ND		0.001	0.00024	ND		0.00099	0.00024	ND		0.001	0.00024
1,1-Dichloropropene	563-58-6	NS	NS	NS	ND		0.00059	0.00019	ND		0.001	0.00032	ND		0.0005	0.00016	ND		0.0005	0.00016	ND		0.0005	0.00016	ND		0.0005	0.00016	ND		0.00049	0.00016	ND		0.00051	0.00016
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	ND		0.0023	0.00038	ND		0.004	0.00065	ND		0.002	0.00032	ND		0.002	0.00032	ND		0.002	0.00032	ND		0.002	0.00032	ND		0.002	0.00032	ND		0.002	0.00033
1,2,3-Trichloropropane	96-18-4	NS	NS	NS	ND		0.0023	0.00015	ND		0.004	0.00026	ND		0.002	0.00013	ND		0.002	0.00013	ND		0.002	0.00013	ND		0.002	0.00013	ND		0.002	0.00012	ND		0.002	0.00013
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	ND		0.0023	0.00022	ND		0.004	0.00039	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.0002
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.0023	0.00032	ND		0.004	0.00055	ND		0.002	0.00027	ND		0.002	0.00027	ND		0.002	0.00027	ND		0.002	0.00027	ND		0.002	0.00027	ND		0.002	0.00028
1,2,4-Trimethylbenzene	95-63-6	5.9	100	5.9	ND		0.0023	0.00039	ND		0.004	0.00068	ND		0.002	0.00033	ND		0.002	0.00033	ND		0.002	0.00033	ND		0.002	0.00033	ND		0.002	0.00033	ND		0.002	0.00034
1,2-Dibromo-3-chloropropane	96-12-8	NS	NS	NS	ND		0.0035	0.0012	ND		0.0061	0.002	ND		0.003	0.001	ND		0.003	0.001	ND		0.003	0.001	ND		0.003	0.001	ND		0.003	0.00098	ND		0.0031	0.001
1,2-Dibromoethane	106-93-4	NS	NS	NS	ND		0.0012	0.00033	ND		0.002	0.00056	ND		0.001	0.00028	ND		0.001	0.00028	ND		0.001	0.00028	ND		0.001	0.00028	ND		0.00099	0.00028	ND		0.001	0.00029
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.0023	0.00017	ND		0.004	0.00029	ND		0.002	0.00014	ND		0.002	0.00014	ND		0.002	0.00014	ND		0.002	0.00014	ND		0.002	0.00014	ND		0.002	0.00015
1,2-Dichloroethane	107-06-2	0.02	5.8	0.02	ND		0.0012	0.0003	ND		0.002	0.00052	ND		0.001	0.00026	ND		0.001	0.00026	ND		0.001	0.00026	ND		0.001	0.00026	ND		0.00099	0.00025	ND		0.001	0.00026
1,2-Dichloroethene, Total	540-59-0	NS	NS	NS	0.0008	J	0.0012	0.00016	0.001	J	0.002	0.00028	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.00099	0.00014	ND		0.001	0.00014
1,2-Dichloropropane	78-87-5	NS	NS	NS	ND		0.0012	0.00015	ND		0.002	0.00025	ND		0.001	0.00012	ND		0.001	0.00012	ND		0.001	0.00012	ND		0.001	0.00012	ND		0.00099	0.00012	ND		0.001	0.00013
1,3,5-Trimethylbenzene	108-67-8	3.1	100	3.1	ND		0.0023	0.00023	ND		0.004	0.00039	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.0002
1,3-Dichlorobenzene	541-73-1	2.6	38	2.6	ND		0.0023	0.00017	ND		0.004	0.0003	ND		0.002	0.00015	ND		0.002	0.00015	ND		0.002	0.00015	ND		0.002	0.00015	ND		0.002	0.00015	ND		0.002	0.00015
1,3-Dichloropropane	142-28-9	NS	NS	NS	ND		0.0023	0.0002	ND		0.004	0.00034	ND		0.002	0.00017	ND		0.002	0.00017	ND		0.002	0.00017	ND		0.002	0.00017	ND		0.002	0.00016	ND		0.002	0.00017
1,3-Dichloropropene, Total	542-75-6	NS	NS	NS	ND		0.00059	0.00018	ND		0.001	0.00032	ND		0.0005	0.00016	ND		0.0005	0.00016	ND		0.0005	0.00016	ND		0.0005	0.00016	ND		0.00049	0.00016	ND		0.00051	0.00016
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.0023	0.0002	ND		0.004	0.00034	ND		0.002	0.00017	ND		0.002	0.00017	ND		0.002	0.00017	ND		0.002	0.00017	ND		0.002	0.00017	ND		0.002	0.00018
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.094	0.041	ND		**0.16**	0.071	ND		0.08	0.035	ND		0.08	0.035	ND		0.08	0.035	ND		0.08	0.035	ND		0.079	0.035	ND		0.082	0.036
2,2-Dichloropropane	594-20-7	NS	NS	NS	ND		0.0023	0.00024	ND		0.004	0.00041	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.00021
2-Butanone	78-93-3	0.1	100	0.1	ND		0.012	0.0026	ND		0.02	0.0045	ND		0.01	0.0022	ND		0.01	0.0022	ND		0.01	0.0022	ND		0.01	0.0022	ND		0.0099	0.0022	ND		0.01	0.0023
2-Hexanone	591-78-6	NS	NS	NS	ND		0.012	0.0014	ND		0.02	0.0024	ND		0.01	0.0012	ND		0.01	0.0012	ND		0.01	0.0012	ND		0.01	0.0012	ND		0.0099	0.0012	ND		0.01	0.0012
4-Methyl-2-pentanone	108-10-1	NS	NS	NS	ND		0.012	0.0015	ND		0.02	0.0026	ND		0.01	0.0013	ND		0.01	0.0013	ND		0.01	0.0013	ND		0.01	0.0013	ND		0.0099	0.0013	ND		0.01	0.0013
Acetone	67-64-1	0.03	100	0.03	ND		0.012	0.0056	ND		0.02	0.0097	ND		0.01	0.0048	ND		0.01	0.0048	ND		0.01	0.0048	ND		0.01	0.0048	ND		0.0099	0.0048	ND		0.01	0.0049
Acrylonitrile	107-13-1	NS	NS	NS	ND		0.0047	0.0013	ND		0.0081	0.0023	ND		0.004	0.0012	ND		0.004	0.0012	ND		0.004	0.0012	ND		0.004	0.0012	ND		0.0039	0.0011	ND		0.0041	0.0012
Benzene	71-43-2	0.06	3.7	0.06	ND		0.00059	0.00019	ND		0.001	0.00034	ND		0.0005	0.00017	ND		0.0005	0.00017	ND		0.0005	0.00017	ND		0.0005	0.00017	ND		0.00049	0.00016	ND		0.00051	0.00017
Bromobenzene	108-86-1	NS	NS	NS	ND		0.0023	0.00017	ND		0.004	0.00029	ND		0.002	0.00014	ND		0.002	0.00014	ND		0.002	0.00014	ND		0.002	0.00014	ND		0.002	0.00014	ND		0.002	0.00015
Bromochloromethane	74-97-5	NS	NS	NS	ND		0.0023	0.00024	ND		0.004	0.00041	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.00021
Bromodichloromethane	75-27-4	NS	NS	NS	ND		0.00059	0.00013	ND		0.001	0.00022	ND		0.0005	0.00011	ND		0.0005	0.00011	ND		0.0005	0.00011	ND		0.0005	0.00011	ND		0.00049	0.00011	ND		0.00051	0.00011
Bromoform	75-25-2	NS	NS	NS	ND		0.0047	0.00029	ND		0.0081	0.0005	ND		0.004	0.00025	ND		0.004	0.00025	ND		0.004	0.00025	ND		0.004	0.00025	ND		0.0039	0.00024	ND		0.0041	0.00025
Bromomethane	74-83-9	NS	NS	NS	ND		0.0023	0.00068	ND		0.004	0.0012	ND		0.002	0.00058	ND		0.002	0.00058	ND		0.002	0.00058	ND		0.002	0.00058	ND		0.002	0.00057	ND		0.002	0.0006
Carbon disulfide	75-15-0	NS	NS	NS	ND		0.012	0.0053	ND		0.02	0.0092	ND		0.01	0.0046	ND		0.01	0.0046	ND		0.01	0.0046	ND		0.01	0.0046	ND		0.0099	0.0045	ND		0.01	0.0047
Carbon tetrachloride	56-23-5	0.76	7.1	0.76	ND		0.0012	0.00027	ND		0.002	0.00046	ND		0.001	0.00023	ND		0.001	0.00023	ND		0.001	0.00023	ND		0.001	0.00023	ND		0.00099	0.00023	ND		0.001	0.00024
Chlorobenzene	108-90-7	4.5	100	4.5	ND		0.00059	0.00015	ND		0.001	0.00026	ND		0.0005	0.00013	ND		0.0005	0.00013	ND		0.0005	0.00013	ND		0.0005	0.00013	ND		0.00049	0.00012	ND		0.00051	0.00013
Chloroethane	75-00-3	NS	NS	NS	ND		0.0023	0.00053	ND		0.004	0.00091	ND		0.002	0.00045	ND		0.002	0.00045	ND		0.002	0.00045	ND		0.002	0.00045	ND		0.002	0.00045	ND		0.002	0.00046
Chloroform	67-66-3	0.37	24	0.37	ND		0.0018	0.00016	ND		0.003	0.00028	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0015	0.00014
Chloromethane	74-87-3	NS	NS	NS	ND		0.0047	0.0011	ND		0.0081	0.0019	ND		0.004	0.00093	ND		0.004	0.00093	ND		0.004	0.00093	ND		0.004	0.00093	ND		0.0039	0.00092	ND		0.0041	0.00096
cis-1,2-Dichloroethene	156-59-2	0.19	41	0.19	0.0008	J	0.0012	0.0002	0.001	J	0.002	0.00035	ND		0.001	0.00018	ND		0.001	0.00018	ND		0.001	0.00018	ND		0.001	0.00018	ND		0.00099	0.00017	ND		0.001	0.00018
cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	ND		0.00059	0.00018	ND		0.001	0.00032	ND		0.0005	0.00016	ND		0.0005	0.00016	ND		0.0005	0.00016	ND		0.0005	0.00016	ND		0.00049	0.00016	ND		0.00051	0.00016
Dibromochloromethane	124-48-1	NS	NS	NS	ND		0.0012	0.00016	ND		0.002	0.00028	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.00099	0.00014	ND		0.001	0.00014
Dibromomethane	74-95-3	NS	NS	NS	ND		0.0023	0.00028	ND		0.004	0.00048	ND		0.002	0.00024	ND		0.002	0.00024	ND		0.002	0.00024	ND		0.002	0.00024	ND		0.002	0.00024	ND		0.002	0.00024
Dichlorodifluoromethane	75-71-8	NS	NS	NS	ND		0.012	0.0011	ND		0.02	0.0018	ND		0.01	0.00092	ND		0.01	0.00092	ND		0.01	0.00092	ND		0.01	0.00092	ND		0.0099	0.0009	ND		0.01	0.00094
Ethyl ether	60-29-7	NS	NS	NS	ND		0.0023	0.0004	ND		0.004	0.00069	ND		0.002	0.00034	ND		0.002	0.00034	ND		0.002	0.00034	ND		0.002	0.00034	ND		0.002	0.00034	ND		0.002	0.00035
Ethylbenzene	100-41-4	1	76	1	ND		0.0012	0.00016	ND		0.002	0.00028	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.001	0.00014	ND		0.00099	0.00014	ND		0.001	0.00014
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.0047	0.0002	ND		0.0081	0.00034	ND		0.004	0.00017	ND		0.004	0.00017	ND		0.004	0.00017	ND		0.004	0.00017	ND		0.0039	0.00017	ND		0.0041	0.00017
Isopropylbenzene	98-82-8	NS	NS	NS	ND		0.0012	0.00013	ND		0.002	0.00022	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.00099	0.00011	ND		0.001	0.00011
Methyl tert butyl ether	1634-04-4	0.1	100	0.1	ND		0.0023	0.00024	ND		0.004	0.00041	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.0002	ND		0.002	0.00021
Methylene chloride	75-09-2	0.05	81	0.05	ND		0.0059	0.0027	ND		0.01	0.0046	ND		0.005	0.0023	ND		0.005	0.0023	ND		0.005	0.0023	ND		0.005	0.0023	ND		0.0049	0.0023	ND		0.0051	0.0024
n-Butylbenzene	104-51-8	18	100	18	ND		0.0012	0.0002	ND		0.002	0.00034	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.00099	0.00016	ND		0.001	0.00017
n-Propylbenzene	103-65-1	5	100	5	ND		0.0012	0.0002	ND		0.002	0.00034	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.001	0.00017	ND		0.00099	0.00017	ND		0.001	0.00018
Naphthalene	91-20-3	12	100	12	ND		0.0047	0.00076	ND		0.0081	0.0013	ND		0.004	0.00065	ND		0.004	0.00065	ND		0.004	0.00065	ND		0.004	0.00065	ND		0.0039	0.00064	ND		0.0041	0.00067
o-Chlorotoluene	95-49-8	NS	NS	NS	ND		0.0023	0.00022	ND		0.004	0.00039	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.00019	ND		0.002	0.0002
o-Xylene	95-47-6	NS	NS	NS	ND		0.0012	0.00034	ND		0.002	0.00059	ND		0.001	0.00029	ND		0.001	0.00029	ND		0.001	0.00029	ND		0.001	0.00029	ND		0.00099	0.00029	ND		0.001	0.0003
p-Chlorotoluene	106-43-4	NS	NS	NS	ND		0.0023	0.00013	ND		0.004	0.00022	ND		0.002	0.00011	ND		0.002	0.00011	ND		0.002	0.00011	ND		0.002	0.00011	ND		0.002	0.00011	ND		0.002	0.00011
p-Diethylbenzene	105-05-5	NS	NS	NS	ND		0.0023	0.00021	ND		0.004	0.00036	ND		0.002	0.00018	ND		0.002	0.00018	ND		0.002	0.00018	ND		0.002	0.00018	ND		0.002	0.00017	ND		0.002	0.00018
p-Ethyltoluene	622-96-8	NS	NS	NS	ND		0.0023	0.00045	ND		0.004	0.00078	ND		0.002	0.00038	ND		0.002	0.00038	ND		0.002	0.00038	ND		0.002	0.00038	ND		0.002	0.00038	ND		0.002	0.00039
p-Isopropyltoluene	99-87-6	NS	NS	NS	ND		0.0012	0.00013	ND		0.002	0.00022	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.001	0.00011	ND		0.00099	0.00011	ND		0.001	0.00011
p/m-Xylene	179601-23-1	NS	NS	NS	ND		0.0023	0.00066	ND		0.004	0.0011	ND		0.002	0.00056	ND		0.002	0.00056	ND		0.002	0.00056	ND		0.002	0.00056	ND		0.002	0.00055	ND		0.002	0.00058
sec-Butylbenzene	135-98-8	25	100	25	ND		0.0012	0.00017	ND		0.002	0.0003	ND		0.001	0.00015	ND		0.001	0.00015	ND		0.001	0.00015	ND		0.001	0.00015	ND		0.00099	0.00014	ND		0.001	0.00015
Styrene	100-42-5	NS	NS	NS	ND		0.0012	0.00023	ND		0.002	0.0004	ND		0.001	0.0002	ND		0.001	0.0002	ND		0.001	0.0002	ND		0.001	0.0002	ND		0.00099	0.00019	ND		0.001	0.0002
tert-Butylbenzene	98-06-6	11	100	11	ND		0.0023	0.00014	ND		0.004	0.00024	ND		0.002	0.00012	ND		0.002	0.00012	ND		0.002	0.00012	ND		0.002	0.00012	ND		0.002	0.00012	ND		0.002	0.00012
Tetrachloroethene	127-18-4	1.3	18	1.3	0.012		0.00059	0.00023	0.054		0.001	0.0004	0.0015		0.0005	0.0002	ND		0.0005	0.0002	ND		0.0005	0.0002	ND		0.0005	0.0002	ND		0.00049	0.00019	ND		0.00051	0.0002
Toluene	108-88-3	0.7	100	0.7	ND		0.0012	0.00064	ND		0.002	0.0011	ND		0.001	0.00054	ND		0.001	0.00054	ND		0.001	0.00054	ND		0.001	0.00054	ND		0.00099	0.00054	ND		0.001	0.00056
trans-1,2-Dichloroethene	156-60-5	0.19	100	0.19	ND		0.0018	0.00016	ND		0.003	0.00028	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0015	0.00014	ND		0.0015	0.00014
trans-1,3-Dichloropropene	10061-02-6	NS	NS	NS	ND		0.0012	0.00032	ND		0.002	0.00055	ND		0.001	0.00027	ND		0.001	0.00027	ND		0.001	0.00027	ND		0.001	0.00027	ND		0.00099	0.00027	ND		0.001	0.00028
trans-1,4-Dichloro-2-butene	110-57-6	NS	NS	NS	ND		0.0059	0.0017	ND		0.01	0.0029	ND		0.005	0.0014	ND		0.005	0.0014	ND		0.005	0.0014	ND		0.005	0.0014	ND		0.0049	0.0014	ND		0.0051	0.0014
Trichloroethene	79-01-6	0.47	6.4	0.47	0.0023		0.00059	0.00016	0.0065		0.001	0.00028	ND		0.0005	0.00014	ND		0.0005	0.00014	ND		0.0005	0.00014	ND		0.0005	0.00014	ND		0.00049	0.00014	ND		0.00051	0.00014
Trichlorofluoromethane	75-69-4	NS	NS	NS	ND		0.0047	0.00081	ND		0.0081	0.0014	ND		0.004	0.0007	ND		0.004	0.0007	ND		0.004	0.0007	ND		0.004	0.0007	ND		0.0039	0.00069	ND		0.0041	0.00071
Vinyl acetate	108-05-4	NS	NS	NS	ND		0.012	0.0025	ND		0.02	0.0043	ND		0.01	0.0022	ND		0.01	0.0022	ND		0.01	0.0022	ND		0.01	0.0022	ND		0.0099	0.0021	ND		0.01	0.0022
Vinyl chloride	75-01-4	0.03	0.48	0.03	ND		0.0012	0.00039	ND		0.002	0.00068	ND		0.001	0.00034	ND		0.001	0.00034	ND		0.001	0.00034	ND		0.001	0.00034	ND		0.00099	0.00033	ND		0.001	0.00034
Xylenes, Total	1330-20-7	0.26	100	1.2	ND		0.0012	0.00034	ND		0.002	0.00059	ND		0.001	0.00029	ND		0.001	0.00029	ND		0.001	0.00029	ND		0.001	0.00029	ND		0.00099	0.00029	ND		0.001	0.0003
Total VOCs					0.0151	-	-	-	0.06221	-	-	-	0.0015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All results reported in milligram per kilogram (mg/kg)

Results Exceed UUSCO

Results Exceed RRUSCO

Results Exceed PGWSCO and AWQS

Q - Laboratory Qualifier

J - The result is less than the detection limit, but greater than zero

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

- - Not Analyzed

ND - Analyzed for but Not Detected at the MDL

NS - No Applicable Standard

TICs - Tentatively Identified Compounds

RL - Reporting Limit

MDL - Method Detection Limit

RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the soil standard

TABLE 3B

245 West 55th Street
New York, New York

Summary of Semi-Volatile Organic Compounds in Soil

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-1 L2468433-07 11/20/2024 0-2'				SB-1 L2468433-08 11/20/2024 2-4'				SB-1 L2468433-09 11/20/2024 4-6'				SB-1 L2468433-10 11/20/2024 6-8'				SB-1 L2468433-11 11/20/2024 8-10'				SB-1D L2468433-20 11/20/2024 0-2'				SB-1D L2468433-24 11/20/2024 2-4'				SB-1D L2468433-25 11/20/2024 4-6'				SB-1D L2468433-26 11/20/2024 6-8'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
BASE/NEUTRAL EXTRACTABLES																																						
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	NS	ND		0.2	0.021	ND		0.19	0.02	ND		0.17	0.018	ND		0.19	0.02	ND		0.22	0.023	ND		0.2	0.021	ND		0.22	0.023	ND		0.18	0.019	ND		0.19	0.02
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.2	0.023	ND		0.19	0.022	ND		0.17	0.019	ND		0.19	0.022	ND		0.22	0.025	ND		0.2	0.023	ND		0.22	0.025	ND		0.18	0.02	ND		0.19	0.022
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.2	0.036	ND		0.19	0.034	ND		0.17	0.03	ND		0.19	0.034	ND		0.22	0.039	ND		0.2	0.036	ND		0.22	0.04	ND		0.18	0.032	ND		0.19	0.035
1,3-Dichlorobenzene	541-73-1	2.6	38	2.4	ND		0.2	0.034	ND		0.19	0.033	ND		0.17	0.029	ND		0.19	0.033	ND		0.22	0.038	ND		0.2	0.034	ND		0.22	0.038	ND		0.18	0.031	ND		0.19	0.033
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.2	0.035	ND		0.19	0.033	ND		0.17	0.03	ND		0.19	0.034	ND		0.22	0.038	ND		0.2	0.035	ND		0.22	0.039	ND		0.18	0.031	ND		0.19	0.034
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.03	0.0091	ND		0.028	0.0088	ND		0.026	0.0078	ND		0.029	0.0088	ND		0.033	0.01	ND		0.03	0.0092	ND		0.033	0.01	ND		0.027	0.0082	ND		0.029	0.0089
2,4,5-Trichlorophenol	95-95-4	NS	NS	NS	ND		0.2	0.038	ND		0.19	0.036	ND		0.17	0.032	ND		0.19	0.037	ND		0.22	0.042	ND		0.2	0.038	ND		0.22	0.042	ND		0.18	0.034	ND		0.19	0.037
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	ND		0.12	0.038	ND		0.11	0.036	ND		0.1	0.032	ND		0.12	0.036	ND		0.13	0.041	ND		0.12	0.038	ND		0.13	0.042	ND		0.11	0.034	ND		0.12	0.037
2,4-Dichlorophenol	120-83-2	NS	NS	NS	ND		0.18	0.032	ND		0.17	0.03	ND		0.15	0.027	ND		0.17	0.031	ND		0.2	0.035	ND		0.18	0.032	ND		0.2	0.036	ND		0.16	0.029	ND		0.17	0.031
2,4-Dimethylphenol	105-67-9	NS	NS	NS	ND		0.2	0.066	ND		0.19	0.063	ND		0.17	0.056	ND		0.19	0.063	ND		0.22	0.072	ND		0.2	0.066	ND		0.22	0.073	ND		0.18	0.059	ND		0.19	0.064
2,4-Dinitrophenol	51-28-5	NS	NS	NS	ND		0.95	0.092	ND		0.91	0.089	ND		0.82	0.079	ND		0.92	0.089	ND		1	0.1	ND		0.96	0.094	ND		1.1	0.1	ND		0.86	0.083	ND		0.93	0.09
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	ND		0.2	0.04	ND		0.19	0.038	ND		0.17	0.034	ND		0.19	0.038	ND		0.22	0.044	ND		0.2	0.04	ND		0.22	0.044	ND		0.18	0.036	ND		0.19	0.039
2,6-Dinitrotoluene	606-20-2	NS	NS	NS	ND		0.2	0.034	ND		0.19	0.033	ND		0.17	0.029	ND		0.19	0.033	ND		0.22	0.038	ND		0.2	0.034	ND		0.22	0.038	ND		0.18	0.031	ND		0.19	0.033
2-Chloronaphthalene	91-58-7	NS	NS	NS	ND		0.2	0.02	ND		0.19	0.019	ND		0.17	0.017	ND		0.19	0.019	ND		0.22	0.022	ND		0.2	0.02	ND		0.22	0.022	ND		0.18	0.018	ND		0.19	0.019
2-Chlorophenol	95-57-8	NS	NS	NS	ND		0.2	0.023	ND		0.19	0.022	ND		0.17	0.02	ND		0.19	0.023	ND		0.22	0.026	ND		0.2	0.024	ND		0.22	0.026	ND		0.18	0.021	ND		0.19	0.023
2-Methylnaphthalene	91-57-6	NS	NS	NS	ND		0.24	0.024	ND		0.23	0.023	ND		0.2	0.02	ND		0.23	0.023	ND		0.26	0.026	ND		0.24	0.024	ND		0.26	0.027	ND		0.21	0.022	ND		0.23	0.023
2-Methylphenol	95-48-7	0.33	100	0.33	ND		0.2	0.031	ND		0.19	0.029	ND		0.17	0.026	ND		0.19	0.03	ND		0.22	0.034	ND		0.2	0.031	ND		0.22	0.034	ND		0.18	0.028	ND		0.19	0.03
2-Nitroaniline	88-74-4	NS	NS	NS	ND		0.2	0.038	ND		0.19	0.037	ND		0.17	0.033	ND		0.19	0.037	ND		0.22	0.042	ND		0.2	0.039	ND		0.22	0.043	ND		0.18	0.034	ND		0.19	0.037
2-Nitrophenol	88-75-5	NS	NS	NS	ND		0.43	0.075	ND		0.41	0.072	ND		0.37	0.064	ND		0.41	0.072	ND		0.47	0.082	ND		0.43	0.075	ND		0.48	0.083	ND		0.39	0.067	ND		0.42	0.073
3,3'-Dichlorobenzidine	91-94-1	NS	NS	NS	ND		0.2	0.053	ND		0.19	0.051	ND		0.17	0.045	ND		0.19	0.051	ND		0.22	0.058	ND		0.2	0.053	ND		0.22	0.059	ND		0.18	0.048	ND		0.19	0.051
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	0.33	100	0.33	ND		0.28	0.031	ND		0.27	0.03	ND		0.24	0.027	ND		0.28	0.03	ND		0.31	0.034	ND		0.29	0.031	ND		0.32	0.035	ND		0.26	0.028	ND		0.28	0.03
3-Nitroaniline	99-09-2	NS	NS	NS	ND		0.2	0.037	ND		0.19	0.036	ND		0.17	0.032	ND		0.19	0.036	ND		0.22	0.041	ND		0.2	0.038	ND		0.22	0.042	ND		0.18	0.034	ND		0.19	0.036
4,6-Dinitro-o-cresol	534-52-1	NS	NS	NS	ND		0.52	0.095	ND		0.49	0.091	ND		0.44	0.082	ND		0.5	0.092	ND		0.57	0.1	ND		0.52	0.096	ND		0.58	0.11	ND		0.46	0.086	ND		0.5	0.093
4-Bromophenyl phenyl ether	101-55-3	NS	NS	NS	ND		0.2	0.03	ND		0.19	0.029	ND		0.17	0.026	ND		0.19	0.029	ND		0.22	0.033	ND		0.2	0.031	ND		0.22	0.034	ND		0.18	0.027	ND		0.19	0.03
4-Chloroaniline	106-47-8	NS	NS	NS	ND		0.2	0.036	ND		0.19	0.035	ND		0.17	0.031	ND		0.19	0.035	ND		0.22	0.04	ND		0.2	0.036	ND		0.22	0.04	ND		0.18	0.032	ND		0.19	0.035
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	NS	ND		0.2	0.021	ND		0.19	0.02	ND		0.17	0.018	ND		0.19	0.02	ND		0.22	0.023	ND		0.2	0.021	ND		0.22	0.024	ND		0.18	0.019	ND		0.19	0.021
4-Nitroaniline	100-01-6	NS	NS	NS	ND		0.2	0.082	ND		0.19	0.079	ND		0.17	0.07	ND		0.19	0.079	ND		0.22	0.09	ND		0.2	0.083	ND		0.22	0.092	ND		0.18	0.074	ND		0.19	0.08
4-Nitrophenol	100-02-7	NS	NS	NS	ND		0.28	0.081	ND		0.27	0.078	ND		0.24	0.069	ND		0.27	0.078	ND		0.31	0.089	ND		0.28	0.082	ND		0.31	0.09	ND		0.25	0.073	ND		0.27	0.079
Acenaphthene	83-32-9	20	100	98	ND		0.16	0.02	ND		0.15	0.02	ND		0.14	0.018	ND		0.15	0.02	ND		0.17	0.023	ND		0.16	0.021	ND		0.18	0.023	ND		0.14	0.018	ND		0.15	0.02
Acenaphthylene	208-96-8	100	100	365	ND		0.16	0.031	ND		0.15	0.029	ND		0.14	0.026	ND		0.15	0.03	ND		0.17	0.034	ND		0.16	0.031	ND		0.18	0.034	ND		0.14	0.028	ND		0.15	0.03
Acetophenone	98-86-2	NS	NS	NS	ND		0.2	0.024	ND		0.19	0.024	ND		0.17	0.021	ND		0.19	0.024	ND		0.22	0.027	ND		0.2	0.025	ND		0.22	0.027	ND		0.18	0.022	ND		0.19	0.024
Anthracene	120-12-7	100	100	1,000	ND		0.12	0.039	ND		0.11	0.037	ND		0.1	0.033	ND		0.12	0.037	ND		0.13	0.043	ND		0.12	0.039	ND		0.13	0.043	ND		0.11	0.035	ND		0.12	0.038
Benzo(a)anthracene	56-55-3	1	1.4	1	ND		0.12	0.022	ND		0.11	0.021	ND		0.1	0.019	ND		0.12	0.022	ND		0.13	0.025	ND		0.12	0.023	ND		0.13	0.025	ND		0.11	0.02	ND		0.12	0.022
Benzo(a)pyrene	50-32-8	1	1	22	ND		0.16	0.048	ND		0.15	0.046	ND		0.14	0.042	ND		0.15	0.047	ND		0.17	0.053	ND		0.16	0.049	ND		0.18	0.054	ND		0.14	0.044	ND		0.15	0.047
Benzo(b)fluoranthene	205-99-2	1	1.4	2.1	ND		0.12	0.033	ND		0.11	0.032	ND		0.1	0.029	ND		0.12	0.032	ND		0.13	0.037	ND		0.12	0.034	ND		0.13	0.037	ND		0.11	0.03	ND		0.12	0.032
Benzo(ghi)perylene	191-24-2	1	4.9	1,000	ND		0.16	0.023	ND		0.15	0.022	ND		0.14	0.02	ND		0.15	0.022	ND		0.17	0.026	ND		0.16	0.024	ND		0.18	0.026	ND		0.14	0.021	ND		0.15	0.023
Benzo(k)fluoranthene	207-08-9	0.8	4.9	2	ND		0.12	0.032	ND		0.11	0.03	ND		0.1	0.027	ND		0.12	0.031	ND		0.13	0.035	ND		0.12	0.032	ND		0.13	0.035	ND		0.11	0.029	ND		0.12	0.031
Benzoic Acid	65-85-0	NS	NS	NS	ND		0.64	0.2	ND		0.62	0.19	ND		0.55	0.17	ND		0.62	0.19	ND		0.71	0.22	ND		0.65	0.2	ND		0.72	0.22	ND		0.58	0.18	ND		0.63	0.2
Benzyl Alcohol	100-51-6	NS	NS	NS	ND		0.2	0.061	ND		0.19	0.058	ND		0.17	0.052	ND		0.19	0.059	ND		0.22	0.067	ND		0.2	0.061	ND		0.22	0.068	ND		0.18	0.055	ND		0.19	0.059
Biphenyl	92-52-4	NS	NS	NS	ND		0.45	0.026	ND		0.43	0.025	ND		0.39	0.022	ND		0.44	0.025	ND		0.5	0.028	ND		0.46	0.026	ND		0.5	0.029	ND		0.41	0.023	ND		0.44	0.025
Bis(2-chloroethoxy)methane	111-91-1	NS	NS	NS	ND		0.21	0.02	ND		0.2	0.019	ND		0.18	0.017	ND		0.21	0.019	ND		0.24	0.022	ND		0.22	0.02	ND		0.24	0.022	ND		0.19	0.018	ND		0.21	0.019
Bis(2-chloroethyl)ether	111-44-4	NS	NS	NS	ND		0.18	0.027	ND		0.17	0.026	ND		0.15	0.023	ND		0.17	0.026	ND		0.2	0.03	ND		0.18	0.027	ND		0.2	0.03	ND		0.16	0.024	ND		0.17	0.026
Bis(2-chloroisopropyl)ether	108-60-1	NS	NS	NS	ND		0.24	0.034	ND		0.23	0.032	ND		0.2	0.029	ND		0.23	0.033	ND		0.26	0.037	ND		0.24	0.034	ND		0.26	0.038	ND		0.21	0.03	ND		0.23	0.033
Bis(2-ethylhexyl)phthalate	117-81-7	NS	NS	NS	ND		0.2	0.069	ND		0.19	0.066	ND		0.17	0.059	ND		0.19	0.066	ND		0.22	0.076	ND		0.2	0.069	ND		0.22	0.076	ND		0.18	0.062	ND		0.19	0.067
Butyl benzyl phthalate	85-68-7	NS	NS	NS	ND		0.2	0.05	ND		0.19	0.048	ND		0.17	0.043	ND		0.19	0.048	ND		0.22	0.055	ND		0.2	0.051	ND		0.22	0.056	ND		0.18	0.045	ND		0.19	0.049
Carbazole	86-74-8	NS	NS	NS	ND		0.2	0.019	ND		0.19	0.018	ND		0.17	0.016	ND		0.19	0.019	ND		0.22	0.021	ND		0.2	0.02	ND		0.22	0.022	ND		0.18	0.017	ND		0.19	0.019
Chrysene	218-01-9	1	4.9	1	ND		0.12	0.021	ND		0.11	0.02	ND		0.1	0.018	ND		0.12	0.02	ND		0.13	0.023	ND		0.12	0.021	ND		0.13	0.023	ND		0.11	0.019	ND		0.12	0.02
Di-n-butylphthalate	84-74-2	NS	NS	NS	ND		0.2	0.038	ND		0.19	0.036	ND		0.17	0.032	ND		0.19	0.036	ND		0.22	0.041	ND		0.2	0.038	ND		0.22	0.042	ND		0.18	0.034	ND		0.19	0.037
Di-n-octylphthalate	117-84-0	NS	NS	NS	ND		0.2	0.068	ND		0.19	0.065	ND		0.17	0.058	ND		0.19	0.065	ND		0.22	0.074	ND		0.2	0.068	ND		0.22	0.075	ND		0.18	0.061	ND		0.19	0.066
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	1,000	ND		0.12	0.023	ND		0.11	0.022	ND		0.1	0.02	ND		0.12	0.022	ND		0.13	0.025	ND		0.12	0.023	ND		0.13	0.026	ND		0.11	0.021	ND		0.12	0.022
Dibenzofuran	132-64-9	2.1	18	110	ND		0.2	0.019	ND		0.19	0.018	ND		0.17	0.016	ND		0.19	0.018	ND		0.22	0.021	ND		0.2	0.019	ND		0.22	0.021	ND		0.18	0.017	ND		0.19	0.018
Diethyl phthalate	84-66-2	NS	NS	NS	ND		0.2	0.018	ND		0.19	0.018	ND		0.17	0.016	ND		0.19	0.018	ND		0.22	0.02	ND		0.2	0.018	ND		0.22	0.02	ND		0.18	0.016	ND		0.19	0.018
Dimethyl phthalate	131-11-3	NS	NS	NS	ND		0.2	0.042	ND		0.19	0.04	ND		0.17	0.036	ND		0.19	0.04	ND		0.22	0.046	ND		0.2	0.042	ND		0.22	0.046	ND		0.18	0.038	ND		0.19	0.041
Fluoranthene	206-44-0	85	100	1,000	ND		0.12	0.023	ND		0.11	0.022	ND		0.1	0.02	ND		0.12	0.022	ND		0.13	0.025	ND		0.12	0.023	ND		0.13	0.025	0.035	J	0.11	0.02	ND		0.12	0.022
Fluorene	86-73-7	30	100	386	ND		0.2	0.019	ND		0.19	0.018	ND		0.17	0.016	ND		0.19	0.019	ND		0.22	0.021	ND		0.2	0.02	ND		0.22	0.022	ND		0.18	0.017	ND		0.19	0.019
Hexachlorobenzene	118-74-1	0.33	0.3	3.2	ND		0.12	0.022	ND		0.11	0.021	ND		0.1	0.019	ND		0.12	0.021	ND		0.13	0.024	ND		0.12	0.022	ND		0.13	0.025	ND		0.11	0.02	ND		0.12	0.022
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.2	0.029	ND		0.19	0.028	ND		0.17	0.025	ND		0.19	0.028	ND		0.22	0.032	ND		0.2	0.029	ND		0.22	0.032	ND		0.18	0.026	ND		0.19	0.028
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	ND		0.57	0.18	ND		0.54	0.17	ND		0.49	0.15	ND		0.55	0.17	ND		0.62	0.2	ND		0.57	0.18	ND		0.63	0.2	ND		0.51	0.16	ND		0.55	0.18
Hexachloroethane	67-72-1	NS	NS	NS	ND		0.16	0.032	ND		0.15	0.031	ND		0.14	0.028	ND		0.15	0.031	ND		0.17	0.035	ND		0.16	0.032	ND		0.18	0.036	ND		0.14	0.029	ND		0.15	0.031
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	1.4	6.6	ND		0.16	0.028	ND		0.15	0.026	ND		0.14	0.024	ND		0.15	0.027	ND		0.17	0.03	ND		0.16	0.028	ND		0.18	0.031	ND		0.14	0.025	ND		0.15	0.027
Isophorone	78-59-1	NS	NS	NS	ND		0.18	0.026	ND		0.17	0.025	ND		0.15	0.022	ND		0.17	0.025	ND		0.2	0.028	ND		0.18	0.026	ND		0.2	0.029	ND		0.16	0.023	ND		0.17	0.025
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	NS	ND		0.2	0.031	ND		0.19	0.029	ND		0.17	0.026	ND		0.19	0.03	ND		0.22	0.034	ND		0.2	0.031	ND		0.22	0.034	ND		0.18	0.028	ND		0.19	0.03
Naphthalene	91-20-3	12	100	12	ND		0.2	0.024	ND		0.19	0.023	ND		0.17	0.021	ND		0.19	0.023	ND		0.22	0.027	ND		0.2	0.024	ND		0.22	0.027	ND		0.18	0.022	ND		0.19	0.024
NDPA/DPA	86-30-6	NS	NS	NS	ND		0.16	0.022	ND		0.15	0.022	ND		0.14	0.019	ND		0.15	0.022	ND		0.17	0.025	ND		0.16	0.023	ND		0.18	0.025	ND		0.14	0.02	ND		0.15	0.022
Nitrobenzene	98-95-3	0.08	1.8	0.08	ND		0.18	0.029	ND		0.17	0.028	ND		0.15	0.025	ND		0.17	0.028	ND		0.2	0.032	ND		0.18	0.03	ND		0.2	0.033	ND		0.16	0.026	ND		0.17	0.029
p-Chloro-m-cresol	59-50-7	NS	NS	NS	ND		0.2	0.03	ND		0.19	0.028	ND		0.17	0.025	ND		0.19	0.028	ND		0.22	0.032	ND		0.2	0.03	ND		0.22	0.033	ND		0.18	0.027	ND		0.19	0.029
Pentachlorophenol	87-86-5	0.8	1.3	0.8	ND		0.16	0.044	ND		0.15	0.042	ND		0.14	0.037	ND		0.15	0.042	ND		0.17	0.048	ND		0.16	0.044	ND		0.18	0.049	ND		0.14	0.039	ND		0.15	0.042
Phenanthrene	85-01-8	1	5	1,000	ND		0.12	0.024	ND		0.11	0.023	ND		0.1	0.021	ND		0.12	0.023	ND		0.13	0.026	ND		0.12	0.024	ND		0.13	0.027	0.046	J	0.11	0.022	ND		0.12	0.024
Phenol	108-95-2	0.33	100	0.33	ND		0.2	0.03	ND		0.19	0.029	ND		0.17	0.026	ND		0.19	0.029	ND		0.22	0.033	ND		0.2	0.03	ND		0.22	0.033	ND		0.18	0.027	ND		0.19	0.029
Pyrene	129-00-0	64	100	1,000	ND		0.12	0.02	ND		0.11	0.019	ND		0.1	0.017	ND		0.12	0.019	ND		0.13	0.022	ND		0.12	0.02	ND		0.13	0.022	0.028	J	0.11	0.018	ND		0.12	0.019
Total SVOCs		NS	NS	NS	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	0.109		-	-	-		-	-

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3B

245 West 55th Street
New York, New York

Summary of Semi-Volatile Organic Compounds in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-1D L2468433-21 11/20/2024 8-10'				SB-2 L2505323-01 1/30/2025 0-2'				SB-2 L2505323-02 1/30/2025 2-4'				SB-2 L2505323-03 1/30/2025 4-6'				SB-2 L2505323-04 1/30/2025 6-8'				DUP L2505323-06 1/30/2025 6-8'				SB-2 L2505323-05 1/30/2025 8-10'				SB-3 L2468036-07 11/19/2024 0-2'				SB-3 L2468036-08 11/19/2024 2-4'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
BASE/NEUTRAL EXTRACTABLES																																						
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	NS	ND		0.2	0.021	ND		0.2	0.021	ND		0.2	0.021	ND		1	0.11	ND		1.8	0.19	ND		0.9	0.094	ND		0.93	0.098	ND		0.2	0.021	ND		0.19	0.02
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.2	0.024	ND		0.2	0.023	ND		0.2	0.023	ND		1	0.12	ND		1.8	0.21	ND		0.9	0.1	ND		0.93	0.11	ND		0.2	0.023	ND		0.19	0.022
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.2	0.037	ND		0.2	0.036	ND		0.2	0.036	ND		1	0.18	ND		**1.8**	0.32	ND		0.9	0.16	ND		0.93	0.17	ND		0.2	0.036	ND		0.19	0.035
1,3-Dichlorobenzene	541-73-1	2.6	38	2.4	ND		0.2	0.035	ND		0.2	0.035	ND		0.2	0.035	ND		1	0.18	ND		1.8	0.31	ND		0.9	0.15	ND		0.93	0.16	ND		0.2	0.034	ND		0.19	0.033
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.2	0.036	ND		0.2	0.035	ND		0.2	0.035	ND		1	0.18	ND		1.8	0.31	ND		0.9	0.16	ND		0.93	0.16	ND		0.2	0.035	ND		0.19	0.034
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.031	0.0094	ND		0.03	0.0093	ND		0.03	0.0093	ND		**0.15**	0.047	ND		**0.27**	0.083	ND		0.13	0.041	ND		0.14	0.043	ND		0.03	0.0092	ND		0.029	0.0089
2,4,5-Trichlorophenol	95-95-4	NS	NS	NS	ND		0.2	0.039	ND		0.2	0.039	ND		0.2	0.039	ND		1	0.2	ND		1.8	0.34	ND		0.9	0.17	ND		0.93	0.18	ND		0.2	0.038	ND		0.19	0.037
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	ND		0.12	0.039	ND		0.12	0.038	ND		0.12	0.038	ND		0.62	0.19	ND		1.1	0.34	ND		0.54	0.17	ND		0.56	0.18	ND		0.12	0.038	ND		0.12	0.036
2,4-Dichlorophenol	120-83-2	NS	NS	NS	ND		0.18	0.033	ND		0.18	0.033	ND		0.18	0.032	ND		0.92	0.16	ND		1.6	0.29	ND		0.81	0.14	ND		0.84	0.15	ND		0.18	0.032	ND		0.17	0.031
2,4-Dimethylphenol	105-67-9	NS	NS	NS	ND		0.2	0.068	ND		0.2	0.067	ND		0.2	0.066	ND		1	0.34	ND		1.8	0.59	ND		0.9	0.3	ND		0.93	0.31	ND		0.2	0.066	ND		0.19	0.064
2,4-Dinitrophenol	51-28-5	NS	NS	NS	ND		0.99	0.096	ND		0.97	0.094	ND		0.97	0.094	ND		4.9	0.48	ND		8.6	0.84	ND		4.3	0.42	ND		4.5	0.44	ND		0.96	0.093	ND		0.93	0.09
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	ND		0.2	0.041	ND		0.2	0.04	ND		0.2	0.04	ND		1	0.2	ND		1.8	0.36	ND		0.9	0.18	ND		0.93	0.19	ND		0.2	0.04	ND		0.19	0.038
2,6-Dinitrotoluene	606-20-2	NS	NS	NS	ND		0.2	0.035	ND		0.2	0.035	ND		0.2	0.034	ND		1	0.18	ND		1.8	0.31	ND		0.9	0.15	ND		0.93	0.16	ND		0.2	0.034	ND		0.19	0.033
2-Chloronaphthalene	91-58-7	NS	NS	NS	ND		0.2	0.02	ND		0.2	0.02	ND		0.2	0.02	ND		1	0.1	ND		1.8	0.18	ND		0.9	0.089	ND		0.93	0.093	ND		0.2	0.02	ND		0.19	0.019
2-Chlorophenol	95-57-8	NS	NS	NS	ND		0.2	0.024	ND		0.2	0.024	ND		0.2	0.024	ND		1	0.12	ND		1.8	0.21	ND		0.9	0.11	ND		0.93	0.11	ND		0.2	0.024	ND		0.19	0.023
2-Methylnaphthalene	91-57-6	NS	NS	NS	ND		0.25	0.025	0.12	J	0.24	0.024	ND		0.24	0.024	ND		1.2	0.12	6.7		2.2	0.22	5.9		1.1	0.11	14		1.1	0.11	ND		0.24	0.024	ND		0.23	0.023
2-Methylphenol	95-48-7	0.33	100	0.33	ND		0.2	0.032	ND		0.2	0.031	ND		0.2	0.031	ND		**1**	0.16	ND		**1.8**	0.28	ND		**0.9**	0.14	ND		**0.93**	0.14	ND		0.2	0.031	ND		0.19	0.03
2-Nitroaniline	88-74-4	NS	NS	NS	ND		0.2	0.04	ND		0.2	0.039	ND		0.2	0.039	ND		1	0.2	ND		1.8	0.35	ND		0.9	0.17	ND		0.93	0.18	ND		0.2	0.039	ND		0.19	0.037
2-Nitrophenol	88-75-5	NS	NS	NS	ND		0.44	0.077	ND		0.44	0.076	ND		0.44	0.076	ND		2.2	0.39	ND		3.9	0.68	ND		1.9	0.34	ND		2	0.35	ND		0.43	0.075	ND		0.42	0.072
3,3'-Dichlorobenzidine	91-94-1	NS	NS	NS	ND		0.2	0.055	ND		0.2	0.054	ND		0.2	0.054	ND		1	0.27	ND		1.8	0.48	ND		0.9	0.24	ND		0.93	0.25	ND		0.2	0.053	ND		0.19	0.051
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	0.33	100	0.33	ND		0.3	0.032	ND		0.29	0.032	ND		0.29	0.032	ND		**1.5**	0.16	ND		**2.6**	0.28	ND		**1.3**	0.14	ND		**1.3**	0.15	ND		0.29	0.031	ND		0.28	0.03
3-Nitroaniline	99-09-2	NS	NS	NS	ND		0.2	0.039	ND		0.2	0.038	ND		0.2	0.038	ND		1	0.19	ND		1.8	0.34	ND		0.9	0.17	ND		0.93	0.18	ND		0.2	0.038	ND		0.19	0.036
4,6-Dinitro-o-cresol	534-52-1	NS	NS	NS	ND		0.53	0.099	ND		0.53	0.097	ND		0.52	0.097	ND		2.7	0.49	ND		4.7	0.86	ND		2.3	0.43	ND		2.4	0.45	ND		0.52	0.096	ND		0.5	0.093
4-Bromophenyl phenyl ether	101-55-3	NS	NS	NS	ND		0.2	0.031	ND		0.2	0.031	ND		0.2	0.031	ND		1	0.16	ND		1.8	0.28	ND		0.9	0.14	ND		0.93	0.14	ND		0.2	0.03	ND		0.19	0.029
4-Chloroaniline	106-47-8	NS	NS	NS	ND		0.2	0.037	ND		0.2	0.037	ND		0.2	0.037	ND		1	0.19	ND		1.8	0.33	ND		0.9	0.16	ND		0.93	0.17	ND		0.2	0.036	ND		0.19	0.035
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	NS	ND		0.2	0.022	ND		0.2	0.022	ND		0.2	0.022	ND		1	0.11	ND		1.8	0.19	ND		0.9	0.096	ND		0.93	0.1	ND		0.2	0.021	ND		0.19	0.021
4-Nitroaniline	100-01-6	NS	NS	NS	ND		0.2	0.085	ND		0.2	0.084	ND		0.2	0.083	ND		1	0.42	ND		1.8	0.75	ND		0.9	0.37	ND		0.93	0.39	ND		0.2	0.083	ND		0.19	0.08
4-Nitrophenol	100-02-7	NS	NS	NS	ND		0.29	0.084	ND		0.28	0.083	ND		0.28	0.082	ND		1.4	0.42	ND		2.5	0.74	ND		1.2	0.37	ND		1.3	0.38	ND		0.28	0.082	ND		0.27	0.079
Acenaphthene	83-32-9	20	100	98	ND		0.16	0.021	0.27		0.16	0.021	ND		0.16	0.021	3.6		0.82	0.11	6		1.4	0.19	4.9		0.72	0.093	4.6		0.75	0.097	ND		0.16	0.021	ND		0.15	0.02
Acenaphthylene	208-96-8	100	100	365	ND		0.16	0.032	ND		0.16	0.031	ND		0.16	0.031	ND		0.82	0.16	ND		1.4	0.28	ND		0.72	0.14	ND		0.75	0.14	ND		0.16	0.031	ND		0.15	0.03
Acetophenone	98-86-2	NS	NS	NS	ND		0.2	0.025	ND		0.2	0.025	ND		0.2	0.025	ND		1	0.13	ND		1.8	0.22	ND		0.9	0.11	ND		0.93	0.12	ND		0.2	0.025	ND		0.19	0.024
Anthracene	120-12-7	100	100	1,000	ND		0.12	0.04	0.57		0.12	0.04	ND		0.12	0.039	ND		0.62	0.2	ND		1.1	0.35	ND		0.54	0.17	ND		0.56	0.18	ND		0.12	0.039	ND		0.12	0.038
Benzo(a)anthracene	56-55-3	1	1.4	1	ND		0.12	0.023	0.83		0.12	0.023	0.16		0.12	0.023	ND		0.62	0.12	ND		1.1	0.2	ND		0.54	0.1	ND		0.56	0.1	ND		0.12	0.022	ND		0.12	0.022
Benzo(a)pyrene	50-32-8	1	1	22	ND		0.16	0.05	0.78		0.16	0.049	0.14	J	0.16	0.049	ND		0.82	0.25	ND		**1.4**	0.44	ND		0.72	0.22	ND		0.75	0.23	ND		0.16	0.049	ND		0.15	0.047
Benzo(b)fluoranthene	205-99-2	1	1.4	2.1	ND		0.12	0.035	1		0.12	0.034	0.18		0.12	0.034	ND		0.62	0.17	ND		1.1	0.3	ND		0.54	0.15	ND		0.56	0.16	ND		0.12	0.034	ND		0.12	0.032
Benzo(ghi)perylene	191-24-2	1	4.9	1,000	ND		0.16	0.024	0.49		0.16	0.024	0.092	J	0.16	0.024	ND		0.82	0.12	ND		1.4	0.21	ND		0.72	0.1	ND		0.75	0.11	ND		0.16	0.024	ND		0.15	0.023
Benzo(k)fluoranthene	207-08-9	0.8	4.9	2	ND		0.12	0.033	0.25		0.12	0.032	0.051	J	0.12	0.032	ND		0.62	0.16	ND		**1.1**	0.29	ND		0.54	0.14	ND		0.56	0.15	ND		0.12	0.032	ND		0.12	0.031
Benzoic Acid	65-85-0	NS	NS	NS	ND		0.67	0.21	ND		0.66	0.2	ND		0.65	0.2	ND		3.3	1	ND		5.8	1.8	ND		2.9	0.91	ND		3	0.94	ND		0.65	0.2	ND		0.62	0.2
Benzyl Alcohol	100-51-6	NS	NS	NS	ND		0.2	0.063	ND		0.2	0.062	ND		0.2	0.062	ND		1	0.31	ND		1.8	0.55	ND		0.9	0.27	ND		0.93	0.28	ND		0.2	0.061	ND		0.19	0.059
Biphenyl	92-52-4	NS	NS	NS	ND		0.47	0.027	0.029	J	0.46	0.026	ND		0.46	0.026	ND		2.3	0.13	ND		4.1	0.23	ND		2	0.12	ND		2.1	0.12	ND		0.46	0.026	ND		0.44	0.025
Bis(2-chloroethoxy)methane	111-91-1	NS	NS	NS	ND		0.22	0.021	ND		0.22	0.02	ND		0.22	0.02	ND		1.1	0.1	ND		1.9	0.18	ND		0.97	0.09	ND		1	0.094	ND		0.22	0.02	ND		0.21	0.019
Bis(2-chloroethyl)ether	111-44-4	NS	NS	NS	ND		0.18	0.028	ND		0.18	0.027	ND		0.18	0.027	ND		0.92	0.14	ND		1.6	0.24	ND		0.81	0.12	ND		0.84	0.13	ND		0.18	0.027	ND		0.17	0.026
Bis(2-chloroisopropyl)ether	108-60-1	NS	NS	NS	ND		0.25	0.035	ND		0.24	0.035	ND		0.24	0.034	ND		1.2	0.18	ND		2.2	0.31	ND		1.1	0.15	ND		1.1	0.16	ND		0.24	0.034	ND		0.23	0.033
Bis(2-ethylhexyl)phthalate	117-81-7	NS	NS	NS	ND		0.2	0.071	ND		0.2	0.07	ND		0.2	0.07	ND		1	0.36	ND		1.8	0.62	ND		0.9	0.31	ND		0.93	0.32	ND		0.2	0.069	ND		0.19	0.067
Butyl benzyl phthalate	85-68-7	NS	NS	NS	ND		0.2	0.052	ND		0.2	0.051	ND		0.2	0.051	ND		1	0.26	ND		1.8	0.45	ND		0.9	0.23	ND		0.93	0.24	ND		0.2	0.05	ND		0.19	0.049
Carbazole	86-74-8	NS	NS	NS	ND		0.2	0.02	0.18	J	0.2	0.02	ND		0.2	0.02	ND		1	0.1	ND		1.8	0.18	ND		0.9	0.087	ND		0.93	0.091	ND		0.2	0.019	ND		0.19	0.019
Chrysene	218-01-9	1	4.9	1	ND		0.12	0.021	0.86		0.12	0.021	0.14		0.12	0.021	0.14	J	0.62	0.11	0.24	J	1.1	0.19	0.18	J	0.54	0.093	ND		0.56	0.097	ND		0.12	0.021	ND		0.12	0.02
Di-n-butylphthalate	84-74-2	NS	NS	NS	ND		0.2	0.039	ND		0.2	0.038	ND		0.2	0.038	ND		1	0.19	ND		1.8	0.34	ND		0.9	0.17	ND		0.93	0.18	ND		0.2	0.038	ND		0.19	0.036
Di-n-octylphthalate	117-84-0	NS	NS	NS	ND		0.2	0.07	ND		0.2	0.069	ND		0.2	0.068	ND		1	0.35	ND		1.8	0.61	ND		0.9	0.3	ND		0.93	0.32	ND		0.2	0.068	ND		0.19	0.066
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	1,000	ND		0.12	0.024	0.11	J	0.12	0.023	ND		0.12	0.023	ND		**0.62**	0.12	ND		**1.1**	0.21	ND		**0.54**	0.1	ND		**0.56**	0.11	ND		0.12	0.023	ND		0.12	0.022
Dibenzofuran	132-64-9	2.1	18	110	ND		0.2	0.019	0.22		0.2	0.019	ND		0.2	0.019	**2.7**		1	0.097	**4.6**		1.8	0.17	**3.6**		0.9	0.085	**3.5**		0.93	0.088	ND		0.2	0.019	ND		0.19	0.018
Diethyl phthalate	84-66-2	NS	NS	NS	ND		0.2	0.019	ND		0.2	0.019	ND		0.2	0.019	ND		1	0.095	ND		1.8	0.17	ND		0.9	0.083	ND		0.93	0.086	ND		0.2	0.018	ND		0.19	0.018
Dimethyl phthalate	131-11-3	NS	NS	NS	ND		0.2	0.043	ND		0.2	0.042	ND		0.2	0.042	ND		1	0.22	ND		1.8	0.38	ND		0.9	0.19	ND		0.93	0.2	ND		0.2	0.042	ND		0.19	0.04
Fluoranthene	206-44-0	85	100	1,000	ND		0.12	0.024	2		0.12	0.023	0.3		0.12	0.023	0.56	J	0.62	0.12	0.8	J	1.1	0.21	0.62		0.54	0.1	0.62		0.56	0.11	ND		0.12	0.023	ND		0.12	0.022
Fluorene	86-73-7	30	100	386	ND		0.2	0.02	0.28		0.2	0.02	ND		0.2	0.02	6.6		1	0.1	10		1.8	0.18	8.2		0.9	0.087	7.6		0.93	0.091	ND		0.2	0.019	ND		0.19	0.019
Hexachlorobenzene	118-74-1	0.33	0.3	3.2	ND		0.12	0.023	ND		0.12	0.023	ND		0.12	0.022	ND		**0.62**	0.12	ND		**1.1**	0.2	ND		**0.54**	0.1	ND		**0.56**	0.1	ND		0.12	0.022	ND		0.12	0.022
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.2	0.03	ND		0.2	0.03	ND		0.2	0.03	ND		1	0.15	ND		1.8	0.26	ND		0.9	0.13	ND		0.93	0.14	ND		0.2	0.029	ND		0.19	0.028
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	ND		0.59	0.19	ND		0.58	0.18	ND		0.58	0.18	ND		2.9	0.93	ND		5.2	1.6	ND		2.6	0.81	ND		2.7	0.85	ND		0.57	0.18	ND		0.55	0.17
Hexachloroethane	67-72-1	NS	NS	NS	ND		0.16	0.033	ND		0.16	0.033	ND		0.16	0.033	ND		0.82	0.17	ND		1.4	0.29	ND		0.72	0.14	ND		0.75	0.15	ND		0.16	0.032	ND		0.15	0.031
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	1.4	6.6	ND		0.16	0.029	0.42		0.16	0.028	0.086	J	0.16	0.028	ND		**0.82**	0.14	ND		**1.4**	0.25	ND		**0.72**	0.12	ND		**0.75**	0.13	ND		0.16	0.028	ND		0.15	0.027
Isophorone	78-59-1	NS	NS	NS	ND		0.18	0.027	ND		0.18	0.026	ND		0.18	0.026	ND		0.92	0.13	ND		1.6	0.23	ND		0.81	0.12	ND		0.84	0.12	ND		0.18	0.026	ND		0.17	0.025
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	NS	ND		0.2	0.032	ND		0.2	0.031	ND		0.2	0.031	ND		1	0.16	ND		1.8	0.28	ND		0.9	0.14	ND		0.93	0.14	ND		0.2	0.031	ND		0.19	0.03
Naphthalene	91-20-3	12	100	12	ND		0.2	0.025	0.34		0.2	0.025	ND		0.2	0.024	ND		1	0.12	ND		1.8	0.22	ND		0.9	0.11	ND		0.93	0.11	ND		0.2	0.024	ND		0.19	0.023
NDPA/DPA	86-30-6	NS	NS	NS	ND		0.16	0.023	ND		0.16	0.023	ND		0.16	0.023	ND		0.82	0.12	ND		1.4	0.2	6.7		0.72	0.1	ND		0.75	0.11	ND		0.16	0.023	ND		0.15	0.022
Nitrobenzene	98-95-3	0.08	1.8	0.08	ND		0.18	0.03	ND		0.18	0.03	ND		0.18	0.03	ND		0.92	0.15	ND		1.6	0.27	ND		0.81	0.13	ND		0.84	0.14	ND		0.18	0.03	ND		0.17	0.028
p-Chloro-m-cresol	59-50-7	NS	NS	NS	ND		0.2	0.031	ND		0.2	0.03	ND		0.2	0.03	ND		1	0.15	ND		1.8	0.27	ND		0.9	0.13	ND		0.93	0.14	ND		0.2	0.03	ND		0.19	0.029
Pentachlorophenol	87-86-5	0.8	1.3	0.8	ND		0.16	0.045	ND		0.16	0.045	ND		0.16	0.044	ND		0.82	0.23	ND		**1.4**	0.4	ND		0.72	0.2	ND		0.75	0.2	ND		0.16	0.044	ND		0.15	0.042
Phenanthrene	85-01-8	1	5	1,000	ND		0.12	0.025	**1.7**		0.12	0.025	0.1	J	0.12	0.024	**9.7**		0.62	0.12	**12**		1.1	0.22	**8.4**		0.54	0.11	**11**		0.56	0.11	ND		0.12	0.024	ND		0.12	0.023
Phenol	108-95-2	0.33	100	0.33	ND		0.2	0.031	ND		0.2	0.031	ND		0.2	0.03	ND		**1**	0.16	ND		**1.8**	0.27	ND		**0.9**	0.14	ND		**0.93**	0.14	ND		0.2	0.03	ND		0.19	0.029
Pyrene	129-00-0	64	100	1,000	ND		0.12	0.02	1.9		0.12	0.02	0.29		0.12	0.02	2		0.62	0.1	3.1		1.1	0.18	2.4		0.54	0.089	2.4		0.56	0.093	ND		0.12	0.02	ND		0.12	0.019
Total SVOCs		NS	NS	NS	-		-	-	12.349	-	-	-	1.539	-	-	-	25.3	-	-	-	43.44	-	-	-	40.9	-	-	-	43.72	-	-	-	-		-	-	-		-	-

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3B

245 West 55th Street
New York, New York

Summary of Semi-Volatile Organic Compounds in Soil

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-3 L2468036-09 11/19/2024 4-6'				SB-3 L2468036-10 11/19/2024 6-8'				SB-3 L2468036-11 11/19/2024 8-10'				SB-4 L2467646-06 11/18/2024 0-2'				SB-4 L2467646-07 11/18/2024 2-4'				SB-4 L2467646-08 11/18/2024 4-6'				SB-4 L2467646-09 11/18/2024 6-8'				SB-5 L2467646-14 11/18/2024 0-2'				SB-5 L2467646-15 11/18/2024 2-4'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
BASE/NEUTRAL EXTRACTABLES																																						
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	NS	ND		0.19	0.02	ND		0.2	0.021	ND		0.2	0.021	ND		0.2	0.021	ND		0.21	0.022	ND		0.17	0.018	ND		0.19	0.02	ND		0.19	0.02	ND		0.18	0.018
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.19	0.022	ND		0.2	0.023	ND		0.2	0.023	ND		0.2	0.023	ND		0.21	0.024	ND		0.17	0.02	ND		0.19	0.022	ND		0.19	0.022	ND		0.18	0.02
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.19	0.034	ND		0.2	0.036	ND		0.2	0.036	ND		0.2	0.036	ND		0.21	0.037	ND		0.17	0.031	ND		0.19	0.034	ND		0.19	0.035	ND		0.18	0.032
1,3-Dichlorobenzene	541-73-1	2.6	38	2.4	ND		0.19	0.033	ND		0.2	0.034	ND		0.2	0.035	ND		0.2	0.035	ND		0.21	0.036	ND		0.17	0.03	ND		0.19	0.033	ND		0.19	0.033	ND		0.18	0.03
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.19	0.033	ND		0.2	0.035	ND		0.2	0.035	ND		0.2	0.035	ND		0.21	0.036	ND		0.17	0.03	ND		0.19	0.034	ND		0.19	0.034	ND		0.18	0.031
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.029	0.0088	ND		0.03	0.0092	ND		0.03	0.0093	ND		0.03	0.0093	ND		0.031	0.0096	ND		0.026	0.008	ND		0.029	0.0088	ND		0.029	0.0089	ND		0.026	0.0081
2,4,5-Trichlorophenol	95-95-4	NS	NS	NS	ND		0.19	0.037	ND		0.2	0.038	ND		0.2	0.039	ND		0.2	0.039	ND		0.21	0.04	ND		0.17	0.033	ND		0.19	0.037	ND		0.19	0.037	ND		0.18	0.034
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	ND		0.11	0.036	ND		0.12	0.038	ND		0.12	0.038	ND		0.12	0.038	ND		0.12	0.039	ND		0.1	0.033	ND		0.12	0.036	ND		0.12	0.037	ND		0.1	0.033
2,4-Dichlorophenol	120-83-2	NS	NS	NS	ND		0.17	0.031	ND		0.18	0.032	ND		0.18	0.032	ND		0.18	0.032	ND		0.19	0.033	ND		0.16	0.028	ND		0.17	0.031	ND		0.17	0.031	ND		0.16	0.028
2,4-Dimethylphenol	105-67-9	NS	NS	NS	ND		0.19	0.063	ND		0.2	0.066	ND		0.2	0.067	ND		0.2	0.067	ND		0.21	0.069	ND		0.17	0.057	ND		0.19	0.063	ND		0.19	0.064	ND		0.18	0.058
2,4-Dinitrophenol	51-28-5	NS	NS	NS	ND		0.92	0.089	ND		0.96	0.093	ND		0.97	0.094	ND		0.97	0.094	ND		1	0.097	ND		0.84	0.081	ND		0.92	0.09	ND		0.93	0.09	ND		0.85	0.082
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	ND		0.19	0.038	ND		0.2	0.04	ND		0.2	0.04	ND		0.2	0.04	ND		0.21	0.042	ND		0.17	0.035	ND		0.19	0.038	ND		0.19	0.039	ND		0.18	0.035
2,6-Dinitrotoluene	606-20-2	NS	NS	NS	ND		0.19	0.033	ND		0.2	0.034	ND		0.2	0.035	ND		0.2	0.035	ND		0.21	0.036	ND		0.17	0.03	ND		0.19	0.033	ND		0.19	0.033	ND		0.18	0.03
2-Chloronaphthalene	91-58-7	NS	NS	NS	ND		0.19	0.019	ND		0.2	0.02	ND		0.2	0.02	ND		0.2	0.02	ND		0.21	0.021	ND		0.17	0.017	ND		0.19	0.019	ND		0.19	0.019	ND		0.18	0.017
2-Chlorophenol	95-57-8	NS	NS	NS	ND		0.19	0.022	ND		0.2	0.024	ND		0.2	0.024	ND		0.2	0.024	ND		0.21	0.025	ND		0.17	0.02	ND		0.19	0.023	ND		0.19	0.023	ND		0.18	0.021
2-Methylnaphthalene	91-57-6	NS	NS	NS	ND		0.23	0.023	ND		0.24	0.024	ND		0.24	0.024	ND		0.24	0.024	ND		0.25	0.025	ND		0.21	0.021	ND		0.23	0.023	ND		0.23	0.023	ND		0.21	0.021
2-Methylphenol	95-48-7	0.33	100	0.33	ND		0.19	0.03	ND		0.2	0.031	ND		0.2	0.031	ND		0.2	0.031	ND		0.21	0.032	ND		0.17	0.027	ND		0.19	0.03	ND		0.19	0.03	ND		0.18	0.027
2-Nitroaniline	88-74-4	NS	NS	NS	ND		0.19	0.037	ND		0.2	0.038	ND		0.2	0.039	ND		0.2	0.039	ND		0.21	0.04	ND		0.17	0.034	ND		0.19	0.037	ND		0.19	0.037	ND		0.18	0.034
2-Nitrophenol	88-75-5	NS	NS	NS	ND		0.41	0.072	ND		0.43	0.075	ND		0.44	0.076	ND		0.44	0.076	ND		0.45	0.078	ND		0.38	0.065	ND		0.42	0.072	ND		0.42	0.073	ND		0.38	0.066
3,3'-Dichlorobenzidine	91-94-1	NS	NS	NS	ND		0.19	0.051	ND		0.2	0.053	ND		0.2	0.054	ND		0.2	0.054	ND		0.21	0.055	ND		0.17	0.046	ND		0.19	0.051	ND		0.19	0.052	ND		0.18	0.047
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	0.33	100	0.33	ND		0.28	0.03	ND		0.29	0.031	ND		0.29	0.032	ND		0.29	0.032	ND		0.3	0.033	ND		0.25	0.027	ND		0.28	0.03	ND		0.28	0.03	ND		0.25	0.028
3-Nitroaniline	99-09-2	NS	NS	NS	ND		0.19	0.036	ND		0.2	0.038	ND		0.2	0.038	ND		0.2	0.038	ND		0.21	0.039	ND		0.17	0.033	ND		0.19	0.036	ND		0.19	0.036	ND		0.18	0.033
4,6-Dinitro-o-cresol	534-52-1	NS	NS	NS	ND		0.5	0.092	ND		0.52	0.096	ND		0.52	0.097	ND		0.52	0.097	ND		0.54	0.1	ND		0.45	0.084	ND		0.5	0.092	ND		0.5	0.093	ND		0.46	0.085
4-Bromophenyl phenyl ether	101-55-3	NS	NS	NS	ND		0.19	0.029	ND		0.2	0.03	ND		0.2	0.031	ND		0.2	0.031	ND		0.21	0.032	ND		0.17	0.026	ND		0.19	0.029	ND		0.19	0.03	ND		0.18	0.027
4-Chloroaniline	106-47-8	NS	NS	NS	ND		0.19	0.035	ND		0.2	0.036	ND		0.2	0.037	ND		0.2	0.037	ND		0.21	0.038	ND		0.17	0.032	ND		0.19	0.035	ND		0.19	0.035	ND		0.18	0.032
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	NS	ND		0.19	0.02	ND		0.2	0.021	ND		0.2	0.022	ND		0.2	0.022	ND		0.21	0.022	ND		0.17	0.019	ND		0.19	0.02	ND		0.19	0.021	ND		0.18	0.019
4-Nitroaniline	100-01-6	NS	NS	NS	ND		0.19	0.079	ND		0.2	0.082	ND		0.2	0.084	ND		0.2	0.084	ND		0.21	0.086	ND		0.17	0.072	ND		0.19	0.08	ND		0.19	0.08	ND		0.18	0.073
4-Nitrophenol	100-02-7	NS	NS	NS	ND		0.27	0.078	ND		0.28	0.081	ND		0.28	0.082	ND		0.28	0.082	ND		0.29	0.085	ND		0.24	0.071	ND		0.27	0.078	ND		0.27	0.079	ND		0.25	0.072
Acenaphthene	83-32-9	20	100	98	ND		0.15	0.02	ND		0.16	0.021	ND		0.16	0.021	ND		0.16	0.021	ND		0.17	0.022	ND		0.14	0.018	ND		0.15	0.02	ND		0.16	0.02	ND		0.14	0.018
Acenaphthylene	208-96-8	100	100	365	ND		0.15	0.029	ND		0.16	0.031	ND		0.16	0.031	ND		0.16	0.031	ND		0.17	0.032	ND		0.14	0.027	ND		0.15	0.03	ND		0.16	0.03	ND		0.14	0.027
Acetophenone	98-86-2	NS	NS	NS	ND		0.19	0.024	ND		0.2	0.025	ND		0.2	0.025	ND		0.2	0.025	ND		0.21	0.026	ND		0.17	0.022	ND		0.19	0.024	ND		0.19	0.024	ND		0.18	0.022
Anthracene	120-12-7	100	100	1,000	ND		0.11	0.037	ND		0.12	0.039	ND		0.12	0.039	ND		0.12	0.039	ND		0.12	0.041	ND		0.1	0.034	ND		0.12	0.037	ND		0.12	0.038	ND		0.1	0.034
Benzo(a)anthracene	56-55-3	1	1.4	1	ND		0.11	0.022	ND		0.12	0.022	ND		0.12	0.023	ND		0.12	0.023	ND		0.12	0.023	ND		0.1	0.02	ND		0.12	0.022	ND		0.12	0.022	ND		0.1	0.02
Benzo(a)pyrene	50-32-8	1	1	22	ND		0.15	0.047	ND		0.16	0.049	ND		0.16	0.049	ND		0.16	0.049	ND		0.17	0.051	ND		0.14	0.042	ND		0.15	0.047	ND		0.16	0.047	ND		0.14	0.043
Benzo(b)fluoranthene	205-99-2	1	1.4	2.1	ND		0.11	0.032	ND		0.12	0.034	ND		0.12	0.034	ND		0.12	0.034	ND		0.12	0.035	ND		0.1	0.029	ND		0.12	0.032	ND		0.12	0.033	ND		0.1	0.03
Benzo(ghi)perylene	191-24-2	1	4.9	1,000	ND		0.15	0.022	ND		0.16	0.023	ND		0.16	0.024	ND		0.16	0.024	ND		0.17	0.024	ND		0.14	0.02	ND		0.15	0.023	ND		0.16	0.023	ND		0.14	0.021
Benzo(k)fluoranthene	207-08-9	0.8	4.9	2	ND		0.11	0.03	ND		0.12	0.032	ND		0.12	0.032	ND		0.12	0.032	ND		0.12	0.033	ND		0.1	0.028	ND		0.12	0.031	ND		0.12	0.031	ND		0.1	0.028
Benzoic Acid	65-85-0	NS	NS	NS	ND		0.62	0.19	ND		0.64	0.2	ND		0.65	0.2	ND		0.65	0.2	ND		0.67	0.21	ND		0.56	0.18	ND		0.62	0.19	ND		0.63	0.2	ND		0.57	0.18
Benzyl Alcohol	100-51-6	NS	NS	NS	ND		0.19	0.058	ND		0.2	0.061	ND		0.2	0.062	ND		0.2	0.062	ND		0.21	0.064	ND		0.17	0.053	ND		0.19	0.059	ND		0.19	0.059	ND		0.18	0.054
Biphenyl	92-52-4	NS	NS	NS	ND		0.44	0.025	ND		0.45	0.026	ND		0.46	0.026	ND		0.46	0.026	ND		0.47	0.027	ND		0.4	0.023	ND		0.44	0.025	ND		0.44	0.025	ND		0.4	0.023
Bis(2-chloroethoxy)methane	111-91-1	NS	NS	NS	ND		0.21	0.019	ND		0.22	0.02	ND		0.22	0.02	ND		0.22	0.02	ND		0.22	0.021	ND		0.19	0.017	ND		0.21	0.019	ND		0.21	0.019	ND		0.19	0.018
Bis(2-chloroethyl)ether	111-44-4	NS	NS	NS	ND		0.17	0.026	ND		0.18	0.027	ND		0.18	0.027	ND		0.18	0.027	ND		0.19	0.028	ND		0.16	0.024	ND		0.17	0.026	ND		0.17	0.026	ND		0.16	0.024
Bis(2-chloroisopropyl)ether	108-60-1	NS	NS	NS	ND		0.23	0.033	ND		0.24	0.034	ND		0.24	0.034	ND		0.24	0.034	ND		0.25	0.036	ND		0.21	0.03	ND		0.23	0.033	ND		0.23	0.033	ND		0.21	0.03
Bis(2-ethylhexyl)phthalate	117-81-7	NS	NS	NS	ND		0.19	0.066	ND		0.2	0.069	ND		0.2	0.07	ND		0.2	0.07	ND		0.21	0.072	ND		0.17	0.06	ND		0.19	0.066	ND		0.19	0.067	ND		0.18	0.061
Butyl benzyl phthalate	85-68-7	NS	NS	NS	ND		0.19	0.048	ND		0.2	0.05	ND		0.2	0.051	ND		0.2	0.051	ND		0.21	0.052	ND		0.17	0.044	ND		0.19	0.048	ND		0.19	0.049	ND		0.18	0.044
Carbazole	86-74-8	NS	NS	NS	ND		0.19	0.018	ND		0.2	0.019	ND		0.2	0.02	ND		0.2	0.02	ND		0.21	0.02	ND		0.17	0.017	ND		0.19	0.019	ND		0.19	0.019	ND		0.18	0.017
Chrysene	218-01-9	1	4.9	1	ND		0.11	0.02	ND		0.12	0.021	ND		0.12	0.021	ND		0.12	0.021	ND		0.12	0.022	ND		0.1	0.018	ND		0.12	0.02	ND		0.12	0.02	ND		0.1	0.018
Di-n-butylphthalate	84-74-2	NS	NS	NS	ND		0.19	0.036	ND		0.2	0.038	ND		0.2	0.038	ND		0.2	0.038	ND		0.21	0.039	ND		0.17	0.033	ND		0.19	0.036	ND		0.19	0.037	ND		0.18	0.033
Di-n-octylphthalate	117-84-0	NS	NS	NS	ND		0.19	0.065	ND		0.2	0.068	ND		0.2	0.069	ND		0.2	0.069	ND		0.21	0.071	ND		0.17	0.059	ND		0.19	0.065	ND		0.19	0.066	ND		0.18	0.06
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	1,000	ND		0.11	0.022	ND		0.12	0.023	ND		0.12	0.023	ND		0.12	0.023	ND		0.12	0.024	ND		0.1	0.02	ND		0.12	0.022	ND		0.12	0.022	ND		0.1	0.02
Dibenzofuran	132-64-9	2.1	18	110	ND		0.19	0.018	ND		0.2	0.019	ND		0.2	0.019	ND		0.2	0.019	ND		0.21	0.02	ND		0.17	0.016	ND		0.19	0.018	ND		0.19	0.018	ND		0.18	0.017
Diethyl phthalate	84-66-2	NS	NS	NS	ND		0.19	0.018	ND		0.2	0.018	ND		0.2	0.019	ND		0.2	0.019	ND		0.21	0.019	ND		0.17	0.016	ND		0.19	0.018	ND		0.19	0.018	ND		0.18	0.016
Dimethyl phthalate	131-11-3	NS	NS	NS	ND		0.19	0.04	ND		0.2	0.042	ND		0.2	0.042	ND		0.2	0.042	ND		0.21	0.044	ND		0.17	0.036	ND		0.19	0.04	ND		0.19	0.041	ND		0.18	0.037
Fluoranthene	206-44-0	85	100	1,000	ND		0.11	0.022	ND		0.12	0.023	ND		0.12	0.023	ND		0.12	0.023	ND		0.12	0.024	ND		0.1	0.02	ND		0.12	0.022	ND		0.12	0.022	ND		0.1	0.02
Fluorene	86-73-7	30	100	386	ND		0.19	0.018	ND		0.2	0.019	ND		0.2	0.02	ND		0.2	0.02	ND		0.21	0.02	ND		0.17	0.017	ND		0.19	0.019	ND		0.19	0.019	ND		0.18	0.017
Hexachlorobenzene	118-74-1	0.33	0.3	3.2	ND		0.11	0.021	ND		0.12	0.022	ND		0.12	0.023	ND		0.12	0.023	ND		0.12	0.023	ND		0.1	0.019	ND		0.12	0.022	ND		0.12	0.022	ND		0.1	0.02
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.19	0.028	ND		0.2	0.029	ND		0.2	0.03	ND		0.2	0.03	ND		0.21	0.03	ND		0.17	0.025	ND		0.19	0.028	ND		0.19	0.028	ND		0.18	0.026
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	ND		0.55	0.17	ND		0.57	0.18	ND		0.58	0.18	ND		0.58	0.18	ND		0.6	0.19	ND		0.5	0.16	ND		0.55	0.17	ND		0.55	0.18	ND		0.5	0.16
Hexachloroethane	67-72-1	NS	NS	NS	ND		0.15	0.031	ND		0.16	0.032	ND		0.16	0.033	ND		0.16	0.033	ND		0.17	0.034	ND		0.14	0.028	ND		0.15	0.031	ND		0.16	0.031	ND		0.14	0.028
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	1.4	6.6	ND		0.15	0.027	ND		0.16	0.028	ND		0.16	0.028	ND		0.16	0.028	ND		0.17	0.029	ND		0.14	0.024	ND		0.15	0.027	ND		0.16	0.027	ND		0.14	0.024
Isophorone	78-59-1	NS	NS	NS	ND		0.17	0.025	ND		0.18	0.026	ND		0.18	0.026	ND		0.18	0.026	ND		0.19	0.027	ND		0.16	0.022	ND		0.17	0.025	ND		0.17	0.025	ND		0.16	0.023
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	NS	ND		0.19	0.029	ND		0.2	0.031	ND		0.2	0.031	ND		0.2	0.031	ND		0.21	0.032	ND		0.17	0.027	ND		0.19	0.03	ND		0.19	0.03	ND		0.18	0.027
Naphthalene	91-20-3	12	100	12	ND		0.19	0.023	ND		0.2	0.024	ND		0.2	0.024	ND		0.2	0.025	ND		0.21	0.025	ND		0.17	0.021	ND		0.19	0.023	ND		0.19	0.024	ND		0.18	0.021
NDPA/DPA	86-30-6	NS	NS	NS	ND		0.15	0.022	ND		0.16	0.023	ND		0.16	0.023	ND		0.16	0.023	ND		0.17	0.024	ND		0.14	0.02	ND		0.15	0.022	ND		0.16	0.022	ND		0.14	0.02
Nitrobenzene	98-95-3	0.08	1.8	0.08	ND		0.17	0.028	ND		0.18	0.029	ND		0.18	0.03	ND		0.18	0.03	ND		0.19	0.031	ND		0.16	0.026	ND		0.17	0.028	ND		0.17	0.029	ND		0.16	0.026
p-Chloro-m-cresol	59-50-7	NS	NS	NS	ND		0.19	0.028	ND		0.2	0.03	ND		0.2	0.03	ND		0.2	0.03	ND		0.21	0.031	ND		0.17	0.026	ND		0.19	0.029	ND		0.19	0.029	ND		0.18	0.026
Pentachlorophenol	87-86-5	0.8	1.3	0.8	ND		0.15	0.042	ND		0.16	0.044	ND		0.16	0.044	ND		0.16	0.044	ND		0.17	0.046	ND		0.14	0.038	ND		0.15	0.042	ND		0.16	0.043	ND		0.14	0.039
Phenanthrene	85-01-8	1	5	1,000	ND		0.11	0.023	ND		0.12	0.024	ND		0.12	0.024	ND		0.12	0.024	ND		0.12	0.025	ND		0.1	0.021	ND		0.12	0.023	ND		0.12	0.024	ND		0.1	0.021
Phenol	108-95-2	0.33	100	0.33	ND		0.19	0.029	ND		0.2	0.03	ND		0.2	0.03	ND		0.2	0.03	ND		0.21	0.031	ND		0.17	0.026	ND		0.19	0.029	ND		0.19	0.029	ND		0.18	0.027
Pyrene	129-00-0	64	100	1,000	ND		0.11	0.019	ND		0.12	0.02	ND		0.12	0.02	ND		0.12	0.02	ND		0.12	0.021	ND		0.1	0.017	ND		0.12	0.019	ND		0.12	0.019	ND		0.1	0.018
Total SVOCs		NS	NS	NS	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-

Notes:

All results reported in mg/kg

Results Exceed UUSCO

Results Exceed RRUSCO

Results Exceed PGWSCO

NA - Not applicable because appropriate toxicological information is not available

Q - Laboratory Qualifier

J - The result is less than the detection limit, but greater than zero

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

~ - Not Analyzed

ND - Analyzed for but Not Detected at the MDL

NS - No Applicable Standard

NSL - No Screening Level

TICs - Tentatively Identified Compounds

RL - Reporting Limit

MDL - Method Detection Limit

RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard

mg/kg - milligram per kilogram

TABLE 3B

245 West 55th Street
New York, New York

Summary of Semi-Volatile Organic Compounds in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-5 L2467646-16 11/18/2024 4-6'				SB-5 L2467646-17 11/18/2024 6-8'				DUP-1 (SB-5) L2467646-18 11/18/2024 6-8'				SB-6 L2468036-18 11/19/2024 0-2'				SB-6 L2468036-19 11/19/2024 2-4'				SB-6 L2468036-20 11/19/2024 4-6'				SB-6 L2468036-21 11/19/2024 6-8'				SB-6 L2468036-22 11/19/2024 8-10'				SB-7 L2468036-35 11/19/2024 0-2'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
BASE/NEUTRAL EXTRACTABLES																																						
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	NS	ND		0.18	0.018	ND		0.18	0.019	ND		0.19	0.02	ND		0.22	0.022	ND		0.18	0.019	ND		0.17	0.018	ND		0.17	0.018	ND		0.2	0.021	ND		0.19	0.02
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.18	0.02	ND		0.18	0.021	ND		0.19	0.022	ND		0.22	0.025	ND		0.18	0.02	ND		0.17	0.02	ND		0.17	0.02	ND		0.2	0.023	ND		0.19	0.022
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.18	0.031	ND		0.18	0.033	ND		0.19	0.034	ND		0.22	0.039	ND		0.18	0.032	ND		0.17	0.031	ND		0.17	0.031	ND		0.2	0.036	ND		0.19	0.034
1,3-Dichlorobenzene	541-73-1	2.6	38	2.4	ND		0.18	0.03	ND		0.18	0.032	ND		0.19	0.033	ND		0.22	0.037	ND		0.18	0.031	ND		0.17	0.03	ND		0.17	0.03	ND		0.2	0.035	ND		0.19	0.032
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.18	0.03	ND		0.18	0.032	ND		0.19	0.034	ND		0.22	0.038	ND		0.18	0.031	ND		0.17	0.03	ND		0.17	0.03	ND		0.2	0.035	ND		0.19	0.033
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.026	0.008	ND		0.028	0.0085	ND		0.029	0.0088	ND		0.032	0.0099	ND		0.027	0.0082	ND		0.026	0.008	ND		0.026	0.008	ND		0.03	0.0093	ND		0.028	0.0087
2,4,5-Trichlorophenol	95-95-4	NS	NS	NS	ND		0.18	0.034	ND		0.18	0.036	ND		0.19	0.037	ND		0.22	0.041	ND		0.18	0.034	ND		0.17	0.033	ND		0.17	0.033	ND		0.2	0.039	ND		0.19	0.036
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	ND		0.1	0.033	ND		0.11	0.035	ND		0.12	0.036	ND		0.13	0.041	ND		0.11	0.034	ND		0.1	0.033	ND		0.1	0.033	ND		0.12	0.038	ND		0.11	0.036
2,4-Dichlorophenol	120-83-2	NS	NS	NS	ND		0.16	0.028	ND		0.17	0.03	ND		0.17	0.031	ND		0.19	0.035	ND		0.16	0.029	ND		0.16	0.028	ND		0.16	0.028	ND		0.18	0.032	ND		0.17	0.03
2,4-Dimethylphenol	105-67-9	NS	NS	NS	ND		0.18	0.058	ND		0.18	0.061	ND		0.19	0.063	ND		0.22	0.071	ND		0.18	0.059	ND		0.17	0.057	ND		0.17	0.057	ND		0.2	0.067	ND		0.19	0.062
2,4-Dinitrophenol	51-28-5	NS	NS	NS	ND		0.84	0.082	ND		0.89	0.086	ND		0.92	0.089	ND		1	0.1	ND		0.86	0.084	ND		0.83	0.081	ND		0.83	0.08	ND		0.97	0.094	ND		0.91	0.088
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	ND		0.18	0.035	ND		0.18	0.037	ND		0.19	0.038	ND		0.22	0.043	ND		0.18	0.036	ND		0.17	0.034	ND		0.17	0.034	ND		0.2	0.04	ND		0.19	0.038
2,6-Dinitrotoluene	606-20-2	NS	NS	NS	ND		0.18	0.03	ND		0.18	0.032	ND		0.19	0.033	ND		0.22	0.037	ND		0.18	0.031	ND		0.17	0.03	ND		0.17	0.03	ND		0.2	0.035	ND		0.19	0.032
2-Chloronaphthalene	91-58-7	NS	NS	NS	ND		0.18	0.017	ND		0.18	0.018	ND		0.19	0.019	ND		0.22	0.021	ND		0.18	0.018	ND		0.17	0.017	ND		0.17	0.017	ND		0.2	0.02	ND		0.19	0.019
2-Chlorophenol	95-57-8	NS	NS	NS	ND		0.18	0.021	ND		0.18	0.022	ND		0.19	0.023	ND		0.22	0.025	ND		0.18	0.021	ND		0.17	0.02	ND		0.17	0.02	ND		0.2	0.024	ND		0.19	0.022
2-Methylnaphthalene	91-57-6	NS	NS	NS	ND		0.21	0.021	ND		0.22	0.022	ND		0.23	0.023	ND		0.26	0.026	ND		0.22	0.022	ND		0.21	0.021	ND		0.21	0.021	ND		0.24	0.024	0.051	J	0.23	0.023
2-Methylphenol	95-48-7	0.33	100	0.33	ND		0.18	0.027	ND		0.18	0.029	ND		0.19	0.03	ND		0.22	0.033	ND		0.18	0.028	ND		0.17	0.027	ND		0.17	0.027	ND		0.2	0.031	ND		0.19	0.029
2-Nitroaniline	88-74-4	NS	NS	NS	ND		0.18	0.034	ND		0.18	0.036	ND		0.19	0.037	ND		0.22	0.042	ND		0.18	0.034	ND		0.17	0.033	ND		0.17	0.033	ND		0.2	0.039	ND		0.19	0.036
2-Nitrophenol	88-75-5	NS	NS	NS	ND		0.38	0.066	ND		0.4	0.07	ND		0.41	0.072	ND		0.46	0.081	ND		0.39	0.067	ND		0.37	0.065	ND		0.37	0.065	ND		0.44	0.076	ND		0.41	0.071
3,3'-Dichlorobenzidine	91-94-1	NS	NS	NS	ND		0.18	0.046	ND		0.18	0.049	ND		0.19	0.051	ND		0.22	0.057	ND		0.18	0.048	ND		0.17	0.046	ND		0.17	0.046	ND		0.2	0.054	ND		0.19	0.05
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	0.33	100	0.33	ND		0.25	0.027	ND		0.27	0.029	ND		0.28	0.03	ND		0.31	0.034	ND		0.26	0.028	ND		0.25	0.027	ND		0.25	0.027	ND		0.29	0.032	ND		0.27	0.03
3-Nitroaniline	99-09-2	NS	NS	NS	ND		0.18	0.033	ND		0.18	0.035	ND		0.19	0.036	ND		0.22	0.041	ND		0.18	0.034	ND		0.17	0.033	ND		0.17	0.033	ND		0.2	0.038	ND		0.19	0.036
4,6-Dinitro-o-cresol	534-52-1	NS	NS	NS	ND		0.46	0.084	ND		0.48	0.089	ND		0.5	0.092	ND		0.56	0.1	ND		0.47	0.086	ND		0.45	0.083	ND		0.45	0.083	ND		0.52	0.097	ND		0.49	0.091
4-Bromophenyl phenyl ether	101-55-3	NS	NS	NS	ND		0.18	0.027	ND		0.18	0.028	ND		0.19	0.029	ND		0.22	0.033	ND		0.18	0.027	ND		0.17	0.026	ND		0.17	0.026	ND		0.2	0.031	ND		0.19	0.029
4-Chloroaniline	106-47-8	NS	NS	NS	ND		0.18	0.032	ND		0.18	0.034	ND		0.19	0.035	ND		0.22	0.039	ND		0.18	0.033	ND		0.17	0.031	ND		0.17	0.031	ND		0.2	0.037	ND		0.19	0.034
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	NS	ND		0.18	0.019	ND		0.18	0.02	ND		0.19	0.02	ND		0.22	0.023	ND		0.18	0.019	ND		0.17	0.018	ND		0.17	0.018	ND		0.2	0.022	ND		0.19	0.02
4-Nitroaniline	100-01-6	NS	NS	NS	ND		0.18	0.072	ND		0.18	0.077	ND		0.19	0.079	ND		0.22	0.089	ND		0.18	0.074	ND		0.17	0.072	ND		0.17	0.072	ND		0.2	0.084	ND		0.19	0.078
4-Nitrophenol	100-02-7	NS	NS	NS	ND		0.24	0.071	ND		0.26	0.076	ND		0.27	0.078	ND		0.3	0.088	ND		0.25	0.073	ND		0.24	0.07	ND		0.24	0.07	ND		0.28	0.082	ND		0.26	0.077
Acenaphthene	83-32-9	20	100	98	ND		0.14	0.018	ND		0.15	0.019	ND		0.15	0.02	ND		0.17	0.022	ND		0.14	0.018	ND		0.14	0.018	ND		0.14	0.018	ND		0.16	0.021	ND		0.15	0.02
Acenaphthylene	208-96-8	100	100	365	ND		0.14	0.027	ND		0.15	0.029	ND		0.15	0.03	ND		0.17	0.033	ND		0.14	0.028	ND		0.14	0.027	ND		0.14	0.027	ND		0.16	0.031	ND		0.15	0.029
Acetophenone	98-86-2	NS	NS	NS	ND		0.18	0.022	ND		0.18	0.023	ND		0.19	0.024	ND		0.22	0.027	ND		0.18	0.022	ND		0.17	0.021	ND		0.17	0.021	ND		0.2	0.025	ND		0.19	0.023
Anthracene	120-12-7	100	100	1,000	ND		0.1	0.034	ND		0.11	0.036	ND		0.12	0.037	ND		0.13	0.042	ND		0.11	0.035	ND		0.1	0.034	ND		0.1	0.034	ND		0.12	0.039	ND		0.11	0.037
Benzo(a)anthracene	56-55-3	1	1.4	1	ND		0.1	0.02	ND		0.11	0.021	ND		0.12	0.022	ND		0.13	0.024	ND		0.11	0.02	ND		0.1	0.019	ND		0.1	0.019	ND		0.12	0.023	0.045	J	0.11	0.021
Benzo(a)pyrene	50-32-8	1	1	22	ND		0.14	0.043	ND		0.15	0.045	ND		0.15	0.047	ND		0.17	0.052	ND		0.14	0.044	ND		0.14	0.042	ND		0.14	0.042	ND		0.16	0.049	0.061	J	0.15	0.046
Benzo(b)fluoranthene	205-99-2	1	1.4	2.1	ND		0.1	0.029	ND		0.11	0.031	ND		0.12	0.032	ND		0.13	0.036	ND		0.11	0.03	ND		0.1	0.029	ND		0.1	0.029	ND		0.12	0.034	0.075	J	0.11	0.032
Benzo(ghi)perylene	191-24-2	1	4.9	1,000	ND		0.14	0.02	ND		0.15	0.022	ND		0.15	0.022	ND		0.17	0.025	ND		0.14	0.021	ND		0.14	0.02	ND		0.14	0.02	ND		0.16	0.024	0.053	J	0.15	0.022
Benzo(k)fluoranthene	207-08-9	0.8	4.9	2	ND		0.1	0.028	ND		0.11	0.03	ND		0.12	0.031	ND		0.13	0.034	ND		0.11	0.029	ND		0.1	0.028	ND		0.1	0.028	ND		0.12	0.032	ND		0.11	0.03
Benzoic Acid	65-85-0	NS	NS	NS	ND		0.57	0.18	ND		0.6	0.19	ND		0.62	0.19	ND		0.7	0.22	ND		0.58	0.18	ND		0.56	0.18	ND		0.56	0.17	ND		0.65	0.2	ND		0.61	0.19
Benzyl Alcohol	100-51-6	NS	NS	NS	ND		0.18	0.054	ND		0.18	0.057	ND		0.19	0.059	ND		0.22	0.066	ND		0.18	0.055	ND		0.17	0.053	ND		0.17	0.053	ND		0.2	0.062	ND		0.19	0.058
Biphenyl	92-52-4	NS	NS	NS	ND		0.4	0.023	ND		0.42	0.024	ND		0.44	0.025	ND		0.49	0.028	ND		0.41	0.023	ND		0.39	0.022	ND		0.39	0.022	ND		0.46	0.026	ND		0.43	0.025
Bis(2-chloroethoxy)methane	111-91-1	NS	NS	NS	ND		0.19	0.018	ND		0.2	0.018	ND		0.21	0.019	ND		0.23	0.022	ND		0.19	0.018	ND		0.19	0.017	ND		0.19	0.017	ND		0.22	0.02	ND		0.2	0.019
Bis(2-chloroethyl)ether	111-44-4	NS	NS	NS	ND		0.16	0.024	ND		0.17	0.025	ND		0.17	0.026	ND		0.19	0.029	ND		0.16	0.024	ND		0.16	0.023	ND		0.16	0.023	ND		0.18	0.027	ND		0.17	0.026
Bis(2-chloroisopropyl)ether	108-60-1	NS	NS	NS	ND		0.21	0.03	ND		0.22	0.032	ND		0.23	0.033	ND		0.26	0.037	ND		0.22	0.031	ND		0.21	0.03	ND		0.21	0.03	ND		0.24	0.034	ND		0.23	0.032
Bis(2-ethylhexyl)phthalate	117-81-7	NS	NS	NS	ND		0.18	0.06	ND		0.18	0.064	ND		0.19	0.066	ND		0.22	0.074	ND		0.18	0.062	ND		0.17	0.06	ND		0.17	0.06	ND		0.2	0.07	ND		0.19	0.066
Butyl benzyl phthalate	85-68-7	NS	NS	NS	ND		0.18	0.044	ND		0.18	0.047	ND		0.19	0.048	ND		0.22	0.054	ND		0.18	0.045	ND		0.17	0.044	ND		0.17	0.044	ND		0.2	0.051	ND		0.19	0.048
Carbazole	86-74-8	NS	NS	NS	ND		0.18	0.017	ND		0.18	0.018	ND		0.19	0.019	ND		0.22	0.021	ND		0.18	0.017	ND		0.17	0.017	ND		0.17	0.017	ND		0.2	0.02	ND		0.19	0.018
Chrysene	218-01-9	1	4.9	1	ND		0.1	0.018	ND		0.11	0.019	ND		0.12	0.02	ND		0.13	0.022	ND		0.11	0.019	ND		0.1	0.018	ND		0.1	0.018	ND		0.12	0.021	0.058	J	0.11	0.02
Di-n-butylphthalate	84-74-2	NS	NS	NS	ND		0.18	0.033	ND		0.18	0.035	ND		0.19	0.036	ND		0.22	0.041	ND		0.18	0.034	ND		0.17	0.033	ND		0.17	0.033	ND		0.2	0.038	ND		0.19	0.036
Di-n-octylphthalate	117-84-0	NS	NS	NS	ND		0.18	0.06	ND		0.18	0.063	ND		0.19	0.065	ND		0.22	0.073	ND		0.18	0.061	ND		0.17	0.059	ND		0.17	0.059	ND		0.2	0.069	ND		0.19	0.064
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	1,000	ND		0.1	0.02	ND		0.11	0.021	ND		0.12	0.022	ND		0.13	0.025	ND		0.11	0.021	ND		0.1	0.02	ND		0.1	0.02	ND		0.12	0.023	ND		0.11	0.022
Dibenzofuran	132-64-9	2.1	18	110	ND		0.18	0.016	ND		0.18	0.018	ND		0.19	0.018	ND		0.22	0.02	ND		0.18	0.017	ND		0.17	0.016	ND		0.17	0.016	ND		0.2	0.019	ND		0.19	0.018
Diethyl phthalate	84-66-2	NS	NS	NS	ND		0.18	0.016	ND		0.18	0.017	ND		0.19	0.018	ND		0.22	0.02	ND		0.18	0.017	ND		0.17	0.016	ND		0.17	0.016	ND		0.2	0.019	ND		0.19	0.018
Dimethyl phthalate	131-11-3	NS	NS	NS	ND		0.18	0.037	ND		0.18	0.039	ND		0.19	0.04	ND		0.22	0.045	ND		0.18	0.038	ND		0.17	0.036	ND		0.17	0.036	ND		0.2	0.042	ND		0.19	0.04
Fluoranthene	206-44-0	85	100	1,000	ND		0.1	0.02	ND		0.11	0.021	ND		0.12	0.022	ND		0.13	0.025	ND		0.11	0.021	ND		0.1	0.02	ND		0.1	0.02	ND		0.12	0.023	0.1	J	0.11	0.022
Fluorene	86-73-7	30	100	386	ND		0.18	0.017	ND		0.18	0.018	ND		0.19	0.019	ND		0.22	0.021	ND		0.18	0.017	ND		0.17	0.017	ND		0.17	0.017	ND		0.2	0.02	ND		0.19	0.018
Hexachlorobenzene	118-74-1	0.33	0.3	3.2	ND		0.1	0.02	ND		0.11	0.021	ND		0.12	0.022	ND		0.13	0.024	ND		0.11	0.02	ND		0.1	0.019	ND		0.1	0.019	ND		0.12	0.023	ND		0.11	0.021
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.18	0.026	ND		0.18	0.027	ND		0.19	0.028	ND		0.22	0.032	ND		0.18	0.026	ND		0.17	0.025	ND		0.17	0.025	ND		0.2	0.03	ND		0.19	0.028
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	ND		0.5	0.16	ND		0.53	0.17	ND		0.55	0.17	ND		0.62	0.2	ND		0.51	0.16	ND		0.49	0.16	ND		0.49	0.16	ND		0.58	0.18	ND		0.54	0.17
Hexachloroethane	67-72-1	NS	NS	NS	ND		0.14	0.028	ND		0.15	0.03	ND		0.15	0.031	ND		0.17	0.035	ND		0.14	0.029	ND		0.14	0.028	ND		0.14	0.028	ND		0.16	0.033	ND		0.15	0.031
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	1.4	6.6	ND		0.14	0.024	ND		0.15	0.026	ND		0.15	0.027	ND		0.17	0.03	ND		0.14	0.025	ND		0.14	0.024	ND		0.14	0.024	ND		0.16	0.028	0.045	J	0.15	0.026
Isophorone	78-59-1	NS	NS	NS	ND		0.16	0.023	ND		0.17	0.024	ND		0.17	0.025	ND		0.19	0.028	ND		0.16	0.023	ND		0.16	0.022	ND		0.16	0.022	ND		0.18	0.026	ND		0.17	0.024
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	NS	ND		0.18	0.027	ND		0.18	0.029	ND		0.19	0.03	ND		0.22	0.033	ND		0.18	0.028	ND		0.17	0.027	ND		0.17	0.027	ND		0.2	0.031	ND		0.19	0.029
Naphthalene	91-20-3	12	100	12	ND		0.18	0.021	ND		0.18	0.022	ND		0.19	0.023	ND		0.22	0.026	ND		0.18	0.022	ND		0.17	0.021	ND		0.17	0.021	ND		0.2	0.024	ND		0.19	0.023
NDPA/DPA	86-30-6	NS	NS	NS	ND		0.14	0.02	ND		0.15	0.021	ND		0.15	0.022	ND		0.17	0.024	ND		0.14	0.02	ND		0.14	0.02	ND		0.14	0.02	ND		0.16	0.023	ND		0.15	0.022
Nitrobenzene	98-95-3	0.08	1.8	0.08	ND		0.16	0.026	ND		0.17	0.027	ND		0.17	0.028	ND		0.19	0.032	ND		0.16	0.026	ND		0.16	0.026	ND		0.16	0.026	ND		0.18	0.03	ND		0.17	0.028
p-Chloro-m-cresol	59-50-7	NS	NS	NS	ND		0.18	0.026	ND		0.18	0.028	ND		0.19	0.029	ND		0.22	0.032	ND		0.18	0.027	ND		0.17	0.026	ND		0.17	0.026	ND		0.2	0.03	ND		0.19	0.028
Pentachlorophenol	87-86-5	0.8	1.3	0.8	ND		0.14	0.038	ND		0.15	0.041	ND		0.15	0.042	ND		0.17	0.047	ND		0.14	0.039	ND		0.14	0.038	ND		0.14	0.038	ND		0.16	0.044	ND		0.15	0.042
Phenanthrene	85-01-8	1	5	1,000	ND		0.1	0.021	ND		0.11	0.022	ND		0.12	0.023	ND		0.13	0.026	ND		0.11	0.022	ND		0.1	0.021	ND		0.1	0.021	ND		0.12	0.024	0.13		0.11	0.023
Phenol	108-95-2	0.33	100	0.33	ND		0.18	0.026	ND		0.18	0.028	ND		0.19	0.029	ND		0.22	0.032	ND		0.18	0.027	ND		0.17	0.026	ND		0.17	0.026	ND		0.2	0.03	ND		0.19	0.028
Pyrene	129-00-0	64	100	1,000	ND		0.1	0.017	ND		0.11	0.018	ND		0.12	0.019	ND		0.13	0.021	ND		0.11	0.018	ND		0.1	0.017	ND		0.1	0.017	ND		0.12	0.02	0.11		0.11	0.019
Total SVOCs		NS	NS	NS	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	-		-	-	0.728		-	-

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3B

245 West 55th Street
New York, New York

Summary of Semi-Volatile Organic Compounds in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-7 L2468036-36 11/19/2024 2-4'				SB-7 L2468036-37 11/19/2024 4-6'				SB-7 L2468036-38 11/19/2024 6-8'				SB-7 L2468036-39 11/19/2024 8-10'				SB-7 L2468036-40 11/19/2024 16-18'				SB-8 L2518818-06 3/28/2025 4-6'				SB-8 L2518818-07 3/28/2025 6-8'				SB-8 L2518818-11 3/28/2025 8-10'				SB-8 L2518818-12 3/28/2025 10-12'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
BASE/NEUTRAL EXTRACTABLES																																								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	NS	ND		0.21	0.022	ND		0.93	0.097	ND		0.89	0.092	ND		0.95	0.099	ND		0.21	0.022	ND		0.18	0.019	ND		0.18	0.019	ND		0.18	0.019	ND		0.2	0.021
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.21	0.024	ND		0.93	0.11	ND		0.89	0.1	ND		0.95	0.11	ND		0.21	0.024	ND		0.18	0.021	ND		0.18	0.021	ND		0.18	0.021	ND		0.2	0.023
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.21	0.038	ND		0.93	0.17	ND		0.89	0.16	ND		0.95	0.17	ND		0.21	0.038	ND		0.18	0.033	ND		0.18	0.033	ND		0.18	0.033	ND		0.2	0.037
1,3-Dichlorobenzene	541-73-1	2.6	38	2.4	ND		0.21	0.037	ND		0.93	0.16	ND		0.89	0.15	ND		0.95	0.16	ND		0.21	0.037	ND		0.18	0.032	ND		0.18	0.032	ND		0.18	0.032	ND		0.2	0.035
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.21	0.037	ND		0.93	0.16	ND		0.89	0.15	ND		0.95	0.17	ND		0.21	0.037	ND		0.18	0.032	ND		0.18	0.032	ND		0.18	0.032	ND		0.2	0.036
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.032	0.0098	ND		**0.14**	0.043	ND		**0.13**	0.041	ND		**0.14**	0.044	ND		0.032	0.0099	ND		0.028	0.0084	ND		0.028	0.0085	ND		0.028	0.0085	ND		0.031	0.0094
2,4,5-Trichlorophenol	95-95-4	NS	NS	NS	ND		0.21	0.041	ND		0.93	0.18	ND		0.89	0.17	ND		0.95	0.18	ND		0.21	0.041	ND		0.18	0.035	ND		0.18	0.035	ND		0.18	0.036	ND		0.2	0.039
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	ND		0.13	0.04	ND		0.56	0.18	ND		0.53	0.17	ND		0.57	0.18	ND		0.13	0.041	ND		0.11	0.035	ND		0.11	0.035	ND		0.11	0.035	ND		0.12	0.039
2,4-Dichlorophenol	120-83-2	NS	NS	NS	ND		0.19	0.034	ND		0.84	0.15	ND		0.8	0.14	ND		0.86	0.15	ND		0.19	0.034	ND		0.16	0.03	ND		0.16	0.03	ND		0.17	0.03	ND		0.18	0.033
2,4-Dimethylphenol	105-67-9	NS	NS	NS	ND		0.21	0.07	ND		0.93	0.31	ND		0.89	0.29	ND		0.95	0.31	ND		0.21	0.071	ND		0.18	0.061	ND		0.18	0.061	ND		0.18	0.061	ND		0.2	0.067
2,4-Dinitrophenol	51-28-5	NS	NS	NS	ND		1	0.099	ND		4.5	0.43	ND		4.2	0.41	ND		4.6	0.44	ND		1	0.1	ND		0.88	0.086	ND		0.88	0.086	ND		0.89	0.086	ND		0.98	0.095
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	ND		0.21	0.043	ND		0.93	0.19	ND		0.89	0.18	ND		0.95	0.19	ND		0.21	0.043	ND		0.18	0.037	ND		0.18	0.037	ND		0.18	0.037	ND		0.2	0.041
2,6-Dinitrotoluene	606-20-2	NS	NS	NS	ND		0.21	0.037	ND		0.93	0.16	ND		0.89	0.15	ND		0.95	0.16	ND		0.21	0.037	ND		0.18	0.032	ND		0.18	0.032	ND		0.18	0.032	ND		0.2	0.035
2-Chloronaphthalene	91-58-7	NS	NS	NS	ND		0.21	0.021	ND		0.93	0.092	ND		0.89	0.088	ND		0.95	0.094	ND		0.21	0.021	ND		0.18	0.018	ND		0.18	0.018	ND		0.18	0.018	ND		0.2	0.02
2-Chlorophenol	95-57-8	NS	NS	NS	ND		0.21	0.025	ND		0.93	0.11	ND		0.89	0.1	ND		0.95	0.11	ND		0.21	0.025	ND		0.18	0.022	ND		0.18	0.022	ND		0.18	0.022	ND		0.2	0.024
2-Methylnaphthalene	91-57-6	NS	NS	NS	ND		0.26	0.026	0.16	J	1.1	0.11	26		1.1	0.11	24		1.1	0.12	0.074	J	0.26	0.026	ND		0.22	0.022	ND		0.22	0.022	ND		0.22	0.022	ND		0.24	0.025
2-Methylphenol	95-48-7	0.33	100	0.33	ND		0.21	0.033	ND		**0.93**	0.14	ND		**0.89**	0.14	ND		**0.95**	0.15	ND		0.21	0.033	ND		0.18	0.028	ND		0.18	0.028	ND		0.18	0.029	ND		0.2	0.032
2-Nitroaniline	88-74-4	NS	NS	NS	ND		0.21	0.041	ND		0.93	0.18	ND		0.89	0.17	ND		0.95	0.18	ND		0.21	0.041	ND		0.18	0.035	ND		0.18	0.036	ND		0.18	0.036	ND		0.2	0.039
2-Nitrophenol	88-75-5	NS	NS	NS	ND		0.46	0.08	ND		2	0.35	ND		1.9	0.33	ND		2	0.36	ND		0.46	0.081	ND		0.4	0.069	ND		0.4	0.069	ND		0.4	0.07	ND		0.44	0.077
3,3'-Dichlorobenzidine	91-94-1	NS	NS	NS	ND		0.21	0.057	ND		0.93	0.25	ND		0.89	0.24	ND		0.95	0.25	ND		0.21	0.057	ND		0.18	0.049	ND		0.18	0.049	ND		0.18	0.049	ND		0.2	0.054
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	0.33	100	0.33	ND		0.31	0.033	ND		**1.3**	0.15	ND		**1.3**	0.14	ND		**1.4**	0.15	ND		0.31	0.034	ND		0.26	0.029	ND		0.26	0.029	ND		0.27	0.029	ND		0.29	0.032
3-Nitroaniline	99-09-2	NS	NS	NS	ND		0.21	0.04	ND		0.93	0.18	ND		0.89	0.17	ND		0.95	0.18	ND		0.21	0.04	ND		0.18	0.035	ND		0.18	0.035	ND		0.18	0.035	ND		0.2	0.038
4,6-Dinitro-o-cresol	534-52-1	NS	NS	NS	ND		0.56	0.1	ND		2.4	0.45	ND		2.3	0.42	ND		2.5	0.46	ND		0.56	0.1	ND		0.48	0.088	ND		0.48	0.088	ND		0.48	0.089	ND		0.53	0.098
4-Bromophenyl phenyl ether	101-55-3	NS	NS	NS	ND		0.21	0.032	ND		0.93	0.14	ND		0.89	0.14	ND		0.95	0.14	ND		0.21	0.033	ND		0.18	0.028	ND		0.18	0.028	ND		0.18	0.028	ND		0.2	0.031
4-Chloroaniline	106-47-8	NS	NS	NS	ND		0.21	0.039	ND		0.93	0.17	ND		0.89	0.16	ND		0.95	0.17	ND		0.21	0.039	ND		0.18	0.033	ND		0.18	0.034	ND		0.18	0.034	ND		0.2	0.037
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	NS	ND		0.21	0.023	ND		0.93	0.1	ND		0.89	0.095	ND		0.95	0.1	ND		0.21	0.023	ND		0.18	0.02	ND		0.18	0.02	ND		0.18	0.02	ND		0.2	0.022
4-Nitroaniline	100-01-6	NS	NS	NS	ND		0.21	0.088	ND		0.93	0.39	ND		0.89	0.37	ND		0.95	0.39	ND		0.21	0.089	ND		0.18	0.076	ND		0.18	0.076	ND		0.18	0.077	ND		0.2	0.084
4-Nitrophenol	100-02-7	NS	NS	NS	ND		0.3	0.087	ND		1.3	0.38	ND		1.2	0.36	ND		1.3	0.39	ND		0.3	0.088	ND		0.26	0.075	ND		0.26	0.075	ND		0.26	0.076	ND		0.28	0.083
Acenaphthene	83-32-9	20	100	98	ND		0.17	0.022	0.72	J	0.75	0.097	5.5		0.71	0.092	4.6		0.76	0.099	ND		0.17	0.022	ND		0.15	0.019	ND		0.15	0.019	ND		0.15	0.019	ND		0.16	0.021
Acenaphthylene	208-96-8	100	100	365	ND		0.17	0.033	ND		0.75	0.14	ND		0.71	0.14	ND		0.76	0.15	ND		0.17	0.033	ND		0.15	0.028	ND		0.15	0.028	ND		0.15	0.029	ND		0.16	0.032
Acetophenone	98-86-2	NS	NS	NS	ND		0.21	0.026	ND		0.93	0.12	ND		0.89	0.11	ND		0.95	0.12	ND		0.21	0.026	ND		0.18	0.023	ND		0.18	0.023	ND		0.18	0.023	ND		0.2	0.025
Anthracene	120-12-7	100	100	1,000	ND		0.13	0.042	0.38	J	0.56	0.18	2.2		0.53	0.17	2.1		0.57	0.18	ND		0.13	0.042	ND		0.11	0.036	ND		0.11	0.036	ND		0.11	0.036	ND		0.12	0.04
Benzo(a)anthracene	56-55-3	1	1.4	1	ND		0.13	0.024	ND		0.56	0.1	ND		0.53	0.1	ND		0.57	0.11	ND		0.13	0.024	ND		0.11	0.021	ND		0.11	0.021	ND		0.11	0.021	ND		0.12	0.023
Benzo(a)pyrene	50-32-8	1	1	22	ND		0.17	0.052	ND		0.75	0.23	ND		0.71	0.22	ND		0.76	0.23	ND		0.17	0.052	ND		0.15	0.045	ND		0.15	0.045	ND		0.15	0.045	ND		0.16	0.05
Benzo(b)fluoranthene	205-99-2	1	1.4	2.1	ND		0.13	0.036	ND		0.56	0.16	ND		0.53	0.15	ND		0.57	0.16	ND		0.13	0.036	ND		0.11	0.031	ND		0.11	0.031	ND		0.11	0.031	ND		0.12	0.034
Benzo(ghi)perylene	191-24-2	1	4.9	1,000	ND		0.17	0.025	ND		0.75	0.11	ND		0.71	0.1	ND		0.76	0.11	ND		0.17	0.025	ND		0.15	0.022	ND		0.15	0.022	ND		0.15	0.022	ND		0.16	0.024
Benzo(k)fluoranthene	207-08-9	0.8	4.9	2	ND		0.13	0.034	ND		0.56	0.15	ND		0.53	0.14	ND		0.57	0.15	ND		0.13	0.034	ND		0.11	0.029	ND		0.11	0.029	ND		0.11	0.03	ND		0.12	0.033
Benzoic Acid	65-85-0	NS	NS	NS	ND		0.69	0.22	ND		3	0.94	ND		2.9	0.9	ND		3.1	0.96	ND		0.7	0.22	ND		0.6	0.18	ND		0.6	0.19	ND		0.6	0.19	ND		0.66	0.21
Benzyl Alcohol	100-51-6	NS	NS	NS	ND		0.21	0.065	ND		0.93	0.28	ND		0.89	0.27	ND		0.95	0.29	ND		0.21	0.066	ND		0.18	0.056	ND		0.18	0.056	ND		0.18	0.057	ND		0.2	0.062
Biphenyl	92-52-4	NS	NS	NS	ND		0.49	0.028	ND		2.1	0.12	ND		2	0.12	ND		2.2	0.12	ND		0.49	0.028	ND		0.42	0.024	ND		0.42	0.024	ND		0.42	0.024	ND		0.46	0.026
Bis(2-chloroethoxy)methane	111-91-1	NS	NS	NS	ND		0.23	0.021	ND		1	0.094	ND		0.96	0.089	ND		1	0.095	ND		0.23	0.022	ND		0.2	0.018	ND		0.2	0.018	ND		0.2	0.018	ND		0.22	0.02
Bis(2-chloroethyl)ether	111-44-4	NS	NS	NS	ND		0.19	0.029	ND		0.84	0.13	ND		0.8	0.12	ND		0.86	0.13	ND		0.19	0.029	ND		0.16	0.025	ND		0.16	0.025	ND		0.17	0.025	ND		0.18	0.028
Bis(2-chloroisopropyl)ether	108-60-1	NS	NS	NS	ND		0.26	0.036	ND		1.1	0.16	ND		1.1	0.15	ND		1.1	0.16	ND		0.26	0.037	ND		0.22	0.031	ND		0.22	0.031	ND		0.22	0.032	ND		0.24	0.035
Bis(2-ethylhexyl)phthalate	117-81-7	NS	NS	NS	ND		0.21	0.074	ND		0.93	0.32	ND		0.89	0.31	ND		0.95	0.33	ND		0.21	0.074	ND		0.18	0.064	ND		0.18	0.064	ND		0.18	0.064	ND		0.2	0.071
Butyl benzyl phthalate	85-68-7	NS	NS	NS	ND		0.21	0.054	ND		0.93	0.24	ND		0.89	0.22	ND		0.95	0.24	ND		0.21	0.054	ND		0.18	0.046	ND		0.18	0.046	ND		0.18	0.047	ND		0.2	0.051
Carbazole	86-74-8	NS	NS	NS	ND		0.21	0.021	ND		0.93	0.091	ND		0.89	0.086	ND		0.95	0.092	ND		0.21	0.021	ND		0.18	0.018	ND		0.18	0.018	ND		0.18	0.018	ND		0.2	0.02
Chrysene	218-01-9	1	4.9	1	ND		0.13	0.022	ND		0.56	0.097	ND		0.53	0.092	ND		0.57	0.099	ND		0.13	0.022	ND		0.11	0.019	ND		0.11	0.019	ND		0.11	0.019	ND		0.12	0.021
Di-n-butylphthalate	84-74-2	NS	NS	NS	ND		0.21	0.04	ND		0.93	0.18	ND		0.89	0.17	ND		0.95	0.18	ND		0.21	0.041	ND		0.18	0.035	ND		0.18	0.035	ND		0.18	0.035	ND		0.2	0.039
Di-n-octylphthalate	117-84-0	NS	NS	NS	ND		0.21	0.072	ND		0.93	0.32	ND		0.89	0.3	ND		0.95	0.32	ND		0.21	0.073	ND		0.18	0.062	ND		0.18	0.063	ND		0.18	0.063	ND		0.2	0.069
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	1,000	ND		0.13	0.025	ND		**0.56**	0.11	ND		**0.53**	0.1	ND		**0.57**	0.11	ND		0.13	0.025	ND		0.11	0.021	ND		0.11	0.021	ND		0.11	0.021	ND		0.12	0.024
Dibenzofuran	132-64-9	2.1	18	110	ND		0.21	0.02	0.54	J	0.93	0.088	4.2		0.89	0.084	3.7		0.95	0.09	0.025	J	0.21	0.02	ND		0.18	0.017	ND		0.18	0.017	ND		0.18	0.018	ND		0.2	0.019
Diethyl phthalate	84-66-2	NS	NS	NS	ND		0.21	0.02	ND		0.93	0.086	ND		0.89	0.082	ND		0.95	0.088	ND		0.21	0.02	ND		0.18	0.017	ND		0.18	0.017	ND		0.18	0.017	ND		0.2	0.019
Dimethyl phthalate	131-11-3	NS	NS	NS	ND		0.21	0.045	ND		0.93	0.2	ND		0.89	0.19	ND		0.95	0.2	ND		0.21	0.045	ND		0.18	0.038	ND		0.18	0.039	ND		0.18	0.039	ND		0.2	0.043
Fluoranthene	206-44-0	85	100	1,000	ND		0.13	0.024	0.14	J	0.56	0.11	0.7		0.53	0.1	0.48	J	0.57	0.11	ND		0.13	0.025	ND		0.11	0.021	ND		0.11	0.021	ND		0.11	0.021	ND		0.12	0.023
Fluorene	86-73-7	30	100	386	ND		0.21	0.021	1.2		0.93	0.091	8.7		0.89	0.086	7.2		0.95	0.092	0.038	J	0.21	0.021	ND		0.18	0.018	ND		0.18	0.018	ND		0.18	0.018	ND		0.2	0.02
Hexachlorobenzene	118-74-1	0.33	0.3	3.2	ND		0.13	0.024	ND		**0.56**	0.1	ND		**0.53**	0.099	ND		**0.57**	0.11	ND		0.13	0.024	ND		0.11	0.02	ND		0.11	0.021	ND		0.11	0.021	ND		0.12	0.023
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.21	0.031	ND		0.93	0.14	ND		0.89	0.13	ND		0.95	0.14	ND		0.21	0.031	ND		0.18	0.027	ND		0.18	0.027	ND		0.18	0.027	ND		0.2	0.03
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	ND		0.61	0.19	ND		2.7	0.84	ND		2.5	0.8	ND		2.7	0.86	ND		0.61	0.19	ND		0.52	0.17	ND		0.53	0.17	ND		0.53	0.17	ND		0.58	0.18
Hexachloroethane	67-72-1	NS	NS	NS	ND		0.17	0.034	ND		0.75	0.15	ND		0.71	0.14	ND		0.76	0.15	ND		0.17	0.035	ND		0.15	0.03	ND		0.15	0.03	ND		0.15	0.03	ND		0.16	0.033
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	1.4	6.6	ND		0.17	0.03	ND		**0.75**	0.13	ND		**0.71**	0.12	ND		**0.76**	0.13	ND		0.17	0.03	ND		0.15	0.026	ND		0.15	0.026	ND		0.15	0.026	ND		0.16	0.028
Isophorone	78-59-1	NS	NS	NS	ND		0.19	0.028	ND		0.84	0.12	ND		0.8	0.12	ND		0.86	0.12	ND		0.19	0.028	ND		0.16	0.024	ND		0.16	0.024	ND		0.17	0.024	ND		0.18	0.026
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	NS	ND		0.21	0.033	ND		0.93	0.14	ND		0.89	0.14	ND		0.95	0.15	ND		0.21	0.033	ND		0.18	0.028	ND		0.18	0.028	ND		0.18	0.029	ND		0.2	0.032
Naphthalene	91-20-3	12	100	12	ND		0.21	0.026	0.13	J	0.93	0.11	2.1		0.89	0.11	1.9		0.95	0.12	0.034	J	0.21	0.026	ND		0.18	0.022	ND		0.18	0.022	ND		0.18	0.022	ND		0.2	0.025
NDPA/DPA	86-30-6	NS	NS	NS	ND		0.17	0.024	ND		0.75	0.11	ND		0.71	0.1	ND		0.76	0.11	ND		0.17	0.024	ND		0.15	0.021	ND		0.15	0.021	ND		0.15	0.021	ND		0.16	0.023
Nitrobenzene	98-95-3	0.08	1.8	0.08	ND		0.19	0.032	ND		0.84	0.14	ND		0.8	0.13	ND		0.86	0.14	ND		0.19	0.032	ND		0.16	0.027	ND		0.16	0.027	ND		0.17	0.027	ND		0.18	0.03
p-Chloro-m-cresol	59-50-7	NS	NS	NS	ND		0.21	0.032	ND		0.93	0.14	ND		0.89	0.13	ND		0.95	0.14	ND		0.21	0.032	ND		0.18	0.027	ND		0.18	0.027	ND		0.18	0.028	ND		0.2	0.03
Pentachlorophenol	87-86-5	0.8	1.3	0.8	ND		0.17	0.047	ND		0.75	0.2	ND		0.71	0.2	ND		0.76	0.21	ND		0.17	0.047	ND		0.15	0.04	ND		0.15	0.04	ND		0.15	0.041	ND		0.16	0.045
Phenanthrene	85-01-8	1	5	1,000	ND		0.13	0.026	**2.8**		0.56	0.11	**24**		0.53	0.11	**20**		0.57	0.12	ND		0.13	0.026	ND		0.11	0.022	ND		0.11	0.022	ND		0.11	0.022	ND		0.12	0.025
Phenol	108-95-2	0.33	100	0.33	ND		0.21	0.032	ND		**0.93**	0.14	ND		**0.89**	0.13	ND		**0.95**	0.14	ND		0.21	0.032	ND		0.18	0.028	ND		0.18	0.028	ND		0.18	0.028	ND		0.2	0.031
Pyrene	129-00-0	64	100	1,000	ND		0.13	0.021	0.66		0.56	0.093	2.5		0.53	0.088	1.8		0.57	0.095	ND		0.13	0.021	ND		0.11	0.018	ND		0.11	0.018	ND		0.11	0.018	ND		0.12	0.02
Total SVOCs		NS	NS	NS	-		-	-	6.73		-	-	75.9		-	-	65.78		-	-	0.171		-	-	-		-	-	-		-	-	-		-	-	-		-	-

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3B

245 West 55th Street
New York, New York

Summary of Semi-Volatile Organic Compounds in Soil

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-8 L2518818-13 3/28/2025 12-14'				SB-8 L2518818-14 3/28/2025 14-16'				SB-8 L2518818-15 3/28/2025 16-18'				SB-8 L2518818-16 3/28/2025 18-20'				DUP (SB-8) L2518818-24 3/28/2025 18-20'				SB-8 L2518818-22 3/28/2025 20-22'				SB-8 L2518818-23 3/28/2025 22-24'				PE-1 L2467646-20 11/18/2024 0-0.5'				PE-2 L2467646-22 11/18/2024 0-0.5'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
BASE/NEUTRAL EXTRACTABLES																																						
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	NS	ND		0.2	0.021	ND		0.2	0.02	ND		0.18	0.018	ND		0.18	0.018	ND		0.18	0.021	ND		0.19	0.019	ND		0.2	0.021	ND		0.2	0.02	ND		0.2	0.02
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.2	0.023	ND		0.2	0.022	ND		0.18	0.02	ND		0.18	0.02	ND		0.18	0.02	ND		0.19	0.021	ND		0.2	0.022	ND		0.2	0.022	ND		0.2	0.022
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.2	0.037	ND		0.2	0.035	ND		0.18	0.032	ND		0.18	0.031	ND		0.18	0.032	ND		0.19	0.034	ND		0.2	0.035	ND		0.2	0.035	ND		0.2	0.035
1,3-Dichlorobenzene	541-73-1	2.6	38	2.4	ND		0.2	0.035	ND		0.2	0.034	ND		0.18	0.03	ND		0.18	0.03	ND		0.18	0.03	ND		0.19	0.032	ND		0.2	0.034	ND		0.2	0.034	ND		0.2	0.034
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.2	0.036	ND		0.2	0.034	ND		0.18	0.031	ND		0.18	0.031	ND		0.18	0.031	ND		0.19	0.032	ND		0.2	0.034	ND		0.2	0.034	ND		0.2	0.034
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.031	0.0094	ND		0.029	0.009	ND		0.027	0.0082	ND		0.026	0.0081	ND		0.026	0.0081	ND		0.028	0.0086	ND		0.03	0.0091	ND		0.029	0.009	ND		0.029	0.009
2,4,5-Trichlorophenol	95-95-4	NS	NS	NS	ND		0.2	0.039	ND		0.2	0.037	ND		0.18	0.034	ND		0.18	0.034	ND		0.18	0.034	ND		0.19	0.036	ND		0.2	0.038	ND		0.2	0.038	ND		0.2	0.038
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	ND		0.12	0.039	ND		0.12	0.037	ND		0.11	0.034	ND		0.1	0.033	ND		0.1	0.033	ND		0.11	0.035	ND		0.12	0.037	ND		0.12	0.037	ND		0.12	0.037
2,4-Dichlorophenol	120-83-2	NS	NS	NS	ND		0.18	0.033	ND		0.18	0.031	ND		0.16	0.028	ND		0.16	0.028	ND		0.16	0.028	ND		0.17	0.03	ND		0.18	0.032	ND		0.18	0.032	ND		0.18	0.032
2,4-Dimethylphenol	105-67-9	NS	NS	NS	ND		0.2	0.067	ND		0.2	0.064	ND		0.18	0.058	ND		0.18	0.058	ND		0.18	0.058	ND		0.19	0.062	ND		0.2	0.065	ND		0.2	0.065	ND		0.2	0.065
2,4-Dinitrophenol	51-28-5	NS	NS	NS	ND		0.98	0.095	ND		0.94	0.091	ND		0.85	0.083	ND		0.84	0.082	ND		0.84	0.082	ND		0.9	0.087	ND		0.95	0.092	ND		0.94	0.092	ND		0.94	0.092
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	ND		0.2	0.041	ND		0.2	0.039	ND		0.18	0.035	ND		0.18	0.035	ND		0.18	0.035	ND		0.19	0.037	ND		0.2	0.039	ND		0.2	0.039	ND		0.2	0.039
2,6-Dinitrotoluene	606-20-2	NS	NS	NS	ND		0.2	0.035	ND		0.2	0.034	ND		0.18	0.03	ND		0.18	0.03	ND		0.18	0.03	ND		0.19	0.032	ND		0.2	0.034	ND		0.2	0.034	ND		0.2	0.034
2-Chloronaphthalene	91-58-7	NS	NS	NS	ND		0.2	0.02	ND		0.2	0.019	ND		0.18	0.018	ND		0.18	0.017	ND		0.18	0.017	ND		0.19	0.018	ND		0.2	0.02	ND		0.2	0.019	ND		0.2	0.019
2-Chlorophenol	95-57-8	NS	NS	NS	ND		0.2	0.024	ND		0.2	0.023	ND		0.18	0.021	ND		0.18	0.021	ND		0.18	0.021	ND		0.19	0.022	ND		0.2	0.023	ND		0.2	0.023	ND		0.2	0.023
2-Methylnaphthalene	91-57-6	NS	NS	NS	ND		0.24	0.025	ND		0.23	0.024	ND		0.21	0.021	ND		0.21	0.021	ND		0.21	0.021	ND		0.22	0.022	ND		0.24	0.024	ND		0.24	0.024	ND		0.24	0.024
2-Methylphenol	95-48-7	0.33	100	0.33	ND		0.2	0.032	ND		0.2	0.03	ND		0.18	0.028	ND		0.18	0.027	ND		0.18	0.027	ND		0.19	0.029	ND		0.2	0.031	ND		0.2	0.03	ND		0.2	0.03
2-Nitroaniline	88-74-4	NS	NS	NS	ND		0.2	0.039	ND		0.2	0.038	ND		0.18	0.034	ND		0.18	0.034	ND		0.18	0.034	ND		0.19	0.036	ND		0.2	0.038	ND		0.2	0.038	ND		0.2	0.038
2-Nitrophenol	88-75-5	NS	NS	NS	ND		0.44	0.077	ND		0.42	0.073	ND		0.38	0.067	ND		0.38	0.066	ND		0.38	0.066	ND		0.4	0.07	ND		0.43	0.074	ND		0.42	0.074	ND		0.42	0.074
3,3'-Dichlorobenzidine	91-94-1	NS	NS	NS	ND		0.2	0.054	ND		0.2	0.052	ND		0.18	0.047	ND		0.18	0.047	ND		0.18	0.047	ND		0.19	0.05	ND		0.2	0.052	ND		0.2	0.052	ND		0.2	0.052
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	0.33	100	0.33	ND		0.29	0.032	ND		0.28	0.031	ND		0.26	0.028	ND		0.25	0.027	ND		0.25	0.028	ND		0.27	0.029	ND		0.28	0.031	ND		0.28	0.031	ND		0.28	0.031
3-Nitroaniline	99-09-2	NS	NS	NS	ND		0.2	0.038	ND		0.2	0.037	ND		0.18	0.033	ND		0.18	0.033	ND		0.18	0.033	ND		0.19	0.035	ND		0.2	0.037	ND		0.2	0.037	ND		0.2	0.037
4,6-Dinitro-o-cresol	534-52-1	NS	NS	NS	ND		0.53	0.098	ND		0.51	0.094	ND		0.46	0.085	ND		0.46	0.084	ND		0.46	0.084	ND		0.48	0.09	ND		0.51	0.095	ND		0.51	0.094	ND		0.51	0.094
4-Bromophenyl phenyl ether	101-55-3	NS	NS	NS	ND		0.2	0.031	ND		0.2	0.03	ND		0.18	0.027	ND		0.18	0.027	ND		0.18	0.027	ND		0.19	0.028	ND		0.2	0.03	ND		0.2	0.03	ND		0.2	0.03
4-Chloroaniline	106-47-8	NS	NS	NS	ND		0.2	0.037	ND		0.2	0.036	ND		0.18	0.032	ND		0.18	0.032	ND		0.18	0.032	ND		0.19	0.034	ND		0.2	0.036	ND		0.2	0.036	ND		0.2	0.036
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	NS	ND		0.2	0.022	ND		0.2	0.021	ND		0.18	0.019	ND		0.18	0.019	ND		0.18	0.019	ND		0.19	0.02	ND		0.2	0.021	ND		0.2	0.021	ND		0.2	0.021
4-Nitroaniline	100-01-6	NS	NS	NS	ND		0.2	0.085	ND		0.2	0.081	ND		0.18	0.073	ND		0.18	0.073	ND		0.18	0.073	ND		0.19	0.077	ND		0.2	0.082	ND		0.2	0.081	ND		0.2	0.081
4-Nitrophenol	100-02-7	NS	NS	NS	ND		0.29	0.083	ND		0.27	0.08	ND		0.25	0.072	ND		0.24	0.072	ND		0.25	0.072	ND		0.26	0.076	ND		0.28	0.08	ND		0.28	0.08	ND		0.27	0.08
Acenaphthene	83-32-9	20	100	98	ND		0.16	0.021	ND		0.16	0.02	ND		0.14	0.018	ND		0.14	0.018	ND		0.14	0.018	ND		0.15	0.019	ND		0.16	0.02	ND		0.16	0.02	ND		0.16	0.02
Acenaphthylene	208-96-8	100	100	365	ND		0.16	0.032	ND		0.16	0.03	ND		0.14	0.027	ND		0.14	0.027	ND		0.14	0.027	ND		0.15	0.029	ND		0.16	0.03	ND		0.16	0.03	ND		0.16	0.03
Acetophenone	98-86-2	NS	NS	NS	ND		0.2	0.025	ND		0.2	0.024	ND		0.18	0.022	ND		0.18	0.022	ND		0.18	0.022	ND		0.19	0.023	ND		0.2	0.024	ND		0.2	0.024	ND		0.2	0.024
Anthracene	120-12-7	100	100	1,000	ND		0.12	0.04	ND		0.12	0.038	ND		0.11	0.035	ND		0.1	0.034	ND		0.1	0.034	ND		0.11	0.036	ND		0.12	0.038	0.073	J	0.12	0.038	ND		0.12	0.038
Benzo(a)anthracene	56-55-3	1	1.4	1	ND		0.12	0.023	ND		0.12	0.022	ND		0.11	0.02	ND		0.1	0.02	ND		0.1	0.02	ND		0.11	0.021	ND		0.12	0.022	0.24		0.12	0.022	ND		0.12	0.022
Benzo(a)pyrene	50-32-8	1	1	22	ND		0.16	0.05	ND		0.16	0.048	ND		0.14	0.043	ND		0.14	0.043	ND		0.14	0.043	ND		0.15	0.046	ND		0.16	0.048	0.2		0.16	0.048	ND		0.16	0.048
Benzo(b)fluoranthene	205-99-2	1	1.4	2.1	ND		0.12	0.034	ND		0.12	0.033	ND		0.11	0.03	ND		0.1	0.03	ND		0.1	0.03	ND		0.11	0.031	ND		0.12	0.033	0.28		0.12	0.033	ND		0.12	0.033
Benzo(ghi)perylene	191-24-2	1	4.9	1,000	ND		0.16	0.024	ND		0.16	0.023	ND		0.14	0.021	ND		0.14	0.021	ND		0.14	0.021	ND		0.15	0.022	ND		0.16	0.023	0.13	J	0.16	0.023	ND		0.16	0.023
Benzo(k)fluoranthene	207-08-9	0.8	4.9	2	ND		0.12	0.033	ND		0.12	0.031	ND		0.11	0.028	ND		0.1	0.028	ND		0.1	0.028	ND		0.11	0.03	ND		0.12	0.032	0.076	J	0.12	0.031	ND		0.12	0.031
Benzoic Acid	65-85-0	NS	NS	NS	ND		0.66	0.21	ND		0.63	0.2	ND		0.58	0.18	ND		0.57	0.18	ND		0.57	0.18	ND		0.6	0.19	ND		0.64	0.2	ND		0.64	0.2	ND		0.64	0.2
Benzyl Alcohol	100-51-6	NS	NS	NS	ND		0.2	0.062	ND		0.2	0.06	ND		0.18	0.054	ND		0.18	0.054	ND		0.18	0.054	ND		0.19	0.057	ND		0.2	0.06	ND		0.2	0.06	ND		0.2	0.06
Biphenyl	92-52-4	NS	NS	NS	ND		0.47	0.026	ND		0.44	0.025	ND		0.4	0.023	ND		0.4	0.023	ND		0.4	0.023	ND		0.42	0.024	ND		0.45	0.026	ND		0.45	0.026	ND		0.45	0.026
Bis(2-chloroethoxy)methane	111-91-1	NS	NS	NS	ND		0.22	0.02	ND		0.21	0.02	ND		0.19	0.018	ND		0.19	0.018	ND		0.19	0.018	ND		0.2	0.019	ND		0.21	0.02	ND		0.21	0.02	ND		0.21	0.02
Bis(2-chloroethyl)ether	111-44-4	NS	NS	NS	ND		0.18	0.028	ND		0.18	0.026	ND		0.16	0.024	ND		0.16	0.024	ND		0.16	0.024	ND		0.17	0.025	ND		0.18	0.027	ND		0.18	0.027	ND		0.18	0.027
Bis(2-chloroisopropyl)ether	108-60-1	NS	NS	NS	ND		0.24	0.035	ND		0.23	0.033	ND		0.21	0.03	ND		0.21	0.03	ND		0.21	0.03	ND		0.22	0.032	ND		0.24	0.034	ND		0.24	0.034	ND		0.24	0.034
Bis(2-ethylhexyl)phthalate	117-81-7	NS	NS	NS	ND		0.2	0.071	ND		0.2	0.068	ND		0.18	0.061	ND		0.18	0.061	ND		0.18	0.061	ND		0.19	0.064	ND		0.2	0.068	ND		0.2	0.068	ND		0.2	0.068
Butyl benzyl phthalate	85-68-7	NS	NS	NS	ND		0.2	0.052	ND		0.2	0.049	ND		0.18	0.045	ND		0.18	0.044	ND		0.18	0.044	ND		0.19	0.047	ND		0.2	0.05	ND		0.2	0.05	ND		0.2	0.049
Carbazole	86-74-8	NS	NS	NS	ND		0.2	0.02	ND		0.2	0.019	ND		0.18	0.017	ND		0.18	0.017	ND		0.18	0.017	ND		0.19	0.018	ND		0.2	0.019	ND		0.2	0.019	ND		0.2	0.019
Chrysene	218-01-9	1	4.9	1	ND		0.12	0.021	ND		0.12	0.02	ND		0.11	0.018	ND		0.1	0.018	ND		0.1	0.018	ND		0.11	0.019	ND		0.12	0.02	0.23		0.12	0.02	ND		0.12	0.02
Di-n-butylphthalate	84-74-2	NS	NS	NS	ND		0.2	0.039	ND		0.2	0.037	ND		0.18	0.034	ND		0.18	0.033	ND		0.18	0.033	ND		0.19	0.035	ND		0.2	0.037	ND		0.2	0.037	ND		0.2	0.037
Di-n-octylphthalate	117-84-0	NS	NS	NS	ND		0.2	0.07	ND		0.2	0.066	ND		0.18	0.06	ND		0.18	0.06	ND		0.18	0.06	ND		0.19	0.063	ND		0.2	0.067	ND		0.2	0.067	ND		0.2	0.067
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	1,000	ND		0.12	0.024	ND		0.12	0.022	ND		0.11	0.02	ND		0.1	0.02	ND		0.1	0.02	ND		0.11	0.022	ND		0.12	0.023	0.033	J	0.12	0.023	ND		0.12	0.023
Dibenzofuran	132-64-9	2.1	18	110	ND		0.2	0.019	ND		0.2	0.018	ND		0.18	0.017	ND		0.18	0.016	ND		0.18	0.017	ND		0.19	0.018	ND		0.2	0.019	ND		0.2	0.018	ND		0.2	0.018
Diethyl phthalate	84-66-2	NS	NS	NS	ND		0.2	0.019	ND		0.2	0.018	ND		0.18	0.016	ND		0.18	0.016	ND		0.18	0.016	ND		0.19	0.017	ND		0.2	0.018	ND		0.2	0.018	ND		0.2	0.018
Dimethyl phthalate	131-11-3	NS	NS	NS	ND		0.2	0.043	ND		0.2	0.041	ND		0.18	0.037	ND		0.18	0.037	ND		0.18	0.037	ND		0.19	0.039	ND		0.2	0.041	ND		0.2	0.041	ND		0.2	0.041
Fluoranthene	206-44-0	85	100	1,000	ND		0.12	0.023	ND		0.12	0.022	ND		0.11	0.02	ND		0.1	0.02	ND		0.1	0.02	ND		0.11	0.021	ND		0.12	0.023	0.45		0.12	0.022	0.032	J	0.12	0.022
Fluorene	86-73-7	30	100	386	ND		0.2	0.02	ND		0.2	0.019	ND		0.18	0.017	ND		0.18	0.017	ND		0.18	0.017	ND		0.19	0.018	ND		0.2	0.019	ND		0.2	0.019	ND		0.2	0.019
Hexachlorobenzene	118-74-1	0.33	0.3	3.2	ND		0.12	0.023	ND		0.12	0.022	ND		0.11	0.02	ND		0.1	0.02	ND		0.1	0.02	ND		0.11	0.021	ND		0.12	0.022	ND		0.12	0.022	ND		0.12	0.022
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.2	0.03	ND		0.2	0.029	ND		0.18	0.026	ND		0.18	0.026	ND		0.18	0.026	ND		0.19	0.027	ND		0.2	0.029	ND		0.2	0.029	ND		0.2	0.029
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	ND		0.58	0.18	ND		0.56	0.18	ND		0.51	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.53	0.17	ND		0.56	0.18	ND		0.56	0.18	ND		0.56	0.18
Hexachloroethane	67-72-1	NS	NS	NS	ND		0.16	0.033	ND		0.16	0.032	ND		0.14	0.029	ND		0.14	0.028	ND		0.14	0.028	ND		0.15	0.03	ND		0.16	0.032	ND		0.16	0.032	ND		0.16	0.032
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	1.4	6.6	ND		0.16	0.028	ND		0.16	0.027	ND		0.14	0.025	ND		0.14	0.024	ND		0.14	0.024	ND		0.15	0.026	ND		0.16	0.028	0.12	J	0.16	0.027	ND		0.16	0.027
Isophorone	78-59-1	NS	NS	NS	ND		0.18	0.026	ND		0.18	0.025	ND		0.16	0.023	ND		0.16	0.023	ND		0.16	0.023	ND		0.17	0.024	ND		0.18	0.026	ND		0.18	0.026	ND		0.18	0.025
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	NS	ND		0.2	0.032	ND		0.2	0.03	ND		0.18	0.027	ND		0.18	0.027	ND		0.18	0.027	ND		0.19	0.029	ND		0.2	0.03	ND		0.2	0.03	ND		0.2	0.03
Naphthalene	91-20-3	12	100	12	ND		0.2	0.025	ND		0.2	0.024	ND		0.18	0.022	ND		0.18	0.021	ND		0.18	0.021	ND		0.19	0.023	ND		0.2	0.024	ND		0.2	0.024	ND		0.2	0.024
NDPA/DPA	86-30-6	NS	NS	NS	ND		0.16	0.023	ND		0.16	0.022	ND		0.14	0.02	ND		0.14	0.02	ND		0.14	0.02	ND		0.15	0.021	ND		0.16	0.022	ND		0.16	0.022	ND		0.16	0.022
Nitrobenzene	98-95-3	0.08	1.8	0.08	ND		0.18	0.03	ND		0.18	0.029	ND		0.16	0.026	ND		0.16	0.026	ND		0.16	0.026	ND		0.17	0.028	ND		0.18	0.029	ND		0.18	0.029	ND		0.18	0.029
p-Chloro-m-cresol	59-50-7	NS	NS	NS	ND		0.2	0.03	ND		0.2	0.029	ND		0.18	0.026	ND		0.18	0.026	ND		0.18	0.026	ND		0.19	0.028	ND		0.2	0.029	ND		0.2	0.029	ND		0.2	0.029
Pentachlorophenol	87-86-5	0.8	1.3	0.8	ND		0.16	0.045	ND		0.16	0.043	ND		0.14	0.039	ND		0.14	0.038	ND		0.14	0.039	ND		0.15	0.041	ND		0.16	0.043	ND		0.16	0.043	ND		0.16	0.043
Phenanthrene	85-01-8	1	5	1,000	ND		0.12	0.025	ND		0.12	0.024	ND		0.11	0.022	ND		0.1	0.021	ND		0.1	0.021	ND		0.11	0.023	ND		0.12	0.024	0.29		0.12	0.024	ND		0.12	0.024
Phenol	108-95-2	0.33	100	0.33	ND		0.2	0.031	ND		0.2	0.03	ND		0.18	0.027	ND		0.18	0.026	ND		0.18	0.026	ND		0.19	0.028	ND		0.2	0.03	ND		0.2	0.03	ND		0.2	0.03
Pyrene	129-00-0	64	100	1,000	ND		0.12	0.02	ND		0.12	0.019	ND		0.11	0.018	ND		0.1	0.017	ND		0.1	0.017	ND		0.11	0.018	ND		0.12	0.02	0.41		0.12	0.02	0.023	J	0.12	0.02
Total SVOCs		NS	NS	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.532		-	-	0.055		-	-		

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3B

245 West 55th Street
New York, New York

Summary of Semi-Volatile Organic Compounds in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	PE-B L2467646-23 11/18/2024 0-0.5'				DUP-2 (PE-B) L2467646-19 11/18/2024 0-0.5'			
					Result	Q	RL	MDL	Result	Q	RL	MDL
BASE/NEUTRAL EXTRACTABLES												
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	NS	ND		0.2	0.021	ND		0.2	0.021
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	ND		0.2	0.023	ND		0.2	0.023
1,2-Dichlorobenzene	95-50-1	1.1	100	1.1	ND		0.2	0.036	ND		0.2	0.036
1,3-Dichlorobenzene	541-73-1	2.6	38	2.4	ND		0.2	0.034	ND		0.2	0.034
1,4-Dichlorobenzene	106-46-7	1.8	24	1.8	ND		0.2	0.035	ND		0.2	0.034
1,4-Dioxane	123-91-1	0.1	5.7	0.1	ND		0.03	0.0092	ND		0.03	0.0091
2,4,5-Trichlorophenol	95-95-4	NS	NS	NS	ND		0.2	0.038	ND		0.2	0.038
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	ND		0.12	0.038	ND		0.12	0.038
2,4-Dichlorophenol	120-83-2	NS	NS	NS	ND		0.18	0.032	ND		0.18	0.032
2,4-Dimethylphenol	105-67-9	NS	NS	NS	ND		0.2	0.066	ND		0.2	0.065
2,4-Dinitrophenol	51-28-5	NS	NS	NS	ND		0.96	0.093	ND		0.95	0.092
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	ND		0.2	0.04	ND		0.2	0.04
2,6-Dinitrotoluene	606-20-2	NS	NS	NS	ND		0.2	0.034	ND		0.2	0.034
2-Chloronaphthalene	91-58-7	NS	NS	NS	ND		0.2	0.02	ND		0.2	0.02
2-Chlorophenol	95-57-8	NS	NS	NS	ND		0.2	0.024	ND		0.2	0.023
2-Methylnaphthalene	91-57-6	NS	NS	NS	ND		0.24	0.024	ND		0.24	0.024
2-Methylphenol	95-48-7	0.33	100	0.33	ND		0.2	0.031	ND		0.2	0.031
2-Nitroaniline	88-74-4	NS	NS	NS	ND		0.2	0.038	ND		0.2	0.038
2-Nitrophenol	88-75-5	NS	NS	NS	ND		0.43	0.075	ND		0.43	0.074
3,3'-Dichlorobenzidine	91-94-1	NS	NS	NS	ND		0.2	0.053	ND		0.2	0.053
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	0.33	100	0.33	ND		0.29	0.031	ND		0.28	0.031
3-Nitroaniline	99-09-2	NS	NS	NS	ND		0.2	0.038	ND		0.2	0.037
4,6-Dinitro-o-cresol	534-52-1	NS	NS	NS	ND		0.52	0.096	ND		0.51	0.095
4-Bromophenyl phenyl ether	101-55-3	NS	NS	NS	ND		0.2	0.03	ND		0.2	0.03
4-Chloroaniline	106-47-8	NS	NS	NS	ND		0.2	0.036	ND		0.2	0.036
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	NS	ND		0.2	0.021	ND		0.2	0.021
4-Nitroaniline	100-01-6	NS	NS	NS	ND		0.2	0.082	ND		0.2	0.082
4-Nitrophenol	100-02-7	NS	NS	NS	ND		0.28	0.081	ND		0.28	0.081
Acenaphthene	83-32-9	20	100	98	ND		0.16	0.021	ND		0.16	0.02
Acenaphthylene	208-96-8	100	100	365	ND		0.16	0.031	ND		0.16	0.03
Acetophenone	98-86-2	NS	NS	NS	ND		0.2	0.025	ND		0.2	0.024
Anthracene	120-12-7	100	100	1,000	ND		0.12	0.039	ND		0.12	0.038
Benzo(a)anthracene	56-55-3	1	1.4	1	ND		0.12	0.022	ND		0.12	0.022
Benzo(a)pyrene	50-32-8	1	1	22	ND		0.16	0.049	ND		0.16	0.048
Benzo(b)fluoranthene	205-99-2	1	1.4	2.1	ND		0.12	0.034	ND		0.12	0.033
Benzo(ghi)perylene	191-24-2	1	4.9	1,000	ND		0.16	0.023	ND		0.16	0.023
Benzo(k)fluoranthene	207-08-9	0.8	4.9	2	ND		0.12	0.032	ND		0.12	0.032
Benzoic Acid	65-85-0	NS	NS	NS	ND		0.64	0.2	ND		0.64	0.2
Benzyl Alcohol	100-51-6	NS	NS	NS	ND		0.2	0.061	ND		0.2	0.06
Biphenyl	92-52-4	NS	NS	NS	ND		0.45	0.026	ND		0.45	0.026
Bis(2-chloroethoxy)methane	111-91-1	NS	NS	NS	ND		0.22	0.02	ND		0.21	0.02
Bis(2-chloroethyl)ether	111-44-4	NS	NS	NS	ND		0.18	0.027	ND		0.18	0.027
Bis(2-chloroisopropyl)ether	108-60-1	NS	NS	NS	ND		0.24	0.034	ND		0.24	0.034
Bis(2-ethylhexyl)phthalate	117-81-7	NS	NS	NS	ND		0.2	0.069	ND		0.2	0.068
Butyl benzyl phthalate	85-68-7	NS	NS	NS	ND		0.2	0.05	ND		0.2	0.05
Carbazole	86-74-8	NS	NS	NS	ND		0.2	0.019	ND		0.2	0.019
Chrysene	218-01-9	1	4.9	1	ND		0.12	0.021	ND		0.12	0.02
Di-n-butylphthalate	84-74-2	NS	NS	NS	ND		0.2	0.038	ND		0.2	0.038
Di-n-octylphthalate	117-84-0	NS	NS	NS	ND		0.2	0.068	ND		0.2	0.067
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	1,000	ND		0.12	0.023	ND		0.12	0.023
Dibenzofuran	132-64-9	2.1	18	110	ND		0.2	0.019	ND		0.2	0.019
Diethyl phthalate	84-66-2	NS	NS	NS	ND		0.2	0.018	ND		0.2	0.018
Dimethyl phthalate	131-11-3	NS	NS	NS	ND		0.2	0.042	ND		0.2	0.042
Fluoranthene	206-44-0	85	100	1,000	ND		0.12	0.023	ND		0.12	0.023
Fluorene	86-73-7	30	100	386	ND		0.2	0.019	ND		0.2	0.019
Hexachlorobenzene	118-74-1	0.33	0.3	3.2	ND		0.12	0.022	ND		0.12	0.022
Hexachlorobutadiene	87-68-3	NS	NS	NS	ND		0.2	0.029	ND		0.2	0.029
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	ND		0.57	0.18	ND		0.56	0.18
Hexachloroethane	67-72-1	NS	NS	NS	ND		0.16	0.032	ND		0.16	0.032
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	1.4	6.6	ND		0.16	0.028	ND		0.16	0.028
Isophorone	78-59-1	NS	NS	NS	ND		0.18	0.026	ND		0.18	0.026
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	NS	ND		0.2	0.031	ND		0.2	0.03
Naphthalene	91-20-3	12	100	12	ND		0.2	0.024	ND		0.2	0.024
NDPA/DPA	86-30-6	NS	NS	NS	ND		0.16	0.023	ND		0.16	0.022
Nitrobenzene	98-95-3	0.08	1.8	0.08	ND		0.18	0.029	ND		0.18	0.029
p-Chloro-m-cresol	59-50-7	NS	NS	NS	ND		0.2	0.03	ND		0.2	0.029
Pentachlorophenol	87-86-5	0.8	1.3	0.8	ND		0.16	0.044	ND		0.16	0.044
Phenanthrene	85-01-8	1	5	1,000	ND		0.12	0.024	ND		0.12	0.024
Phenol	108-95-2	0.33	100	0.33	ND		0.2	0.03	ND		0.2	0.03
Pyrene	129-00-0	64	100	1,000	ND		0.12	0.02	ND		0.12	0.02
Total SVOCs		NS	NS	NS	-		-	-	-		-	-

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
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NS - No Applicable Standard
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TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Soils

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-1 L2468433-07 11/20/2024 0-2'				SB-1 L2468433-08 11/20/2024 2-4'				SB-1 L2468433-09 11/20/2024 4-6'				SB-1 L2468433-10 11/20/2024 6-8'				SB-1 L2468433-11 11/20/2024 8-10'				SB-1D L2468433-20 11/20/2024 0-2'				SB-1D L2468433-24 11/20/2024 2-4'				SB-1D L2468433-25 11/20/2024 4-6'				SB-1D L2468433-26 11/20/2024 6-8'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
POLYCHLORINATED BIPHENYLS																																						
Aroclor 1016	12674-11-2	0.1	1	3.2	ND		0.0586	0.0052	ND		0.0544	0.00483	ND		0.049	0.00435	ND		0.0562	0.00499	ND		0.0625	0.00555	ND		0.0596	0.0053	ND		0.0648	0.00575	ND		0.0507	0.0045	ND		0.0547	0.00486
Aroclor 1221	11104-28-2	0.1	1	3.2	ND		0.0586	0.00587	ND		0.0544	0.00545	ND		0.049	0.00491	ND		0.0562	0.00563	ND		0.0625	0.00626	ND		0.0596	0.00598	ND		0.0648	0.00649	ND		0.0507	0.00508	ND		0.0547	0.00548
Aroclor 1232	11141-16-5	0.1	1	3.2	ND		0.0586	0.0124	ND		0.0544	0.0115	ND		0.049	0.0104	ND		0.0562	0.0119	ND		0.0625	0.0132	ND		0.0596	0.0126	ND		0.0648	0.0137	ND		0.0507	0.0107	ND		0.0547	0.0116
Aroclor 1242	53469-21-9	0.1	1	3.2	ND		0.0586	0.00789	ND		0.0544	0.00733	ND		0.049	0.00661	ND		0.0562	0.00758	ND		0.0625	0.00842	ND		0.0596	0.00804	ND		0.0648	0.00873	ND		0.0507	0.00683	ND		0.0547	0.00738
Aroclor 1248	12672-29-6	0.1	1	3.2	ND		0.0586	0.00878	ND		0.0544	0.00815	ND		0.049	0.00735	ND		0.0562	0.00843	ND		0.0625	0.00937	ND		0.0596	0.00895	ND		0.0648	0.00971	ND		0.0507	0.0076	ND		0.0547	0.00821
Aroclor 1254	11097-69-1	0.1	1	3.2	ND		0.0586	0.00641	ND		0.0544	0.00595	ND		0.049	0.00536	ND		0.0562	0.00615	ND		0.0625	0.00684	ND		0.0596	0.00653	ND		0.0648	0.00708	ND		0.0507	0.00554	ND		0.0547	0.00599
Aroclor 1260	11096-82-5	0.1	1	3.2	ND		0.0586	0.0108	ND		0.0544	0.01	ND		0.049	0.00906	ND		0.0562	0.0104	ND		0.0625	0.0115	ND		0.0596	0.011	ND		0.0648	0.012	ND		0.0507	0.00936	ND		0.0547	0.0101
Aroclor 1262	37324-23-5	0.1	1	3.2	ND		0.0586	0.00744	ND		0.0544	0.0069	ND		0.049	0.00623	ND		0.0562	0.00714	ND		0.0625	0.00794	ND		0.0596	0.00758	ND		0.0648	0.00822	ND		0.0507	0.00644	ND		0.0547	0.00695
Aroclor 1268	11100-14-4	0.1	1	3.2	ND		0.0586	0.00607	ND		0.0544	0.00563	ND		0.049	0.00508	ND		0.0562	0.00582	ND		0.0625	0.00647	ND		0.0596	0.00618	ND		0.0648	0.00671	ND		0.0507	0.00525	ND		0.0547	0.00567
PCBs, Total	1336-36-3	0.1	1	3.2	ND		0.0586	0.0052	ND		0.0544	0.00483	ND		0.049	0.00435	ND		0.0562	0.00499	ND		0.0625	0.00555	ND		0.0596	0.0053	ND		0.0648	0.00575	ND		0.0507	0.0045	ND		0.0547	0.00486
ORGANOCHLORINE PESTICIDES																																						
4,4'-DDD	72-54-8	0.0033	5	14	ND		0.00187	0.000668	ND		0.00184	0.000658	ND		0.00164	0.000586	ND		0.00176	0.000629	ND		0.00207	0.000738	ND		0.00198	0.000704	ND		0.00211	0.000752	ND		0.00167	0.000597	ND		0.00186	0.000664
4,4'-DDE	72-55-9	0.0033	3.4	9.3	0.000481	J	0.00187	0.000433	ND		0.00184	0.000426	ND		0.00164	0.00038	ND		0.00176	0.000408	ND		0.00207	0.000479	0.000552	J	0.00198	0.000457	0.00104	J	0.00211	0.000487	0.000489	J	0.00167	0.000387	ND		0.00186	0.000431
4,4'-DDT	50-29-3	0.0033	3.8	135	ND		0.00187	0.0015	ND		0.00184	0.00148	ND		0.00164	0.00132	ND		0.00176	0.00142	ND		0.00207	0.00166	ND		0.00198	0.00159	ND		0.00211	0.00169	ND		0.00167	0.00134	ND		0.00186	0.0015
Aldrin	309-00-2	0.0048	0.044	0.19	ND		0.00187	0.000659	ND		0.00184	0.000649	ND		0.00164	0.000578	ND		0.00176	0.000621	ND		0.00207	0.000729	ND		0.00198	0.000695	ND		0.00211	0.000742	ND		0.00167	0.000589	ND		0.00186	0.000656
Alpha-BHC	319-84-6	0.02	0.18	0.02	ND		0.00078	0.000222	ND		0.000768	0.000218	ND		0.000684	0.000194	ND		0.000735	0.000209	ND		0.000862	0.000245	ND		0.000823	0.000234	ND		0.000878	0.000249	ND		0.000697	0.000198	ND		0.000776	0.00022
Beta-BHC	319-85-7	0.021	0.18	0.09	ND		0.00187	0.00071	ND		0.00184	0.000699	ND		0.00164	0.000623	ND		0.00176	0.000669	ND		0.00207	0.000785	ND		0.00198	0.000749	ND		0.00211	0.000799	ND		0.00167	0.000634	ND		0.00186	0.000706
Chlordane	57-74-9	NS	NS	NS	ND		0.0156	0.0062	ND		0.0154	0.00611	ND		0.0137	0.00544	ND		0.0147	0.00584	ND		0.0172	0.00686	ND		0.0164	0.00654	ND		0.0176	0.00698	ND		0.0139	0.00554	ND		0.0155	0.00617
cis-Chlordane	5103-71-9	0.014	0.65	4.5	ND		0.00234	0.000652	ND		0.0023	0.000642	ND		0.00205	0.000572	ND		0.0022	0.000614	ND		0.00259	0.000721	ND		0.00247	0.000688	ND		0.00263	0.000734	ND		0.00209	0.000583	ND		0.00233	0.000649
Delta-BHC	319-86-8	0.04	100	0.1	ND		0.00187	0.000367	ND		0.00184	0.000361	ND		0.00164	0.000322	ND		0.00176	0.000346	ND		0.00207	0.000405	ND		0.00198	0.000387	ND		0.00211	0.000413	ND		0.00167	0.000328	ND		0.00186	0.000365
Dieldrin	60-57-1	0.005	0.075	0.1	ND		0.00117	0.000585	ND		0.00115	0.000576	ND		0.00103	0.000513	ND		0.0011	0.000551	ND		0.00129	0.000647	ND		0.00123	0.000617	ND		0.00132	0.000658	ND		0.00104	0.000523	ND		0.00116	0.000582
Endosulfan I	959-98-8	4.3	35	65	ND		0.00187	0.000442	ND		0.00184	0.000436	ND		0.00164	0.000388	ND		0.00176	0.000417	ND		0.00207	0.000489	ND		0.00198	0.000467	ND		0.00211	0.000498	ND		0.00167	0.000395	ND		0.00186	0.00044
Endosulfan II	33213-65-9	4.3	35	44	ND		0.00187	0.000626	ND		0.00184	0.000616	ND		0.00164	0.000549	ND		0.00176	0.00059	ND		0.00207	0.000692	ND		0.00198	0.00066	ND		0.00211	0.000704	ND		0.00167	0.000559	ND		0.00186	0.000622
Endosulfan sulfate	1031-07-8	4.3	35	47	ND		0.00078	0.000371	ND		0.000768	0.000366	ND		0.000684	0.000326	ND		0.000735	0.00035	ND		0.000862	0.00041	ND		0.000823	0.000392	ND		0.000878	0.000418	ND		0.000697	0.000332	ND		0.000776	0.000369
Endrin	72-20-8	0.014	5.3	0.06	ND		0.00078	0.00032	ND		0.000768	0.000315	ND		0.000684	0.00028	ND		0.000735	0.000301	ND		0.000862	0.000354	ND		0.000823	0.000337	ND		0.000878	0.00036	ND		0.000697	0.000286	ND		0.000776	0.000318
Endrin aldehyde	7421-93-4	NS	NS	NS	ND		0.00234	0.000819	ND		0.0023	0.000807	ND		0.00205	0.000718	ND		0.0022	0.000772	ND		0.00259	0.000905	ND		0.00247	0.000864	ND		0.00263	0.000922	ND		0.00209	0.000732	ND		0.00233	0.000815
Endrin ketone	53494-70-5	NS	NS	NS	ND		0.00187	0.000482	ND		0.00184	0.000475	ND		0.00164	0.000423	ND		0.00176	0.000454	ND		0.00207	0.000533	ND		0.00198	0.000508	ND		0.00211	0.000543	ND		0.00167	0.000431	ND		0.00186	0.00048
Heptachlor	76-44-8	0.013	0.53	0.38	ND		0.000936	0.00042	ND		0.000922	0.000413	ND		0.000821	0.000368	ND		0.000882	0.000396	ND		0.00103	0.000464	ND		0.000988	0.000443	ND		0.00105	0.000472	ND		0.000837	0.000375	ND		0.000931	0.000418
Heptachlor epoxide	1024-57-3	NS	NS	NS	ND		0.00351	0.00105	ND		0.00346	0.00104	ND		0.00308	0.000924	ND		0.00331	0.000992	ND		0.00388	0.00116	ND		0.0037	0.00111	ND		0.00395	0.00118	ND		0.00314	0.000941	ND		0.00349	0.00105
Lindane	58-89-9	0.025	0.21	0.05	ND		0.00078	0.000349	ND		0.000768	0.000343	ND		0.000684	0.000306	ND		0.000735	0.000329	ND		0.000862	0.000385	ND		0.000823	0.000368	ND		0.000878	0.000392	ND		0.000697	0.000312	ND		0.000776	0.000347
Methoxychlor	72-43-5	NS	NS	NS	ND		0.00351	0.00109	ND		0.00346	0.00108	ND		0.00308	0.000958	ND		0.00331	0.00103	ND		0.00388	0.00121	ND		0.0037	0.00115	ND		0.00395	0.00123	ND		0.00314	0.000976	ND		0.00349	0.00109
Toxaphene	8001-35-2	NS	NS	NS	ND		0.0351	0.00983	ND		0.0346	0.00968	ND		0.0308	0.00862	ND		0.0331	0.00926	ND		0.0388	0.0109	ND		0.037	0.0104	ND		0.0395	0.0111	ND		0.0314	0.00878	ND		0.0349	0.00978
trans-Chlordane	5103-74-2	NS	NS	NS	ND		0.00234	0.000618	ND		0.0023	0.000608	ND		0.00205	0.000542	ND		0.0022	0.000582	ND		0.00259	0.000683	ND		0.00247	0.000652	ND		0.00263	0.000695	ND		0.00209	0.000552	ND		0.00233	0.000615

Notes:
All results reported in mg/kg

Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO

NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the soil standard
mg/kg - milligram per kilogram
I - The lower value for the two columns has been reported due to obvious interference.
P - The RPD between the results for the two columns exceeds the method-specified criteria.

TABLE 3C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Soils

SAMPLE ID:		Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-1D				SB-2				SB-2				SB-2				SB-2				DUP				SB-2				SB-3				SB-3			
LAB ID:					L2468433-21				L2505323-01				L2505323-02				L2505323-03				L2505323-04				L2505323-06				L2505323-05				L2468036-07				L2468036-08			
COLLECTION DATE:					11/20/2024				1/30/2025				1/30/2025				1/30/2025				1/30/2025				1/30/2025				1/30/2025				11/19/2024				11/19/2024			
DEPTH:					8-10'				0-2'				2-4'				4-6'				6-8'				6-8'				8-10'				0-2'				2-4'			
	CAS				Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
POLYCHLORINATED BIPHENYLS																																								
Aroclor 1016	12674-11-2	0.1	1	3.2	ND		0.0593	0.00527	ND		0.0575	0.0051	ND		0.0592	0.00526	ND		0.0597	0.0053	ND		0.0532	0.00472	ND		0.051	0.00453	ND		0.0553	0.00491	ND		0.0591	0.00525	ND		0.0569	0.00506
Aroclor 1221	11104-28-2	0.1	1	3.2	ND		0.0593	0.00594	ND		0.0575	0.00576	ND		0.0592	0.00593	ND		0.0597	0.00598	ND		0.0532	0.00533	ND		0.051	0.00511	ND		0.0553	0.00554	ND		0.0591	0.00593	ND		0.0569	0.0057
Aroclor 1232	11141-16-5	0.1	1	3.2	ND		0.0593	0.0126	ND		0.0575	0.0122	ND		0.0592	0.0126	ND		0.0597	0.0127	ND		0.0532	0.0113	ND		0.051	0.0108	ND		0.0553	0.0117	ND		0.0591	0.0125	ND		0.0569	0.0121
Aroclor 1242	53469-21-9	0.1	1	3.2	ND		0.0593	0.008	ND		0.0575	0.00775	ND		0.0592	0.00798	ND		0.0597	0.00805	ND		0.0532	0.00717	ND		0.051	0.00688	ND		0.0553	0.00746	ND		0.0591	0.00797	ND		0.0569	0.00768
Aroclor 1248	12672-29-6	0.1	1	3.2	ND		0.0593	0.0089	ND		0.0575	0.00862	ND		0.0592	0.00888	ND		0.0597	0.00896	ND		0.0532	0.00797	ND		0.051	0.00765	ND		0.0553	0.0083	ND		0.0591	0.00887	ND		0.0569	0.00854
Aroclor 1254	11097-69-1	0.1	1	3.2	ND		0.0593	0.00649	ND		0.0575	0.00629	ND		0.0592	0.00648	ND		0.0597	0.00653	ND		0.0532	0.00582	ND		0.051	0.00558	ND		0.0553	0.00605	ND		0.0591	0.00647	ND		0.0569	0.00623
Aroclor 1260	11096-82-5	0.1	1	3.2	ND		0.0593	0.011	ND		0.0575	0.0106	ND		0.0592	0.0109	ND		0.0597	0.011	ND		0.0532	0.00982	ND		0.051	0.00943	ND		0.0553	0.0102	ND		0.0591	0.0109	ND		0.0569	0.0105
Aroclor 1262	37324-23-5	0.1	1	3.2	ND		0.0593	0.00753	ND		0.0575	0.0073	ND		0.0592	0.00752	ND		0.0597	0.00758	ND		0.0532	0.00675	ND		0.051	0.00648	ND		0.0553	0.00703	ND		0.0591	0.00751	ND		0.0569	0.00723
Aroclor 1268	11100-14-4	0.1	1	3.2	ND		0.0593	0.00614	ND		0.0575	0.00595	ND		0.0592	0.00613	ND		0.0597	0.00619	ND		0.0532	0.00551	ND		0.051	0.00528	ND		0.0553	0.00573	ND		0.0591	0.00613	ND		0.0569	0.0059
PCBs, Total	1336-36-3	0.1	1	3.2	ND		0.0593	0.00527	ND		0.0575	0.0051	ND		0.0592	0.00526	ND		0.0597	0.0053	ND		0.0532	0.00472	ND		0.051	0.00453	ND		0.0553	0.00491	ND		0.0591	0.00525	ND		0.0569	0.00506
ORGANOCHLORINE PESTICIDES																																								
4,4'-DDD	72-54-8	0.0033	5	14	ND		0.00198	0.000705	ND		0.00191	0.00068	ND		0.00187	0.000668	ND		**0.00984**	**0.00351**	ND		**0.00876**	0.00312	ND		**0.00827**	0.00295	ND		**0.00887**	0.00316	ND		0.00193	0.000688	ND		0.0018	0.000643
4,4'-DDE	72-55-9	0.0033	3.4	9.3	ND		0.00198	0.000457	ND		0.00191	0.000441	ND		0.00187	0.000433	ND		**0.00984**	0.00228	ND		**0.00876**	0.00202	ND		**0.00827**	0.00191	ND		**0.00887**	0.00205	ND		0.00193	0.000446	ND		0.0018	0.000417
4,4'-DDT	50-29-3	0.0033	3.8	135	ND		0.00198	0.00159	ND		0.00191	0.00153	ND		0.00187	0.00151	ND		**0.00984**	**0.00791**	ND		**0.00876**	**0.00704**	ND		**0.00827**	**0.00665**	ND		**0.00887**	**0.00713**	ND		0.00193	0.00155	ND		0.0018	0.00145
Aldrin	309-00-2	0.0048	0.044	0.19	ND		0.00198	0.000696	ND		0.00191	0.000671	ND		0.00187	0.00066	ND		**0.00984**	0.00346	ND		**0.00876**	0.00308	ND		**0.00827**	0.00291	ND		**0.00887**	0.00312	ND		0.00193	0.00068	ND		0.0018	0.000635
Alpha-BHC	319-84-6	0.02	0.18	0.02	ND		0.000824	0.000234	ND		0.000794	0.000226	ND		0.00078	0.000222	ND		0.0041	0.00116	ND		0.00365	0.00104	ND		0.00344	0.000978	ND		0.0037	0.00105	ND		0.000804	0.000228	ND		0.000751	0.000213
Beta-BHC	319-85-7	0.021	0.18	0.09	ND		0.00198	0.00075	ND		0.00191	0.000723	ND		0.00187	0.00071	ND		0.00984	0.00373	ND		0.00876	0.00332	ND		0.00827	0.00314	ND		0.00887	0.00336	ND		0.00193	0.000732	ND		0.0018	0.000684
Chlordane	57-74-9	NS	NS	NS	ND		0.0165	0.00655	ND		0.0159	0.00631	ND		0.0156	0.0062	ND		0.082	0.0326	ND		0.073	0.029	ND		0.0689	0.0274	ND		0.0739	0.0294	ND		0.0161	0.00639	ND		0.015	0.00597
cis-Chlordane	5103-71-9	0.014	0.65	4.5	ND		0.00247	0.000689	ND		0.00238	0.000664	ND		0.00234	0.000652	ND		0.0123	0.00343	ND		0.011	0.00305	ND		0.0103	0.00288	ND		0.0111	0.00309	ND		0.00241	0.000672	ND		0.00225	0.000628
Delta-BHC	319-86-8	0.04	100	0.1	ND		0.00198	0.000387	ND		0.00191	0.000373	ND		0.00187	0.000367	ND		0.00984	0.00193	ND		0.00876	0.00172	ND		0.00827	0.00162	ND		0.00887	0.00174	ND		0.00193	0.000378	ND		0.0018	0.000353
Dieldrin	60-57-1	0.005	0.075	0.1	ND		0.00124	0.000618	ND		0.00119	0.000596	ND		0.00117	0.000585	ND		**0.00615**	0.00308	ND		0.00548	0.00274	ND		0.00517	0.00258	ND		0.00554	0.00277	ND		0.00121	0.000603	ND		0.00113	0.000563
Endosulfan I	959-98-8	4.3	35	65	ND		0.00198	0.000467	ND		0.00191	0.00045	ND		0.00187	0.000442	ND		0.00984	0.00232	ND		0.00876	0.00207	ND		0.00827	0.00195	ND		0.00887	0.0021	ND		0.00193	0.000456	ND		0.0018	0.000426
Endosulfan II	33213-65-9	4.3	35	44	ND		0.00198	0.000661	ND		0.00191	0.000637	ND		0.00187	0.000626	ND		0.00984	0.00329	ND		0.00876	0.00293	ND		0.00827	0.00276	ND		0.00887	0.00296	ND		0.00193	0.000645	ND		0.0018	0.000602
Endosulfan sulfate	1031-07-8	4.3	35	47	ND		0.000824	0.000392	ND		0.000794	0.000378	ND		0.00078	0.000372	ND		0.0041	0.00195	ND		0.00365	0.00174	ND		0.00344	0.00164	ND		0.0037	0.00176	ND		0.000804	0.000383	ND		0.000751	0.000358
Endrin	72-20-8	0.014	5.3	0.06	ND		0.000824	0.000338	ND		0.000794	0.000326	ND		0.00078	0.00032	ND		0.0041	0.00168	ND		0.00365	0.0015	ND		0.00344	0.00141	ND		0.0037	0.00152	ND		0.000804	0.00033	ND		0.000751	0.000308
Endrin aldehyde	7421-93-4	NS	NS	NS	ND		0.00247	0.000865	ND		0.00238	0.000834	ND		0.00234	0.00082	ND		0.0123	0.0043	ND		0.011	0.00383	ND		0.0103	0.00362	ND		0.0111	0.00388	ND		0.00241	0.000844	ND		0.00225	0.000789
Endrin ketone	53494-70-5	NS	NS	NS	ND		0.00198	0.000509	ND		0.00191	0.000491	ND		0.00187	0.000482	ND		0.00984	0.00253	ND		0.00876	0.00226	ND		0.00827	0.00213	ND		0.00887	0.00228	ND		0.00193	0.000497	ND		0.0018	0.000464
Heptachlor	76-44-8	0.013	0.53	0.38	ND		0.000989	0.000443	ND		0.000953	0.000427	ND		0.000937	0.00042	ND		0.00492	0.00221	ND		0.00438	0.00196	ND		0.00413	0.00185	ND		0.00443	0.00199	ND		0.000965	0.000433	ND		0.000902	0.000404
Heptachlor epoxide	1024-57-3	NS	NS	NS	ND		0.00371	0.00111	ND		0.00357	0.00107	ND		0.00351	0.00105	ND		0.0184	0.00554	ND		0.0164	0.00493	ND		0.0155	0.00465	ND		0.0166	0.00499	ND		0.00362	0.00108	ND		0.00338	0.00101
Lindane	58-89-9	0.025	0.21	0.05	ND		0.000824	0.000368	ND		0.000794	0.000355	ND		0.00078	0.000349	ND		0.0041	0.00183	ND		0.00365	0.00163	ND		0.00344	0.00154	ND		0.0037	0.00165	ND		0.000804	0.000359	ND		0.000751	0.000336
Methoxychlor	72-43-5	NS	NS	NS	ND		0.00371	0.00115	ND		0.00357	0.00111	ND		0.00351	0.00109	ND		0.0184	0.00574	ND		0.0164	0.00511	ND		0.0155	0.00482	ND		0.0166	0.00517	ND		0.00362	0.00112	ND		0.00338	0.00105
Toxaphene	8001-35-2	NS	NS	NS	ND		0.0371	0.0104	ND		0.0357	0.01	ND		0.0351	0.00983	ND		0.184	0.0517	ND		0.164	0.046	ND		0.155	0.0434	ND		0.166	0.0466	ND		0.0362	0.0101	ND		0.0338	0.00946
trans-Chlordane	5103-74-2	NS	NS	NS	ND		0.00247	0.000652	ND		0.00238	0.000629	ND		0.00234	0.000618	ND		0.0123	0.00325	ND		0.011	0.00289	ND		0.0103	0.00273	ND		0.0111	0.00293	ND		0.00241	0.000637	ND		0.00225	0.000595

Notes:
All results reported in mg/kg

Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO

NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
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NS - No Applicable Standard
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mg/kg - milligram per kilogram
I - The lower value for the two columns has been reported due to obvious interference.
P - The RPD between the results for the two columns exceeds the method-specified criteria.

TABLE 3C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Soils

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-3 L2468036-09 11/19/2024 4-6'				SB-3 L2468036-10 11/19/2024 6-8'				SB-3 L2468036-11 11/19/2024 8-10'				SB-4 L2467646-06 11/18/2024 0-2'				SB-4 L2467646-07 11/18/2024 2-4'				SB-4 L2467646-08 11/18/2024 4-6'				SB-4 L2467646-09 11/18/2024 6-8'				SB-5 L2467646-14 11/18/2024 0-2'				SB-5 L2467646-15 11/18/2024 2-4'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
POLYCHLORINATED BIPHENYLS																																						
Aroclor 1016	12674-11-2	0.1	1	3.2	ND		0.0551	0.0049	ND		0.0607	0.00539	ND		0.0576	0.00512	ND		0.0577	0.00512	ND		0.0579	0.00514	ND		0.0511	0.00454	ND		0.0546	0.00484	ND		0.0585	0.00519	ND		0.0497	0.00442
Aroclor 1221	11104-28-2	0.1	1	3.2	ND		0.0551	0.00552	ND		0.0607	0.00608	ND		0.0576	0.00577	ND		0.0577	0.00578	ND		0.0579	0.0058	ND		0.0511	0.00512	ND		0.0546	0.00547	ND		0.0585	0.00586	ND		0.0497	0.00498
Aroclor 1232	11141-16-5	0.1	1	3.2	ND		0.0551	0.0117	ND		0.0607	0.0129	ND		0.0576	0.0122	ND		0.0577	0.0122	ND		0.0579	0.0123	ND		0.0511	0.0108	ND		0.0546	0.0116	ND		0.0585	0.0124	ND		0.0497	0.0105
Aroclor 1242	53469-21-9	0.1	1	3.2	ND		0.0551	0.00743	ND		0.0607	0.00818	ND		0.0576	0.00777	ND		0.0577	0.00777	ND		0.0579	0.00781	ND		0.0511	0.00689	ND		0.0546	0.00736	ND		0.0585	0.00788	ND		0.0497	0.0067
Aroclor 1248	12672-29-6	0.1	1	3.2	ND		0.0551	0.00827	ND		0.0607	0.0091	ND		0.0576	0.00864	ND		0.0577	0.00865	ND		0.0579	0.00869	ND		0.0511	0.00766	ND		0.0546	0.00818	ND		0.0585	0.00877	ND		0.0497	0.00746
Aroclor 1254	11097-69-1	0.1	1	3.2	ND		0.0551	0.00603	ND		0.0607	0.00664	ND		0.0576	0.0063	ND		0.0577	0.00631	ND		0.0579	0.00634	ND		0.0511	0.00559	ND		0.0546	0.00597	ND		0.0585	0.0064	ND		0.0497	0.00544
Aroclor 1260	11096-82-5	0.1	1	3.2	ND		0.0551	0.0102	ND		0.0607	0.0112	ND		0.0576	0.0106	0.0395	J	0.0577	0.0106	0.0297	J	0.0579	0.0107	ND		0.0511	0.00944	ND		0.0546	0.0101	ND		0.0585	0.0108	ND		0.0497	0.00919
Aroclor 1262	37324-23-5	0.1	1	3.2	ND		0.0551	0.007	ND		0.0607	0.00771	ND		0.0576	0.00732	ND		0.0577	0.00732	ND		0.0579	0.00735	ND		0.0511	0.00649	ND		0.0546	0.00693	ND		0.0585	0.00743	ND		0.0497	0.00632
Aroclor 1268	11100-14-4	0.1	1	3.2	ND		0.0551	0.00571	ND		0.0607	0.00629	ND		0.0576	0.00597	ND		0.0577	0.00598	ND		0.0579	0.006	ND		0.0511	0.00529	ND		0.0546	0.00565	ND		0.0585	0.00606	ND		0.0497	0.00515
PCBs, Total	1336-36-3	0.1	1	3.2	ND		0.0551	0.0049	ND		0.0607	0.00539	ND		0.0576	0.00512	0.0395	J	0.0577	0.00512	0.0297	J	0.0579	0.00514	ND		0.0511	0.00454	ND		0.0546	0.00484	ND		0.0585	0.00519	ND		0.0497	0.00442
ORGANOCHLORINE PESTICIDES																																						
4,4'-DDD	72-54-8	0.0033	5	14	ND		0.00179	0.000639	ND		0.0019	0.000678	ND		0.00194	0.00069	ND		0.00196	0.000701	ND		0.00198	0.000708	ND		0.00165	0.000588	ND		0.00176	0.000628	ND		0.00181	0.000645	ND		0.00171	0.000609
4,4'-DDE	72-55-9	0.0033	3.4	9.3	ND		0.00179	0.000414	ND		0.0019	0.00044	ND		0.00194	0.000448	**0.0139**		0.00196	0.000454	**0.00819**		0.00198	0.000459	ND		0.00165	0.000382	ND		0.00176	0.000407	0.000917	J	0.00181	0.000418	ND		0.00171	0.000395
4,4'-DDT	50-29-3	0.0033	3.8	135	ND		0.00179	0.00144	ND		0.0019	0.00153	ND		0.00194	0.00156	ND		0.00196	0.00158	ND		0.00198	0.0016	ND		0.00165	0.00133	ND		0.00176	0.00142	ND		0.00181	0.00145	ND		0.00171	0.00137
Aldrin	309-00-2	0.0048	0.044	0.19	ND		0.00179	0.000631	ND		0.0019	0.000669	ND		0.00194	0.000682	ND		0.00196	0.000692	ND		0.00198	0.000698	ND		0.00165	0.000581	ND		0.00176	0.00062	ND		0.00181	0.000636	ND		0.00171	0.000601
Alpha-BHC	319-84-6	0.02	0.18	0.02	ND		0.000746	0.000212	ND		0.000792	0.000225	ND		0.000807	0.000229	ND		0.000818	0.000232	ND		0.000827	0.000235	ND		0.000688	0.000195	ND		0.000734	0.000208	ND		0.000753	0.000214	ND		0.000711	0.000202
Beta-BHC	319-85-7	0.021	0.18	0.09	ND		0.00179	0.000679	ND		0.0019	0.000721	ND		0.00194	0.000734	ND		0.00196	0.000745	ND		0.00198	0.000752	ND		0.00165	0.000626	ND		0.00176	0.000668	ND		0.00181	0.000686	ND		0.00171	0.000647
Chlordane	57-74-9	NS	NS	NS	ND		0.0149	0.00593	ND		0.0158	0.0063	ND		0.0161	0.00641	ND		0.0164	0.00651	ND		0.0165	0.00657	ND		0.0138	0.00546	ND		0.0147	0.00584	ND		0.0151	0.00599	ND		0.0142	0.00565
cis-Chlordane	5103-71-9	0.014	0.65	4.5	ND		0.00224	0.000624	ND		0.00238	0.000662	ND		0.00242	0.000674	ND		0.00246	0.000684	ND		0.00248	0.000691	ND		0.00206	0.000575	ND		0.0022	0.000614	ND		0.00226	0.00063	ND		0.00213	0.000594
Delta-BHC	319-86-8	0.04	100	0.1	ND		0.00179	0.000351	ND		0.0019	0.000372	ND		0.00194	0.000379	ND		0.00196	0.000385	ND		0.00198	0.000388	ND		0.00165	0.000323	ND		0.00176	0.000345	ND		0.00181	0.000354	ND		0.00171	0.000334
Dieldrin	60-57-1	0.005	0.075	0.1	ND		0.00112	0.00056	ND		0.00119	0.000594	ND		0.00121	0.000605	ND		0.00123	0.000614	ND		0.00124	0.00062	ND		0.00103	0.000516	ND		0.0011	0.000551	ND		0.00113	0.000565	ND		0.00107	0.000533
Endosulfan I	959-98-8	4.3	35	65	ND		0.00179	0.000423	ND		0.0019	0.000449	ND		0.00194	0.000457	ND		0.00196	0.000464	ND		0.00198	0.000469	ND		0.00165	0.00039	ND		0.00176	0.000416	ND		0.00181	0.000427	ND		0.00171	0.000403
Endosulfan II	33213-65-9	4.3	35	44	ND		0.00179	0.000599	ND		0.0019	0.000635	ND		0.00194	0.000647	ND		0.00196	0.000656	ND		0.00198	0.000663	ND		0.00165	0.000551	ND		0.00176	0.000589	ND		0.00181	0.000604	ND		0.00171	0.00057
Endosulfan sulfate	1031-07-8	4.3	35	47	ND		0.000746	0.000355	ND		0.000792	0.000377	ND		0.000807	0.000384	ND		0.000818	0.00039	ND		0.000827	0.000393	ND		0.000688	0.000327	ND		0.000734	0.000349	ND		0.000753	0.000358	ND		0.000711	0.000338
Endrin	72-20-8	0.014	5.3	0.06	ND		0.000746	0.000306	ND		0.000792	0.000325	ND		0.000807	0.000331	ND		0.000818	0.000336	ND		0.000827	0.000339	ND		0.000688	0.000282	ND		0.000734	0.000301	ND		0.000753	0.000309	ND		0.000711	0.000292
Endrin aldehyde	7421-93-4	NS	NS	NS	ND		0.00224	0.000784	ND		0.00238	0.000832	ND		0.00242	0.000847	ND		0.00246	0.000859	ND		0.00248	0.000868	ND		0.00206	0.000722	ND		0.0022	0.000771	ND		0.00226	0.000791	ND		0.00213	0.000747
Endrin ketone	53494-70-5	NS	NS	NS	ND		0.00179	0.000461	ND		0.0019	0.00049	ND		0.00194	0.000498	ND		0.00196	0.000506	ND		0.00198	0.000511	ND		0.00165	0.000425	ND		0.00176	0.000454	ND		0.00181	0.000466	ND		0.00171	0.000439
Heptachlor	76-44-8	0.013	0.53	0.38	ND		0.000896	0.000402	ND		0.000951	0.000426	ND		0.000968	0.000434	ND		0.000982	0.00044	ND		0.000992	0.000445	ND		0.000825	0.00037	ND		0.000881	0.000395	ND		0.000904	0.000405	ND		0.000853	0.000383
Heptachlor epoxide	1024-57-3	NS	NS	NS	ND		0.00336	0.00101	ND		0.00356	0.00107	ND		0.00363	0.00109	ND		0.00368	0.0011	ND		0.00372	0.00112	ND		0.00309	0.000928	ND		0.0033	0.000991	ND		0.00339	0.00102	ND		0.0032	0.00096
Lindane	58-89-9	0.025	0.21	0.05	ND		0.000746	0.000334	ND		0.000792	0.000354	ND		0.000807	0.00036	ND		0.000818	0.000366	ND		0.000827	0.000369	ND		0.000688	0.000307	ND		0.000734	0.000328	ND		0.000753	0.000337	ND		0.000711	0.000318
Methoxychlor	72-43-5	NS	NS	NS	ND		0.00336	0.00104	ND		0.00356	0.00111	ND		0.00363	0.00113	ND		0.00368	0.00114	ND		0.00372	0.00116	ND		0.00309	0.000962	ND		0.0033	0.00103	ND		0.00339	0.00105	ND		0.0032	0.000996
Toxaphene	8001-35-2	NS	NS	NS	ND		0.0336	0.00941	ND		0.0356	0.00998	ND		0.0363	0.0102	ND		0.0368	0.0103	ND		0.0372	0.0104	ND		0.0309	0.00866	ND		0.033	0.00925	ND		0.0339	0.00949	ND		0.032	0.00896
trans-Chlordane	5103-74-2	NS	NS	NS	ND		0.00224	0.000591	ND		0.00238	0.000627	ND		0.00242	0.000639	ND		0.00246	0.000648	ND		0.00248	0.000655	ND		0.00206	0.000544	ND		0.0022	0.000581	ND		0.00226	0.000597	ND		0.00213	0.000563

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the soil standard
mg/kg - milligram per kilogram
I - The lower value for the two columns has been reported due to obvious interference.
P - The RPD between the results for the two columns exceeds the method-specified criteria.

TABLE 3C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Soils

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-5 L2467646-16 11/18/2024 4-6'				SB-5 L2467646-17 11/18/2024 6-8'				DUP-1 (SB-5) L2467646-18 11/18/2024 6-8'				SB-6 L2468036-18 11/19/2024 0-2'				SB-6 L2468036-19 11/19/2024 2-4'				SB-6 L2468036-20 11/19/2024 4-6'				SB-6 L2468036-21 11/19/2024 6-8'				SB-6 L2468036-22 11/19/2024 8-10'				SB-7 L2468036-35 11/19/2024 0-2'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
POLYCHLORINATED BIPHENYLS																																						
Aroclor 1016	12674-11-2	0.1	1	3.2	ND		0.0499	0.00443	ND		0.0536	0.00476	ND		0.0574	0.0051	ND		0.0609	0.00541	ND		0.0503	0.00447	ND		0.0481	0.00427	ND		0.0509	0.00452	ND		0.0573	0.00509	ND		0.0553	0.00491
Aroclor 1221	11104-28-2	0.1	1	3.2	ND		0.0499	0.005	ND		0.0536	0.00538	ND		0.0574	0.00575	ND		0.0609	0.0061	ND		0.0503	0.00504	ND		0.0481	0.00482	ND		0.0509	0.0051	ND		0.0573	0.00574	ND		0.0553	0.00554
Aroclor 1232	11141-16-5	0.1	1	3.2	ND		0.0499	0.0106	ND		0.0536	0.0114	ND		0.0574	0.0122	ND		0.0609	0.0129	ND		0.0503	0.0107	ND		0.0481	0.0102	ND		0.0509	0.0108	ND		0.0573	0.0122	ND		0.0553	0.0117
Aroclor 1242	53469-21-9	0.1	1	3.2	ND		0.0499	0.00672	ND		0.0536	0.00723	ND		0.0574	0.00774	ND		0.0609	0.00821	ND		0.0503	0.00678	ND		0.0481	0.00649	ND		0.0509	0.00686	ND		0.0573	0.00773	ND		0.0553	0.00745
Aroclor 1248	12672-29-6	0.1	1	3.2	ND		0.0499	0.00748	ND		0.0536	0.00805	ND		0.0574	0.00861	ND		0.0609	0.00914	ND		0.0503	0.00754	ND		0.0481	0.00722	ND		0.0509	0.00763	ND		0.0573	0.0086	ND		0.0553	0.00829
Aroclor 1254	11097-69-1	0.1	1	3.2	ND		0.0499	0.00546	ND		0.0536	0.00587	ND		0.0574	0.00628	ND		0.0609	0.00667	ND		0.0503	0.0055	ND		0.0481	0.00526	ND		0.0509	0.00556	ND		0.0573	0.00627	ND		0.0553	0.00605
Aroclor 1260	11096-82-5	0.1	1	3.2	ND		0.0499	0.00922	ND		0.0536	0.00992	ND		0.0574	0.0106	ND		0.0609	0.0113	ND		0.0503	0.0093	ND		0.0481	0.00889	ND		0.0509	0.0094	ND		0.0573	0.0106	ND		0.0553	0.0102
Aroclor 1262	37324-23-5	0.1	1	3.2	ND		0.0499	0.00633	ND		0.0536	0.00681	ND		0.0574	0.00729	ND		0.0609	0.00774	ND		0.0503	0.00639	ND		0.0481	0.00611	ND		0.0509	0.00646	ND		0.0573	0.00728	ND		0.0553	0.00702
Aroclor 1268	11100-14-4	0.1	1	3.2	ND		0.0499	0.00517	ND		0.0536	0.00556	ND		0.0574	0.00594	ND		0.0609	0.00631	ND		0.0503	0.00521	ND		0.0481	0.00499	ND		0.0509	0.00527	ND		0.0573	0.00594	ND		0.0553	0.00573
PCBs, Total	1336-36-3	0.1	1	3.2	ND		0.0499	0.00443	ND		0.0536	0.00476	ND		0.0574	0.0051	ND		0.0609	0.00541	ND		0.0503	0.00447	ND		0.0481	0.00427	ND		0.0509	0.00452	ND		0.0573	0.00509	ND		0.0553	0.00491
ORGANOCHLORINE PESTICIDES																																						
4,4'-DDD	72-54-8	0.0033	5	14	ND		0.00161	0.000574	ND		0.00178	0.000637	ND		0.00182	0.000649	ND		0.00203	0.000726	ND		0.00168	0.000601	ND		0.00161	0.000573	ND		0.00167	0.000597	ND		0.00195	0.000696	ND		0.0018	0.000643
4,4'-DDE	72-55-9	0.0033	3.4	9.3	ND		0.00161	0.000372	ND		0.00178	0.000413	ND		0.00182	0.000421	ND		0.00203	0.00047	ND		0.00168	0.00039	ND		0.00161	0.000372	ND		0.00167	0.000387	ND		0.00195	0.000451	ND		0.0018	0.000417
4,4'-DDT	50-29-3	0.0033	3.8	135	ND		0.00161	0.0013	ND		0.00178	0.00144	ND		0.00182	0.00146	ND		0.00203	0.00164	ND		0.00168	0.00135	ND		0.00161	0.00129	ND		0.00167	0.00135	ND		0.00195	0.00157	ND		0.0018	0.00145
Aldrin	309-00-2	0.0048	0.044	0.19	ND		0.00161	0.000567	ND		0.00178	0.000629	ND		0.00182	0.000641	ND		0.00203	0.000716	ND		0.00168	0.000593	ND		0.00161	0.000566	ND		0.00167	0.00059	ND		0.00195	0.000687	ND		0.0018	0.000634
Alpha-BHC	319-84-6	0.02	0.18	0.02	ND		0.000671	0.000191	ND		0.000744	0.000211	ND		0.000759	0.000215	ND		0.000848	0.000241	ND		0.000702	0.000199	ND		0.00067	0.00019	ND		0.000698	0.000198	ND		0.000813	0.000231	ND		0.000751	0.000213
Beta-BHC	319-85-7	0.021	0.18	0.09	ND		0.00161	0.000611	ND		0.00178	0.000677	ND		0.00182	0.00069	ND		0.00203	0.000771	ND		0.00168	0.000639	ND		0.00161	0.00061	ND		0.00167	0.000635	ND		0.00195	0.00074	ND		0.0018	0.000683
Chlordane	57-74-9	NS	NS	NS	ND		0.0134	0.00534	ND		0.0149	0.00592	ND		0.0152	0.00603	ND		0.017	0.00674	ND		0.014	0.00558	ND		0.0134	0.00532	ND		0.014	0.00555	ND		0.0162	0.00646	ND		0.015	0.00597
cis-Chlordane	5103-71-9	0.014	0.65	4.5	ND		0.00201	0.000561	ND		0.00223	0.000622	ND		0.00228	0.000634	ND		0.00254	0.000709	ND		0.00211	0.000587	ND		0.00201	0.00056	ND		0.00209	0.000583	ND		0.00244	0.00068	ND		0.00225	0.000628
Delta-BHC	319-86-8	0.04	100	0.1	ND		0.00161	0.000315	ND		0.00178	0.00035	ND		0.00182	0.000356	ND		0.00203	0.000398	ND		0.00168	0.00033	ND		0.00161	0.000315	ND		0.00167	0.000328	ND		0.00195	0.000382	ND		0.0018	0.000353
Dieldrin	60-57-1	0.005	0.075	0.1	ND		0.00101	0.000503	ND		0.00112	0.000558	ND		0.00114	0.000569	ND		0.00127	0.000636	ND		0.00105	0.000526	ND		0.001	0.000502	ND		0.00105	0.000523	ND		0.00122	0.00061	ND		0.00113	0.000563
Endosulfan I	959-98-8	4.3	35	65	ND		0.00161	0.00038	ND		0.00178	0.000422	ND		0.00182	0.00043	ND		0.00203	0.000481	ND		0.00168	0.000398	ND		0.00161	0.00038	ND		0.00167	0.000396	ND		0.00195	0.000461	ND		0.0018	0.000426
Endosulfan II	33213-65-9	4.3	35	44	ND		0.00161	0.000538	ND		0.00178	0.000597	ND		0.00182	0.000608	ND		0.00203	0.00068	ND		0.00168	0.000563	ND		0.00161	0.000537	ND		0.00167	0.00056	ND		0.00195	0.000652	ND		0.0018	0.000602
Endosulfan sulfate	1031-07-8	4.3	35	47	ND		0.000671	0.000319	ND		0.000744	0.000354	ND		0.000759	0.000361	ND		0.000848	0.000404	ND		0.000702	0.000334	ND		0.00067	0.000319	ND		0.000698	0.000332	ND		0.000813	0.000387	ND		0.000751	0.000357
Endrin	72-20-8	0.014	5.3	0.06	ND		0.000671	0.000275	ND		0.000744	0.000305	ND		0.000759	0.000311	ND		0.000848	0.000348	ND		0.000702	0.000288	ND		0.00067	0.000275	ND		0.000698	0.000286	ND		0.000813	0.000333	ND		0.000751	0.000308
Endrin aldehyde	7421-93-4	NS	NS	NS	ND		0.00201	0.000705	ND		0.00223	0.000781	ND		0.00228	0.000796	ND		0.00254	0.00089	ND		0.00211	0.000737	ND		0.00201	0.000703	ND		0.00209	0.000733	ND		0.00244	0.000854	ND		0.00225	0.000788
Endrin ketone	53494-70-5	NS	NS	NS	ND		0.00161	0.000415	ND		0.00178	0.00046	ND		0.00182	0.000469	ND		0.00203	0.000524	ND		0.00168	0.000434	ND		0.00161	0.000414	ND		0.00167	0.000431	ND		0.00195	0.000502	ND		0.0018	0.000464
Heptachlor	76-44-8	0.013	0.53	0.38	ND		0.000805	0.000361	ND		0.000893	0.0004	ND		0.00091	0.000408	ND		0.00102	0.000456	ND		0.000842	0.000378	ND		0.000804	0.00036	ND		0.000837	0.000375	ND		0.000975	0.000437	ND		0.000901	0.000404
Heptachlor epoxide	1024-57-3	NS	NS	NS	ND		0.00302	0.000906	ND		0.00335	0.001	ND		0.00341	0.00102	ND		0.00381	0.00114	ND		0.00316	0.000948	ND		0.00301	0.000904	ND		0.00314	0.000942	ND		0.00366	0.0011	ND		0.00338	0.00101
Lindane	58-89-9	0.025	0.21	0.05	ND		0.000671	0.0003	ND		0.000744	0.000333	ND		0.000759	0.000339	ND		0.000848	0.000379	ND		0.000702	0.000314	ND		0.00067	0.000299	ND		0.000698	0.000312	ND		0.000813	0.000363	ND		0.000751	0.000336
Methoxychlor	72-43-5	NS	NS	NS	ND		0.00302	0.00094	ND		0.00335	0.00104	ND		0.00341	0.00106	ND		0.00381	0.00119	ND		0.00316	0.000983	ND		0.00301	0.000938	ND		0.00314	0.000977	ND		0.00366	0.00114	ND		0.00338	0.00105
Toxaphene	8001-35-2	NS	NS	NS	ND		0.0302	0.00846	ND		0.0335	0.00938	ND		0.0341	0.00956	ND		0.0381	0.0107	ND		0.0316	0.00884	ND		0.0301	0.00844	ND		0.0314	0.00879	ND		0.0366	0.0102	ND		0.0338	0.00946
trans-Chlordane	5103-74-2	NS	NS	NS	ND		0.00201	0.000532	ND		0.00223	0.000589	ND		0.00228	0.000601	ND		0.00254	0.000671	ND		0.00211	0.000556	ND		0.00201	0.00053	ND		0.00209	0.000553	ND		0.00244	0.000644	ND		0.00225	0.000595

Notes:
All results reported in mg/kg

Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO

NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the soil standard
mg/kg - milligram per kilogram
I - The lower value for the two columns has been reported due to obvious interference.
P - The RPD between the results for the two columns exceeds the method-specified criteria.

TABLE 3C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Soils

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-7 L2468036-36 11/19/2024 2-4'				SB-7 L2468036-37 11/19/2024 4-6'				SB-7 L2468036-38 11/19/2024 6-8'				SB-7 L2468036-39 11/19/2024 8-10'				SB-7 L2468036-40 11/19/2024 16-18'				SB-8 L2518818-06 3/28/2025 4-6'				SB-8 L2518818-07 3/28/2025 6-8'				SB-8 L2518818-11 3/28/2025 8-10'				SB-8 L2518818-12 3/28/2025 10-12'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
POLYCHLORINATED BIPHENYLS																																								
Aroclor 1016	12674-11-2	0.1	1	3.2	ND		0.0631	0.0056	ND		0.0555	0.00493	ND		0.0511	0.00454	ND		0.0539	0.00479	ND		0.0611	0.00542	ND		0.0522	0.00464	ND		**0.222**	0.0197	ND		0.0562	0.00499	ND		0.0589	0.00523
Aroclor 1221	11104-28-2	0.1	1	3.2	ND		0.0631	0.00632	ND		0.0555	0.00556	ND		0.0511	0.00512	ND		0.0539	0.0054	ND		0.0611	0.00612	ND		0.0522	0.00524	ND		**0.222**	0.0223	ND		0.0562	0.00563	ND		0.0589	0.0059
Aroclor 1232	11141-16-5	0.1	1	3.2	ND		0.0631	0.0134	ND		0.0555	0.0118	ND		0.0511	0.0108	ND		0.0539	0.0114	ND		0.0611	0.0129	ND		0.0522	0.0111	ND		**0.222**	0.0471	ND		0.0562	0.0119	ND		0.0589	0.0125
Aroclor 1242	53469-21-9	0.1	1	3.2	ND		0.0631	0.0085	ND		0.0555	0.00748	ND		0.0511	0.00689	ND		0.0539	0.00727	ND		0.0611	0.00823	ND		0.0522	0.00704	ND		**0.222**	0.03	ND		0.0562	0.00757	ND		0.0589	0.00794
Aroclor 1248	12672-29-6	0.1	1	3.2	ND		0.0631	0.00946	ND		0.0555	0.00833	ND		0.0511	0.00767	ND		0.0539	0.00809	ND		0.0611	0.00916	ND		0.0522	0.00784	ND		**0.222**	0.0333	ND		0.0562	0.00843	ND		0.0589	0.00884
Aroclor 1254	11097-69-1	0.1	1	3.2	ND		0.0631	0.0069	ND		0.0555	0.00607	ND		0.0511	0.00559	ND		0.0539	0.0059	ND		0.0611	0.00668	ND		0.0522	0.00572	ND		**0.222**	0.0243	ND		0.0562	0.00615	ND		0.0589	0.00645
Aroclor 1260	11096-82-5	0.1	1	3.2	ND		0.0631	0.0116	ND		0.0555	0.0103	ND		0.0511	0.00945	ND		0.0539	0.00997	ND		0.0611	0.0113	ND		0.0522	0.00966	ND		**0.222**	0.0411	ND		0.0562	0.0104	ND		0.0589	0.0109
Aroclor 1262	37324-23-5	0.1	1	3.2	ND		0.0631	0.00801	ND		0.0555	0.00705	ND		0.0511	0.0065	ND		0.0539	0.00685	ND		0.0611	0.00776	ND		0.0522	0.00664	ND		**0.222**	0.0282	ND		0.0562	0.00714	ND		0.0589	0.00748
Aroclor 1268	11100-14-4	0.1	1	3.2	ND		0.0631	0.00653	ND		0.0555	0.00575	ND		0.0511	0.0053	ND		0.0539	0.00559	ND		0.0611	0.00633	ND		0.0522	0.00541	ND		**0.222**	0.023	ND		0.0562	0.00582	ND		0.0589	0.0061
PCBs, Total	1336-36-3	0.1	1	3.2	ND		0.0631	0.0056	ND		0.0555	0.00493	ND		0.0511	0.00454	ND		0.0539	0.00479	ND		0.0611	0.00542	ND		0.0522	0.00464	ND		**0.222**	0.0197	ND		0.0562	0.00499	ND		0.0589	0.00523
ORGANOCHLORINE PESTICIDES																																								
4,4'-DDD	72-54-8	0.0033	5	14	ND		0.00206	0.000733	ND		0.00174	0.00062	ND		0.00167	0.000596	ND		0.00174	0.00062	ND		0.00208	0.00074	ND		**0.00877**	0.00313	ND		**0.00741**	0.00264	ND		0.00179	0.000638	ND		0.00191	0.000682
4,4'-DDE	72-55-9	0.0033	3.4	9.3	ND		0.00206	0.000475	ND		0.00174	0.000402	ND		0.00167	0.000386	ND		0.00174	0.000402	ND		0.00208	0.00048	ND		**0.00877**	0.00203	ND		**0.00741**	0.00171	ND		0.00179	0.000413	ND		0.00191	0.000442
4,4'-DDT	50-29-3	0.0033	3.8	135	ND		0.00206	0.00165	ND		0.00174	0.0014	ND		0.00167	0.00134	ND		0.00174	0.0014	ND		0.00208	0.00167	ND		**0.00877**	**0.00705**	ND		**0.00741**	**0.00596**	ND		0.00179	0.00144	ND		0.00191	0.00154
Aldrin	309-00-2	0.0048	0.044	0.19	ND		0.00206	0.000724	ND		0.00174	0.000612	ND		0.00167	0.000588	ND		0.00174	0.000613	ND		0.00208	0.000731	ND		**0.00877**	0.00309	ND		**0.00741**	0.00261	ND		0.00179	0.000629	ND		0.00191	0.000673
Alpha-BHC	319-84-6	0.02	0.18	0.02	ND		0.000857	0.000243	ND		0.000725	0.000206	ND		0.000696	0.000198	ND		0.000725	0.000206	ND		0.000865	0.000246	ND		0.00365	0.00104	ND		0.00309	0.000876	ND		0.000745	0.000212	ND		0.000797	0.000226
Beta-BHC	319-85-7	0.021	0.18	0.09	ND		0.00206	0.00078	ND		0.00174	0.000659	ND		0.00167	0.000633	ND		0.00174	0.00066	ND		0.00208	0.000787	ND		0.00877	0.00332	ND		0.00741	0.00281	ND		0.00179	0.000678	ND		0.00191	0.000725
Chlordane	57-74-9	NS	NS	NS	ND		0.0171	0.00681	ND		0.0145	0.00576	ND		0.0139	0.00553	ND		0.0145	0.00576	ND		0.0173	0.00688	ND		0.073	0.029	ND		0.0617	0.0245	ND		0.0149	0.00592	ND		0.0159	0.00634
cis-Chlordane	5103-71-9	0.014	0.65	4.5	ND		0.00257	0.000716	ND		0.00217	0.000606	0.00442	IP	0.00209	0.000582	ND		0.00217	0.000606	ND		0.0026	0.000723	ND		0.011	0.00305	ND		0.00926	0.00258	ND		0.00223	0.000623	ND		0.00239	0.000666
Delta-BHC	319-86-8	0.04	100	0.1	ND		0.00206	0.000403	ND		0.00174	0.00034	ND		0.00167	0.000327	ND		0.00174	0.000341	ND		0.00208	0.000407	ND		0.00877	0.00172	ND		0.00741	0.00145	ND		0.00179	0.00035	ND		0.00191	0.000374
Dieldrin	60-57-1	0.005	0.075	0.1	ND		0.00128	0.000642	ND		0.00109	0.000543	ND		0.00104	0.000522	ND		0.00109	0.000544	ND		0.0013	0.000649	ND		**0.00548**	0.00274	ND		0.00463	0.00231	ND		0.00112	0.000559	ND		0.0012	0.000598
Endosulfan I	959-98-8	4.3	35	65	ND		0.00206	0.000486	ND		0.00174	0.000411	ND		0.00167	0.000394	ND		0.00174	0.000411	ND		0.00208	0.00049	ND		0.00877	0.00207	ND		0.00741	0.00175	ND		0.00179	0.000422	ND		0.00191	0.000452
Endosulfan II	33213-65-9	4.3	35	44	ND		0.00206	0.000687	ND		0.00174	0.000581	ND		0.00167	0.000558	ND		0.00174	0.000581	ND		0.00208	0.000694	ND		0.00877	0.00293	ND		0.00741	0.00248	ND		0.00179	0.000597	ND		0.00191	0.000639
Endosulfan sulfate	1031-07-8	4.3	35	47	ND		0.000857	0.000408	ND		0.000725	0.000345	ND		0.000696	0.000331	ND		0.000725	0.000345	ND		0.000865	0.000412	ND		0.00365	0.00174	ND		0.00309	0.00147	ND		0.000745	0.000354	ND		0.000797	0.000379
Endrin	72-20-8	0.014	5.3	0.06	ND		0.000857	0.000351	ND		0.000725	0.000297	ND		0.000696	0.000285	ND		0.000725	0.000297	ND		0.000865	0.000355	ND		0.00365	0.0015	ND		0.00309	0.00126	ND		0.000745	0.000305	ND		0.000797	0.000327
Endrin aldehyde	7421-93-4	NS	NS	NS	ND		0.00257	0.0009	ND		0.00217	0.000761	ND		0.00209	0.00073	ND		0.00217	0.000761	ND		0.0026	0.000908	ND		0.011	0.00384	ND		0.00926	0.00324	ND		0.00223	0.000782	ND		0.00239	0.000837
Endrin ketone	53494-70-5	NS	NS	NS	ND		0.00206	0.000529	ND		0.00174	0.000448	ND		0.00167	0.00043	ND		0.00174	0.000448	ND		0.00208	0.000535	ND		0.00877	0.00226	ND		0.00741	0.00191	ND		0.00179	0.00046	ND		0.00191	0.000492
Heptachlor	76-44-8	0.013	0.53	0.38	ND		0.00103	0.000461	ND		0.00087	0.00039	ND		0.000835	0.000374	ND		0.00087	0.00039	ND		0.00104	0.000465	ND		0.00438	0.00196	ND		0.0037	0.00166	ND		0.000894	0.000401	ND		0.000956	0.000429
Heptachlor epoxide	1024-57-3	NS	NS	NS	ND		0.00386	0.00116	ND		0.00326	0.000978	ND		0.00313	0.000939	ND		0.00326	0.000979	ND		0.00389	0.00117	ND		0.0164	0.00493	ND		0.0139	0.00417	ND		0.00335	0.001	ND		0.00359	0.00108
Lindane	58-89-9	0.025	0.21	0.05	ND		0.000857	0.000383	ND		0.000725	0.000324	ND		0.000696	0.000311	ND		0.000725	0.000324	ND		0.000865	0.000387	ND		0.00365	0.00163	ND		0.00309	0.00138	ND		0.000745	0.000333	ND		0.000797	0.000356
Methoxychlor	72-43-5	NS	NS	NS	ND		0.00386	0.0012	ND		0.00326	0.00101	ND		0.00313	0.000974	ND		0.00326	0.00101	ND		0.00389	0.00121	ND		0.0164	0.00511	ND		0.0139	0.00432	ND		0.00335	0.00104	ND		0.00359	0.00112
Toxaphene	8001-35-2	NS	NS	NS	ND		0.0386	0.0108	ND		0.0326	0.00913	ND		0.0313	0.00877	ND		0.0326	0.00913	ND		0.0389	0.0109	ND		0.164	0.046	ND		0.139	0.0389	ND		0.0335	0.00939	ND		0.0359	0.01
trans-Chlordane	5103-74-2	NS	NS	NS	ND		0.00257	0.000678	ND		0.00217	0.000574	0.00598	IP	0.00209	0.000551	ND		0.00217	0.000574	ND		0.0026	0.000685	ND		0.011	0.00289	ND		0.00926	0.00244	ND		0.00223	0.00059	ND		0.00239	0.000631

Notes:
All results reported in mg/kg

Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO

NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the soil standard
mg/kg - milligram per kilogram
I - The lower value for the two columns has been reported due to obvious interference.
P - The RPD between the results for the two columns exceeds the method-specified criteria.

TABLE 3C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Soils

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-8 L2518818-13 3/28/2025 12-14'				SB-8 L2518818-14 3/28/2025 14-16'				SB-8 L2518818-15 3/28/2025 16-18'				SB-8 L2518818-16 3/28/2025 18-20'				DUP (SB-8) L2518818-24 3/28/2025 18-20'				SB-8 L2518818-22 3/28/2025 20-22'				SB-8 L2518818-23 3/28/2025 22-24'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
POLYCHLORINATED BIPHENYLS																																
Aroclor 1016	12674-11-2	0.1	1	3.2	ND		0.061	0.00542	ND		0.0577	0.00513	ND		0.0526	0.00468	ND		0.0531	0.00472	ND		0.0514	0.00456	ND		0.0535	0.00475	ND		0.0552	0.0049
Aroclor 1221	11104-28-2	0.1	1	3.2	ND		0.061	0.00611	ND		0.0577	0.00578	ND		0.0526	0.00528	ND		0.0531	0.00532	ND		0.0514	0.00515	ND		0.0535	0.00536	ND		0.0552	0.00553
Aroclor 1232	11141-16-5	0.1	1	3.2	ND		0.061	0.0129	ND		0.0577	0.0122	ND		0.0526	0.0112	ND		0.0531	0.0113	ND		0.0514	0.0109	ND		0.0535	0.0113	ND		0.0552	0.0117
Aroclor 1242	53469-21-9	0.1	1	3.2	ND		0.061	0.00822	ND		0.0577	0.00778	ND		0.0526	0.0071	ND		0.0531	0.00716	ND		0.0514	0.00692	ND		0.0535	0.00721	ND		0.0552	0.00744
Aroclor 1248	12672-29-6	0.1	1	3.2	ND		0.061	0.00915	ND		0.0577	0.00866	ND		0.0526	0.0079	ND		0.0531	0.00797	ND		0.0514	0.0077	ND		0.0535	0.00802	ND		0.0552	0.00828
Aroclor 1254	11097-69-1	0.1	1	3.2	ND		0.061	0.00667	ND		0.0577	0.00632	ND		0.0526	0.00576	ND		0.0531	0.00581	ND		0.0514	0.00562	ND		0.0535	0.00585	ND		0.0552	0.00604
Aroclor 1260	11096-82-5	0.1	1	3.2	ND		0.061	0.0113	ND		0.0577	0.0107	ND		0.0526	0.00973	ND		0.0531	0.00982	ND		0.0514	0.00949	ND		0.0535	0.00988	ND		0.0552	0.0102
Aroclor 1262	37324-23-5	0.1	1	3.2	ND		0.061	0.00775	ND		0.0577	0.00733	ND		0.0526	0.00669	ND		0.0531	0.00675	ND		0.0514	0.00652	ND		0.0535	0.00679	ND		0.0552	0.00701
Aroclor 1268	11100-14-4	0.1	1	3.2	ND		0.061	0.00632	ND		0.0577	0.00598	ND		0.0526	0.00546	ND		0.0531	0.0055	ND		0.0514	0.00532	ND		0.0535	0.00554	ND		0.0552	0.00572
PCBs, Total	1336-36-3	0.1	1	3.2	ND		0.061	0.00542	ND		0.0577	0.00513	ND		0.0526	0.00468	ND		0.0531	0.00472	ND		0.0514	0.00456	ND		0.0535	0.00475	ND		0.0552	0.0049
ORGANOCHLORINE PESTICIDES																																
4,4'-DDD	72-54-8	0.0033	5	14	ND		0.00199	0.000708	ND		0.00184	0.000657	ND		0.00166	0.00059	ND		0.00169	0.000602	ND		0.00164	0.000585	ND		0.00176	0.000626	ND		0.00189	0.000675
4,4'-DDE	72-55-9	0.0033	3.4	9.3	ND		0.00199	0.000459	ND		0.00184	0.000426	ND		0.00166	0.000383	ND		0.00169	0.000391	ND		0.00164	0.000379	ND		0.00176	0.000406	ND		0.00189	0.000438
4,4'-DDT	50-29-3	0.0033	3.8	135	ND		0.00199	0.0016	ND		0.00184	0.00148	ND		0.00166	0.00133	ND		0.00169	0.00136	ND		0.00164	0.00132	ND		0.00176	0.00141	ND		0.00189	0.00152
Aldrin	309-00-2	0.0048	0.044	0.19	ND		0.00199	0.000699	ND		0.00184	0.000648	ND		0.00166	0.000583	ND		0.00169	0.000595	ND		0.00164	0.000577	ND		0.00176	0.000618	ND		0.00189	0.000666
Alpha-BHC	319-84-6	0.02	0.18	0.02	ND		0.000828	0.000235	ND		0.000767	0.000218	ND		0.00069	0.000196	ND		0.000704	0.0002	ND		0.000683	0.000194	ND		0.000731	0.000208	ND		0.000789	0.000224
Beta-BHC	319-85-7	0.021	0.18	0.09	ND		0.00199	0.000753	ND		0.00184	0.000698	ND		0.00166	0.000628	ND		0.00169	0.00064	ND		0.00164	0.000622	ND		0.00176	0.000666	ND		0.00189	0.000718
Chlordane	57-74-9	NS	NS	NS	ND		0.0166	0.00658	ND		0.0153	0.0061	ND		0.0138	0.00548	ND		0.0141	0.0056	ND		0.0137	0.00543	ND		0.0146	0.00581	ND		0.0158	0.00627
cis-Chlordane	5103-71-9	0.014	0.65	4.5	ND		0.00248	0.000692	ND		0.0023	0.000642	ND		0.00207	0.000577	ND		0.00211	0.000588	ND		0.00205	0.000571	ND		0.00219	0.000611	ND		0.00236	0.000659
Delta-BHC	319-86-8	0.04	100	0.1	ND		0.00199	0.000389	ND		0.00184	0.000361	ND		0.00166	0.000324	ND		0.00169	0.000331	ND		0.00164	0.000321	ND		0.00176	0.000344	ND		0.00189	0.000371
Dieldrin	60-57-1	0.005	0.075	0.1	ND		0.00124	0.000621	ND		0.00115	0.000576	ND		0.00103	0.000517	ND		0.00106	0.000528	ND		0.00102	0.000512	ND		0.0011	0.000548	ND		0.00118	0.000591
Endosulfan I	959-98-8	4.3	35	65	ND		0.00199	0.000469	ND		0.00184	0.000435	ND		0.00166	0.000391	ND		0.00169	0.000399	ND		0.00164	0.000387	ND		0.00176	0.000415	ND		0.00189	0.000447
Endosulfan II	33213-65-9	4.3	35	44	ND		0.00199	0.000664	ND		0.00184	0.000615	ND		0.00166	0.000553	ND		0.00169	0.000564	ND		0.00164	0.000548	ND		0.00176	0.000586	ND		0.00189	0.000632
Endosulfan sulfate	1031-07-8	4.3	35	47	ND		0.000828	0.000394	ND		0.000767	0.000365	ND		0.00069	0.000328	ND		0.000704	0.000335	ND		0.000683	0.000325	ND		0.000731	0.000348	ND		0.000789	0.000375
Endrin	72-20-8	0.014	5.3	0.06	ND		0.000828	0.000339	ND		0.000767	0.000315	ND		0.00069	0.000283	ND		0.000704	0.000288	ND		0.000683	0.00028	ND		0.000731	0.0003	ND		0.000789	0.000323
Endrin aldehyde	7421-93-4	NS	NS	NS	ND		0.00248	0.000869	ND		0.0023	0.000806	ND		0.00207	0.000724	ND		0.00211	0.000739	ND		0.00205	0.000717	ND		0.00219	0.000768	ND		0.00236	0.000828
Endrin ketone	53494-70-5	NS	NS	NS	ND		0.00199	0.000511	ND		0.00184	0.000474	ND		0.00166	0.000426	ND		0.00169	0.000435	ND		0.00164	0.000422	ND		0.00176	0.000452	ND		0.00189	0.000487
Heptachlor	76-44-8	0.013	0.53	0.38	ND		0.000993	0.000445	ND		0.000921	0.000413	ND		0.000828	0.000371	ND		0.000845	0.000379	ND		0.00082	0.000368	ND		0.000878	0.000393	ND		0.000946	0.000424
Heptachlor epoxide	1024-57-3	NS	NS	NS	ND		0.00372	0.00112	ND		0.00345	0.00104	ND		0.0031	0.000931	ND		0.00317	0.00095	ND		0.00307	0.000922	ND		0.00329	0.000987	ND		0.00355	0.00106
Lindane	58-89-9	0.025	0.21	0.05	ND		0.000828	0.00037	ND		0.000767	0.000343	ND		0.00069	0.000308	ND		0.000704	0.000315	ND		0.000683	0.000305	ND		0.000731	0.000327	ND		0.000789	0.000352
Methoxychlor	72-43-5	NS	NS	NS	ND		0.00372	0.00116	ND		0.00345	0.00107	ND		0.0031	0.000966	ND		0.00317	0.000985	ND		0.00307	0.000957	ND		0.00329	0.00102	ND		0.00355	0.0011
Toxaphene	8001-35-2	NS	NS	NS	ND		0.0372	0.0104	ND		0.0345	0.00967	ND		0.031	0.00869	ND		0.0317	0.00887	ND		0.0307	0.00861	ND		0.0329	0.00922	ND		0.0355	0.00994
trans-Chlordane	5103-74-2	NS	NS	NS	ND		0.00248	0.000655	ND		0.0023	0.000608	ND		0.00207	0.000546	ND		0.00211	0.000557	ND		0.00205	0.000541	ND		0.00219	0.000579	ND		0.00236	0.000624

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the soil standard
mg/kg - milligram per kilogram
I - The lower value for the two columns has been reported due to obvious interference.
P - The RPD between the results for the two columns exceeds the method-specified criteria.

TABLE 3C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Soils

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	PE-1 L2467646-20 11/18/2024 0-0.5'				PE-2 L2467646-22 11/18/2024 0-.5'				PE-B L2467646-23 11/18/2024 0-0.5'				DUP-2 (PE-B) L2467646-19 11/18/2024 0-0.5'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
POLYCHLORINATED BIPHENYLS																				
Aroclor 1016	12674-11-2	0.1	1	3.2	ND		0.0596	0.00529	ND		0.0594	0.00527	ND		0.0604	0.00536	ND		0.0579	0.00514
Aroclor 1221	11104-28-2	0.1	1	3.2	ND		0.0596	0.00597	ND		0.0594	0.00595	ND		0.0604	0.00605	ND		0.0579	0.0058
Aroclor 1232	11141-16-5	0.1	1	3.2	ND		0.0596	0.0126	ND		0.0594	0.0126	ND		0.0604	0.0128	ND		0.0579	0.0123
Aroclor 1242	53469-21-9	0.1	1	3.2	ND		0.0596	0.00803	ND		0.0594	0.008	ND		0.0604	0.00814	ND		0.0579	0.0078
Aroclor 1248	12672-29-6	0.1	1	3.2	ND		0.0596	0.00894	ND		0.0594	0.00891	ND		0.0604	0.00906	ND		0.0579	0.00868
Aroclor 1254	11097-69-1	0.1	1	3.2	ND		0.0596	0.00652	ND		0.0594	0.0065	ND		0.0604	0.00661	ND		0.0579	0.00633
Aroclor 1260	11096-82-5	0.1	1	3.2	ND		0.0596	0.011	ND		0.0594	0.011	ND		0.0604	0.0112	ND		0.0579	0.0107
Aroclor 1262	37324-23-5	0.1	1	3.2	ND		0.0596	0.00757	ND		0.0594	0.00754	ND		0.0604	0.00767	ND		0.0579	0.00735
Aroclor 1268	11100-14-4	0.1	1	3.2	ND		0.0596	0.00617	ND		0.0594	0.00615	ND		0.0604	0.00626	ND		0.0579	0.006
PCBs, Total	1336-36-3	0.1	1	3.2	ND		0.0596	0.00529	ND		0.0594	0.00527	ND		0.0604	0.00536	ND		0.0579	0.00514
ORGANOCHLORINE PESTICIDES																				
4,4'-DDD	72-54-8	0.0033	5	14	ND		0.00181	0.000646	ND		0.00187	0.000667	ND		0.00193	0.000687	ND		0.00183	0.000653
4,4'-DDE	72-55-9	0.0033	3.4	9.3	ND		0.00181	0.000418	ND		0.00187	0.000432	ND		0.00193	0.000446	ND		0.00183	0.000423
4,4'-DDT	50-29-3	0.0033	3.8	135	ND		0.00181	0.00146	ND		0.00187	0.0015	ND		0.00193	0.00155	ND		0.00183	0.00147
Aldrin	309-00-2	0.0048	0.044	0.19	ND		0.00181	0.000637	ND		0.00187	0.000658	ND		0.00193	0.000678	ND		0.00183	0.000645
Alpha-BHC	319-84-6	0.02	0.18	0.02	ND		0.000754	0.000214	ND		0.000779	0.000221	ND		0.000803	0.000228	ND		0.000763	0.000217
Beta-BHC	319-85-7	0.021	0.18	0.09	ND		0.00181	0.000686	ND		0.00187	0.000709	ND		0.00193	0.00073	ND		0.00183	0.000694
Chlordane	57-74-9	NS	NS	NS	ND		0.0151	0.006	ND		0.0156	0.00619	ND		0.016	0.00638	ND		0.0153	0.00607
cis-Chlordane	5103-71-9	0.014	0.65	4.5	ND		0.00226	0.00063	ND		0.00234	0.000651	ND		0.00241	0.000671	ND		0.00229	0.000638
Delta-BHC	319-86-8	0.04	100	0.1	ND		0.00181	0.000354	ND		0.00187	0.000366	ND		0.00193	0.000377	ND		0.00183	0.000359
Dieldrin	60-57-1	0.005	0.075	0.1	ND		0.00113	0.000566	ND		0.00117	0.000584	ND		0.0012	0.000602	ND		0.00114	0.000572
Endosulfan I	959-98-8	4.3	35	65	ND		0.00181	0.000428	ND		0.00187	0.000442	ND		0.00193	0.000455	ND		0.00183	0.000433
Endosulfan II	33213-65-9	4.3	35	44	ND		0.00181	0.000605	ND		0.00187	0.000625	ND		0.00193	0.000644	ND		0.00183	0.000612
Endosulfan sulfate	1031-07-8	4.3	35	47	ND		0.000754	0.000359	ND		0.000779	0.000371	ND		0.000803	0.000382	ND		0.000763	0.000363
Endrin	72-20-8	0.014	5.3	0.06	ND		0.000754	0.000309	ND		0.000779	0.000319	ND		0.000803	0.000329	ND		0.000763	0.000313
Endrin aldehyde	7421-93-4	NS	NS	NS	ND		0.00226	0.000792	ND		0.00234	0.000818	ND		0.00241	0.000843	ND		0.00229	0.000801
Endrin ketone	53494-70-5	NS	NS	NS	ND		0.00181	0.000466	ND		0.00187	0.000481	ND		0.00193	0.000496	ND		0.00183	0.000472
Heptachlor	76-44-8	0.013	0.53	0.38	ND		0.000905	0.000406	ND		0.000935	0.000419	ND		0.000963	0.000432	ND		0.000916	0.00041
Heptachlor epoxide	1024-57-3	NS	NS	NS	ND		0.00339	0.00102	ND		0.00351	0.00105	ND		0.00361	0.00108	ND		0.00343	0.00103
Lindane	58-89-9	0.025	0.21	0.05	ND		0.000754	0.000337	ND		0.000779	0.000348	ND		0.000803	0.000359	ND		0.000763	0.000341
Methoxychlor	72-43-5	NS	NS	NS	ND		0.00339	0.00106	ND		0.00351	0.00109	ND		0.00361	0.00112	ND		0.00343	0.00107
Toxaphene	8001-35-2	NS	NS	NS	ND		0.0339	0.0095	ND		0.0351	0.00982	ND		0.0361	0.0101	ND		0.0343	0.00961
trans-Chlordane	5103-74-2	NS	NS	NS	ND		0.00226	0.000597	ND		0.00234	0.000617	ND		0.00241	0.000636	ND		0.00229	0.000604

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO
NA - Not applicable because appropriate toxicological information is not available
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J - The result is less than the detection limit, but greater than zero
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RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the soil standard
mg/kg - milligram per kilogram
I - The lower value for the two columns has been reported due to obvious interference.
P - The RPD between the results for the two columns exceeds the method-specified criteria.

TABLE 3D

245 West 55th Street
New York, New York

Summary of Per- and Polyfluoroalkyl Substances (PFAS) Results in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Guidance Values for Anticipated Site Use - Restricted-Residential (ug/kg)	Guidance Values for Anticipated Site Use - Unrestricted (ug/kg)	Guidance Values for Anticipated Site Use - Protection of Groundwater (ug/kg)	SB-1 L2468433-07 11/20/2024 0-2'				SB-1 L2468433-08 11/20/2024 2-4'				SB-1 L2468433-09 11/20/2024 4-6'				SB-1 L2468433-10 11/20/2024 6-8'				SB-1 L2468433-11 11/20/2024 8-10'				SB-1D L2468433-20 11/20/2024 0-2'				SB-1D L2468433-24 11/20/2024 2-4'				SB-1D L2468433-25 11/20/2024 4-6'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
PERFLUORINATED ALKYL ACIDS BY EPA 1633																																		
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	ND		0.798	0.04	ND		0.796	0.04	ND		0.797	0.04	ND		0.796	0.04	ND		0.796	0.04	ND		0.796	0.04	ND		0.801	0.04	ND		0.797	0.04
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	ND		0.798	0.258	ND		0.796	0.258	ND		0.797	0.258	ND		0.796	0.258	ND		0.796	0.258	ND		0.796	0.258	ND		0.801	0.259	ND		0.797	0.258
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	ND		0.798	0.077	ND		0.796	0.077	ND		0.797	0.077	ND		0.796	0.077	ND		0.796	0.077	ND		0.796	0.077	ND		0.801	0.078	ND		0.797	0.077
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	NS	NS	NS	0.161	J	0.798	0.148	ND		0.796	0.147	ND		0.797	0.147	ND		0.796	0.147	ND		0.796	0.147	ND		0.796	0.147	ND		0.801	0.148	ND		0.797	0.147
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	914637-49-3	NS	NS	NS	ND		4.98	0.235	ND		4.98	0.235	ND		4.98	0.235	ND		4.97	0.235	ND		4.98	0.235	ND		4.98	0.235	ND		5	0.236	ND		4.98	0.235
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	812-70-4	NS	NS	NS	ND		4.98	0.364	ND		4.98	0.364	ND		4.98	0.364	ND		4.97	0.364	ND		4.98	0.364	ND		4.98	0.364	ND		5	0.366	ND		4.98	0.364
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	356-02-5	NS	NS	NS	ND		0.997	0.092	ND		0.996	0.092	ND		0.996	0.092	ND		0.995	0.092	ND		0.995	0.092	ND		0.995	0.092	ND		1	0.092	ND		0.996	0.092
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	ND		0.798	0.03	ND		0.796	0.03	ND		0.797	0.03	ND		0.796	0.029	ND		0.796	0.03	ND		0.796	0.029	ND		0.801	0.03	ND		0.797	0.03
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	ND		0.798	0.03	ND		0.796	0.03	ND		0.797	0.03	ND		0.796	0.029	ND		0.796	0.03	ND		0.796	0.029	ND		0.801	0.03	ND		0.797	0.03
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	NS	NS	NS	ND		0.798	0.038	ND		0.796	0.038	ND		0.797	0.038	ND		0.796	0.038	ND		0.796	0.038	ND		0.796	0.038	ND		0.801	0.038	ND		0.797	0.038
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	NS	NS	NS	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.2	0.022	ND		0.199	0.022
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	NS	NS	NS	ND		1.99	0.081	ND		1.99	0.081	ND		1.99	0.081	ND		1.99	0.081	ND		1.99	0.081	ND		1.99	0.081	ND		2	0.082	ND		1.99	0.081
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	0.199		0.199	0.044	ND		0.199	0.044	ND		0.199	0.044	ND		0.199	0.044	ND		0.199	0.044	ND		0.199	0.044	ND		0.2	0.044	ND		0.199	0.044
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	NS	NS	NS	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.2	0.026	ND		0.199	0.026
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	NS	NS	NS	ND		1.99	0.121	ND		1.99	0.121	ND		1.99	0.121	ND		1.99	0.121	ND		1.99	0.121	ND		1.99	0.121	ND		2	0.122	ND		1.99	0.121
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	ND		0.199	0.085	ND		0.199	0.085	ND		0.199	0.085	ND		0.199	0.085	ND		0.199	0.085	ND		0.199	0.085	ND		0.2	0.086	ND		0.199	0.085
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	NS	NS	NS	ND		0.399	0.082	ND		0.398	0.082	ND		0.398	0.082	ND		0.398	0.082	ND		0.398	0.082	ND		0.398	0.082	ND		0.4	0.083	ND		0.398	0.082
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	113507-82-7	NS	NS	NS	ND		0.399	0.046	ND		0.398	0.046	ND		0.398	0.046	ND		0.398	0.046	ND		0.398	0.046	ND		0.398	0.046	ND		0.4	0.046	ND		0.398	0.046
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	377-73-1	NS	NS	NS	ND		0.399	0.017	ND		0.398	0.017	ND		0.398	0.017	ND		0.398	0.017	ND		0.398	0.017	ND		0.398	0.017	ND		0.4	0.017	ND		0.398	0.017
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	NS	NS	NS	ND		0.399	0.024	ND		0.398	0.024	ND		0.398	0.024	ND		0.398	0.024	ND		0.398	0.024	ND		0.398	0.024	ND		0.4	0.024	ND		0.398	0.024
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	0.041	JF	0.199	0.02	ND		0.199	0.02	ND		0.199	0.02	ND		0.199	0.02	ND		0.199	0.02	ND		0.199	0.02	ND		0.2	0.02	ND		0.199	0.02
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	0.129	J	0.798	0.028	0.083	J	0.796	0.028	0.038	J	0.797	0.028	0.082	J	0.796	0.028	0.06	J	0.796	0.028	0.068	J	0.796	0.028	0.081	J	0.801	0.028	0.079	J	0.797	0.028
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	0.019	J	0.199	0.014	0.352		0.199	0.014	1.08		0.199	0.014	1		0.199	0.014	ND		0.199	0.014	0.026	J	0.199	0.014	0.123	J	0.2	0.014	1		0.199	0.014
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	ND		0.199	0.035	0.055	J	0.199	0.035	0.114	J	0.199	0.035	0.138	J	0.199	0.035	0.035	J	0.199	0.035	ND		0.199	0.035	ND		0.2	0.035	0.127	J	0.199	0.035
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	NS	NS	NS	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.2	0.022	ND		0.199	0.022
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	ND		0.199	0.021	ND		0.199	0.021	0.038	J	0.199	0.021	0.025	J	0.199	0.021	ND		0.199	0.021	ND		0.199	0.021	ND		0.2	0.021	0.03	J	0.199	0.021
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	ND		0.199	0.045	ND		0.199	0.045	ND		0.199	0.045	ND		0.199	0.045	ND		0.199	0.045	ND		0.199	0.045	ND		0.2	0.045	ND		0.199	0.045
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	NS	NS	0.094	J	0.199	0.012	0.053	J	0.199	0.012	0.025	J	0.199	0.012	0.039	J	0.199	0.012	ND		0.199	0.012	0.022	J	0.199	0.012	0.039	J	0.2	0.012	0.041	J	0.199	0.012
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	0.066	J	0.199	0.02	0.029	J	0.199	0.02	ND		0.199	0.02	0.026	J	0.199	0.02	0.032	J	0.199	0.02	ND		0.199	0.02	ND		0.2	0.02	ND		0.199	0.02
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	NS	0.108	J	0.199	0.015	0.084	J	0.199	0.015	0.038	J	0.199	0.015	0.053	JF	0.199	0.015	ND		0.199	0.015	0.051	J	0.199	0.015	0.046	J	0.2	0.015	0.044	JF	0.199	0.015
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	ND		0.199	0.03	ND		0.199	0.03	ND		0.199	0.03	ND		0.199	0.029	ND		0.199	0.03	0.069	J	0.199	0.029	ND		0.2	0.03	ND		0.199	0.03
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	ND		0.199	0.013	0.053	J	0.199	0.013	0.166	J	0.199	0.013	0.271		0.199	0.013	0.026	J	0.199	0.013	ND		0.199	0.013	ND		0.2	0.013	0.178	J	0.199	0.013
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NS	NS	NS	0.065	J	0.199	0.01	0.047	JF	0.199	0.01	0.081	JF	0.199	0.01	0.072	JF	0.199	0.01	ND		0.199	0.01	0.029	JF	0.199	0.01	0.048	JF	0.2	0.01	0.065	JF	0.199	0.01
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	44	0.88	1	**1.12**		0.199	0.031	**12.9**		0.199	0.031	**45.4**		0.199	0.031	**38**		0.199	0.031	**26.4**		0.199	0.031	**2.44**		0.199	0.031	**5.98**		0.2	0.031	**41.7**		0.199	0.031
Perfluorooctanoic Acid (PFOA)	335-67-1	33	0.66	0.8	**1.05**		0.199	0.026	0.424		0.199	0.026	0.286		0.199	0.026	0.469		0.199	0.026	0.228		0.199	0.026	0.295		0.199	0.026	0.314		0.2	0.026	0.602		0.199	0.026
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.2	0.026	ND		0.199	0.026
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	NS	0.217	J	0.399	0.038	0.105	J	0.398	0.038	0.046	J	0.398	0.038	0.096	J	0.398	0.038	ND		0.398	0.038	0.082	J	0.398	0.038	0.093	J	0.4	0.038	0.079	J	0.398	0.038
Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	NS	NS	NS	ND		0.199	0.024	ND		0.199	0.024	ND		0.199	0.024	ND		0.199	0.024	ND		0.199	0.024	ND		0.199	0.024	ND		0.2	0.024	ND		0.199	0.024
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	ND		0.199	0.016	ND		0.199	0.016	ND		0.199	0.016	ND		0.199	0.016	ND		0.199	0.016	ND		0.199	0.016	ND		0.2	0.016	ND		0.199	0.016
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	ND		0.199	0.013	0.039	JF	0.199	0.013	0.105	J	0.199	0.013	0.145	J	0.199	0.013	ND		0.199	0.013	ND		0.199	0.013	ND		0.2	0.013	0.113	J	0.199	0.013

Notes:
All results reported in ug/kg
Results Exceed Guidance Values for Anticipated Site Use - Restricted Residential Use
Results Exceed Guidance Values for Anticipated Site Use - Unrestricted Use
Results Exceed Guidance Values for Anticipated Site Use - Protection of Groundwater
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero.
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
F - The result is considered an estimated maximum concentration.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
PPB (ug/kg) - Parts per Billion

TABLE 3D

245 West 55th Street
New York, New York

Summary of Per- and Polyfluoroalkyl Substances (PFAS) Results in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Guidance Values for Anticipated Site Use - Restricted-Residential (ug/kg)	Guidance Values for Anticipated Site Use - Unrestricted (ug/kg)	Guidance Values for Anticipated Site Use - Protection of Groundwater (ug/kg)	SB-1D L2468433-26 11/20/2024 6-8'				SB-1D L2468433-21 11/20/2024 8-10'				SB-2 L2505323-01 1/30/2025 0-2'				SB-2 L2505323-02 1/30/2025 2-4'				SB-2 L2505323-03 1/30/2025 4-6'				SB-2 L2505323-04 1/30/2025 6-8'				DUP (SB-2) L2505323-06 1/30/2025 6-8'				SB-2 L2505323-05 1/30/2025 8-10'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
PERFLUORINATED ALKYL ACIDS BY EPA 1633																																		
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	ND		0.799	0.04	ND		0.8	0.04	ND		0.797	0.04	ND		0.797	0.04	ND		0.796	0.04	ND		0.804	0.04	ND		0.798	0.04	ND		0.798	0.04
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	ND		0.799	0.259	ND		0.8	0.259	ND		0.797	0.258	ND		0.797	0.258	ND		0.796	0.258	ND		0.804	0.26	ND		0.798	0.259	ND		0.798	0.258
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	ND		0.799	0.078	ND		0.8	0.078	ND		0.797	0.077	ND		0.797	0.077	ND		0.796	0.077	ND		0.804	0.078	ND		0.798	0.077	ND		0.798	0.077
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	NS	NS	NS	ND		0.799	0.148	ND		0.8	0.148	ND		0.797	0.147	ND		0.797	0.147	0.152	J	0.796	0.147	ND		0.804	0.149	ND		0.798	0.148	ND		0.798	0.148
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	914637-49-3	NS	NS	NS	ND		4.99	0.236	ND		5	0.236	ND		4.98	0.235	ND		4.98	0.235	ND		4.97	0.235	ND		5.02	0.237	ND		4.99	0.236	ND		4.99	0.235
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	812-70-4	NS	NS	NS	ND		4.99	0.365	ND		5	0.365	ND		4.98	0.364	ND		4.98	0.364	ND		4.97	0.364	ND		5.02	0.367	ND		4.99	0.365	ND		4.99	0.365
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	356-02-5	NS	NS	NS	ND		0.998	0.092	ND		1	0.092	ND		0.997	0.092	ND		0.996	0.092	ND		0.994	0.092	ND		1	0.092	ND		0.998	0.092	ND		0.997	0.092
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	ND		0.799	0.03	ND		0.8	0.03	ND		0.797	0.03	ND		0.797	0.03	ND		0.796	0.029	ND		0.804	0.03	ND		0.798	0.03	ND		0.798	0.03
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	ND		0.799	0.03	ND		0.8	0.03	ND		0.797	0.03	ND		0.797	0.03	ND		0.796	0.029	ND		0.804	0.03	ND		0.798	0.03	ND		0.798	0.03
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	NS	NS	NS	ND		0.799	0.038	ND		0.8	0.038	ND		0.797	0.038	ND		0.797	0.038	ND		0.796	0.038	ND		0.804	0.039	ND		0.798	0.038	ND		0.798	0.038
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	NS	NS	NS	ND		0.2	0.022	ND		0.2	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.201	0.022	ND		0.2	0.022	ND		0.199	0.022
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	NS	NS	NS	ND		2	0.082	ND		2	0.082	ND		1.99	0.081	ND		1.99	0.081	ND		1.99	0.081	ND		2.01	0.082	ND		2	0.081	ND		1.99	0.081
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	0.741		0.2	0.044	ND		0.2	0.044	0.159	J	0.199	0.044	ND		0.199	0.044	ND		0.199	0.044	ND		0.201	0.044	ND		0.2	0.044	ND		0.199	0.044
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	NS	NS	NS	ND		0.2	0.026	ND		0.2	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.201	0.027	ND		0.2	0.026	ND		0.199	0.026
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	NS	NS	NS	ND		2	0.121	ND		2	0.122	ND		1.99	0.121	ND		1.99	0.121	ND		1.99	0.121	ND		2.01	0.122	ND		2	0.121	ND		1.99	0.121
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	ND		0.2	0.086	ND		0.2	0.086	ND		0.199	0.085	ND		0.199	0.085	ND		0.199	0.085	ND		0.201	0.086	ND		0.2	0.085	ND		0.199	0.085
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	NS	NS	NS	ND		0.399	0.082	ND		0.4	0.082	ND		0.399	0.082	ND		0.398	0.082	ND		0.398	0.082	ND		0.402	0.083	ND		0.399	0.082	ND		0.399	0.082
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	113507-82-7	NS	NS	NS	ND		0.399	0.046	ND		0.4	0.046	ND		0.399	0.046	ND		0.398	0.046	ND		0.398	0.046	ND		0.402	0.047	ND		0.399	0.046	ND		0.399	0.046
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	377-73-1	NS	NS	NS	ND		0.399	0.017	ND		0.4	0.017	ND		0.399	0.017	ND		0.398	0.017	ND		0.398	0.017	ND		0.402	0.017	ND		0.399	0.017	ND		0.399	0.017
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	NS	NS	NS	ND		0.399	0.024	ND		0.4	0.024	ND		0.399	0.024	ND		0.398	0.024	ND		0.398	0.024	ND		0.402	0.024	ND		0.399	0.024	ND		0.399	0.024
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	ND		0.2	0.02	ND		0.2	0.02	ND		0.199	0.02	ND		0.199	0.02	0.082	JF	0.199	0.02	ND		0.201	0.02	ND		0.2	0.02	ND		0.199	0.02
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	0.049	J	0.799	0.028	0.057	J	0.8	0.028	0.053	J	0.797	0.028	0.034	J	0.797	0.028	0.035	J	0.796	0.028	ND		0.804	0.028	ND		0.798	0.028	0.028	J	0.798	0.028
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	0.629		0.2	0.014	ND		0.2	0.014	0.234		0.199	0.014	0.255		0.199	0.014	0.074	J	0.199	0.014	0.133	J	0.201	0.015	0.122	J	0.2	0.014	0.22		0.199	0.014
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	0.125	J	0.2	0.035	ND		0.2	0.035	0.045	J	0.199	0.035	0.045	J	0.199	0.035	ND		0.199	0.035	ND		0.201	0.035	ND		0.2	0.035	ND		0.199	0.035
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	NS	NS	NS	ND		0.2	0.022	ND		0.2	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.201	0.022	ND		0.2	0.022	ND		0.199	0.022
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	ND		0.2	0.021	ND		0.2	0.021	ND		0.199	0.021	ND		0.199	0.021	ND		0.199	0.021	ND		0.201	0.021	ND		0.2	0.021	ND		0.199	0.021
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	ND		0.2	0.045	ND		0.2	0.045	ND		0.199	0.045	ND		0.199	0.045	ND		0.199	0.045	ND		0.201	0.045	ND		0.2	0.045	ND		0.199	0.045
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	NS	NS	0.034	J	0.2	0.012	ND		0.2	0.012	0.051	J	0.199	0.012	0.052	J	0.199	0.012	0.05	J	0.199	0.012	ND		0.201	0.012	ND		0.2	0.012	ND		0.199	0.012
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	0.05	J	0.2	0.02	0.042	J	0.2	0.02	0.034	J	0.199	0.02	0.029	J	0.199	0.02	ND		0.199	0.02	ND		0.201	0.02	ND		0.2	0.02	ND		0.199	0.02
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	NS	0.082	J	0.2	0.015	ND		0.2	0.015	0.039	J	0.199	0.015	0.057	J	0.199	0.015	0.035	J	0.199	0.015	ND		0.201	0.015	ND		0.2	0.015	ND		0.199	0.015
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	ND		0.2	0.03	ND		0.2	0.03	ND		0.199	0.03	ND		0.199	0.03	ND		0.199	0.029	ND		0.201	0.03	ND		0.2	0.03	ND		0.199	0.03
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	0.14	J	0.2	0.013	ND		0.2	0.013	0.026	J	0.199	0.013	0.025	J	0.199	0.013	ND		0.199	0.013	ND		0.201	0.013	ND		0.2	0.013	ND		0.199	0.013
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NS	NS	NS	0.117	JF	0.2	0.01	ND		0.2	0.01	0.098	J	0.199	0.01	0.032	JF	0.199	0.01	0.029	JF	0.199	0.01	0.04	JF	0.201	0.01	0.018	JF	0.2	0.01	0.037	JF	0.199	0.01
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	44	0.88	1	**64.8**		0.998	0.156	**18.9**		0.2	0.031	**3.93**		0.199	0.031	**2.67**		0.199	0.031	**1.42**		0.199	0.031	0.822		0.201	0.031	0.301		0.2	0.031	0.335		0.199	0.031
Perfluorooctanoic Acid (PFOA)	335-67-1	33	0.66	0.8	0.607		0.2	0.026	0.289		0.2	0.026	0.574		0.199	0.026	0.36		0.199	0.026	0.326		0.199	0.026	0.073	J	0.201	0.027	0.054	J	0.2	0.026	0.081	J	0.199	0.026
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	ND		0.2	0.026	ND		0.2	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.201	0.027	ND		0.2	0.026	ND		0.199	0.026
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	NS	0.078	J	0.399	0.038	ND		0.4	0.038	0.041	J	0.399	0.038	0.05	J	0.398	0.038	0.049	J	0.398	0.038	ND		0.402	0.039	ND		0.399	0.038	ND		0.399	0.038
Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	NS	NS	NS	ND		0.2	0.024	ND		0.2	0.024	ND		0.199	0.024	ND		0.199	0.024	ND		0.199	0.024	ND		0.201	0.024	ND		0.2	0.024	ND		0.199	0.024
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	ND		0.2	0.016	ND		0.2	0.016	ND		0.199	0.016	ND		0.199	0.016	ND		0.199	0.016	ND		0.201	0.016	ND		0.2	0.016	ND		0.199	0.016
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	0.109	J	0.2	0.013	ND		0.2	0.013	0.037	J	0.199	0.013	0.036	J	0.199	0.013	ND		0.199	0.013	ND		0.201	0.013	ND		0.2	0.013	ND		0.199	0.013

Notes:

All results reported in ug/kg

Results Exceed Guidance Values for Anticipated Site Use - Restricted Residential Use

Results Exceed Guidance Values for Anticipated Site Use - Unrestricted Use

Results Exceed Guidance Values for Anticipated Site Use - Protection of Groundwater

NA - Not applicable because appropriate toxicological information is not available

Q - Laboratory Qualifier

J - The result is less than the detection limit, but greater than zero.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The result is considered an estimated maximum concentration.

~ - Not Analyzed

ND - Analyzed for but Not Detected at the MDL

NS - No Applicable Standard

NSL - No Screening Level

TICs - Tentatively Identified Compounds

RL - Reporting Limit

MDL - Method Detection Limit

RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard

PPB (ug/kg) - Parts per Billion

TABLE 3D

245 West 55th Street
New York, New York

Summary of Per- and Polyfluoroalkyl Substances (PFAS) Results in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Guidance Values for Anticipated Site Use - Restricted-Residential (ug/kg)	Guidance Values for Anticipated Site Use - Unrestricted (ug/kg)	Guidance Values for Anticipated Site Use - Protection of Groundwater (ug/kg)	SB-3 L2468036-07 11/19/2024 0-2'				SB-3 L2468036-08 11/19/2024 2-4'				SB-3 L2468036-09 11/19/2024 4-6'				SB-3 L2468036-10 11/19/2024 6-8'				SB-3 L2468036-11 11/19/2024 8-10'				SB-4 L2467646-06 11/18/2024 0-2'				SB-4 L2467646-07 11/18/2024 2-4'				SB-4 L2467646-08 11/18/2024 4-6'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
PERFLUORINATED ALKYL ACIDS BY EPA 1633																																		
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	ND		0.785	0.039	ND		0.794	0.04	ND		0.783	0.039	ND		0.784	0.039	ND		0.79	0.04	ND		0.793	0.04	ND		0.789	0.04	ND		0.796	0.04
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	ND		0.785	0.254	ND		0.794	0.257	ND		0.783	0.254	ND		0.784	0.254	ND		0.79	0.256	ND		0.793	0.257	ND		0.789	0.256	ND		0.796	0.258
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	ND		0.785	0.076	ND		0.794	0.077	ND		0.783	0.076	ND		0.784	0.076	ND		0.79	0.077	ND		0.793	0.077	ND		0.789	0.077	ND		0.796	0.077
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	NS	NS	NS	ND		0.785	0.145	ND		0.794	0.147	ND		0.783	0.145	ND		0.784	0.145	ND		0.79	0.146	ND		0.793	0.147	ND		0.789	0.146	ND		0.796	0.147
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	914637-49-3	NS	NS	NS	ND		4.91	0.232	ND		4.96	0.234	ND		4.9	0.231	ND		4.9	0.231	ND		4.94	0.233	ND		4.96	0.234	ND		4.93	0.233	ND		4.97	0.235
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	812-70-4	NS	NS	NS	ND		4.91	0.359	ND		4.96	0.363	ND		4.9	0.358	ND		4.9	0.358	ND		4.94	0.361	ND		4.96	0.362	ND		4.93	0.361	ND		4.97	0.364
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	356-02-5	NS	NS	NS	ND		0.982	0.09	ND		0.992	0.091	ND		0.979	0.09	ND		0.98	0.09	ND		0.988	0.091	ND		0.992	0.091	ND		0.987	0.091	ND		0.995	0.092
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	ND		0.785	0.029	ND		0.794	0.029	ND		0.783	0.029	ND		0.784	0.029	ND		0.79	0.029	ND		0.793	0.029	ND		0.789	0.029	ND		0.796	0.029
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	ND		0.785	0.029	ND		0.794	0.029	ND		0.783	0.029	ND		0.784	0.029	ND		0.79	0.029	ND		0.793	0.029	ND		0.789	0.029	ND		0.796	0.029
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	NS	NS	NS	ND		0.785	0.038	ND		0.794	0.038	ND		0.783	0.038	ND		0.784	0.038	ND		0.79	0.038	ND		0.793	0.038	ND		0.789	0.038	ND		0.796	0.038
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	NS	NS	NS	ND		0.196	0.021	ND		0.198	0.021	ND		0.196	0.021	ND		0.196	0.021	ND		0.198	0.021	ND		0.198	0.021	ND		0.197	0.021	ND		0.199	0.022
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	NS	NS	NS	ND		1.96	0.08	ND		1.98	0.081	ND		1.96	0.08	ND		1.96	0.08	ND		1.98	0.081	ND		1.98	0.081	ND		1.97	0.081	ND		1.99	0.081
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	ND		0.196	0.043	ND		0.198	0.044	ND		0.196	0.043	ND		0.196	0.043	ND		0.198	0.043	ND		0.198	0.044	ND		0.197	0.043	ND		0.199	0.044
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	NS	NS	NS	ND		0.196	0.026	ND		0.198	0.026	ND		0.196	0.026	ND		0.196	0.026	ND		0.198	0.026	ND		0.198	0.026	ND		0.197	0.026	ND		0.199	0.026
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	NS	NS	NS	ND		1.96	0.119	ND		1.98	0.121	ND		1.96	0.119	ND		1.96	0.119	ND		1.98	0.12	ND		1.98	0.12	ND		1.97	0.12	ND		1.99	0.121
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	ND		0.196	0.084	ND		0.198	0.085	ND		0.196	0.084	ND		0.196	0.084	ND		0.198	0.085	ND		0.198	0.085	ND		0.197	0.085	ND		0.199	0.085
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	NS	NS	NS	ND		0.393	0.081	ND		0.397	0.082	ND		0.392	0.081	ND		0.392	0.081	ND		0.395	0.081	ND		0.397	0.082	ND		0.395	0.081	ND		0.398	0.082
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	113507-82-7	NS	NS	NS	ND		0.393	0.046	ND		0.397	0.046	ND		0.392	0.045	ND		0.392	0.045	ND		0.395	0.046	ND		0.397	0.046	ND		0.395	0.046	ND		0.398	0.046
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	377-73-1	NS	NS	NS	ND		0.393	0.017	ND		0.397	0.017	ND		0.392	0.016	ND		0.392	0.016	ND		0.395	0.017	ND		0.397	0.017	ND		0.395	0.017	ND		0.398	0.017
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	NS	NS	NS	ND		0.393	0.024	ND		0.397	0.024	ND		0.392	0.024	ND		0.392	0.024	ND		0.395	0.024	ND		0.397	0.024	ND		0.395	0.024	ND		0.398	0.024
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	ND		0.196	0.02	ND		0.198	0.02	ND		0.196	0.02	ND		0.196	0.02	ND		0.198	0.02	ND		0.198	0.02	ND		0.197	0.02	ND		0.199	0.02
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	ND		0.785	0.028	ND		0.794	0.028	ND		0.783	0.027	ND		0.784	0.027	ND		0.79	0.028	0.06	J	0.793	0.028	0.039	J	0.789	0.028	ND		0.796	0.028
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	ND		0.196	0.014	ND		0.198	0.014	ND		0.196	0.014	ND		0.196	0.014	ND		0.198	0.014	ND		0.198	0.014	ND		0.197	0.014	ND		0.199	0.014
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	0.048	J	0.196	0.035	0.108	J	0.198	0.035	0.154	J	0.196	0.035	0.136	J	0.196	0.035	ND		0.198	0.035	ND		0.198	0.035	ND		0.197	0.035	ND		0.199	0.035
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	NS	NS	NS	ND		0.196	0.021	ND		0.198	0.021	ND		0.196	0.021	ND		0.196	0.021	ND		0.198	0.021	ND		0.198	0.021	ND		0.197	0.021	ND		0.199	0.022
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	ND		0.196	0.02	ND		0.198	0.021	ND		0.196	0.02	ND		0.196	0.02	ND		0.198	0.021	ND		0.198	0.021	ND		0.197	0.021	ND		0.199	0.021
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	ND		0.196	0.044	ND		0.198	0.044	ND		0.196	0.044	ND		0.196	0.044	ND		0.198	0.044	ND		0.198	0.044	ND		0.197	0.044	ND		0.199	0.045
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	NS	NS	ND		0.196	0.012	0.04	J	0.198	0.012	0.037	J	0.196	0.012	ND		0.196	0.012	ND		0.198	0.012	ND		0.198	0.012	0.038	J	0.197	0.012	0.023	J	0.199	0.012
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	ND		0.196	0.02	0.036	J	0.198	0.02	0.031	J	0.196	0.02	ND		0.196	0.02	ND		0.198	0.02	0.022	J	0.198	0.02	0.032	J	0.197	0.02	ND		0.199	0.02
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	NS	ND		0.196	0.015	ND		0.198	0.015	ND		0.196	0.015	0.036	J	0.196	0.015	ND		0.198	0.015	0.033	J	0.198	0.015	0.045	J	0.197	0.015	0.028	JF	0.199	0.015
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	ND		0.196	0.029	ND		0.198	0.029	ND		0.196	0.029	ND		0.196	0.029	ND		0.198	0.029	ND		0.198	0.029	ND		0.197	0.029	ND		0.199	0.029
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	ND		0.196	0.013	0.028	J	0.198	0.013	0.11	J	0.196	0.013	0.093	J	0.196	0.013	ND		0.198	0.013	ND		0.198	0.013	ND		0.197	0.013	ND		0.199	0.013
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NS	NS	NS	ND		0.196	0.01	ND		0.198	0.01	ND		0.196	0.01	ND		0.196	0.01	ND		0.198	0.01	ND		0.198	0.01	ND		0.197	0.01	ND		0.199	0.01
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	44	0.88	1	0.567		0.196	0.031	**1.56**		0.198	0.031	**3.33**		0.196	0.031	**3.53**		0.196	0.031	0.72		0.198	0.031	0.186	J	0.198	0.031	0.1	J	0.197	0.031	0.191	J	0.199	0.031
Perfluorooctanoic Acid (PFOA)	335-67-1	33	0.66	0.8	0.157	J	0.196	0.026	0.409		0.198	0.026	0.289		0.196	0.026	0.149	J	0.196	0.026	ND		0.198	0.026	0.214		0.198	0.026	0.242		0.197	0.026	0.109	J	0.199	0.026
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	ND		0.196	0.026	ND		0.198	0.026	ND		0.196	0.026	ND		0.196	0.026	ND		0.198	0.026	ND		0.198	0.026	ND		0.197	0.026	ND		0.199	0.026
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	NS	ND		0.393	0.038	ND		0.397	0.038	ND		0.392	0.038	ND		0.392	0.038	ND		0.395	0.038	0.044	J	0.397	0.038	ND		0.395	0.038	ND		0.398	0.038
Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	NS	NS	NS	ND		0.196	0.024	ND		0.198	0.024	ND		0.196	0.024	ND		0.196	0.024	ND		0.198	0.024	ND		0.198	0.024	ND		0.197	0.024	ND		0.199	0.024
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	ND		0.196	0.016	ND		0.198	0.016	ND		0.196	0.016	ND		0.196	0.016	ND		0.198	0.016	ND		0.198	0.016	ND		0.197	0.016	ND		0.199	0.016
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	ND		0.196	0.013	0.031	J	0.198	0.013	0.034	J	0.196	0.013	ND		0.196	0.013	ND		0.198	0.013	ND		0.198	0.013	ND		0.197	0.013	ND		0.199	0.013

Notes:
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Results Exceed Guidance Values for Anticipated Site Use - Restricted Residential Use
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NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero.
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~ - Not Analyzed
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NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
PPB (ug/kg) - Parts per Billion

TABLE 3D

245 West 55th Street
New York, New York

Summary of Per- and Polyfluoroalkyl Substances (PFAS) Results in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Guidance Values for Anticipated Site Use - Restricted-Residential (ug/kg)	Guidance Values for Anticipated Site Use - Unrestricted (ug/kg)	Guidance Values for Anticipated Site Use - Protection of Groundwater (ug/kg)	SB-4 L2467646-09 11/18/2024 6-8'				SB-5 L2467646-14 11/18/2024 0-2'				SB-5 L2467646-15 11/18/2024 2-4'				SB-5 L2467646-16 11/18/2024 4-6'				SB-5 L2467646-17 11/18/2024 6-8'				DUP-1 (SB-5) L2467646-18 11/18/2024 6-8'				SB-6 L2468036-18 11/19/2024 0-2'				SB-6 L2468036-19 11/19/2024 2-4'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
PERFLUORINATED ALKYL ACIDS BY EPA 1633																																		
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	ND		0.792	0.04	ND		0.788	0.039	ND		0.791	0.04	ND		0.782	0.039	ND		0.797	0.04	ND		0.786	0.039	ND		0.783	0.039	ND		0.792	0.04
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	ND		0.792	0.257	ND		0.788	0.255	ND		0.791	0.256	ND		0.782	0.254	ND		0.797	0.258	ND		0.786	0.255	ND		0.783	0.254	ND		0.792	0.256
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	ND		0.792	0.077	ND		0.788	0.076	ND		0.791	0.077	ND		0.782	0.076	ND		0.797	0.077	ND		0.786	0.076	ND		0.783	0.076	ND		0.792	0.077
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	NS	NS	NS	ND		0.792	0.147	ND		0.788	0.146	ND		0.791	0.146	ND		0.782	0.145	ND		0.797	0.147	ND		0.786	0.145	ND		0.783	0.145	ND		0.792	0.146
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	914637-49-3	NS	NS	NS	ND		4.95	0.234	ND		4.92	0.232	ND		4.94	0.233	ND		4.89	0.231	ND		4.98	0.235	ND		4.91	0.232	ND		4.9	0.231	ND		4.95	0.234
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	812-70-4	NS	NS	NS	ND		4.95	0.362	ND		4.92	0.36	ND		4.94	0.361	ND		4.89	0.358	ND		4.98	0.364	ND		4.91	0.359	ND		4.9	0.358	ND		4.95	0.362
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	356-02-5	NS	NS	NS	ND		0.991	0.091	ND		0.984	0.091	ND		0.988	0.091	ND		0.978	0.09	ND		0.996	0.092	ND		0.983	0.09	ND		0.979	0.09	ND		0.99	0.091
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	ND		0.792	0.029	ND		0.788	0.029	ND		0.791	0.029	ND		0.782	0.029	ND		0.797	0.03	ND		0.786	0.029	ND		0.783	0.029	ND		0.792	0.029
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	ND		0.792	0.029	ND		0.788	0.029	ND		0.791	0.029	ND		0.782	0.029	ND		0.797	0.03	ND		0.786	0.029	ND		0.783	0.029	ND		0.792	0.029
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	NS	NS	NS	ND		0.792	0.038	ND		0.788	0.038	ND		0.791	0.038	ND		0.782	0.038	ND		0.797	0.038	ND		0.786	0.038	ND		0.783	0.038	ND		0.792	0.038
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	NS	NS	NS	ND		0.198	0.021	ND		0.197	0.021	ND		0.198	0.021	ND		0.196	0.021	ND		0.199	0.022	ND		0.196	0.021	ND		0.196	0.021	ND		0.198	0.021
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	NS	NS	NS	ND		1.98	0.081	ND		1.97	0.08	ND		1.98	0.081	ND		1.96	0.08	ND		1.99	0.081	ND		1.96	0.08	ND		1.96	0.08	ND		1.98	0.081
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	ND		0.198	0.044	ND		0.197	0.043	ND		0.198	0.044	ND		0.196	0.043	ND		0.199	0.044	ND		0.196	0.043	ND		0.196	0.043	ND		0.198	0.044
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	NS	NS	NS	ND		0.198	0.026	ND		0.197	0.026	ND		0.198	0.026	ND		0.196	0.026	ND		0.199	0.026	ND		0.196	0.026	ND		0.196	0.026	ND		0.198	0.026
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	NS	NS	NS	ND		1.98	0.12	ND		1.97	0.12	ND		1.98	0.12	ND		1.96	0.119	ND		1.99	0.121	ND		1.96	0.119	ND		1.96	0.119	ND		1.98	0.12
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	ND		0.198	0.085	ND		0.197	0.084	ND		0.198	0.085	ND		0.196	0.084	ND		0.199	0.085	ND		0.196	0.084	ND		0.196	0.084	ND		0.198	0.085
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	NS	NS	NS	ND		0.396	0.082	ND		0.394	0.081	ND		0.395	0.081	ND		0.391	0.081	ND		0.398	0.082	ND		0.393	0.081	ND		0.392	0.081	ND		0.396	0.082
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	113507-82-7	NS	NS	NS	ND		0.396	0.046	ND		0.394	0.046	ND		0.395	0.046	ND		0.391	0.045	ND		0.398	0.046	ND		0.393	0.046	ND		0.392	0.045	ND		0.396	0.046
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	377-73-1	NS	NS	NS	ND		0.396	0.017	ND		0.394	0.017	ND		0.395	0.017	ND		0.391	0.016	ND		0.398	0.017	ND		0.393	0.017	ND		0.392	0.016	ND		0.396	0.017
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	NS	NS	NS	ND		0.396	0.024	ND		0.394	0.024	ND		0.395	0.024	ND		0.391	0.024	ND		0.398	0.024	ND		0.393	0.024	ND		0.392	0.024	ND		0.396	0.024
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	ND		0.198	0.02	ND		0.197	0.02	ND		0.198	0.02	ND		0.196	0.02	ND		0.199	0.02	ND		0.196	0.02	ND		0.196	0.02	ND		0.198	0.02
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	ND		0.792	0.028	0.038	J	0.788	0.028	ND		0.791	0.028	ND		0.782	0.027	ND		0.797	0.028	ND		0.786	0.028	ND		0.783	0.027	ND		0.792	0.028
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	0.028	J	0.198	0.014	ND		0.197	0.014	ND		0.198	0.014	ND		0.196	0.014	ND		0.199	0.014	ND		0.196	0.014	2.13		0.196	0.014	0.476		0.198	0.014
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	0.156	J	0.198	0.035	ND		0.197	0.035	ND		0.198	0.035	ND		0.196	0.034	ND		0.199	0.035	ND		0.196	0.035	ND		0.196	0.035	ND		0.198	0.035
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	NS	NS	NS	ND		0.198	0.021	ND		0.197	0.021	ND		0.198	0.021	ND		0.196	0.021	ND		0.199	0.022	ND		0.196	0.021	ND		0.196	0.021	ND		0.198	0.021
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	ND		0.198	0.021	ND		0.197	0.021	ND		0.198	0.021	ND		0.196	0.02	ND		0.199	0.021	ND		0.196	0.02	ND		0.196	0.02	ND		0.198	0.021
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	ND		0.198	0.044	ND		0.197	0.044	ND		0.198	0.044	ND		0.196	0.044	ND		0.199	0.045	ND		0.196	0.044	ND		0.196	0.044	ND		0.198	0.044
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	NS	NS	0.025	J	0.198	0.012	0.022	J	0.197	0.012	0.024	J	0.198	0.012	0.017	J	0.196	0.012	ND		0.199	0.012	ND		0.196	0.012	ND		0.196	0.012	ND		0.198	0.012
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	ND		0.198	0.02	0.038	J	0.197	0.02	ND		0.198	0.02	0.02	J	0.196	0.02	ND		0.199	0.02	ND		0.196	0.02	ND		0.196	0.02	ND		0.198	0.02
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	NS	ND		0.198	0.015	0.035	J	0.197	0.015	ND		0.198	0.015	ND		0.196	0.015	ND		0.199	0.015	ND		0.196	0.015	ND		0.196	0.015	ND		0.198	0.015
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	ND		0.198	0.029	ND		0.197	0.029	ND		0.198	0.029	ND		0.196	0.029	ND		0.199	0.03	ND		0.196	0.029	ND		0.196	0.029	ND		0.198	0.029
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	0.029	J	0.198	0.013	ND		0.197	0.013	ND		0.198	0.013	ND		0.196	0.013	ND		0.199	0.013	ND		0.196	0.013	0.051	J	0.196	0.013	0.032	J	0.198	0.013
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NS	NS	NS	ND		0.198	0.01	ND		0.197	0.01	ND		0.198	0.01	ND		0.196	0.01	ND		0.199	0.01	ND		0.196	0.01	0.056	JF	0.196	0.01	ND		0.198	0.01
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	44	0.88	1	**1.28**		0.198	0.031	0.136	J	0.197	0.031	0.108	J	0.198	0.031	0.158	J	0.196	0.031	0.186	J	0.199	0.031	0.338		0.196	0.031	**1.44**		0.196	0.031	**0.972**		0.198	0.031
Perfluorooctanoic Acid (PFOA)	335-67-1	33	0.66	0.8	0.167	J	0.198	0.026	0.163	J	0.197	0.026	0.104	J	0.198	0.026	0.107	J	0.196	0.026	0.129	J	0.199	0.026	0.163	J	0.196	0.026	0.153	J	0.196	0.026	0.177	J	0.198	0.026
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	ND		0.198	0.026	ND		0.197	0.026	ND		0.198	0.026	ND		0.196	0.026	ND		0.199	0.026	ND		0.196	0.026	ND		0.196	0.026	ND		0.198	0.026
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	NS	ND		0.396	0.038	ND		0.394	0.038	ND		0.395	0.038	ND		0.391	0.038	ND		0.398	0.038	ND		0.393	0.038	ND		0.392	0.038	ND		0.396	0.038
Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	NS	NS	NS	ND		0.198	0.024	ND		0.197	0.024	ND		0.198	0.024	ND		0.196	0.024	ND		0.199	0.024	ND		0.196	0.024	ND		0.196	0.024	ND		0.198	0.024
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	ND		0.198	0.016	ND		0.197	0.016	ND		0.198	0.016	ND		0.196	0.016	ND		0.199	0.016	ND		0.196	0.016	ND		0.196	0.016	ND		0.198	0.016
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	0.029	J	0.198	0.013	ND		0.197	0.013	ND		0.198	0.013	ND		0.196	0.013	ND		0.199	0.013	ND		0.196	0.013	0.024	J	0.196	0.013	ND		0.198	0.013

Notes:
All results reported in ug/kg
Results Exceed Guidance Values for Anticipated Site Use - Restricted Residential Use
Results Exceed Guidance Values for Anticipated Site Use - Unrestricted Use
Results Exceed Guidance Values for Anticipated Site Use - Protection of Groundwater
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero.
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
F - The result is considered an estimated maximum concentration.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
PPB (ug/kg) - Parts per Billion

TABLE 3D

245 West 55th Street
New York, New York

Summary of Per- and Polyfluoroalkyl Substances (PFAS) Results in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Guidance Values for Anticipated Site Use - Restricted-Residential (ug/kg)	Guidance Values for Anticipated Site Use - Unrestricted (ug/kg)	Guidance Values for Anticipated Site Use - Protection of Groundwater (ug/kg)	SB-6 L2468036-20 11/19/2024 4-6'				SB-6 L2468036-21 11/19/2024 6-8'				SB-6 L2468036-22 11/19/2024 8-10'				SB-7 L2468036-35 11/19/2024 0-2'				SB-7 L2468036-36 11/19/2024 2-4'				SB-7 L2468036-37 11/19/2024 4-6'				SB-7 L2468036-38 11/19/2024 6-8'				SB-7 L2468036-39 11/19/2024 8-10'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
PERFLUORINATED ALKYL ACIDS BY EPA 1633																																				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	ND		0.785	0.039	ND		0.784	0.039	ND		0.777	0.039	ND		0.786	0.039	ND		0.785	0.039	ND		0.789	0.039	ND		0.796	0.04	ND		0.798	0.04
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	ND		0.785	0.254	ND		0.784	0.254	ND		0.777	0.252	ND		0.786	0.255	ND		0.785	0.254	ND		0.789	0.256	ND		0.796	0.258	ND		0.798	0.259
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	ND		0.785	0.076	ND		0.784	0.076	ND		0.777	0.075	ND		0.786	0.076	ND		0.785	0.076	ND		0.789	0.077	ND		0.796	0.077	ND		0.798	0.077
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	NS	NS	NS	ND		0.785	0.145	ND		0.784	0.145	ND		0.777	0.144	ND		0.786	0.145	ND		0.785	0.145	ND		0.789	0.146	ND		0.796	0.147	ND		0.798	0.148
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	914637-49-3	NS	NS	NS	ND		4.91	0.232	ND		4.9	0.231	ND		4.86	0.229	ND		4.91	0.232	ND		4.91	0.232	ND		4.93	0.233	ND		4.98	0.235	ND		4.99	0.235
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	812-70-4	NS	NS	NS	ND		4.91	0.359	ND		4.9	0.358	ND		4.86	0.355	ND		4.91	0.359	ND		4.91	0.359	ND		4.93	0.36	ND		4.98	0.364	ND		4.99	0.365
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	356-02-5	NS	NS	NS	ND		0.981	0.09	ND		0.98	0.09	ND		0.971	0.089	ND		0.983	0.09	ND		0.981	0.09	ND		0.986	0.091	ND		0.995	0.092	ND		0.998	0.092
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	ND		0.785	0.029	ND		0.784	0.029	ND		0.777	0.029	ND		0.786	0.029	ND		0.785	0.029	ND		0.789	0.029	ND		0.796	0.029	ND		0.798	0.03
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	ND		0.785	0.029	ND		0.784	0.029	ND		0.777	0.029	ND		0.786	0.029	ND		0.785	0.029	ND		0.789	0.029	ND		0.796	0.029	ND		0.798	0.03
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	NS	NS	NS	ND		0.785	0.038	ND		0.784	0.038	ND		0.777	0.037	ND		0.786	0.038	ND		0.785	0.038	ND		0.789	0.038	ND		0.796	0.038	ND		0.798	0.038
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	NS	NS	NS	ND		0.196	0.021	ND		0.196	0.021	ND		0.194	0.021	ND		0.196	0.021	ND		0.196	0.021	ND		0.197	0.021	ND		0.199	0.022	ND		0.2	0.022
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	NS	NS	NS	ND		1.96	0.08	ND		1.96	0.08	ND		1.94	0.079	ND		1.96	0.08	ND		1.96	0.08	ND		1.97	0.081	ND		1.99	0.081	ND		2	0.081
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	ND		0.196	0.043	0.485		0.196	0.043	ND		0.194	0.043	ND		0.196	0.043	ND		0.196	0.043	ND		0.197	0.043	ND		0.199	0.044	ND		0.2	0.044
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	NS	NS	NS	ND		0.196	0.026	ND		0.196	0.026	ND		0.194	0.026	ND		0.196	0.026	ND		0.196	0.026	ND		0.197	0.026	ND		0.199	0.026	ND		0.2	0.026
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	NS	NS	NS	ND		1.96	0.119	ND		1.96	0.119	ND		1.94	0.118	ND		1.96	0.119	ND		1.96	0.119	ND		1.97	0.12	ND		1.99	0.121	ND		2	0.121
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	ND		0.196	0.084	ND		0.196	0.084	ND		0.194	0.083	ND		0.196	0.084	ND		0.196	0.084	ND		0.197	0.084	ND		0.199	0.085	ND		0.2	0.085
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	NS	NS	NS	ND		0.392	0.081	ND		0.392	0.081	ND		0.388	0.08	ND		0.393	0.081	ND		0.392	0.081	ND		0.394	0.081	ND		0.398	0.082	ND		0.399	0.082
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	113507-82-7	NS	NS	NS	ND		0.392	0.046	ND		0.392	0.046	ND		0.388	0.045	ND		0.393	0.046	ND		0.392	0.046	ND		0.394	0.046	ND		0.398	0.046	ND		0.399	0.046
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	377-73-1	NS	NS	NS	ND		0.392	0.017	ND		0.392	0.017	ND		0.388	0.016	ND		0.393	0.017	ND		0.392	0.017	ND		0.394	0.017	ND		0.398	0.017	ND		0.399	0.017
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	NS	NS	NS	ND		0.392	0.024	ND		0.392	0.024	ND		0.388	0.023	ND		0.393	0.024	ND		0.392	0.024	ND		0.394	0.024	ND		0.398	0.024	ND		0.399	0.024
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	ND		0.196	0.02	ND		0.196	0.02	ND		0.194	0.019	ND		0.196	0.02	ND		0.196	0.02	ND		0.197	0.02	ND		0.199	0.02	ND		0.2	0.02
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	ND		0.785	0.028	0.059	J	0.784	0.027	ND		0.777	0.027	0.039	J	0.786	0.028	0.031	J	0.785	0.028	0.051	J	0.789	0.028	0.046	J	0.796	0.028	0.119	J	0.798	0.028
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	0.051	J	0.196	0.014	0.042	J	0.196	0.014	ND		0.194	0.014	ND		0.196	0.014	ND		0.196	0.014	ND		0.197	0.014	ND		0.199	0.014	ND		0.2	0.014
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	0.097	J	0.196	0.035	0.121	J	0.196	0.035	ND		0.194	0.034	ND		0.196	0.035	ND		0.196	0.035	ND		0.197	0.035	ND		0.199	0.035	ND		0.2	0.035
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	NS	NS	NS	ND		0.196	0.021	ND		0.196	0.021	ND		0.194	0.021	ND		0.196	0.021	ND		0.196	0.021	ND		0.197	0.021	ND		0.199	0.022	ND		0.2	0.022
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	ND		0.196	0.02	0.027	J	0.196	0.02	ND		0.194	0.02	ND		0.196	0.02	ND		0.196	0.02	ND		0.197	0.021	ND		0.199	0.021	ND		0.2	0.021
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	ND		0.196	0.044	ND		0.196	0.044	ND		0.194	0.044	ND		0.196	0.044	ND		0.196	0.044	ND		0.197	0.044	ND		0.199	0.045	ND		0.2	0.045
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	NS	NS	ND		0.196	0.012	0.06	J	0.196	0.012	ND		0.194	0.012	0.044	J	0.196	0.012	0.046	J	0.196	0.012	0.033	J	0.197	0.012	ND		0.199	0.012	ND		0.2	0.012
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	ND		0.196	0.02	ND		0.196	0.02	ND		0.194	0.019	ND		0.196	0.02	0.026	J	0.196	0.02	ND		0.197	0.02	ND		0.199	0.02	ND		0.2	0.02
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	NS	ND		0.196	0.015	0.057	JF	0.196	0.015	ND		0.194	0.015	0.053	J	0.196	0.015	0.046	J	0.196	0.015	ND		0.197	0.015	ND		0.199	0.015	ND		0.2	0.015
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	ND		0.196	0.029	ND		0.196	0.029	ND		0.194	0.029	ND		0.196	0.029	ND		0.196	0.029	ND		0.197	0.029	ND		0.199	0.029	ND		0.2	0.03
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	0.068	J	0.196	0.013	0.086	J	0.196	0.013	0.033	J	0.194	0.012	0.035	JF	0.196	0.013	ND		0.196	0.013	ND		0.197	0.013	ND		0.199	0.013	ND		0.2	0.013
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NS	NS	NS	0.041	JF	0.196	0.01	0.22		0.196	0.01	ND		0.194	0.01	ND		0.196	0.01	ND		0.196	0.01	ND		0.197	0.01	ND		0.199	0.01	ND		0.2	0.01
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	44	0.88	1	**2.81**		0.196	0.031	**2.84**		0.196	0.031	**2.42**		0.194	0.03	**1.11**		0.196	0.031	0.469		0.196	0.031	0.2		0.197	0.031	0.09	J	0.199	0.031	0.263		0.2	0.031
Perfluorooctanoic Acid (PFOA)	335-67-1	33	0.66	0.8	0.266		0.196	0.026	0.125	J	0.196	0.026	0.16	J	0.194	0.026	0.24		0.196	0.026	0.259		0.196	0.026	0.122	J	0.197	0.026	0.074	J	0.199	0.026	0.118	J	0.2	0.026
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	ND		0.196	0.026	ND		0.196	0.026	ND		0.194	0.026	ND		0.196	0.026	ND		0.196	0.026	ND		0.197	0.026	ND		0.199	0.026	ND		0.2	0.026
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	NS	ND		0.392	0.038	0.06	J	0.392	0.038	ND		0.388	0.037	0.072	J	0.393	0.038	ND		0.392	0.038	ND		0.394	0.038	ND		0.398	0.038	ND		0.399	0.038
Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	NS	NS	NS	ND		0.196	0.024	ND		0.196	0.024	ND		0.194	0.023	ND		0.196	0.024	ND		0.196	0.024	ND		0.197	0.024	ND		0.199	0.024	ND		0.2	0.024
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	ND		0.196	0.016	ND		0.196	0.016	ND		0.194	0.016	ND		0.196	0.016	ND		0.196	0.016	ND		0.197	0.016	ND		0.199	0.016	ND		0.2	0.016
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	0.046	J	0.196	0.013	0.074	J	0.196	0.013	ND		0.194	0.012	ND		0.196	0.013	ND		0.196	0.013	ND		0.197	0.013	ND		0.199	0.013	ND		0.2	0.013

Notes:
All results reported in ug/kg
Results Exceed Guidance Values for Anticipated Site Use - Restricted Residential Use
Results Exceed Guidance Values for Anticipated Site Use - Unrestricted Use
Results Exceed Guidance Values for Anticipated Site Use - Protection of Groundwater
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero.
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
F - The result is considered an estimated maximum concentration.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
PPB (ug/kg) - Parts per Billion

TABLE 3D

245 West 55th Street
New York, New York

Summary of Per- and Polyfluoroalkyl Substances (PFAS) Results in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Guidance Values for Anticipated Site Use - Restricted-Residential (ug/kg)	Guidance Values for Anticipated Site Use - Unrestricted (ug/kg)	Guidance Values for Anticipated Site Use - Protection of Groundwater (ug/kg)	SB-7 L2468036-40 11/19/2024 16-18'				SB-8 L2518818-06 3/28/2025 4-6'				SB-8 L2518818-07 3/28/2025 6-8'				SB-8 L2518818-11 3/28/2025 8-10'				SB-8 L2518818-12 3/28/2025 10-12'				SB-8 L2518818-13 3/28/2025 12-14'				SB-8 L2518818-14 3/28/2025 14-16'				SB-8 L2518818-15 3/28/2025 16-18'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
PERFLUORINATED ALKYL ACIDS BY EPA 1633																																		
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	ND		0.796	0.04	ND		0.798	0.04	ND		0.799	0.04	ND		0.796	0.04	ND		0.793	0.04	ND		0.799	0.04	ND		0.796	0.04	ND		0.798	0.04
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	ND		0.796	0.258	ND		0.798	0.258	ND		0.799	0.259	ND		0.796	0.258	ND		0.793	0.257	ND		0.799	0.259	ND		0.796	0.258	ND		0.798	0.259
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	ND		0.796	0.077	ND		0.798	0.077	ND		0.799	0.078	ND		0.796	0.077	ND		0.793	0.077	ND		0.799	0.078	ND		0.796	0.077	ND		0.798	0.077
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	NS	NS	NS	ND		0.796	0.147	ND		0.798	0.148	ND		0.799	0.148	ND		0.796	0.147	ND		0.793	0.147	ND		0.799	0.148	ND		0.796	0.147	0.224	J	0.798	0.148
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	914637-49-3	NS	NS	NS	ND		4.98	0.235	ND		4.98	0.235	ND		5	0.236	ND		4.97	0.235	ND		4.96	0.234	ND		4.99	0.236	ND		4.97	0.235	ND		4.99	0.236
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	812-70-4	NS	NS	NS	ND		4.98	0.364	ND		4.98	0.364	ND		5	0.365	ND		4.97	0.364	ND		4.96	0.362	ND		4.99	0.365	ND		4.97	0.364	ND		4.99	0.365
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	356-02-5	NS	NS	NS	ND		0.995	0.092	ND		0.997	0.092	ND		0.999	0.092	ND		0.994	0.092	ND		0.992	0.091	ND		0.998	0.092	ND		0.994	0.092	ND		0.998	0.092
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	ND		0.796	0.03	ND		0.798	0.03	ND		0.799	0.03	ND		0.796	0.029	ND		0.793	0.029	ND		0.799	0.03	ND		0.796	0.029	ND		0.798	0.03
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	ND		0.796	0.03	ND		0.798	0.03	ND		0.799	0.03	ND		0.796	0.029	ND		0.793	0.029	ND		0.799	0.03	ND		0.796	0.029	ND		0.798	0.03
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	NS	NS	NS	ND		0.796	0.038	ND		0.798	0.038	ND		0.799	0.038	ND		0.796	0.038	ND		0.793	0.038	ND		0.799	0.038	ND		0.796	0.038	ND		0.798	0.038
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	NS	NS	NS	ND		0.199	0.022	ND		0.199	0.022	ND		0.2	0.022	ND		0.199	0.022	ND		0.198	0.021	ND		0.2	0.022	ND		0.199	0.022	ND		0.2	0.022
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	NS	NS	NS	ND		1.99	0.081	ND		1.99	0.081	ND		2	0.082	ND		1.99	0.081	ND		1.98	0.081	ND		2	0.082	ND		1.99	0.081	ND		2	0.081
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	ND		0.199	0.044	ND		0.199	0.044	ND		0.2	0.044	ND		0.199	0.044	ND		0.198	0.044	ND		0.2	0.044	ND		0.199	0.044	ND		0.2	0.044
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	NS	NS	NS	ND		0.199	0.026	ND		0.199	0.026	ND		0.2	0.026	ND		0.199	0.026	ND		0.198	0.026	ND		0.2	0.026	ND		0.199	0.026	ND		0.2	0.026
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	NS	NS	NS	ND		1.99	0.121	ND		1.99	0.121	ND		2	0.122	ND		1.99	0.121	ND		1.98	0.12	ND		2	0.121	ND		1.99	0.121	ND		2	0.121
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	ND		0.199	0.085	ND		0.199	0.085	ND		0.2	0.086	ND		0.199	0.085	ND		0.198	0.085	ND		0.2	0.086	ND		0.199	0.085	ND		0.2	0.085
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	NS	NS	NS	ND		0.398	0.082	ND		0.399	0.082	ND		0.4	0.082	ND		0.398	0.082	ND		0.397	0.082	ND		0.399	0.082	ND		0.398	0.082	ND		0.399	0.082
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	113507-82-7	NS	NS	NS	ND		0.398	0.046	ND		0.399	0.046	ND		0.4	0.046	ND		0.398	0.046	ND		0.397	0.046	ND		0.399	0.046	ND		0.398	0.046	ND		0.399	0.046
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	377-73-1	NS	NS	NS	ND		0.398	0.017	ND		0.399	0.017	ND		0.4	0.017	ND		0.398	0.017	ND		0.397	0.017	ND		0.399	0.017	ND		0.398	0.017	ND		0.399	0.017
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	NS	NS	NS	ND		0.398	0.024	ND		0.399	0.024	ND		0.4	0.024	ND		0.398	0.024	ND		0.397	0.024	ND		0.399	0.024	ND		0.398	0.024	ND		0.399	0.024
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	ND		0.199	0.02	ND		0.199	0.02	ND		0.2	0.02	ND		0.199	0.02	ND		0.198	0.02	ND		0.2	0.02	ND		0.199	0.02	ND		0.2	0.02
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	0.071	J	0.796	0.028	0.075	J	0.798	0.028	0.082	J	0.799	0.028	0.084	J	0.796	0.028	0.052	J	0.793	0.028	0.053	J	0.799	0.028	0.061	J	0.796	0.028	0.077	J	0.798	0.028
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	ND		0.199	0.014	0.075	J	0.199	0.014	0.025	J	0.2	0.014	ND		0.199	0.014	ND		0.198	0.014	ND		0.2	0.014	ND		0.199	0.014	ND		0.2	0.014
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	ND		0.199	0.035	0.117	J	0.199	0.035	ND		0.2	0.035	ND		0.199	0.035	ND		0.198	0.035	ND		0.2	0.035	ND		0.199	0.035	ND		0.2	0.035
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	NS	NS	NS	ND		0.199	0.022	ND		0.199	0.022	ND		0.2	0.022	ND		0.199	0.022	ND		0.198	0.021	ND		0.2	0.022	ND		0.199	0.022	ND		0.2	0.022
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	ND		0.199	0.021	ND		0.199	0.021	ND		0.2	0.021	ND		0.199	0.021	ND		0.198	0.021	ND		0.2	0.021	ND		0.199	0.021	ND		0.2	0.021
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	ND		0.199	0.045	ND		0.199	0.045	ND		0.2	0.045	ND		0.199	0.045	ND		0.198	0.044	ND		0.2	0.045	ND		0.199	0.045	0.057	J	0.2	0.045
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	NS	NS	ND		0.199	0.012	0.025	J	0.199	0.012	0.024	J	0.2	0.012	0.059	J	0.199	0.012	0.047	J	0.198	0.012	0.026	J	0.2	0.012	0.036	J	0.199	0.012	0.042	J	0.2	0.012
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	0.021	J	0.199	0.02	ND		0.199	0.02	0.021	J	0.2	0.02	0.032	JF	0.199	0.02	ND		0.198	0.02	0.026	J	0.2	0.02	ND		0.199	0.02	0.053	J	0.2	0.02
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	NS	ND		0.199	0.015	0.019	JF	0.199	0.015	0.027	JF	0.2	0.015	0.068	J	0.199	0.015	0.082	J	0.198	0.015	0.054	JF	0.2	0.015	0.053	JF	0.199	0.015	0.032	JF	0.2	0.015
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	ND		0.199	0.03	ND		0.199	0.03	ND		0.2	0.03	ND		0.199	0.029	ND		0.198	0.029	ND		0.2	0.03	ND		0.199	0.029	ND		0.2	0.03
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	ND		0.199	0.013	0.118	J	0.199	0.013	0.222		0.2	0.013	0.45		0.199	0.013	0.528		0.198	0.013	0.244		0.2	0.013	0.258		0.199	0.013	0.053	J	0.2	0.013
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NS	NS	NS	0.022	JF	0.199	0.01	ND		0.199	0.01	ND		0.2	0.01	ND		0.199	0.01	ND		0.198	0.01	ND		0.2	0.01	ND		0.199	0.01	ND		0.2	0.01
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	44	0.88	1	**3.42**		0.199	0.031	**1.35**		0.199	0.031	**1.73**		0.2	0.031	**1.54**		0.199	0.031	0.835		0.198	0.031	0.407		0.2	0.031	0.54		0.199	0.031	0.281	F	0.2	0.031
Perfluorooctanoic Acid (PFOA)	335-67-1	33	0.66	0.8	0.03	J	0.199	0.026	0.12	J	0.199	0.026	0.132	J	0.2	0.026	0.402		0.199	0.026	0.214		0.198	0.026	0.196	J	0.2	0.026	0.239		0.199	0.026	0.546		0.2	0.026
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	ND		0.199	0.026	ND		0.199	0.026	ND		0.2	0.026	ND		0.199	0.026	ND		0.198	0.026	ND		0.2	0.026	ND		0.199	0.026	ND		0.2	0.026
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	NS	ND		0.398	0.038	0.051	J	0.399	0.038	0.061	J	0.4	0.038	0.236	J	0.398	0.038	0.34	J	0.397	0.038	0.122	J	0.399	0.038	0.126	J	0.398	0.038	ND		0.399	0.038
Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	NS	NS	NS	ND		0.199	0.024	ND		0.199	0.024	ND		0.2	0.024	ND		0.199	0.024	ND		0.198	0.024	ND		0.2	0.024	ND		0.199	0.024	ND		0.2	0.024
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	ND		0.199	0.016	ND		0.199	0.016	ND		0.2	0.016	ND		0.199	0.016	ND		0.198	0.016	ND		0.2	0.016	ND		0.199	0.016	ND		0.2	0.016
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	ND		0.199	0.013	ND		0.199	0.013	ND		0.2	0.013	ND		0.199	0.013	ND		0.198	0.013	ND		0.2	0.013	ND		0.199	0.013	ND		0.2	0.013

Notes:
All results reported in ug/kg
Results Exceed Guidance Values for Anticipated Site Use - Restricted Residential Use
Results Exceed Guidance Values for Anticipated Site Use - Unrestricted Use
Results Exceed Guidance Values for Anticipated Site Use - Protection of Groundwater
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero.
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
F - The result is considered an estimated maximum concentration.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
PPB (ug/kg) - Parts per Billion

TABLE 3D

245 West 55th Street
New York, New York

Summary of Per- and Polyfluoroalkyl Substances (PFAS) Results in Soil

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Guidance Values for Anticipated Site Use - Restricted-Residential (ug/kg)	Guidance Values for Anticipated Site Use - Unrestricted (ug/kg)	Guidance Values for Anticipated Site Use - Protection of Groundwater (ug/kg)	SB-8 L2518818-16 3/28/2025 18-20'				DUP (SB-8) L2518818-24 3/28/2025 18-20'				SB-8 L2518818-22 3/28/2025 20-22'				SB-8 L2518818-23 3/28/2025 22-24'				PE-1 L2467646-20 11/18/2024 0-0.5'				PE-2 L2467646-22 11/18/2024 0-0.5'				PE-B L2467646-23 11/18/2024 0-0.5'				DUP-2 (PE-B) L2467646-19 11/18/2024 0-0.5'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
PERFLUORINATED ALKYL ACIDS BY EPA 1633																																		
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	ND		0.798	0.04	ND		0.801	0.04	ND		0.795	0.04	ND		0.796	0.04	ND		0.796	0.04	ND		0.794	0.04	ND		0.796	0.04	ND		0.795	0.04
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	ND		0.798	0.258	ND		0.801	0.259	ND		0.795	0.258	ND		0.796	0.258	ND		0.796	0.258	ND		0.794	0.257	ND		0.796	0.258	ND		0.795	0.258
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	ND		0.798	0.077	ND		0.801	0.078	ND		0.795	0.077	ND		0.796	0.077	ND		0.796	0.077	ND		0.794	0.077	ND		0.796	0.077	ND		0.795	0.077
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	NS	NS	NS	ND		0.798	0.148	ND		0.801	0.148	ND		0.795	0.147	ND		0.796	0.147	ND		0.796	0.147	ND		0.794	0.147	ND		0.796	0.147	ND		0.795	0.147
2H,2H,3H-Perfluorooctanoic Acid (5:3FTCA)	914637-49-3	NS	NS	NS	ND		4.98	0.235	ND		5	0.236	ND		4.97	0.234	ND		4.97	0.235	ND		4.97	0.235	ND		4.96	0.234	ND		4.98	0.235	ND		4.97	0.235
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	812-70-4	NS	NS	NS	ND		4.98	0.364	ND		5	0.366	ND		4.97	0.363	ND		4.97	0.364	ND		4.97	0.364	ND		4.96	0.363	ND		4.98	0.364	ND		4.97	0.363
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	356-02-5	NS	NS	NS	ND		0.997	0.092	ND		1	0.092	ND		0.994	0.091	ND		0.995	0.092	ND		0.995	0.092	ND		0.993	0.091	ND		0.996	0.092	ND		0.994	0.091
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	ND		0.798	0.03	ND		0.801	0.03	ND		0.795	0.029	ND		0.796	0.029	ND		0.796	0.029	ND		0.794	0.029	ND		0.796	0.03	ND		0.795	0.029
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	ND		0.798	0.03	ND		0.801	0.03	ND		0.795	0.029	ND		0.796	0.029	ND		0.796	0.029	ND		0.794	0.029	ND		0.796	0.03	ND		0.795	0.029
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	NS	NS	NS	ND		0.798	0.038	ND		0.801	0.038	ND		0.795	0.038	ND		0.796	0.038	ND		0.796	0.038	ND		0.794	0.038	ND		0.796	0.038	ND		0.795	0.038
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	NS	NS	NS	ND		0.199	0.022	ND		0.2	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.198	0.021	ND		0.199	0.022	ND		0.199	0.022
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	NS	NS	NS	ND		1.99	0.081	ND		2	0.082	ND		1.99	0.081	ND		1.99	0.081	ND		1.99	0.081	ND		1.98	0.081	ND		1.99	0.081	ND		1.99	0.081
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	ND		0.199	0.044	ND		0.2	0.044	ND		0.199	0.044	ND		0.199	0.044	ND		0.199	0.044	ND		0.198	0.044	ND		0.199	0.044	ND		0.199	0.044
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	NS	NS	NS	ND		0.199	0.026	ND		0.2	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.198	0.026	ND		0.199	0.026	ND		0.199	0.026
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	NS	NS	NS	ND		1.99	0.121	ND		2	0.122	ND		1.99	0.121	ND		1.99	0.121	ND		1.99	0.121	ND		1.98	0.121	ND		1.99	0.121	ND		1.99	0.121
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	ND		0.199	0.085	ND		0.2	0.086	ND		0.199	0.085	ND		0.199	0.085	ND		0.199	0.085	ND		0.198	0.085	ND		0.199	0.085	ND		0.199	0.085
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	NS	NS	NS	ND		0.399	0.082	ND		0.4	0.083	ND		0.397	0.082	ND		0.398	0.082	ND		0.398	0.082	ND		0.397	0.082	ND		0.398	0.082	ND		0.398	0.082
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	113507-82-7	NS	NS	NS	ND		0.399	0.046	ND		0.4	0.046	ND		0.397	0.046	ND		0.398	0.046	ND		0.398	0.046	ND		0.397	0.046	ND		0.398	0.046	ND		0.398	0.046
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	377-73-1	NS	NS	NS	ND		0.399	0.017	ND		0.4	0.017	ND		0.397	0.017	ND		0.398	0.017	ND		0.398	0.017	ND		0.397	0.017	ND		0.398	0.017	ND		0.398	0.017
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	NS	NS	NS	ND		0.399	0.024	ND		0.4	0.024	ND		0.397	0.024	ND		0.398	0.024	ND		0.398	0.024	ND		0.397	0.024	ND		0.398	0.024	ND		0.398	0.024
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	ND		0.199	0.02	ND		0.2	0.02	ND		0.199	0.02	ND		0.199	0.02	ND		0.199	0.02	ND		0.198	0.02	ND		0.199	0.02	ND		0.199	0.02
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	0.164	J	0.798	0.028	ND		0.801	0.028	0.072	J	0.795	0.028	ND		0.796	0.028	ND		0.796	0.028	0.03	J	0.794	0.028	ND		0.796	0.028	ND		0.795	0.028
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	ND		0.199	0.014	ND		0.2	0.014	ND		0.199	0.014	ND		0.199	0.014	ND		0.199	0.014	0.018	J	0.198	0.014	ND		0.199	0.014	ND		0.199	0.014
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	ND		0.199	0.035	ND		0.2	0.035	ND		0.199	0.035	ND		0.199	0.035	0.061	J	0.199	0.035	0.038	J	0.198	0.035	ND		0.199	0.035	ND		0.199	0.035
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	NS	NS	NS	ND		0.199	0.022	ND		0.2	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.199	0.022	ND		0.198	0.021	ND		0.199	0.022	ND		0.199	0.022
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	ND		0.199	0.021	ND		0.2	0.021	ND		0.199	0.021	ND		0.199	0.021	ND		0.199	0.021	0.043	J	0.198	0.021	ND		0.199	0.021	ND		0.199	0.021
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	0.05	J	0.199	0.045	ND		0.2	0.045	ND		0.199	0.045	ND		0.199	0.045	ND		0.199	0.045	ND		0.198	0.045	ND		0.199	0.045	ND		0.199	0.045
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	NS	NS	0.079	J	0.199	0.012	0.075	J	0.2	0.012	0.102	J	0.199	0.012	0.017	J	0.199	0.012	ND		0.199	0.012	0.048	J	0.198	0.012	ND		0.199	0.012	ND		0.199	0.012
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	0.133	J	0.199	0.02	0.106	J	0.2	0.02	0.161	J	0.199	0.02	ND		0.199	0.02	ND		0.199	0.02	0.048	J	0.198	0.02	ND		0.199	0.02	ND		0.199	0.02
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	NS	0.026	J	0.199	0.015	0.027	JF	0.2	0.015	0.027	JF	0.199	0.015	ND		0.199	0.015	0.019	J	0.199	0.015	0.029	J	0.198	0.015	ND		0.199	0.015	0.02	J	0.199	0.015
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	ND		0.199	0.03	ND		0.2	0.03	ND		0.199	0.029	ND		0.199	0.029	ND		0.199	0.029	ND		0.198	0.029	ND		0.199	0.03	ND		0.199	0.029
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	0.038	J	0.199	0.013	0.025	J	0.2	0.013	ND		0.199	0.013	ND		0.199	0.013	0.03	J	0.199	0.013	0.037	J	0.198	0.013	ND		0.199	0.013	ND		0.199	0.013
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NS	NS	NS	ND		0.199	0.01	ND		0.2	0.01	ND		0.199	0.01	ND		0.199	0.01	ND		0.199	0.01	0.018	JF	0.198	0.01	ND		0.199	0.01	ND		0.199	0.01
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	44	0.88	1	0.355		0.199	0.031	0.237		0.2	0.031	0.429		0.199	0.031	0.1	J	0.199	0.031	0.758		0.199	0.031	**1.01**		0.198	0.031	0.392		0.199	0.031	0.646		0.199	0.031
Perfluorooctanoic Acid (PFOA)	335-67-1	33	0.66	0.8	**1.62**		0.199	0.026	**1.41**		0.2	0.026	**0.936**		0.199	0.026	0.06	J	0.199	0.026	0.078	J	0.199	0.026	**0.731**		0.198	0.026	0.08	J	0.199	0.026	0.094	J	0.199	0.026
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	ND		0.199	0.026	ND		0.2	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.199	0.026	ND		0.198	0.026	ND		0.199	0.026	ND		0.199	0.026
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	NS	ND		0.399	0.038	ND		0.4	0.038	ND		0.397	0.038	ND		0.398	0.038	ND		0.398	0.038	ND		0.397	0.038	ND		0.398	0.038	ND		0.398	0.038
Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	NS	NS	NS	ND		0.199	0.024	ND		0.2	0.024	ND		0.199	0.024	ND		0.199	0.024	ND		0.199	0.024	ND		0.198	0.024	ND		0.199	0.024	ND		0.199	0.024
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	ND		0.199	0.016	ND		0.2	0.016	ND		0.199	0.016	ND		0.199	0.016	ND		0.199	0.016	0.018	J	0.198	0.016	ND		0.199	0.016	ND		0.199	0.016
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	ND		0.199	0.013	ND		0.2	0.013	ND		0.199	0.013	ND		0.199	0.013	ND		0.199	0.013	0.032	J	0.198	0.013	ND		0.199	0.013	ND		0.199	0.013

Notes:
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Results Exceed Guidance Values for Anticipated Site Use - Restricted Residential Use
Results Exceed Guidance Values for Anticipated Site Use - Unrestricted Use
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RL - Reporting Limit
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RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
PPB (ug/kg) - Parts per Billion

TABLE 3E

245 West 55th Street
New York, New York

Summary of Metals in Soils

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-1 L2468433-07 11/20/2024 0-2'				SB-1 L2468433-08 11/20/2024 2-4'				SB-1 L2468433-09 11/20/2024 4-6'				SB-1 L2468433-10 11/20/2024 6-8'				SB-1 L2468433-11 11/20/2024 8-10'				SB-1D L2468433-20 11/20/2024 0-2'				SB-1D L2468433-24 11/20/2024 2-4'				SB-1D L2468433-25 11/20/2024 4-6'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																																				
Aluminum, Total	7429-90-5	NS	NS	NS	7710		9.43	2.55	4970		9.04	2.44	3680		7.9	2.13	3530		8.82	2.38	6020		10	2.7	8030		9.78	2.64	6790		10.5	2.85	3760		8.78	2.37
Antimony, Total	7440-36-0	NS	NS	NS	0.833	J	4.72	0.358	0.435	J	4.52	0.344	0.363	J	3.95	0.3	0.339	J	4.41	0.335	ND		5.01	0.38	0.569	J	4.89	0.372	0.489	J	5.27	0.401	ND		4.39	0.334
Arsenic, Total	7440-38-2	13	16	16	10.1		0.943	0.196	1.64		0.904	0.188	0.994		0.79	0.164	0.958		0.882	0.183	2.11		1	0.208	6.31		0.978	0.203	6.09		1.05	0.219	1.27		0.878	0.183
Barium, Total	7440-39-3	*410*	*410*	820	122		0.943	0.164	73.3		0.904	0.157	28.3		0.79	0.137	32.5		0.882	0.154	65.1		1	0.174	232		0.978	0.17	301		1.05	0.183	27.4		0.878	0.153
Beryllium, Total	7440-41-7	*4.4*	*43*	47	0.57		0.472	0.031	0.272	J	0.452	0.03	0.204	J	0.395	0.026	0.212	J	0.441	0.029	0.379	J	0.501	0.033	0.469	J	0.489	0.032	0.442	J	0.527	0.035	0.226	J	0.439	0.029
Cadmium, Total	7440-43-9	2.5	*2.5*	7.5	0.157	J	0.943	0.092	ND		0.904	0.089	ND		0.79	0.077	ND		0.882	0.086	ND		1	0.098	0.213	J	0.978	0.096	ND		1.05	0.103	0.115	J	0.878	0.086
Calcium, Total	7440-70-2	NS	NS	NS	6290		9.43	3.3	3400		9.04	3.16	5590		7.9	2.76	5190		8.82	3.09	8930		10	3.5	4570		9.78	3.42	4900		10.5	3.69	6840		8.78	3.07
Chromium, Total	7440-47-3	NS	NS	NS	17.2		0.943	0.091	13		0.904	0.087	20.9		0.79	0.076	19.6		0.882	0.085	14.1		1	0.096	19.2		0.978	0.094	15.5		1.05	0.101	16.4		0.878	0.084
Cobalt, Total	7440-48-4	NS	NS	NS	5.6		1.89	0.156	4.04		1.81	0.15	3.7		1.58	0.131	3.33		1.76	0.146	6.04		2	0.166	10.7		1.96	0.162	6.18		2.11	0.175	3.99		1.76	0.146
Copper, Total	7440-50-8	50	280	1,720	24.1		0.943	0.243	10.4		0.904	0.233	8.88		0.79	0.204	7.05		0.882	0.228	15.4		1	0.258	18.4		0.978	0.252	29.8		1.05	0.272	18		0.878	0.226
Iron, Total	7439-89-6	NS	NS	NS	28500		4.72	0.852	11600		4.52	0.816	8700		3.95	0.713	8440		4.41	0.797	12700		5.01	0.904	24300		4.89	0.883	24600		5.27	0.952	8710		4.39	0.793
Lead, Total	7439-92-1	63	400	450	9.59		4.72	0.253	5.4		4.52	0.242	3.66	J	3.95	0.212	3.58	J	4.41	0.236	6.9		5.01	0.268	10.4		4.89	0.262	7.52		5.27	0.282	3.92	J	4.39	0.235
Magnesium, Total	7439-95-4	NS	NS	NS	2900		9.43	1.45	3420		9.04	1.39	4990		7.9	1.22	4480		8.82	1.36	7240		10	1.54	3460		9.78	1.51	3260		10.5	1.62	4460		8.78	1.35
Manganese, Total	7439-96-5	1,600	2,000	2,000	593		0.943	0.15	378		0.904	0.144	293		0.79	0.126	287		0.882	0.14	274		1	0.159	**2020**		1.96	0.311	**1620**		1.05	0.168	260		0.878	0.14
Mercury, Total	7439-97-6	0.18	0.3	0.73	ND		0.087	0.057	ND		0.076	0.05	ND		0.073	0.047	ND		0.083	0.054	ND		0.087	0.056	ND		0.084	0.055	ND		0.092	0.06	ND		0.074	0.049
Nickel, Total	7440-02-0	30	320	130	16.6		2.36	0.228	10.7		2.26	0.219	9.57		1.97	0.191	8.62		2.2	0.213	14.3		2.5	0.242	17		2.44	0.237	14.1		2.64	0.255	10.2		2.2	0.212
Potassium, Total	7440-09-7	NS	NS	NS	795		236	13.6	802		226	13	750		197	11.4	692		220	12.7	1250		250	14.4	928		244	14.1	1100		264	15.2	730		220	12.6
Selenium, Total	7782-49-2	3.9	110	4	ND		1.89	0.243	ND		1.81	0.233	ND		1.58	0.204	ND		1.76	0.228	ND		2	0.258	ND		1.96	0.252	ND		2.11	0.272	ND		1.76	0.226
Silver, Total	7440-22-4	2	110	8.3	0.386	J	0.472	0.267	0.4	J	0.452	0.256	ND		0.395	0.224	ND		0.441	0.25	ND		0.501	0.283	ND		0.489	0.277	0.699		0.527	0.298	0.574		0.439	0.248
Sodium, Total	7440-23-5	NS	NS	NS	135	J	189	2.97	99.3	J	181	2.85	85.6	J	158	2.49	75.5	J	176	2.78	146	J	200	3.15	126	J	196	3.08	135	J	211	3.32	96.8	J	176	2.76
Thallium, Total	7440-28-0	NS	NS	NS	ND		1.89	0.297	ND		1.81	0.285	ND		1.58	0.249	ND		1.76	0.278	ND		2	0.315	ND		1.96	0.308	ND		2.11	0.332	ND		1.76	0.276
Vanadium, Total	7440-62-2	NS	NS	NS	24.5		0.943	0.191	12.8		0.904	0.184	10.4		0.79	0.16	9.76		0.882	0.179	18		1	0.203	21.9		0.978	0.198	18.6		1.05	0.214	10.4		0.878	0.178
Zinc, Total	7440-66-6	109	6,600	2,480	45.3		4.72	0.276	28.2		4.52	0.265	18.5		3.95	0.231	18.1		4.41	0.258	30.3		5.01	0.293	46.8		4.89	0.286	40.6		5.27	0.309	45.2		4.39	0.257
GENERAL CHEMISTRY																																				
Chromium, Trivalent	16065-83-1	30	110	NS	16.6	J	0.96	0.192	12.5	J	0.937	0.187	19.8		0.838	0.168	18.6		0.928	0.186	14.1		1.06	0.213	19.2		0.989	0.198	15.5		1.08	0.216	15.9	J	0.883	0.177
Chromium, Hexavalent	18540-29-9	1	1	19	0.576	J	0.96	0.192	0.492	J	0.937	0.187	**1.08**		0.838	0.168	**1.03**		0.928	0.186	ND		**1.06**	0.213	ND		0.989	0.198	ND		**1.08**	0.216	0.508	J	0.883	0.177
Cyanide, Total	57-12-5	2.3	13	40	ND		1.1	0.24	ND		1.1	0.23	ND		0.95	0.2	ND		1	0.22	ND		1.3	0.27	ND		1.2	0.26	0.7	J	1.3	0.27	ND		1.1	0.23
Solids, Total	NONE	NS	NS	NS	83.3		0.1	NA	85.4		0.1	NA	95.4		0.1	NA	86.2		0.1	NA	75.2		0.1	NA	80.9		0.1	NA	74.1		0.1	NA	90.6		0.1	NA

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO and NY-AWQS
NY-AWQS - New York TOGS 111 Ambient Water Quality Standards
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3E

245 West 55th Street
New York, New York

Summary of Metals in Soils

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-1D L2468433-26 11/20/2024 6-8'				SB-1D L2468433-21 11/20/2024 8-10'				SB-2 L2505323-01 1/30/2025 0-2'				SB-2 L2505323-02 1/30/2025 2-4'				SB-2 L2505323-03 1/30/2025 4-6'				SB-2 L2505323-04 1/30/2025 6-8'				DUP L2505323-06 1/30/2025 6-8'				SB-2 L2505323-05 1/30/2025 8-10'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																																				
Aluminum, Total	7429-90-5	NS	NS	NS	4490		9.49	2.56	5380		9.53	2.57	6400		9.51	3.09	6130		9.58	3.12	4530		9.7	3.15	3620		8.37	2.72	3430		8.43	2.74	4820		9.02	2.93
Antimony, Total	7440-36-0	NS	NS	NS	0.361	J	4.75	0.361	0.481	J	4.77	0.362	ND		4.75	3.66	ND		4.79	3.69	ND		4.85	3.73	ND		4.18	3.22	ND		4.22	3.24	ND		4.51	3.47
Arsenic, Total	7440-38-2	13	16	16	1.21		0.949	0.197	1.72		0.953	0.198	2.1		0.951	0.411	5.51		0.958	0.414	1.05		0.97	0.419	1.07		0.837	0.361	0.99		0.843	0.364	0.656	J	0.902	0.39
Barium, Total	7440-39-3	*410*	*410*	820	36.4		0.949	0.165	55.7		0.953	0.166	85.4		0.951	0.101	157		0.958	0.102	93.2		0.97	0.103	41.9		0.837	0.089	38.3		0.843	0.089	52.6		0.902	0.096
Beryllium, Total	7440-41-7	*4.4*	*43*	47	0.266	J	0.475	0.031	0.331	J	0.477	0.031	0.395	J	0.475	0.052	0.455	J	0.479	0.053	0.302	J	0.485	0.053	0.225	J	0.418	0.046	0.21	J	0.422	0.046	0.322	J	0.451	0.05
Cadmium, Total	7440-43-9	2.5	*2.5*	7.5	0.102	J	0.949	0.093	ND		0.953	0.093	0.231	J	0.951	0.052	0.449	J	0.958	0.053	0.162	J	0.97	0.053	0.056	J	0.837	0.046	0.06	J	0.843	0.046	0.104	J	0.902	0.05
Calcium, Total	7440-70-2	NS	NS	NS	6980		9.49	3.32	7500		9.53	3.34	8380		9.51	5.39	5240		9.58	5.44	5250		9.7	5.5	7620		8.37	4.74	7100		8.43	4.78	8430		9.02	5.11
Chromium, Total	7440-47-3	NS	NS	NS	18.6		0.949	0.091	11.7		0.953	0.092	12.7		0.951	0.806	12		0.958	0.813	10.7		0.97	0.822	7.3		0.837	0.71	6.69		0.843	0.715	9.63		0.902	0.765
Cobalt, Total	7440-48-4	NS	NS	NS	4.8		1.9	0.158	5.58		1.91	0.158	5.16		1.9	0.236	7.66		1.92	0.238	4.72		1.94	0.24	3.92		1.67	0.207	3.68		1.69	0.209	5.46		1.8	0.224
Copper, Total	7440-50-8	50	280	1,720	18.7		0.949	0.245	13.5		0.953	0.246	27.6		0.951	0.216	19.7		0.958	0.218	12		0.97	0.22	9.58		0.837	0.19	9.01		0.843	0.191	15		0.902	0.205
Iron, Total	7439-89-6	NS	NS	NS	10400		4.75	0.857	11400		4.77	0.861	9800		4.75	0.998	26000		4.79	1.01	13000		4.85	1.02	7200		4.18	0.878	6810		4.22	0.885	9730		4.51	0.947
Lead, Total	7439-92-1	63	400	450	4.82		4.75	0.254	6.44		4.77	0.255	36.2		4.75	0.226	17.3		4.79	0.228	9.77		4.85	0.231	4.1	J	4.18	0.199	3.59	J	4.22	0.201	6.24		4.51	0.215
Magnesium, Total	7439-95-4	NS	NS	NS	5750		9.49	1.46	6710		9.53	1.47	2960		9.51	1.55	3060		9.58	1.56	3880		9.7	1.58	5090		8.37	1.36	4810		8.43	1.37	6040		9.02	1.47
Manganese, Total	7439-96-5	1,600	2,000	2,000	325		0.949	0.151	257		0.953	0.152	241		0.951	0.51	344		0.958	0.514	244		0.97	0.52	269		0.837	0.448	269		0.843	0.452	263		0.902	0.483
Mercury, Total	7439-97-6	0.18	0.3	0.73	ND		0.082	0.054	ND		0.083	0.054	0.115		0.085	0.056	0.072	J	0.08	0.052	0.054	J	0.08	0.052	ND		0.072	0.047	ND		0.072	0.047	0.057	J	0.08	0.052
Nickel, Total	7440-02-0	30	320	130	11.5		2.37	0.23	13		2.38	0.231	12.5		2.38	0.768	18.9		2.4	0.774	12.5		2.42	0.784	10.3		2.09	0.676	9.62		2.11	0.681	13		2.25	0.729
Potassium, Total	7440-09-7	NS	NS	NS	859		237	13.7	1130		238	13.7	897		238	48.2	945		240	48.6	859		242	49.2	732		209	42.4	720		211	42.7	995		225	45.7
Selenium, Total	7782-49-2	3.9	110	4	ND		1.9	0.245	0.262	J	1.91	0.246	ND		1.9	0.313	0.486	J	1.92	0.315	ND		1.94	0.319	ND		1.67	0.275	ND		1.69	0.277	ND		1.8	0.297
Silver, Total	7440-22-4	2	110	8.3	0.392	J	0.475	0.269	ND		0.477	0.27	**14.9**		0.475	0.283	**5.63**		0.479	0.286	**2.86**		0.485	0.289	**4.96**		0.418	0.249	**4.94**		0.422	0.251	**5.18**		0.451	0.269
Sodium, Total	7440-23-5	NS	NS	NS	112	J	190	2.99	126	J	191	3	176	J	190	101	174	J	192	102	115	J	194	103	ND		167	88.7	89.6	J	169	89.4	113	J	180	95.6
Thallium, Total	7440-28-0	NS	NS	NS	ND		1.9	0.299	ND		1.91	0.3	ND		1.9	0.858	ND		1.92	0.865	ND		1.94	0.875	ND		1.67	0.755	ND		1.69	0.76	ND		1.8	0.813
Vanadium, Total	7440-62-2	NS	NS	NS	12.7		0.949	0.193	16.4		0.953	0.194	13.9		0.951	0.144	19		0.958	0.145	13		0.97	0.146	10.8		0.837	0.126	9.74		0.843	0.127	13		0.902	0.136
Zinc, Total	7440-66-6	109	6,600	2,480	32.1		4.75	0.278	28.2		4.77	0.279	47.2		4.75	0.576	40.4		4.79	0.581	28		4.85	0.588	18		4.18	0.507	16.9		4.22	0.511	25.5		4.51	0.546
GENERAL CHEMISTRY																																				
Chromium, Trivalent	16065-83-1	30	110	NS	17.7	J	0.957	0.191	11.7		1	0.2	12.7		0.995	0.806	12		0.982	0.813	10.7		1	0.822	7.3		0.889	0.71	6.69		0.878	0.715	9.63		0.911	0.765
Chromium, Hexavalent	18540-29-9	1	1	19	0.909	J	0.957	0.191	ND		1	0.2	ND		0.995	0.199	ND		0.982	0.196	ND		1	0.2	ND		0.889	0.178	ND		0.878	0.176	ND		0.911	0.182
Cyanide, Total	57-12-5	2.3	13	40	ND		1.2	0.24	ND		1.2	0.26	0.74	J	1.2	0.26	ND		1.2	0.26	ND		1.2	0.26	ND		1	0.22	ND		1	0.22	ND		1.1	0.24
Solids, Total	NONE	NS	NS	NS	83.6		0.1	NA	79.9		0.1	NA	80.4		0.1	NA	81.5		0.1	NA	79.8		0.1	NA	90		0.1	NA	91.1		0.1	NA	87.8		0.1	NA

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO and NY-AWQS
NY-AWQS - New York TOGS 111 Ambient Water Quality Standards
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
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NS - No Applicable Standard
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TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3E

245 West 55th Street
New York, New York

Summary of Metals in Soils

SAMPLE ID: LAB ID: COLLECTION DATE: DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-3 L2468036-07 11/19/2024 0-2'				SB-3 L2468036-08 11/19/2024 2-4'				SB-3 L2468036-09 11/19/2024 4-6'				SB-3 L2468036-10 11/19/2024 6-8'				SB-3 L2468036-11 11/19/2024 8-10'				SB-4 L2467646-06 11/18/2024 0-2'				SB-4 L2467646-07 11/18/2024 2-4'				SB-4 L2467646-08 11/18/2024 4-6'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																																				
Aluminum, Total	7429-90-5	NS	NS	NS	6750		9.3	2.51	5410		9.03	2.44	4910		9.18	2.48	4670		9.73	2.63	4190		9.41	2.54	6140		9.52	2.57	4420		9.52	2.57	2940		8.23	2.22
Antimony, Total	7440-36-0	NS	NS	NS	ND		4.65	0.353	ND		4.51	0.343	ND		4.59	0.349	ND		4.87	0.37	ND		4.7	0.357	ND		4.76	0.362	ND		4.76	0.362	ND		4.12	0.313
Arsenic, Total	7440-38-2	13	16	16	2.73		0.93	0.193	3.13		0.903	0.188	2.4		0.918	0.191	1.97		0.973	0.202	2.56		0.941	0.196	4.68		0.952	0.198	9.42		0.952	0.198	0.632	J	0.823	0.171
Barium, Total	7440-39-3	*410*	*410*	820	77.1		0.93	0.162	61.3		0.903	0.157	51.5		0.918	0.16	48.1		0.973	0.169	79.7		0.941	0.164	**500**		0.952	0.166	**498**		0.952	0.166	24.5		0.823	0.143
Beryllium, Total	7440-41-7	*4.4*	*43*	47	0.319	J	0.465	0.031	0.342	J	0.451	0.03	0.283	J	0.459	0.03	0.308	J	0.487	0.032	0.262	J	0.47	0.031	0.306	J	0.476	0.031	0.311	J	0.476	0.031	0.173	J	0.412	0.027
Cadmium, Total	7440-43-9	2.5	*2.5*	7.5	ND		0.93	0.091	ND		0.903	0.089	ND		0.918	0.09	ND		0.973	0.095	ND		0.941	0.092	ND		0.952	0.093	ND		0.952	0.093	ND		0.823	0.081
Calcium, Total	7440-70-2	NS	NS	NS	5270		9.3	3.25	5270		9.03	3.16	3690		9.18	3.21	6410		9.73	3.41	5680		9.41	3.29	4280		9.52	3.33	3010		9.52	3.33	4410		8.23	2.88
Chromium, Total	7440-47-3	NS	NS	NS	13.8		0.93	0.089	13.1		0.903	0.087	12.6		0.918	0.088	26.7		0.973	0.093	37.4		0.941	0.09	15.1		0.952	0.091	11.5		0.952	0.091	6.4		0.823	0.079
Cobalt, Total	7440-48-4	NS	NS	NS	4.27		1.86	0.154	5.15		1.8	0.15	4.37		1.84	0.152	4.61		1.95	0.162	3.89		1.88	0.156	6.89		1.9	0.158	4.79		1.9	0.158	3.04		1.65	0.137
Copper, Total	7440-50-8	50	280	1,720	16.8		0.93	0.24	13.6		0.903	0.233	11.6		0.918	0.237	11		0.973	0.251	10.2		0.941	0.243	12.8		0.952	0.246	10.4		0.952	0.246	5.85		0.823	0.212
Iron, Total	7439-89-6	NS	NS	NS	14700		4.65	0.84	13600		4.51	0.815	11700		4.59	0.829	11300		4.87	0.879	11200		4.7	0.849	25300		4.76	0.86	30800		4.76	0.86	7100		4.12	0.743
Lead, Total	7439-92-1	63	400	450	31.3		4.65	0.249	39.6		4.51	0.242	21.7		4.59	0.246	14.4		4.87	0.261	7.59		4.7	0.252	7.05		4.76	0.255	6.13		4.76	0.255	3.33	J	4.12	0.22
Magnesium, Total	7439-95-4	NS	NS	NS	3000		9.3	1.43	3720		9.03	1.39	3120		9.18	1.41	5040		9.73	1.5	4020		9.41	1.45	2380		9.52	1.47	2050		9.52	1.47	3570		8.23	1.27
Manganese, Total	7439-96-5	1,600	2,000	2,000	392		0.93	0.148	345		0.903	0.144	234		0.918	0.146	201		0.973	0.155	270		0.941	0.15	**3160**		0.952	0.151	**2700**		0.952	0.151	210		0.823	0.131
Mercury, Total	7439-97-6	0.18	0.3	0.73	0.125		0.081	0.053	0.118		0.075	0.049	0.158		0.082	0.053	ND		0.081	0.053	ND		0.082	0.053	ND		0.092	0.06	ND		0.093	0.061	ND		0.083	0.054
Nickel, Total	7440-02-0	30	320	130	11.7		2.32	0.225	12		2.26	0.218	10.7		2.3	0.222	11		2.43	0.236	9.44		2.35	0.228	17.3		2.38	0.23	12.3		2.38	0.23	7.84		2.06	0.199
Potassium, Total	7440-09-7	NS	NS	NS	918		232	13.4	956		226	13	770		230	13.2	1050		243	14	832		235	13.5	930		238	13.7	733		238	13.7	579		206	11.8
Selenium, Total	7782-49-2	3.9	110	4	ND		1.86	0.24	ND		1.8	0.233	ND		1.84	0.237	ND		1.95	0.251	ND		1.88	0.243	ND		1.9	0.246	ND		1.9	0.246	ND		1.65	0.212
Silver, Total	7440-22-4	2	110	8.3	ND		0.465	0.263	0.802		0.451	0.256	ND		0.459	0.26	ND		0.487	0.275	ND		0.47	0.266	0.453	J	0.476	0.27	ND		0.476	0.269	ND		0.412	0.233
Sodium, Total	7440-23-5	NS	NS	NS	93.4	J	186	2.93	95.6	J	180	2.84	78.7	J	184	2.89	106	J	195	3.06	95.9	J	188	2.96	177	J	190	3	142	J	190	3	73.8	J	165	2.59
Thallium, Total	7440-28-0	NS	NS	NS	ND		1.86	0.293	ND		1.8	0.284	ND		1.84	0.289	ND		1.95	0.306	ND		1.88	0.296	ND		1.9	0.3	ND		1.9	0.3	ND		1.65	0.259
Vanadium, Total	7440-62-2	NS	NS	NS	14		0.93	0.189	15.6		0.903	0.183	12.3		0.918	0.186	14.4		0.973	0.198	12.4		0.941	0.191	14.8		0.952	0.193	15.4		0.952	0.193	8.07		0.823	0.167
Zinc, Total	7440-66-6	109	6,600	2,480	48.5		4.65	0.272	46.6		4.51	0.264	34.2		4.59	0.269	28.9		4.87	0.285	23.8		4.7	0.276	33.3		4.76	0.279	26		4.76	0.279	15.6		4.12	0.241
GENERAL CHEMISTRY																																				
Chromium, Trivalent	16065-83-1	30	110	NS	13.8		0.971	0.194	13.1		0.941	0.188	12.6		0.923	0.184	26.7		0.978	0.196	**36.5**	**J**	0.983	0.196	15.1		1	0.2	11.5		1	0.2	6.4		0.842	0.168
Chromium, Hexavalent	18540-29-9	1	1	19	ND		0.971	0.194	ND		0.941	0.188	ND		0.923	0.184	ND		0.978	0.196	0.934	J	0.983	0.196	ND		1	0.2	ND		1	0.2	ND		0.842	0.168
Cyanide, Total	57-12-5	2.3	13	40	ND		1.1	0.24	ND		1.1	0.24	ND		1.1	0.23	ND		1.2	0.25	ND		1.1	0.24	0.46	J	1.2	0.26	0.32	J	1.2	0.26	ND		1	0.22
Solids, Total	NONE	NS	NS	NS	82.4		0.1	NA	85		0.1	NA	86.7		0.1	NA	81.8		0.1	NA	81.4		0.1	NA	79.9		0.1	NA	79.8		0.1	NA	95		0.1	NA

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO and NY-AWQS
NY-AWQS - New York TOGS 111 Ambient Water Quality Standards
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3E

245 West 55th Street
New York, New York

Summary of Metals in Soils

SAMPLE ID:		Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-4				SB-5				SB-5				SB-5				SB-5				SB-5				DUP-1 (SB-5)				SB-6				SB-6			
LAB ID:					L2467646-09				L2467646-14				L2467646-15				L2467646-16				L2467646-17				L2467646-18				L2468036-18				L2468036-19			
COLLECTION DATE:					11/18/2024				11/18/2024				11/18/2024				11/18/2024				11/18/2024				11/18/2024				11/19/2024				11/19/2024			
DEPTH:					6-8'				0-2'				2-4'				4-6'				6-8'				6-8'				0-2'				2-4'			
	CAS				Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																																				
Aluminum, Total	7429-90-5	NS	NS	NS	3710		8.9	2.4	4530		9.29	2.51	3500		8.54	2.3	2600		8.36	2.26	2990		8.77	2.37	2740		9.01	2.43	8000		10	2.7	3530		8.43	2.28
Antimony, Total	7440-36-0	NS	NS	NS	ND		4.45	0.338	ND		4.64	0.353	ND		4.27	0.324	ND		4.18	0.318	ND		4.38	0.333	ND		4.5	0.342	ND		5	0.38	ND		4.22	0.32
Arsenic, Total	7440-38-2	13	16	16	0.947		0.89	0.185	0.714	J	0.929	0.193	0.996		0.854	0.178	0.544	J	0.836	0.174	0.659	J	0.877	0.182	0.364	J	0.901	0.187	5.57		1	0.208	2.19		0.843	0.175
Barium, Total	7440-39-3	*410*	*410*	820	29.4		0.89	0.155	64.3		0.929	0.162	37.8		0.854	0.149	23.3		0.836	0.145	28.8		0.877	0.153	28.3		0.901	0.157	131		1	0.174	78.6		0.843	0.147
Beryllium, Total	7440-41-7	*4.4*	*43*	47	0.229	J	0.445	0.029	0.304	J	0.464	0.031	0.218	J	0.427	0.028	0.156	J	0.418	0.028	0.19	J	0.438	0.029	0.174	J	0.45	0.03	0.476	J	0.5	0.033	0.227	J	0.422	0.028
Cadmium, Total	7440-43-9	2.5	*2.5*	7.5	ND		0.89	0.087	ND		0.929	0.091	ND		0.854	0.084	ND		0.836	0.082	ND		0.877	0.086	ND		0.901	0.088	ND		1	0.098	ND		0.843	0.083
Calcium, Total	7440-70-2	NS	NS	NS	7210		8.9	3.11	2520		9.29	3.25	4940		8.54	2.99	6240		8.36	2.92	7110		8.77	3.07	7780		9.01	3.15	5570		10	3.5	3420		8.43	2.95
Chromium, Total	7440-47-3	NS	NS	NS	7.65		0.89	0.085	10.1		0.929	0.089	7.74		0.854	0.082	5.37		0.836	0.08	6.31		0.877	0.084	4.8		0.901	0.087	14.7		1	0.096	8.99		0.843	0.081
Cobalt, Total	7440-48-4	NS	NS	NS	3.75		1.78	0.148	4.21		1.86	0.154	3.96		1.71	0.142	2.8		1.67	0.139	3.16		1.75	0.146	3.01		1.8	0.15	5.33		2	0.166	2.97		1.69	0.14
Copper, Total	7440-50-8	50	280	1,720	7.85		0.89	0.23	9.54		0.929	0.24	7.71		0.854	0.22	5.29		0.836	0.216	6.29		0.877	0.226	6.45		0.901	0.232	15.2		1	0.258	6.62		0.843	0.218
Iron, Total	7439-89-6	NS	NS	NS	8980		4.45	0.803	9920		4.64	0.838	8220		4.27	0.771	6560		4.18	0.754	7510		4.38	0.792	5950		4.5	0.814	21700		5	0.902	10400		4.22	0.762
Lead, Total	7439-92-1	63	400	450	4.3	J	4.45	0.238	6.76		4.64	0.249	4.42		4.27	0.229	2.77	J	4.18	0.224	3.55	J	4.38	0.235	3.11	J	4.5	0.241	18.2		5	0.268	4.16	J	4.22	0.226
Magnesium, Total	7439-95-4	NS	NS	NS	5090		8.9	1.37	2660		9.29	1.43	4130		8.54	1.32	3960		8.36	1.29	4500		8.77	1.35	4580		9.01	1.39	2540		10	1.54	2860		8.43	1.3
Manganese, Total	7439-96-5	1,600	2,000	2,000	241		0.89	0.141	163		0.929	0.148	257		0.854	0.136	282		0.836	0.133	275		0.877	0.139	255		0.901	0.143	342		1	0.159	246		0.843	0.134
Mercury, Total	7439-97-6	0.18	0.3	0.73	ND		0.076	0.05	ND		0.085	0.055	ND		0.077	0.05	ND		0.077	0.05	ND		0.086	0.056	ND		0.088	0.057	ND		0.097	0.064	ND		0.074	0.048
Nickel, Total	7440-02-0	30	320	130	9.42		2.22	0.215	10.8		2.32	0.225	9.4		2.14	0.207	7.09		2.09	0.202	8.03		2.19	0.212	7.52		2.25	0.218	13.1		2.5	0.242	8.08		2.11	0.204
Potassium, Total	7440-09-7	NS	NS	NS	836		222	12.8	871		232	13.4	660		214	12.3	515		209	12	615		219	12.6	528		225	13	882		250	14.4	628		211	12.1
Selenium, Total	7782-49-2	3.9	110	4	ND		1.78	0.23	ND		1.86	0.24	ND		1.71	0.22	ND		1.67	0.216	ND		1.75	0.226	ND		1.8	0.232	ND		2	0.258	ND		1.69	0.218
Silver, Total	7440-22-4	2	110	8.3	ND		0.445	0.252	ND		0.464	0.263	ND		0.427	0.242	ND		0.418	0.236	ND		0.438	0.248	ND		0.45	0.255	ND		0.5	0.283	0.264	J	0.422	0.239
Sodium, Total	7440-23-5	NS	NS	NS	82.3	J	178	2.8	96.4	J	186	2.92	72	J	171	2.69	55.4	J	167	2.63	75.6	J	175	2.76	60.4	J	180	2.84	87.7	J	200	3.15	69.7	J	169	2.66
Thallium, Total	7440-28-0	NS	NS	NS	ND		1.78	0.28	ND		1.86	0.292	ND		1.71	0.269	ND		1.67	0.263	ND		1.75	0.276	ND		1.8	0.284	ND		2	0.315	ND		1.69	0.266
Vanadium, Total	7440-62-2	NS	NS	NS	10.9		0.89	0.181	13.8		0.929	0.188	10.3		0.854	0.173	7.43		0.836	0.17	8.6		0.877	0.178	6.35		0.901	0.183	17.7		1	0.203	10.1		0.843	0.171
Zinc, Total	7440-66-6	109	6,600	2,480	19.4		4.45	0.261	30.7		4.64	0.272	20.1		4.27	0.25	13.6		4.18	0.245	15.5		4.38	0.257	14.6		4.5	0.264	42.1		5	0.293	19.1		4.22	0.247
GENERAL CHEMISTRY																																				
Chromium, Trivalent	16065-83-1	30	110	NS	7.65		0.937	0.187	10.1		0.955	0.191	7.74		0.86	0.172	5.37		0.84	0.168	6.31		0.899	0.18	4.8		0.929	0.186	14.7		1.04	0.208	8.99		0.868	0.174
Chromium, Hexavalent	18540-29-9	1	1	19	ND		0.937	0.187	ND		0.955	0.191	ND		0.86	0.172	ND		0.84	0.168	ND		0.899	0.18	ND		0.929	0.186	ND		**1.04**	0.208	ND		0.868	0.174
Cyanide, Total	57-12-5	2.3	13	40	ND		1.1	0.24	ND		1.2	0.24	ND		0.99	0.21	ND		0.96	0.2	ND		1	0.22	ND		1.1	0.24	ND		1.3	0.27	ND		1.1	0.23
Solids, Total	NONE	NS	NS	NS	85.4		0.1	NA	83.8		0.1	NA	93		0.1	NA	95.2		0.1	NA	89		0.1	NA	86.1		0.1	NA	76.9		0.1	NA	92.2		0.1	NA

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO and NY-AWQS
NY-AWQS - New York TOGS 111 Ambient Water Quality Standards
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3E

245 West 55th Street
New York, New York

Summary of Metals in Soils

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-6 L2468036-20 11/19/2024 4-6'				SB-6 L2468036-21 11/19/2024 6-8'				SB-6 L2468036-22 11/19/2024 8-10'				SB-7 L2468036-35 11/19/2024 0-2'				SB-7 L2468036-36 11/19/2024 2-4'				SB-7 L2468036-37 11/19/2024 4-6'				SB-7 L2468036-38 11/19/2024 6-8'				SB-7 L2468036-39 11/19/2024 8-10'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																																				
Aluminum, Total	7429-90-5	NS	NS	NS	2360		7.9	2.13	3220		8.23	2.22	4510		9.74	2.63	6500		8.84	2.38	6550		10.1	2.73	4470		8.68	2.34	3800		8.29	2.24	4920		8.62	2.33
Antimony, Total	7440-36-0	NS	NS	NS	ND		3.95	0.3	ND		4.11	0.313	ND		4.87	0.37	ND		4.42	0.336	ND		5.06	0.384	ND		4.34	0.33	ND		4.15	0.315	ND		4.31	0.328
Arsenic, Total	7440-38-2	13	16	16	0.649	J	0.79	0.164	0.95		0.823	0.171	1.52		0.974	0.203	2.27		0.884	0.184	2.34		1.01	0.21	1.87		0.868	0.18	1.29		0.829	0.172	1.67		0.862	0.179
Barium, Total	7440-39-3	*410*	*410*	820	21.2		0.79	0.138	36.4		0.823	0.143	53.8		0.974	0.17	98.7		0.884	0.154	172		1.01	0.176	87		0.868	0.151	35.3		0.829	0.144	43.8		0.862	0.15
Beryllium, Total	7440-41-7	*4.4*	*43*	47	0.139	J	0.395	0.026	0.212	J	0.411	0.027	0.299	J	0.487	0.032	0.416	J	0.442	0.029	0.396	J	0.506	0.033	0.257	J	0.434	0.029	0.246	J	0.415	0.027	0.316	J	0.431	0.028
Cadmium, Total	7440-43-9	2.5	*2.5*	7.5	ND		0.79	0.078	ND		0.823	0.081	ND		0.974	0.096	ND		0.884	0.087	ND		1.01	0.099	ND		0.868	0.085	ND		0.829	0.081	ND		0.862	0.085
Calcium, Total	7440-70-2	NS	NS	NS	4910		7.9	2.77	6710		8.23	2.88	9010		9.74	3.41	3860		8.84	3.09	2270		10.1	3.54	4550		8.68	3.04	7810		8.29	2.9	7920		8.62	3.02
Chromium, Total	7440-47-3	NS	NS	NS	11.5		0.79	0.076	8.68		0.823	0.079	9.83		0.974	0.094	17.4		0.884	0.085	13.9		1.01	0.097	11.4		0.868	0.083	9.92		0.829	0.08	54.8		0.862	0.083
Cobalt, Total	7440-48-4	NS	NS	NS	2.38		1.58	0.131	3.36		1.64	0.136	4.71		1.95	0.162	7.31		1.77	0.147	6.73		2.02	0.168	4.2		1.74	0.144	3.94		1.66	0.138	4.8		1.72	0.143
Copper, Total	7440-50-8	50	280	1,720	4.66		0.79	0.204	7.47		0.823	0.212	11.7		0.974	0.251	27.7		0.884	0.228	15.3		1.01	0.261	12.2		0.868	0.224	13.8		0.829	0.214	32.5		0.862	0.222
Iron, Total	7439-89-6	NS	NS	NS	5950		3.95	0.714	8030		4.11	0.743	10800		4.87	0.88	16200		4.42	0.798	20700		5.06	0.914	9680		4.34	0.784	9060		4.15	0.749	10900		4.31	0.778
Lead, Total	7439-92-1	63	400	450	2.55	J	3.95	0.212	3.99	J	4.11	0.22	5.48		4.87	0.261	9.53		4.42	0.237	8.88		5.06	0.271	5.48		4.34	0.233	5		4.15	0.222	9.71		4.31	0.231
Magnesium, Total	7439-95-4	NS	NS	NS	3520		7.9	1.22	4370		8.23	1.27	5820		9.74	1.5	2660		8.84	1.36	2570		10.1	1.56	3760		8.68	1.34	5460		8.29	1.28	5890		8.62	1.33
Manganese, Total	7439-96-5	1,600	2,000	2,000	212		0.79	0.126	254		0.823	0.131	315		0.974	0.155	210		0.884	0.14	872		1.01	0.161	276		0.868	0.138	329		0.829	0.132	243		0.862	0.137
Mercury, Total	7439-97-6	0.18	0.3	0.73	ND		0.067	0.044	ND		0.069	0.045	ND		0.083	0.054	0.069	J	0.077	0.05	0.093	J	0.101	0.066	ND		0.086	0.056	0.071		0.07	0.046	0.099		0.088	0.057
Nickel, Total	7440-02-0	30	320	130	5.98		1.98	0.191	7.8		2.06	0.199	10.8		2.44	0.236	**52.6**		2.21	0.214	19		2.53	0.245	10.4		2.17	0.21	9.45		2.07	0.201	10.9		2.15	0.208
Potassium, Total	7440-09-7	NS	NS	NS	448		198	11.4	651		206	11.8	931		244	14	876		221	12.7	1020		253	14.6	825		217	12.5	835		207	11.9	1120		215	12.4
Selenium, Total	7782-49-2	3.9	110	4	ND		1.58	0.204	ND		1.64	0.212	ND		1.95	0.251	ND		1.77	0.228	ND		2.02	0.261	ND		1.74	0.224	ND		1.66	0.214	ND		1.72	0.222
Silver, Total	7440-22-4	2	110	8.3	0.851		0.395	0.224	ND		0.411	0.233	ND		0.487	0.276	**26.6**		0.971	0.55	**6.75**		0.506	0.286	**15.9**		0.434	0.246	**41.4**		1.66	0.94	**148**		3.58	2.03
Sodium, Total	7440-23-5	NS	NS	NS	49	J	158	2.49	77.7	J	164	2.59	141	J	195	3.07	110	J	177	2.78	94	J	202	3.19	86.3	J	174	2.74	90.3	J	166	2.61	111	J	172	2.72
Thallium, Total	7440-28-0	NS	NS	NS	ND		1.58	0.249	ND		1.64	0.259	ND		1.95	0.307	ND		1.77	0.278	ND		2.02	0.319	ND		1.74	0.274	ND		1.66	0.261	ND		1.72	0.272
Vanadium, Total	7440-62-2	NS	NS	NS	6.9		0.79	0.16	9.61		0.823	0.167	13.8		0.974	0.198	17.1		0.884	0.179	17.5		1.01	0.205	12.4		0.868	0.176	11.7		0.829	0.168	13.5		0.862	0.175
Zinc, Total	7440-66-6	109	6,600	2,480	12.1		3.95	0.232	16.2		4.11	0.241	23.8		4.87	0.286	39.3		4.42	0.259	39		5.06	0.296	25.9		4.34	0.254	20.1		4.15	0.243	27.8		4.31	0.252
GENERAL CHEMISTRY																																				
Chromium, Trivalent	16065-83-1	30	110	NS	11.2	J	0.838	0.168	8.29	J	0.846	0.169	9.51	J	0.996	0.199	17.4		0.932	0.186	13.9		1.04	0.207	11.4		0.901	0.18	9.92		0.877	0.175	**54.8**		0.916	0.183
Chromium, Hexavalent	18540-29-9	1	1	19	0.335	J	0.838	0.168	0.391	J	0.846	0.169	0.324	J	0.996	0.199	ND		0.932	0.186	ND		**1.04**	0.207	ND		0.901	0.18	ND		0.877	0.175	ND		0.916	0.183
Cyanide, Total	57-12-5	2.3	13	40	ND		1	0.22	ND		1	0.21	ND		1.2	0.26	ND		1.1	0.24	ND		1.2	0.26	ND		1.1	0.22	ND		1	0.22	ND		1.1	0.24
Solids, Total	NONE	NS	NS	NS	95.4		0.1	NA	94.6		0.1	NA	80.3		0.1	NA	85.8		0.1	NA	77.2		0.1	NA	88.8		0.1	NA	91.2		0.1	NA	87.3		0.1	NA

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO and NY-AWQS
NY-AWQS - New York TOGS 111 Ambient Water Quality Standards
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3E

245 West 55th Street
New York, New York

Summary of Metals in Soils

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-7 L2468036-40 11/19/2024 16-18'				SB-8 L2518818-06 3/28/2025 4-6'				SB-8 L2518818-07 3/28/2025 6-8'				SB-8 L2518818-11 3/28/2025 8-10'				SB-8 L2518818-12 3/28/2025 10-12'				SB-8 L2518818-13 3/28/2025 12-14'				SB-8 L2518818-14 3/28/2025 14-16'				SB-8 L2518818-15 3/28/2025 16-18'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																																				
Aluminum, Total	7429-90-5	NS	NS	NS	5600		10.1	2.72	8040		8.49	2.76	7760		8.71	2.83	6990		8.84	2.87	7050		9.56	3.11	7340		9.61	3.12	6820		9.42	3.06	3690		8.66	2.82
Antimony, Total	7440-36-0	NS	NS	NS	ND		5.04	0.383	ND		4.25	3.27	ND		4.36	3.36	ND		4.42	3.4	ND		4.78	3.68	ND		4.81	3.7	ND		4.71	3.62	ND		4.33	3.34
Arsenic, Total	7440-38-2	13	16	16	2.06		1.01	0.21	3.65		0.849	0.367	1.93		0.871	0.376	2.57		0.884	0.382	2.01		0.956	0.413	2.07		0.961	0.415	2.69		0.942	0.407	ND		0.866	0.374
Barium, Total	7440-39-3	*410*	*410*	820	68.2		1.01	0.175	58.3		0.849	0.09	51.8		0.871	0.092	36.8		0.884	0.094	46.1		0.956	0.101	42.1		0.961	0.102	63.1		0.942	0.1	31.6		0.866	0.092
Beryllium, Total	7440-41-7	*4.4*	*43*	47	0.369	J	0.504	0.033	0.362	J	0.425	0.047	0.314	J	0.436	0.048	0.308	J	0.442	0.049	0.391	J	0.478	0.053	0.3	J	0.481	0.053	0.356	J	0.471	0.052	0.147	J	0.433	0.048
Cadmium, Total	7440-43-9	2.5	*2.5*	7.5	ND		1.01	0.099	0.215	J	0.849	0.047	0.151	J	0.871	0.048	0.145	J	0.884	0.049	0.132	J	0.956	0.053	ND		0.961	0.053	ND		0.942	0.052	ND		0.866	0.048
Calcium, Total	7440-70-2	NS	NS	NS	9860		10.1	3.53	5830		8.49	4.82	5960		8.71	4.94	5760		8.84	5.01	1790		9.56	5.42	3170		9.61	5.45	2790		9.42	5.34	1320		8.66	4.91
Chromium, Total	7440-47-3	NS	NS	NS	12.6		1.01	0.097	12.3		0.849	0.72	13.2		0.871	0.739	10.9		0.884	0.75	11		0.956	0.811	13.6		0.961	0.815	15.3		0.942	0.798	7.6		0.866	0.735
Cobalt, Total	7440-48-4	NS	NS	NS	5.48		2.02	0.167	8.44		1.7	0.211	7.27		1.74	0.216	6.67		1.77	0.219	6.07		1.91	0.237	8.3		1.92	0.238	7.53		1.88	0.234	4.22		1.73	0.215
Copper, Total	7440-50-8	50	280	1,720	16.2		1.01	0.26	25.1		0.849	0.193	22.4		0.871	0.198	19.4		0.884	0.201	13.6		0.956	0.217	12.6		0.961	0.218	12.1		0.942	0.214	6.64		0.866	0.197
Iron, Total	7439-89-6	NS	NS	NS	12900		5.04	0.91	20700		21.2	4.46	14200		4.36	0.915	13600		4.42	0.929	13900		4.78	1	15000		4.81	1.01	17500		4.71	0.989	12400		4.33	0.91
Lead, Total	7439-92-1	63	400	450	7.64		5.04	0.27	**96.3**		4.25	0.202	25		4.36	0.207	43.8		4.42	0.21	24.3		4.78	0.228	12.7		4.81	0.229	16.3		4.71	0.224	4.66		4.33	0.206
Magnesium, Total	7439-95-4	NS	NS	NS	5940		10.1	1.55	3140		8.49	1.38	3590		8.71	1.42	2550		8.84	1.44	2110		9.56	1.56	2560		9.61	1.57	2450		9.42	1.53	1690		8.66	1.41
Manganese, Total	7439-96-5	1,600	2,000	2,000	243		1.01	0.16	253		0.849	0.455	221		0.871	0.467	231		0.884	0.474	293		0.956	0.513	717		0.961	0.515	890		0.942	0.505	245		0.866	0.464
Mercury, Total	7439-97-6	0.18	0.3	0.73	ND		0.101	0.066	**0.299**		0.022	0.014	0.122		0.087	0.056	0.168		0.082	0.053	**0.202**		0.083	0.054	ND		0.082	0.053	ND		0.093	0.06	ND		0.076	0.049
Nickel, Total	7440-02-0	30	320	130	14.1		2.52	0.244	15.8		2.12	0.686	16.2		2.18	0.704	14.2		2.21	0.714	12		2.39	0.773	13.9		2.4	0.777	12.7		2.35	0.761	6.91		2.17	0.7
Potassium, Total	7440-09-7	NS	NS	NS	1250		252	14.5	1590		212	43	2200		218	44.2	1070		221	44.8	1020		239	48.5	1110		240	48.7	1130		235	47.7	780		217	43.9
Selenium, Total	7782-49-2	3.9	110	4	ND		2.02	0.26	ND		1.7	0.279	ND		1.74	0.287	ND		1.77	0.291	ND		1.91	0.315	0.357	J	1.92	0.316	ND		1.88	0.31	ND		1.73	0.285
Silver, Total	7440-22-4	2	110	8.3	ND		0.504	0.285	ND		0.425	0.253	ND		0.436	0.26	ND		0.442	0.264	ND		0.478	0.285	ND		0.481	0.286	ND		0.471	0.28	ND		0.433	0.258
Sodium, Total	7440-23-5	NS	NS	NS	110	J	202	3.17	190		170	90	204		174	92.4	181		177	93.7	266		191	101	377		192	102	434		188	99.8	161	J	173	91.8
Thallium, Total	7440-28-0	NS	NS	NS	ND		2.02	0.317	ND		1.7	0.766	ND		1.74	0.786	ND		1.77	0.798	ND		1.91	0.863	ND		1.92	0.867	ND		1.88	0.849	ND		1.73	0.782
Vanadium, Total	7440-62-2	NS	NS	NS	17.6		1.01	0.204	21.4		0.849	0.128	15.3		0.871	0.132	16.8		0.884	0.134	16.9		0.956	0.144	13.9		0.961	0.145	15.1		0.942	0.142	9.52		0.866	0.131
Zinc, Total	7440-66-6	109	6,600	2,480	32.3		5.04	0.295	53.9		4.25	0.515	43.9		4.36	0.528	43.4		4.42	0.536	32		4.78	0.58	42.4		4.81	0.583	39.4		4.71	0.571	18.3		4.33	0.525
GENERAL CHEMISTRY																																				
Chromium, Trivalent	16065-83-1	30	110	NS	12.6		1.04	0.208	12	J	0.903	0.72	13.2		0.889	0.739	10.9		0.907	0.75	11		0.99	0.811	13.6		0.994	0.815	15.3		0.963	0.798	7.6		0.869	0.735
Chromium, Hexavalent	18540-29-9	1	1	19	ND		**1.04**	0.208	0.327	J	0.903	0.18	ND		0.889	0.178	ND		0.907	0.181	ND		0.99	0.198	ND		0.994	0.199	ND		0.963	0.192	ND		0.869	0.174
Cyanide, Total	57-12-5	2.3	13	40	ND		1.2	0.27	ND		1.1	0.23	ND		1.1	0.23	ND		1.1	0.23	ND		1.2	0.26	ND		1.2	0.25	ND		1.2	0.25	ND		1	0.22
Solids, Total	NONE	NS	NS	NS	76.8		0.1	NA	88.6		0.1	NA	90		0.1	NA	88.2		0.1	NA	80.8		0.1	NA	80.5		0.1	NA	83.1		0.1	NA	92.1		0.1	NA

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO and NY-AWQS
NY-AWQS - New York TOGS 111 Ambient Water Quality Standards
NA - Not applicable because appropriate toxicological information is not available
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TICs - Tentatively Identified Compounds
RL - Reporting Limit
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RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 3E

245 West 55th Street
New York, New York

Summary of Metals in Soils

SAMPLE ID: / LAB ID: / COLLECTION DATE: / DEPTH:	CAS	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)	SB-8 L2518818-16 3/28/2025 18-20'				DUP (SB-8) L2518818-24 3/28/2025 18-20'				SB-8 L2518818-22 3/28/2025 20-22'				SB-8 L2518818-23 3/28/2025 22-24'				PE-1 L2467646-20 11/18/2024 0-0.5'				PE-2 L2467646-22 11/18/2024 0-0.5'				PE-B L2467646-23 11/18/2024 0-0.5'				DUP-2 (PE-B) L2467646-19 11/18/2024 0-0.5'			
					Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																																				
Aluminum, Total	7429-90-5	NS	NS	NS	4380		8.22	2.67	4060		8.06	2.62	3560		8.72	2.83	3180		9.37	3.05	6050		9.38	2.53	5080		9.57	2.58	3600		9.37	2.53	2850		9.56	2.58
Antimony, Total	7440-36-0	NS	NS	NS	ND		4.11	3.17	ND		4.03	3.1	ND		4.36	3.36	ND		4.69	3.61	ND		4.69	0.357	ND		4.78	0.364	ND		4.68	0.356	ND		4.78	0.363
Arsenic, Total	7440-38-2	13	16	16	1.04		0.822	0.355	0.849		0.806	0.348	1		0.872	0.377	1.14		0.937	0.405	3.86		0.938	0.195	1.82		0.957	0.199	1.5		0.937	0.195	1.26		0.956	0.199
Barium, Total	7440-39-3	*410*	*410*	820	21.5		0.822	0.087	20.8		0.806	0.086	20		0.872	0.092	16.3		0.937	0.099	66.6		0.938	0.163	58.8		0.957	0.166	48.2		0.937	0.163	29.8		0.956	0.166
Beryllium, Total	7440-41-7	*4.4*	*43*	47	0.499		0.411	0.045	0.328	J	0.403	0.044	0.225	J	0.436	0.048	0.212	J	0.469	0.052	0.355	J	0.469	0.031	0.306	J	0.478	0.032	0.247	J	0.468	0.031	0.193	J	0.478	0.032
Cadmium, Total	7440-43-9	2.5	*2.5*	7.5	ND		0.822	0.045	ND		0.806	0.044	ND		0.872	0.048	ND		0.937	0.052	ND		0.938	0.092	ND		0.957	0.094	ND		0.937	0.092	ND		0.956	0.094
Calcium, Total	7440-70-2	NS	NS	NS	3360		8.22	4.66	3690		8.06	4.57	7360		8.72	4.94	8110		9.37	5.31	15200		9.38	3.28	4280		9.57	3.35	4060		9.37	3.28	5960		9.56	3.35
Chromium, Total	7440-47-3	NS	NS	NS	7.31		0.822	0.697	7.21		0.806	0.684	7.31		0.872	0.739	7.06		0.937	0.795	16.2		0.938	0.09	8.55		0.957	0.092	10		0.937	0.09	8.27		0.956	0.092
Cobalt, Total	7440-48-4	NS	NS	NS	7.5		1.64	0.204	6.24		1.61	0.2	3.72		1.74	0.216	3.77		1.87	0.232	5.54		1.88	0.156	4.09		1.91	0.159	4.31		1.87	0.156	3.28		1.91	0.159
Copper, Total	7440-50-8	50	280	1,720	8.61		0.822	0.187	8.02		0.806	0.183	6.2		0.872	0.198	8.53		0.937	0.213	16.8		0.938	0.242	14.2		0.957	0.247	9.54		0.937	0.242	6.88		0.956	0.247
Iron, Total	7439-89-6	NS	NS	NS	9380		4.11	0.863	8830		4.03	0.847	9990		4.36	0.916	8620		4.69	0.984	13700		4.69	0.848	9110		4.78	0.864	7820		4.68	0.846	6470		4.78	0.863
Lead, Total	7439-92-1	63	400	450	4.87		4.11	0.196	4.45		4.03	0.192	5.21		4.36	0.208	5.15		4.69	0.223	57.6		4.69	0.252	57.1		4.78	0.256	10.5		4.68	0.251	5.47		4.78	0.256
Magnesium, Total	7439-95-4	NS	NS	NS	3070		8.22	1.34	3210		8.06	1.31	5530		8.72	1.42	5770		9.37	1.53	4600		9.38	1.44	2360		9.57	1.47	3350		9.37	1.44	3590		9.56	1.47
Manganese, Total	7439-96-5	1,600	2,000	2,000	419		0.822	0.441	349		0.806	0.432	129		0.872	0.467	186		0.937	0.502	388		0.938	0.149	203		0.957	0.152	327		0.937	0.149	214		0.956	0.152
Mercury, Total	7439-97-6	0.18	0.3	0.73	ND		0.081	0.053	ND		0.083	0.054	ND		0.087	0.057	ND		0.086	0.056	**0.241**		0.085	0.055	0.114		0.092	0.06	0.077	J	0.1	0.065	ND		0.093	0.061
Nickel, Total	7440-02-0	30	320	130	12.8		2.06	0.664	11.5		2.02	0.652	9.03		2.18	0.704	8.83		2.34	0.757	12.4		2.35	0.227	9.42		2.39	0.232	9.77		2.34	0.227	7.54		2.39	0.231
Potassium, Total	7440-09-7	NS	NS	NS	683		206	41.7	628		202	40.9	698		218	44.2	646		234	47.5	1150		235	13.5	716		239	13.8	1180		234	13.5	822		239	13.8
Selenium, Total	7782-49-2	3.9	110	4	ND		1.64	0.27	ND		1.61	0.265	ND		1.74	0.287	0.455	J	1.87	0.308	ND		1.88	0.242	ND		1.91	0.247	ND		1.87	0.242	ND		1.91	0.247
Silver, Total	7440-22-4	2	110	8.3	ND		0.411	0.245	ND		0.403	0.24	ND		0.436	0.26	ND		0.469	0.279	0.697		0.469	0.266	0.327	J	0.478	0.271	ND		0.468	0.265	ND		0.478	0.271
Sodium, Total	7440-23-5	NS	NS	NS	123	J	164	87.2	116	J	161	85.5	125	J	174	92.4	ND		187	99.4	91.9	J	188	2.96	65.2	J	191	3.01	82	J	187	2.95	66.5	J	191	3.01
Thallium, Total	7440-28-0	NS	NS	NS	ND		1.64	0.742	ND		1.61	0.727	ND		1.74	0.786	ND		1.87	0.846	ND		1.88	0.296	ND		1.91	0.301	ND		1.87	0.295	ND		1.91	0.301
Vanadium, Total	7440-62-2	NS	NS	NS	9.7		0.822	0.124	8.74		0.806	0.122	10.2		0.872	0.132	9.31		0.937	0.142	21.5		0.938	0.19	9.64		0.957	0.194	11.4		0.937	0.19	8.56		0.956	0.194
Zinc, Total	7440-66-6	109	6,600	2,480	29.1		4.11	0.498	24.4		4.03	0.489	18.7		4.36	0.528	18.3		4.69	0.568	64.2		4.69	0.275	42.2		4.78	0.28	22.3		4.68	0.274	16.7		4.78	0.28
GENERAL CHEMISTRY																																				
Chromium, Trivalent	16065-83-1	30	110	NS	7.31		0.852	0.697	7.21		0.846	0.684	7.31		0.9	0.739	7.06		0.95	0.795	16.2		0.958	0.192	8.55		0.967	0.193	10		0.968	0.194	7.97	J	0.964	0.193
Chromium, Hexavalent	18540-29-9	1	1	19	ND		0.852	0.17	ND		0.846	0.169	ND		0.9	0.18	ND		0.95	0.19	ND		0.958	0.192	ND		0.967	0.193	ND		0.968	0.194	0.301	J	0.964	0.193
Cyanide, Total	57-12-5	2.3	13	40	ND		0.98	0.21	ND		1	0.22	ND		1.1	0.23	ND		1.2	0.25	ND		1.2	0.24	0.36	J	1.2	0.25	ND		1.2	0.26	ND		1.2	0.24
Solids, Total	NONE	NS	NS	NS	93.9		0.1	NA	94.6		0.1	NA	88.9		0.1	NA	84.2		0.1	NA	83.5		0.1	NA	82.7		0.1	NA	82.6		0.1	NA	83		0.1	NA

Notes:
All results reported in mg/kg
Results Exceed UUSCO
Results Exceed RRUSCO
Results Exceed PGWSCO and NY-AWQS
NY-AWQS - New York TOGS 111 Ambient Water Quality Standards
NA - Not applicable because appropriate toxicological information is not available
Q - Laboratory Qualifier
J - The result is less than the detection limit, but greater than zero
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
~ - Not Analyzed
ND - Analyzed for but Not Detected at the MDL
NS - No Applicable Standard
NSL - No Screening Level
TICs - Tentatively Identified Compounds
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the GWQS standard
mg/kg - milligram per kilogram

TABLE 4A

245 West 55th Street
New York, New York

Summary of Volatile Organic Compounds Results in Groundwater

SAMPLE ID: / LAB ID: / COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	MW-1 L2471072-06 12/5/2024				MW-1 L2507953-07 2/13/2025				MW-2 L2507953-08 2/13/2025				DUP L2507953-12 2/13/2025				MW-3 L2471072-07 12/5/2024				MW-3 L2507953-02 2/12/2025				MW-4 L2471072-03 12/4/2024				MW-4 L2507953-05 2/12/2025				MW-5 L2471072-04 12/4/2024			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
Volatile Organic Compounds																																						
1,1,1,2-Tetrachloroethane	630-20-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,1,1-Trichloroethane	71-55-6	5	***71***		2.5	0.7	***54***		2.5	0.7	ND		5	1.4	ND		5	1.4	2	J	2.5	0.7	1.8	J	2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,1,2,2-Tetrachloroethane	79-34-5	5	ND		0.5	0.17	ND		0.5	0.17	ND		1	0.33	ND		1	0.33	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17
1,1,2-Trichloroethane	79-00-5	1	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**3**	1	ND		**3**	1	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5
1,1-Dichloroethane	75-34-3	5	***18***		2.5	0.7	***14***		2.5	0.7	***240***		5	1.4	***230***		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,1-Dichloroethene	75-35-4	5	1.2		0.5	0.17	2.3		0.5	0.17	0.96	J	1	0.34	0.99	J	1	0.34	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17
1,1-Dichloropropene	563-58-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2,3-Trichlorobenzene	87-61-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2,3-Trichloropropane	96-18-4	0.04	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**5**	**1.4**	ND		**5**	**1.4**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**
1,2,4,5-Tetramethylbenzene	95-93-2	5	ND		2	0.54	ND		2	0.54	***7***		4	1.1	***5.8***		4	1.1	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54
1,2,4-Trichlorobenzene	120-82-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2,4-Trimethylbenzene	95-63-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2-Dibromo-3-chloropropane	96-12-8	0.04	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**5**	**1.4**	ND		**5**	**1.4**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**
1,2-Dibromoethane	106-93-4	0.0006	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**4**	**1.3**	ND		**4**	**1.3**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**
1,2-Dichlorobenzene	95-50-1	3	ND		2.5	0.7	ND		2.5	0.7	ND		**5**	1.4	ND		**5**	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2-Dichloroethane	107-06-2	0.6	ND		0.5	0.13	ND		0.5	0.13	ND		**1**	0.26	ND		**1**	0.26	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13
1,2-Dichloroethene, Total	540-59-0	NS	2.9		2.5	0.7	5.9		2.5	0.7	23		5	1.4	22		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2-Dichloropropane	78-87-5	1	ND		1	0.14	ND		1	0.14	ND		**2**	0.27	ND		**2**	0.27	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14
1,3,5-Trimethylbenzene	108-67-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,3-Dichlorobenzene	541-73-1	3	ND		2.5	0.7	ND		2.5	0.7	ND		**5**	1.4	ND		**5**	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,3-Dichloropropane	142-28-9	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,3-Dichloropropene, Total	542-75-6	NS	ND		0.5	0.14	ND		0.5	0.14	ND		1	0.29	ND		1	0.29	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14
1,4-Dichlorobenzene	106-46-7	3	ND		2.5	0.7	ND		2.5	0.7	ND		**5**	1.4	ND		**5**	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,4-Dioxane	123-91-1	0.35	0.129	J	0.15	0.0339	ND		**250**	**61**	***0.701***		0.144	0.0326	***0.681***		0.139	0.0314	ND		0.139	0.0314	ND		**250**	**61**	ND		0.139	0.0314	ND		**250**	**61**	ND		0.144	0.0326
2,2-Dichloropropane	594-20-7	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
2-Butanone	78-93-3	50	ND		5	1.9	ND		5	1.9	ND		10	3.9	ND		10	3.9	ND		5	1.9	ND		5	1.9	2.2	J	5	1.9	ND		5	1.9	2.2	J	5	1.9
2-Hexanone	591-78-6	50	ND		5	1	ND		5	1	ND		10	2	ND		10	2	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
4-Methyl-2-pentanone	108-10-1	NS	ND		5	1	ND		5	1	ND		10	2	ND		10	2	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
Acetone	67-64-1	50	3.1	J	5	1.5	ND		5	1.5	ND		10	2.9	ND		10	2.9	ND		5	1.5	ND		5	1.5	2.1	J	5	1.5	ND		5	1.5	2.2	J	5	1.5
Acrylonitrile	107-13-1	5	ND		5	1.5	ND		5	1.5	ND		**10**	3	ND		**10**	3	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5
Benzene	71-43-2	1	ND		0.5	0.16	ND		0.5	0.16	ND		1	0.32	ND		1	0.32	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16
Bromobenzene	108-86-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Bromochloromethane	74-97-5	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Bromodichloromethane	75-27-4	50	ND		0.5	0.19	ND		0.5	0.19	ND		1	0.38	ND		1	0.38	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19
Bromoform	75-25-2	50	ND		2	0.65	ND		2	0.65	ND		4	1.3	ND		4	1.3	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65
Bromomethane	74-83-9	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Carbon disulfide	75-15-0	60	ND		5	1	ND		5	1	ND		10	2	ND		10	2	ND		5	1	ND		5	1	1.4	J	5	1	49		5	1	ND		5	1
Carbon tetrachloride	56-23-5	5	ND		0.5	0.13	ND		0.5	0.13	ND		1	0.27	ND		1	0.27	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13
Chlorobenzene	108-90-7	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Chloroethane	75-00-3	5	ND		2.5	0.7	ND		2.5	0.7	***29***		5	1.4	***25***		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Chloroform	67-66-3	7	2.9		2.5	0.7	2.9		2.5	0.7	ND		5	1.4	ND		5	1.4	2	J	2.5	0.7	ND		2.5	0.7	3.1		2.5	0.7	1.6	J	2.5	0.7	ND		2.5	0.7
Chloromethane	74-87-3	NS	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
cis-1,2-Dichloroethene	156-59-2	5	2.9		2.5	0.7	***5.9***		2.5	0.7	***23***		5	1.4	***22***		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
cis-1,3-Dichloropropene	10061-01-5	0.4	ND		**0.5**	0.14	ND		0.5	0.14	ND		**1**	0.29	ND		**1**	0.29	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14
Dibromochloromethane	124-48-1	50	ND		0.5	0.15	ND		0.5	0.15	ND		1	0.3	ND		1	0.3	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15
Dibromomethane	74-95-3	5	ND		5	1	ND		5	1	ND		**10**	2	ND		**10**	2	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
Dichlorodifluoromethane	75-71-8	5	ND		5	1	ND		5	1	ND		**10**	2	ND		**10**	2	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
Ethyl ether	60-29-7	NS	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Ethylbenzene	100-41-4	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Hexachlorobutadiene	87-68-3	0.5	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**5**	**1.4**	ND		**5**	**1.4**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**
Isopropylbenzene	98-82-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Methyl tert butyl ether	1634-04-4	10	ND		2.5	0.17	ND		2.5	0.17	ND		5	0.33	ND		5	0.33	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17
Methylene chloride	75-09-2	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
n-Butylbenzene	104-51-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
n-Propylbenzene	103-65-1	5	ND		2.5	0.7	ND		2.5	0.7	1.9	J	5	1.4	1.6	J	5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Naphthalene	91-20-3	10	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
o-Chlorotoluene	95-49-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
o-Xylene	95-47-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
p-Chlorotoluene	106-43-4	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
p-Diethylbenzene	105-05-5	NS	ND		2	0.7	ND		2	0.7	3.1	J	4	1.4	2.9	J	4	1.4	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7
p-Ethyltoluene	622-96-8	NS	ND		2	0.7	ND		2	0.7	ND		4	1.4	ND		4	1.4	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7
p-Isopropyltoluene	99-87-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
p/m-Xylene	179601-23-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
sec-Butylbenzene	135-98-8	5	ND		2.5	0.7	ND		2.5	0.7	2.5	J	5	1.4	2.4	J	5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Styrene	100-42-5	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
tert-Butylbenzene	98-06-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Tetrachloroethene	127-18-4	5	***52***		0.5	0.18	***64***		0.5	0.18	***48***		1	0.36	***58***		1	0.36	4.2		0.5	0.18	4.3		0.5	0.18	1.5		0.5	0.18	1.3		0.5	0.18	3.1		0.5	0.18
Toluene	108-88-3	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
trans-1,2-Dichloroethene	156-60-5	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
trans-1,3-Dichloropropene	10061-02-6	0.4	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**1**	0.33	ND		**1**	0.33	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16
trans-1,4-Dichloro-2-butene	110-57-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Trichloroethene	79-01-6	5	2.7		0.5	0.18	4.9		0.5	0.18	***48***		1	0.35	***53***		1	0.35	ND		0.5	0.18	ND		0.5	0.18	0.27	J	0.5	0.18	0.36	J	0.5	0.18	1.5		0.5	0.18
Trichlorofluoromethane	75-69-4	5	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Vinyl acetate	108-05-4	NS	ND		5	1	ND		5	1	ND		10	2	ND		10	2	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
Vinyl chloride	75-01-4	2	ND		1	0.07	0.62	J	1	0.07	***15***		2	0.14	***15***		2	0.14	ND		1	0.07	ND		1	0.07	ND		1	0.07	ND		1	0.07	ND		1	0.07
Xylenes, Total	1330-20-7	NS	ND		2.5	0.7	ND		2.5	0.7	ND		5	1.4	ND		5	1.4	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Total VOCs		NS	153.8		-	-	148.62	-	-	-	418.46	-	-	-	416.69	-	-	-	8.2		-	-	6.1	-	-	-	10.57		-	-	1.66	-	-	-	59.6		-	-

Notes:
All results are reported in micrograms per liter (µg/L)
Bold - Indicates a concentration detected above NY-AWQS
Italicized - Indicates a concentration detected above NY-TOGS-GA
NS - No Applicable Standard
~ - Not Analyzed
- - Not Applicable
ND - Analyzed for but Not Detected at the MDL
Q - Qualifier
J - The concentration was detected at a value equal to or below the RL, but greater than the MDL
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4A

245 West 55th Street
New York, New York

Summary of Volatile Organic Compounds Results in Groundwater

SAMPLE ID: / LAB ID: / COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	MW-5 L2507953-04 2/12/2025				MW-6 L2471072-01 12/4/2024				MW-6 L2507953-09 2/13/2025				MW-7 L2471072-08 12/5/2024				MW-7 L2471072-08 R1 12/5/2024				DUP L2471072-09 12/5/2024				DUP L2471072-09 R1 12/5/2024				MW-7 L2507953-03 2/12/2025				MW-8 L2522485-03 4/11/2025			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
Volatile Organic Compounds																																						
1,1,1,2-Tetrachloroethane	630-20-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
1,1,1-Trichloroethane	71-55-6	5	ND		2.5	0.7	***9.9***		2.5	0.7	2	J	2.5	0.7	1.2	J	2.5	0.7	~		~	~	1.9	J	2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
1,1,2,2-Tetrachloroethane	79-34-5	5	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	~		~	~	ND		0.5	0.17	~		~	~	ND		1	0.33	ND		0.5	0.17
1,1,2-Trichloroethane	79-00-5	1	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	~		~	~	ND		**1.5**	0.5	~		~	~	ND		**3**	1	ND		**1.5**	0.5
1,1-Dichloroethane	75-34-3	5	ND		2.5	0.7	***50***		2.5	0.7	***10***		2.5	0.7	***180***		**12**	3.5	***270***	E	2.5	0.7	***260***	E	2.5	0.7	***240***		**12**	3.5	***210***		5	1.4	1.2	J	2.5	0.7
1,1-Dichloroethene	75-35-4	5	ND		0.5	0.17	1.5		0.5	0.17	1.2		0.5	0.17	3.8		0.5	0.17	~		~	~	4.2		0.5	0.17	~		~	~	4.2		1	0.34	ND		0.5	0.17
1,1-Dichloropropene	563-58-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
1,2,3-Trichlorobenzene	87-61-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
1,2,3-Trichloropropane	96-18-4	0.04	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	~		~	~	ND		**2.5**	**0.7**	~		~	~	ND		**5**	**1.4**	ND		**2.5**	**0.7**
1,2,4,5-Tetramethylbenzene	95-93-2	5	ND		2	0.54	ND		2	0.54	ND		2	0.54	***14***		2	0.54	~		~	~	***13***		2	0.54	~		~	~	3.8	J	4	1.1	ND		2	0.54
1,2,4-Trichlorobenzene	120-82-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
1,2,4-Trimethylbenzene	95-63-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
1,2-Dibromo-3-chloropropane	96-12-8	0.04	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	~		~	~	ND		**2.5**	**0.7**	~		~	~	ND		**5**	**1.4**	ND		**2.5**	**0.7**
1,2-Dibromoethane	106-93-4	0.0006	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	~		~	~	ND		**2**	**0.65**	~		~	~	ND		**4**	**1.3**	ND		**2**	**0.65**
1,2-Dichlorobenzene	95-50-1	3	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		**5**	1.4	ND		2.5	0.7
1,2-Dichloroethane	107-06-2	0.6	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	~		~	~	ND		0.5	0.13	~		~	~	ND		**1**	0.26	ND		0.5	0.13
1,2-Dichloroethene, Total	540-59-0	NS	ND		2.5	0.7	18	J	2.5	0.7	25		2.5	0.7	64		2.5	0.7	~		~	~	69		2.5	0.7	~		~	~	110		5	1.4	16		2.5	0.7
1,2-Dichloropropane	78-87-5	1	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14	~		~	~	ND		1	0.14	~		~	~	ND		**2**	0.27	ND		1	0.14
1,3,5-Trimethylbenzene	108-67-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
1,3-Dichlorobenzene	541-73-1	3	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		**5**	1.4	ND		2.5	0.7
1,3-Dichloropropane	142-28-9	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
1,3-Dichloropropene, Total	542-75-6	NS	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	~		~	~	ND		0.5	0.14	~		~	~	ND		1	0.29	ND		0.5	0.14
1,4-Dichlorobenzene	106-46-7	3	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		**5**	1.4	ND		2.5	0.7
1,4-Dioxane	123-91-1	0.35	ND		**250**	**61**	0.0885	J	0.15	0.0339	ND		**250**	**61**	0.22		0.15	0.0339	~		~	~	0.254		0.15	0.0339	~		~	~	ND		**500**	**120**	ND		0.144	0.0326
2,2-Dichloropropane	594-20-7	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
2-Butanone	78-93-3	50	ND		5	1.9	3.4	J	5	1.9	ND		5	1.9	ND		5	1.9	~		~	~	ND		5	1.9	~		~	~	ND		**10**	3.9	ND		5	1.9
2-Hexanone	591-78-6	50	ND		5	1	ND		5	1	ND		5	1	ND		5	1	~		~	~	ND		5	1	~		~	~	ND		10	2	ND		5	1
4-Methyl-2-pentanone	108-10-1	NS	ND		5	1	ND		5	1	ND		5	1	ND		5	1	~		~	~	ND		5	1	~		~	~	ND		10	2	ND		5	1
Acetone	67-64-1	50	ND		5	1.5	14		5	1.5	ND		5	1.5	ND		5	1.5	~		~	~	ND		5	1.5	~		~	~	ND		10	2.9	2.6	J	5	1.5
Acrylonitrile	107-13-1	5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	~		~	~	ND		5	1.5	~		~	~	ND		**10**	3	ND		5	1.5
Benzene	71-43-2	1	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	~		~	~	ND		0.5	0.16	~		~	~	ND		1	0.32	ND		0.5	0.16
Bromobenzene	108-86-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Bromochloromethane	74-97-5	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Bromodichloromethane	75-27-4	50	ND		0.5	0.19	0.72		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	~		~	~	ND		0.5	0.19	~		~	~	ND		1	0.38	ND		0.5	0.19
Bromoform	75-25-2	50	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	~		~	~	ND		2	0.65	~		~	~	ND		4	1.3	ND		2	0.65
Bromomethane	74-83-9	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Carbon disulfide	75-15-0	60	ND		5	1	ND		5	1	ND		5	1	ND		5	1	~		~	~	ND		5	1	~		~	~	ND		10	2	ND		5	1
Carbon tetrachloride	56-23-5	5	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	~		~	~	ND		0.5	0.13	~		~	~	ND		1	0.27	ND		0.5	0.13
Chlorobenzene	108-90-7	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Chloroethane	75-00-3	5	ND		2.5	0.7	0.73	J	2.5	0.7	ND		2.5	0.7	***130***		2.5	0.7	~		~	~	***100***		2.5	0.7	~		~	~	***120***		5	1.4	ND		2.5	0.7
Chloroform	67-66-3	7	ND		2.5	0.7	***15***		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Chloromethane	74-87-3	NS	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
cis-1,2-Dichloroethene	156-59-2	5	ND		2.5	0.7	***16***		2.5	0.7	***21***		2.5	0.7	***56***		2.5	0.7	~		~	~	***59***		2.5	0.7	~		~	~	***89***		5	1.4	***7.9***		2.5	0.7
cis-1,3-Dichloropropene	10061-01-5	0.4	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	~		~	~	ND		**0.5**	0.14	~		~	~	ND		**1**	0.29	ND		**0.5**	0.14
Dibromochloromethane	124-48-1	50	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	~		~	~	ND		0.5	0.15	~		~	~	ND		1	0.3	ND		0.5	0.15
Dibromomethane	74-95-3	5	ND		5	1	ND		5	1	ND		5	1	ND		5	1	~		~	~	ND		5	1	~		~	~	ND		**10**	2	ND		5	1
Dichlorodifluoromethane	75-71-8	5	ND		5	1	ND		5	1	ND		5	1	ND		5	1	~		~	~	ND		5	1	~		~	~	ND		**10**	2	ND		5	1
Ethyl ether	60-29-7	NS	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Ethylbenzene	100-41-4	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Hexachlorobutadiene	87-68-3	0.5	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	~		~	~	ND		**2.5**	**0.7**	~		~	~	ND		**5**	**1.4**	ND		**2.5**	**0.7**
Isopropylbenzene	98-82-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	2.8		2.5	0.7	~		~	~	2.7		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Methyl tert butyl ether	1634-04-4	10	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	~		~	~	ND		2.5	0.17	~		~	~	ND		5	0.33	ND		2.5	0.17
Methylene chloride	75-09-2	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	1.8	J	2.5	0.7	~		~	~	1.5	J	2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
n-Butylbenzene	104-51-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	2.4	J	2.5	0.7	~		~	~	2.3	J	2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
n-Propylbenzene	103-65-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	***6.4***		2.5	0.7	~		~	~	***6.1***		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Naphthalene	91-20-3	10	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	0.95	J	2.5	0.7	~		~	~	0.9	J	2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
o-Chlorotoluene	95-49-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
o-Xylene	95-47-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
p-Chlorotoluene	106-43-4	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
p-Diethylbenzene	105-05-5	NS	ND		2	0.7	ND		2	0.7	ND		2	0.7	5.1		2	0.7	~		~	~	5		2	0.7	~		~	~	1.7	J	4	1.4	ND		2	0.7
p-Ethyltoluene	622-96-8	NS	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	~		~	~	ND		2	0.7	~		~	~	ND		4	1.4	ND		2	0.7
p-Isopropyltoluene	99-87-6	5	ND		2.5	0.7	***15***		2.5	0.7	3.2		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
p/m-Xylene	179601-23-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
sec-Butylbenzene	135-98-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	3.1		2.5	0.7	~		~	~	3		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Styrene	100-42-5	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
tert-Butylbenzene	98-06-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	0.89	J	2.5	0.7	~		~	~	0.95	J	2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Tetrachloroethene	127-18-4	5	3		0.5	0.18	***160***		0.5	0.18	***75***		0.5	0.18	0.89		0.5	0.18	~		~	~	1.3		0.5	0.18	~		~	~	3.6		1	0.36	4.6		0.5	0.18
Toluene	108-88-3	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
trans-1,2-Dichloroethene	156-60-5	5	ND		2.5	0.7	2	J	2.5	0.7	4		2.5	0.7	***7.6***		2.5	0.7	~		~	~	***9.9***		2.5	0.7	~		~	~	***21***		5	1.4	***7.8***		2.5	0.7
trans-1,3-Dichloropropene	10061-02-6	0.4	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	~		~	~	ND		**0.5**	0.16	~		~	~	ND		**1**	0.33	ND		**0.5**	0.16
trans-1,4-Dichloro-2-butene	110-57-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Trichloroethene	79-01-6	5	1.3		0.5	0.18	***7.8***		0.5	0.18	4.8		0.5	0.18	***43***		0.5	0.18	~		~	~	***54***		0.5	0.18	~		~	~	***68***		1	0.35	1.1		0.5	0.18
Trichlorofluoromethane	75-69-4	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Vinyl acetate	108-05-4	NS	ND		5	1	ND		5	1	ND		5	1	ND		5	1	~		~	~	ND		5	1	~		~	~	ND		10	2	ND		5	1
Vinyl chloride	75-01-4	2	ND		1	0.07	0.47	J	1	0.07	0.49	J	1	0.07	***22***		1	0.07	~		~	~	***24***		1	0.07	~		~	~	***24***		2	0.14	***4.1***		1	0.07
Xylenes, Total	1330-20-7	NS	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	~		~	~	ND		2.5	0.7	~		~	~	ND		5	1.4	ND		2.5	0.7
Total VOCs		NS	4.3	-	-	-	296.52		-	-	121.69	-	-	-	481.93		-	-	~		~	~	549.75		-	-	~		~	~	545.3	-	-	-	29.3	-	-	-

Notes:
All results are reported in micrograms per liter (µg/L)
Bold - Indicates a concentration detected above NY-AWQS
Italicized - Indicates a concentration detected above NY-TOGS-GA
NS - No Applicable Standard
~ - Not Analyzed
- - Not Applicable
ND - Analyzed for but Not Detected at the MDL
Q - Qualifier
J - The concentration was detected at a value equal to or below the RL, but greater than the MDL
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4A

245 West 55th Street
New York, New York

Summary of Volatile Organic Compounds Results in Groundwater

SAMPLE ID:		New York TOGS 111 Ambient Water Quality Standards (NY-AWQS)	DUP				MW-1D				MW-1D				TRIP BLANK				TRIP BLANK				TRIP BLANK				TRIP BLANK				TRIP BLANK				FIELD BLANK				FIELD BLANK				FIELD BLANK			
LAB ID:	CAS Number		L2522485-04				L2471072-02				L2507953-01				L2471072-05				L2471072-10				L2507953-06				L2507953-10				L2522485-01				L2471072-11				L2507953-11				L2522485-02			
COLLECTION DATE:			4/11/2025				12/4/2024				2/12/2025				12/4/2024				12/5/2024				2/12/2025				2/12/2025				4/11/2025				12/5/2024				2/13/2025				4/11/2025			
		(ug/l)	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
Volatile Organic Compounds																																														
1,1,1,2-Tetrachloroethane	630-20-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,1,1-Trichloroethane	71-55-6	5	ND		2.5	0.7	3.8		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,1,2,2-Tetrachloroethane	79-34-5	5	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17
1,1,2-Trichloroethane	79-00-5	1	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5	ND		**1.5**	0.5
1,1-Dichloroethane	75-34-3	5	1.2	J	2.5	0.7	2	J	2.5	0.7	1.3	J	2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,1-Dichloroethene	75-35-4	5	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17	ND		0.5	0.17
1,1-Dichloropropene	563-58-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2,3-Trichlorobenzene	87-61-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2,3-Trichloropropane	96-18-4	0.04	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**
1,2,4,5-Tetramethylbenzene	95-93-2	5	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54
1,2,4-Trichlorobenzene	120-82-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2,4-Trimethylbenzene	95-63-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2-Dibromo-3-chloropropane	96-12-8	0.04	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**
1,2-Dibromoethane	106-93-4	0.0006	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**	ND		**2**	**0.65**
1,2-Dichlorobenzene	95-50-1	3	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2-Dichloroethane	107-06-2	0.6	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13
1,2-Dichloroethene, Total	540-59-0	NS	15		2.5	0.7	2.2	J	2.5	0.7	1.9	J	2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,2-Dichloropropane	78-87-5	1	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14	ND		1	0.14
1,3,5-Trimethylbenzene	108-67-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,3-Dichlorobenzene	541-73-1	3	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,3-Dichloropropane	142-28-9	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,3-Dichloropropene, Total	542-75-6	NS	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14	ND		0.5	0.14
1,4-Dichlorobenzene	106-46-7	3	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
1,4-Dioxane	123-91-1	0.35	ND		0.15	0.0339	0.098	J	0.139	0.0314	ND		**250**	**61**	ND		**250**	**61**	ND		**250**	**61**	ND		**250**	**61**	ND		**250**	**61**	ND		**250**	**61**	ND		0.15	0.0339	ND		0.139	0.0314	ND		0.134	0.0303
2,2-Dichloropropane	594-20-7	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
2-Butanone	78-93-3	50	ND		5	1.9	2.4	J	5	1.9	ND		5	1.9	1.9	J	5	1.9	ND		5	1.9	ND		5	1.9	ND		5	1.9	ND		5	1.9	ND		5	1.9	ND		5	1.9	ND		5	1.9	ND		5	1.9
2-Hexanone	591-78-6	50	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
4-Methyl-2-pentanone	108-10-1	NS	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
Acetone	67-64-1	50	1.9	J	5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	2.2	J	5	1.5	ND		5	1.5	1.6	J	5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5
Acrylonitrile	107-13-1	5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5	ND		5	1.5
Benzene	71-43-2	1	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16	ND		0.5	0.16
Bromobenzene	108-86-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Bromochloromethane	74-97-5	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Bromodichloromethane	75-27-4	50	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19	ND		0.5	0.19
Bromoform	75-25-2	50	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65
Bromomethane	74-83-9	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Carbon disulfide	75-15-0	60	ND		5	1	1.1	J	5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	2.3	J	5	1
Carbon tetrachloride	56-23-5	5	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13	ND		0.5	0.13
Chlorobenzene	108-90-7	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Chloroethane	75-00-3	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Chloroform	67-66-3	7	ND		2.5	0.7	1.1	J	2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Chloromethane	74-87-3	NS	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
cis-1,2-Dichloroethene	156-59-2	5	***8***		2.5	0.7	1.2	J	2.5	0.7	0.94	J	2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
cis-1,3-Dichloropropene	10061-01-5	0.4	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14	ND		**0.5**	0.14
Dibromochloromethane	124-48-1	50	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15	ND		0.5	0.15
Dibromomethane	74-95-3	5	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
Dichlorodifluoromethane	75-71-8	5	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
Ethyl ether	60-29-7	NS	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Ethylbenzene	100-41-4	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Hexachlorobutadiene	87-68-3	0.5	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**	ND		**2.5**	**0.7**
Isopropylbenzene	98-82-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Methyl tert butyl ether	1634-04-4	10	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17	ND		2.5	0.17
Methylene chloride	75-09-2	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
n-Butylbenzene	104-51-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
n-Propylbenzene	103-65-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Naphthalene	91-20-3	10	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
o-Chlorotoluene	95-49-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
o-Xylene	95-47-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
p-Chlorotoluene	106-43-4	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
p-Diethylbenzene	105-05-5	NS	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7
p-Ethyltoluene	622-96-8	NS	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7	ND		2	0.7
p-Isopropyltoluene	99-87-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
p/m-Xylene	179601-23-1	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
sec-Butylbenzene	135-98-8	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Styrene	100-42-5	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
tert-Butylbenzene	98-06-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
Tetrachloroethene	127-18-4	5	4.5		0.5	0.18	1.3		0.5	0.18	0.23	J	0.5	0.18	ND		0.5	0.18	ND		0.5	0.18	ND		0.5	0.18	ND		0.5	0.18	ND		0.5	0.18	ND		0.5	0.18	ND		0.5	0.18	ND		0.5	0.18	ND		0.5	0.18	ND		0.5	0.18
Toluene	108-88-3	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
trans-1,2-Dichloroethene	156-60-5	5	***7.3***		2.5	0.7	0.95	J	2.5	0.7	1	J	2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7
trans-1,3-Dichloropropene	10061-02-6	0.4	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16	ND		**0.5**	0.16
trans-1,4-Dichloro-2-butene	110-57-6	5	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7	ND		2.5	0.7

TABLE 4B

245 West 55th Street
New York, New York

Summary of Semi-Volatile Organic Compounds in Groundwater

SAMPLE ID: / LAB ID: / COLLECTION DATE:	CAS	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	New York TOGS 111 Groundwater Effluent Limitations (Class GA) (NY-TOGS-GA) (ug/l)	MW-1 L2471072-06 12/5/2024				MW-2 L2507953-08 2/13/2025				DUP L2507953-12 2/13/2025				MW-3 L2471072-07 12/5/2024				MW-4 L2471072-03 12/4/2024				MW-5 L2471072-04 12/4/2024				MW-6 L2471072-01 12/4/2024			
				Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
SEMIVOLATILE ORGANIC COMPOUNDS																															
1,2,4,5-Tetrachlorobenzene	95-94-3	5	5	ND		**10**	0.24	ND		10	0.24	ND		10	0.24	ND		**10**	0.24	ND		**10**	0.24	ND		**10**	0.24	ND		**10**	0.24
1,2,4-Trichlorobenzene	120-82-1	5	5	ND		5	0.98	ND		5	0.98	ND		5	0.98	ND		5	0.98	ND		5	0.98	ND		5	0.98	ND		5	0.98
1,2-Dichlorobenzene	95-50-1	3	3	ND		2	0.33	ND		2	0.33	ND		2	0.33	ND		2	0.33	ND		2	0.33	ND		2	0.33	ND		2	0.33
1,3-Dichlorobenzene	541-73-1	3	3	ND		2	0.32	ND		2	0.32	ND		2	0.32	ND		2	0.32	ND		2	0.32	ND		2	0.32	ND		2	0.32
1,4-Dichlorobenzene	106-46-7	3	3	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39
2,4,5-Trichlorophenol	95-95-4	NS	NS	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1
2,4,6-Trichlorophenol	88-06-2	NS	NS	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1
2,4-Dichlorophenol	120-83-2	1	2	ND		**5**	**1.7**	ND		**5**	**1.7**	ND		**5**	**1.7**	ND		**5**	**1.7**	ND		**5**	**1.7**	ND		**5**	**1.7**	ND		**5**	**1.7**
2,4-Dimethylphenol	105-67-9	50	2	ND		**5**	2	ND		**5**	2	ND		**5**	2	ND		**5**	2	ND		**5**	2	ND		5	2	ND		5	2
2,4-Dinitrophenol	51-28-5	10	2	ND		**20**	**5.4**	ND		**20**	**5.4**	ND		**20**	**5.4**	ND		**20**	**5.4**	ND		**20**	**5.4**	ND		**20**	**5.4**	ND		**20**	**5.4**
2,4-Dinitrotoluene	121-14-2	5	5	ND		5	0.54	ND		5	0.54	ND		5	0.54	ND		5	0.54	ND		5	0.54	ND		5	0.54	ND		5	0.54
2,6-Dinitrotoluene	606-20-2	5	5	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84
2-Chloronaphthalene	91-58-7	10	10	ND		2	0.35	ND		0.2	0.02	0.1	J	0.2	0.02	ND		2	0.35	ND		2	0.35	ND		2	0.35	ND		2	0.35
2-Chlorophenol	95-57-8	NS	NS	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65
2-Methylnaphthalene	91-57-6	NS	NS	ND		2	0.37	0.03	J	0.1	0.03	0.31		0.1	0.03	ND		2	0.37	ND		2	0.37	ND		2	0.37	0.48	J	2	0.37
2-Methylphenol	95-48-7	NS	NS	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3
2-Nitroaniline	88-74-4	5	5	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
2-Nitrophenol	88-75-5	NS	NS	ND		10	2	ND		10	2	ND		10	2	ND		10	2	ND		10	2	ND		10	2	ND		10	2
3,3'-Dichlorobenzidine	91-94-1	5	5	ND		5	1.8	ND		5	1.8	ND		5	1.8	ND		5	1.8	ND		5	1.8	ND		5	1.8	ND		5	1.8
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	NS	NS	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4
3-Nitroaniline	99-09-2	5	5	ND		5	1.2	ND		5	1.2	ND		5	1.2	ND		5	1.2	ND		5	1.2	ND		5	1.2	ND		5	1.2
4,6-Dinitro-o-cresol	534-52-1	NS	NS	ND		10	2.3	ND		10	2.3	ND		10	2.3	ND		10	2.3	ND		10	2.3	ND		10	2.3	ND		10	2.3
4-Bromophenyl phenyl ether	101-55-3	NS	NS	ND		2	0.24	ND		2	0.24	ND		2	0.24	ND		2	0.24	ND		2	0.24	ND		2	0.24	ND		2	0.24
4-Chloroaniline	106-47-8	5	5	ND		5	0.47	ND		5	0.47	ND		5	0.47	ND		5	0.47	ND		5	0.47	ND		5	0.47	ND		5	0.47
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39
4-Nitroaniline	100-01-6	5	5	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4
4-Nitrophenol	100-02-7	NS	NS	ND		10	1.4	ND		10	1.4	ND		10	1.4	ND		10	1.4	ND		10	1.4	ND		10	1.4	ND		10	1.4
Acenaphthene	83-32-9	20	20	ND		2	0.4	1.4		0.1	0.02	2.9		0.1	0.02	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4
Acenaphthylene	208-96-8	NS	NS	ND		2	0.32	0.07	J	0.1	0.02	0.17		0.1	0.02	ND		2	0.32	ND		2	0.32	ND		2	0.32	ND		2	0.32
Acetophenone	98-86-2	NS	NS	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92
Anthracene	120-12-7	50	50	ND		2	0.47	0.09	J	0.1	0.02	0.12		0.1	0.02	ND		2	0.47	ND		2	0.47	ND		2	0.47	ND		2	0.47
Benzo(a)anthracene	56-55-3	0.002	0.002	ND		**2**	**0.32**	ND		**0.1**	**0.03**	ND		**0.1**	**0.03**	ND		**2**	**0.32**	ND		**2**	**0.32**	ND		**2**	**0.32**	ND		**2**	**0.32**
Benzo(a)pyrene	50-32-8	0	0	ND		**2**	**0.37**	ND		**0.1**	**0.02**	ND		**0.1**	**0.02**	ND		**2**	**0.37**	ND		**2**	**0.37**	ND		**2**	**0.37**	ND		**2**	**0.37**
Benzo(b)fluoranthene	205-99-2	0.002	0.002	ND		**2**	**0.53**	ND		**0.1**	**0.03**	ND		**0.1**	**0.03**	ND		**2**	**0.53**	ND		**2**	**0.53**	ND		**2**	**0.53**	ND		**2**	**0.53**
Benzo(ghi)perylene	191-24-2	NS	NS	ND		2	0.37	ND		0.1	0.02	ND		0.1	0.02	ND		2	0.37	ND		2	0.37	ND		2	0.37	ND		2	0.37
Benzo(k)fluoranthene	207-08-9	0.002	0.002	ND		**2**	**0.62**	ND		**0.1**	**0.03**	ND		**0.1**	**0.03**	ND		**2**	**0.62**	ND		**2**	**0.62**	ND		**2**	**0.62**	ND		**2**	**0.62**
Benzoic Acid	65-85-0	NS	NS	14	J	50	2.6	ND		50	2.6	ND		50	2.6	13	J	50	2.6	ND		50	2.6	ND		50	2.6	ND		50	2.6
Benzyl Alcohol	100-51-6	NS	NS	ND		2	0.38	ND		2	0.38	ND		2	0.38	ND		2	0.38	ND		2	0.38	ND		2	0.38	ND		2	0.38
Biphenyl	92-52-4	NS	NS	ND		2	0.2	ND		2	0.2	ND		2	0.2	ND		2	0.2	ND		2	0.2	ND		2	0.2	ND		2	0.2
Bis(2-chloroethoxy)methane	111-91-1	5	5	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84
Bis(2-chloroethyl)ether	111-44-4	1	1	ND		**2**	0.39	ND		**2**	0.39	ND		**2**	0.39	ND		**2**	0.39	ND		**2**	0.39	ND		**2**	0.39	ND		**2**	0.39
Bis(2-chloroisopropyl)ether	108-60-1	5	5	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4
Bis(2-ethylhexyl)phthalate	117-81-7	5	5	ND		3	1.4	ND		3	1.4	ND		3	1.4	ND		3	1.4	ND		3	1.4	ND		3	1.4	ND		3	1.4
Butyl benzyl phthalate	85-68-7	50	50	ND		5	2.6	ND		5	2.6	ND		5	2.6	ND		5	2.6	ND		5	2.6	ND		5	2.6	ND		5	2.6
Carbazole	86-74-8	NS	NS	ND		2	0.31	ND		2	0.31	ND		2	0.31	ND		2	0.31	ND		2	0.31	ND		2	0.31	ND		2	0.31
Chrysene	218-01-9	0.002	0.002	ND		**2**	**0.22**	ND		**0.1**	**0.03**	ND		**0.1**	**0.03**	ND		**2**	**0.22**	ND		**2**	**0.22**	ND		**2**	**0.22**	ND		**2**	**0.22**
Di-n-butylphthalate	84-74-2	50	50	ND		5	0.96	ND		5	0.96	ND		5	0.96	ND		5	0.96	ND		5	0.96	ND		5	0.96	ND		5	0.96
Di-n-octylphthalate	117-84-0	50	50	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3
Dibenzo(a,h)anthracene	53-70-3	NS	NS	ND		2	0.29	ND		0.1	0.02	ND		0.1	0.02	ND		2	0.29	ND		2	0.29	ND		2	0.29	ND		2	0.29
Dibenzofuran	132-64-9	NS	NS	ND		2	0.4	ND		2	0.4	1.7	J	2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4
Diethyl phthalate	84-66-2	50	50	ND		5	0.76	ND		5	0.76	ND		5	0.76	ND		5	0.76	ND		5	0.76	ND		5	0.76	ND		5	0.76
Dimethyl phthalate	131-11-3	50	50	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92
Fluoranthene	206-44-0	50	50	ND		2	0.41	0.03	J	0.1	0.03	0.04	J	0.1	0.03	ND		2	0.41	ND		2	0.41	ND		2	0.41	ND		2	0.41
Fluorene	86-73-7	50	50	ND		2	0.44	0.42		0.1	0.03	1.2		0.1	0.03	ND		2	0.44	ND		2	0.44	ND		2	0.44	ND		2	0.44
Hexachlorobenzene	118-74-1	0.04	0.04	ND		**2**	**0.45**	ND		**0.8**	**0.01**	ND		**0.8**	**0.01**	ND		**2**	**0.45**	ND		**2**	**0.45**	ND		**2**	**0.45**	ND		**2**	**0.45**
Hexachlorobutadiene	87-68-3	0.5	0.5	ND		**2**	0.36	ND		0.5	0.02	ND		0.5	0.02	ND		**2**	0.36	ND		**2**	0.36	ND		**2**	0.36	ND		**2**	0.36
Hexachlorocyclopentadiene	77-47-4	5	5	ND		**20**	1.2	ND		20	1.2	ND		20	1.2	ND		**20**	1.2	ND		**20**	1.2	ND		**20**	1.2	ND		**20**	1.2
Hexachloroethane	67-72-1	5	5	ND		2	0.2	ND		0.8	0.02	ND		0.8	0.02	ND		2	0.2	ND		2	0.2	ND		2	0.2	ND		2	0.2
Indeno(1,2,3-cd)pyrene	193-39-5	0.002	0.002	ND		**2**	**0.48**	ND		**0.1**	**0.02**	ND		**0.1**	**0.02**	ND		**2**	**0.48**	ND		**2**	**0.48**	ND		**2**	**0.48**	ND		**2**	**0.48**
Isophorone	78-59-1	50	50	ND		5	0.86	ND		5	0.86	ND		5	0.86	ND		5	0.86	ND		5	0.86	ND		5	0.86	ND		5	0.86
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	ND		5	0.91	ND		5	0.91	ND		5	0.91	ND		5	0.91	ND		5	0.91	ND		5	0.91	ND		5	0.91
Naphthalene	91-20-3	10	10	ND		2	0.54	0.43		0.1	0.02	0.34		0.1	0.02	ND		2	0.54	ND		2	0.54	ND		2	0.54	ND		2	0.54
NDPA/DPA	86-30-6	50	50	ND		2	0.92	ND		2	0.92	ND		2	0.92	ND		2	0.92	ND		2	0.92	ND		2	0.92	ND		2	0.92
Nitrobenzene	98-95-3	0.4	0.4	ND		**2**	0.2	ND		**2**	0.2	ND		**2**	0.2	ND		**2**	0.2	ND		**2**	0.2	ND		**2**	0.2	ND		**2**	0.2
p-Chloro-m-cresol	59-50-7	NS	NS	ND		2	0.61	ND		2	0.61	ND		2	0.61	ND		2	0.61	ND		2	0.61	ND		2	0.61	ND		2	0.61
Pentachlorophenol	87-86-5	1	2	ND		**10**	**2.5**	0.07	J	0.8	0.06	0.08	J	0.8	0.06	ND		**10**	**2.5**	ND		**10**	**2.5**	ND		**10**	**2.5**	ND		**10**	**2.5**
Phenanthrene	85-01-8	50	50	ND		2	0.42	ND		0.1	0.04	0.08	J	0.1	0.04	ND		2	0.42	ND		2	0.42	ND		2	0.42	ND		2	0.42
Phenol	108-95-2	1	2	ND		**5**	0.35	ND		5	0.35	ND		5	0.35	ND		**5**	0.35	ND		**5**	0.35	ND		**5**	0.35	0.69	J	**5**	0.35
Pyrene	129-00-0	50	50	ND		2	0.41	0.08	J	0.1	0.04	0.07	J	0.1	0.04	ND		2	0.41	ND		2	0.41	ND		2	0.41	ND		2	0.41
Total SVOCs		NS	NS	14	-	-	-	2.62		-	-	7.11		-	-	13		-	-	-		-	-	-		-	-	1.17		-	-

Notes:
All results are reported in micrograms per liter (ug/L)
Bold - Indicates a concentration detected above NY-AWQS
Italicized - Indicates a concentration detected above NY-TOGS-GA
NS - No Applicable Standard
~ - Not Analyzed
- - Not Applicable
ND - Analyzed for but Not Detected at the MDL
Q - Qualifier
J - The concentration was detected at a value equal to or below the RL, but greater than the MDL
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4B

245 West 55th Street
New York, New York

Summary of Semi-Volatile Organic Compounds in Groundwater

SAMPLE ID: / LAB ID: / COLLECTION DATE:	CAS	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	New York TOGS 111 Groundwater Effluent Limitations (Class GA) (NY-TOGS-GA) (ug/l)	MW-7 L2471072-08 12/5/2024				DUP L2471072-09 12/5/2024				MW-8 L2522485-03 4/11/2025				DUP L2522485-04 4/11/2025				MW-1D L2471072-02 12/4/2024				FIELD BLANK L2471072-11 12/5/2024				FIELD BLANK L2507953-11 2/13/2025			
				Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
SEMIVOLATILE ORGANIC COMPOUNDS																															
1,2,4,5-Tetrachlorobenzene	95-94-3	5	5	ND		**10**	0.24	ND		**10**	0.24	ND		**10**	0.24	ND		**10**	0.24	ND		**10**	0.24	ND		**10**	0.24	ND		**10**	0.24
1,2,4-Trichlorobenzene	120-82-1	5	5	ND		5	0.98	ND		5	0.98	ND		5	0.98	ND		5	0.98	ND		5	0.98	ND		5	0.98	ND		5	0.98
1,2-Dichlorobenzene	95-50-1	3	3	ND		2	0.33	ND		2	0.33	ND		2	0.33	ND		2	0.33	ND		2	0.33	ND		2	0.33	ND		2	0.33
1,3-Dichlorobenzene	541-73-1	3	3	ND		2	0.32	ND		2	0.32	ND		2	0.32	ND		2	0.32	ND		2	0.32	ND		2	0.32	ND		2	0.32
1,4-Dichlorobenzene	106-46-7	3	3	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39
2,4,5-Trichlorophenol	95-95-4	NS	NS	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1
2,4,6-Trichlorophenol	88-06-2	NS	NS	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1	ND		5	2.1
2,4-Dichlorophenol	120-83-2	1	2	ND		**5**	**1.7**	ND		**5**	**1.7**	ND		**5**	**1.7**	ND		**5**	**1.7**	ND		**5**	**1.7**	ND		**5**	**1.7**	ND		**5**	**1.7**
2,4-Dimethylphenol	105-67-9	50	2	ND		5	2	ND		5	2	ND		5	2	ND		5	2	ND		5	2	ND		5	2	ND		5	2
2,4-Dinitrophenol	51-28-5	10	2	ND		**20**	**5.4**	ND		**20**	**5.4**	ND		**20**	**5.4**	ND		**20**	**5.4**	ND		**20**	**5.4**	ND		**20**	**5.4**	ND		**20**	**5.4**
2,4-Dinitrotoluene	121-14-2	5	5	ND		5	0.54	ND		5	0.54	ND		5	0.54	ND		5	0.54	ND		5	0.54	ND		5	0.54	ND		5	0.54
2,6-Dinitrotoluene	606-20-2	5	5	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84
2-Chloronaphthalene	91-58-7	10	10	ND		2	0.35	ND		2	0.35	ND		0.2	0.02	ND		0.2	0.02	ND		2	0.35	ND		2	0.35	ND		0.2	0.02
2-Chlorophenol	95-57-8	NS	NS	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65	ND		2	0.65
2-Methylnaphthalene	91-57-6	NS	NS	14		2	0.37	18		2	0.37	ND		0.1	0.03	ND		0.1	0.03	ND		2	0.37	ND		2	0.37	ND		0.1	0.03
2-Methylphenol	95-48-7	NS	NS	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3
2-Nitroaniline	88-74-4	5	5	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1	ND		5	1
2-Nitrophenol	88-75-5	NS	NS	ND		10	2	ND		10	2	ND		10	2	ND		10	2	ND		10	2	ND		10	2	ND		10	2
3,3'-Dichlorobenzidine	91-94-1	5	5	ND		5	1.8	ND		5	1.8	ND		5	1.8	ND		5	1.8	ND		5	1.8	ND		5	1.8	ND		5	1.8
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	NS	NS	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4
3-Nitroaniline	99-09-2	5	5	ND		5	1.2	ND		5	1.2	ND		5	1.2	ND		5	1.2	ND		5	1.2	ND		5	1.2	ND		5	1.2
4,6-Dinitro-o-cresol	534-52-1	NS	NS	ND		10	2.3	ND		10	2.3	ND		10	2.3	ND		10	2.3	ND		10	2.3	ND		10	2.3	ND		10	2.3
4-Bromophenyl phenyl ether	101-55-3	NS	NS	ND		2	0.24	ND		2	0.24	ND		2	0.24	ND		2	0.24	ND		2	0.24	ND		2	0.24	ND		2	0.24
4-Chloroaniline	106-47-8	5	5	ND		5	0.47	ND		5	0.47	ND		5	0.47	ND		5	0.47	ND		5	0.47	ND		5	0.47	ND		5	0.47
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39	ND		2	0.39
4-Nitroaniline	100-01-6	5	5	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4	ND		5	1.4
4-Nitrophenol	100-02-7	NS	NS	ND		10	1.4	ND		10	1.4	ND		10	1.4	ND		10	1.4	ND		10	1.4	ND		10	1.4	ND		10	1.4
Acenaphthene	83-32-9	20	20	3.5		2	0.4	4.7		2	0.4	0.25		0.1	0.02	0.27		0.1	0.02	ND		2	0.4	ND		2	0.4	ND		0.1	0.02
Acenaphthylene	208-96-8	NS	NS	ND		2	0.32	ND		2	0.32	ND		0.1	0.02	ND		0.1	0.02	ND		2	0.32	ND		2	0.32	0.02	J	0.1	0.02
Acetophenone	98-86-2	NS	NS	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92
Anthracene	120-12-7	50	50	ND		2	0.47	ND		2	0.47	ND		0.1	0.02	ND		0.1	0.02	ND		2	0.47	ND		2	0.47	ND		0.1	0.02
Benzo(a)anthracene	56-55-3	0.002	0.002	ND		**2**	**0.32**	ND		**2**	**0.32**	ND		**0.1**	**0.03**	ND		**0.1**	**0.03**	ND		**2**	**0.32**	ND		**2**	**0.32**	ND		**0.1**	**0.03**
Benzo(a)pyrene	50-32-8	0	0	ND		**2**	**0.37**	ND		**2**	**0.37**	ND		**0.1**	**0.02**	ND		**0.1**	**0.02**	ND		**2**	**0.37**	ND		**2**	**0.37**	ND		**0.1**	**0.02**
Benzo(b)fluoranthene	205-99-2	0.002	0.002	ND		**2**	**0.53**	ND		**2**	**0.53**	ND		**0.1**	**0.03**	ND		**0.1**	**0.03**	ND		**2**	**0.53**	ND		**2**	**0.53**	ND		**0.1**	**0.03**
Benzo(ghi)perylene	191-24-2	NS	NS	ND		2	0.37	ND		2	0.37	ND		0.1	0.02	ND		0.1	0.02	ND		2	0.37	ND		2	0.37	ND		0.1	0.02
Benzo(k)fluoranthene	207-08-9	0.002	0.002	ND		**2**	**0.62**	ND		**2**	**0.62**	ND		**0.1**	**0.03**	ND		**0.1**	**0.03**	ND		**2**	**0.62**	ND		**2**	**0.62**	ND		**0.1**	**0.03**
Benzoic Acid	65-85-0	NS	NS	ND		50	2.6	ND		50	2.6	2.8	J	50	2.6	4.6	J	50	2.6	ND		50	2.6	ND		50	2.6	ND		50	2.6
Benzyl Alcohol	100-51-6	NS	NS	ND		2	0.38	ND		2	0.38	ND		2	0.38	ND		2	0.38	ND		2	0.38	ND		2	0.38	ND		2	0.38
Biphenyl	92-52-4	NS	NS	ND		2	0.2	ND		2	0.2	ND		2	0.2	ND		2	0.2	ND		2	0.2	ND		2	0.2	ND		2	0.2
Bis(2-chloroethoxy)methane	111-91-1	5	5	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84	ND		5	0.84
Bis(2-chloroethyl)ether	111-44-4	1	1	ND		**2**	0.39	ND		**2**	0.39	ND		**2**	0.39	ND		**2**	0.39	ND		**2**	0.39	ND		**2**	0.39	ND		**2**	0.39
Bis(2-chloroisopropyl)ether	108-60-1	5	5	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4
Bis(2-ethylhexyl)phthalate	117-81-7	5	5	ND		3	1.4	ND		3	1.4	2.8	J	3	1.4	2.3	J	3	1.4	ND		3	1.4	ND		3	1.4	ND		3	1.4
Butyl benzyl phthalate	85-68-7	50	50	ND		5	2.6	ND		5	2.6	4.1	J	5	2.6	ND		5	2.6	ND		5	2.6	ND		5	2.6	ND		5	2.6
Carbazole	86-74-8	NS	NS	ND		2	0.31	ND		2	0.31	ND		2	0.31	ND		2	0.31	ND		2	0.31	ND		2	0.31	ND		2	0.31
Chrysene	218-01-9	0.002	0.002	ND		**2**	**0.22**	ND		**2**	**0.22**	ND		**0.1**	**0.03**	ND		**0.1**	**0.03**	ND		**2**	**0.22**	ND		**2**	**0.22**	ND		**0.1**	**0.03**
Di-n-butylphthalate	84-74-2	50	50	ND		5	0.96	ND		5	0.96	ND		5	0.96	ND		5	0.96	ND		5	0.96	ND		5	0.96	ND		5	0.96
Di-n-octylphthalate	117-84-0	50	50	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3	ND		5	2.3
Dibenzo(a,h)anthracene	53-70-3	NS	NS	ND		2	0.29	ND		2	0.29	ND		0.1	0.02	ND		0.1	0.02	ND		2	0.29	ND		2	0.29	ND		0.1	0.02
Dibenzofuran	132-64-9	NS	NS	ND		2	0.4	2.7		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4	ND		2	0.4
Diethyl phthalate	84-66-2	50	50	ND		5	0.76	ND		5	0.76	ND		5	0.76	ND		5	0.76	ND		5	0.76	ND		5	0.76	ND		5	0.76
Dimethyl phthalate	131-11-3	50	50	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92	ND		5	0.92
Fluoranthene	206-44-0	50	50	ND		2	0.41	ND		2	0.41	ND		0.1	0.03	ND		0.1	0.03	ND		2	0.41	ND		2	0.41	ND		0.1	0.03
Fluorene	86-73-7	50	50	3.8		2	0.44	5.1		2	0.44	ND		0.1	0.03	ND		0.1	0.03	ND		2	0.44	ND		2	0.44	ND		0.1	0.03
Hexachlorobenzene	118-74-1	0.04	0.04	ND		**2**	**0.45**	ND		**2**	**0.45**	ND		**0.8**	0.01	ND		**0.8**	**0.01**	ND		**2**	**0.45**	ND		**2**	**0.45**	0.02	J	**0.8**	**0.01**
Hexachlorobutadiene	87-68-3	0.5	0.5	ND		**2**	0.36	ND		**2**	0.36	ND		0.5	0.02	ND		0.5	0.02	ND		**2**	0.36	ND		**2**	0.36	ND		0.5	0.02
Hexachlorocyclopentadiene	77-47-4	5	5	ND		**20**	1.2	ND		**20**	1.2	ND		**20**	1.2	ND		**20**	1.2	ND		**20**	1.2	ND		**20**	1.2	ND		0.5	1.2
Hexachloroethane	67-72-1	5	5	ND		2	0.2	ND		2	0.2	ND		0.8	0.02	ND		0.8	0.02	ND		2	0.2	ND		2	0.2	ND		0.8	0.02
Indeno(1,2,3-cd)pyrene	193-39-5	0.002	0.002	ND		**2**	**0.48**	ND		**2**	**0.48**	ND		**0.1**	**0.02**	ND		**0.1**	**0.02**	ND		**2**	**0.48**	ND		**2**	**0.48**	ND		**0.1**	**0.02**
Isophorone	78-59-1	50	50	ND		5	0.86	ND		5	0.86	ND		5	0.86	ND		5	0.86	ND		5	0.86	ND		5	0.86	ND		5	0.86
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	ND		5	0.91	ND		5	0.91	ND		5	0.91	ND		5	0.91	ND		5	0.91	ND		5	0.91	ND		5	0.91
Naphthalene	91-20-3	10	10	ND		2	0.54	ND		2	0.54	0.03	J	0.1	0.02	0.03	J	0.1	0.02	ND		2	0.54	ND		2	0.54	ND		0.1	0.02
NDPA/DPA	86-30-6	50	50	ND		2	0.92	ND		2	0.92	ND		2	0.92	ND		2	0.92	ND		2	0.92	ND		2	0.92	ND		2	0.92
Nitrobenzene	98-95-3	0.4	0.4	ND		**2**	0.2	ND		**2**	0.2	ND		**2**	0.2	ND		**2**	0.2	ND		**2**	0.2	ND		**2**	0.2	ND		**2**	0.2
p-Chloro-m-cresol	59-50-7	NS	NS	ND		2	0.61	ND		2	0.61	ND		2	0.61	ND		2	0.61	ND		2	0.61	ND		2	0.61	ND		2	0.61
Pentachlorophenol	87-86-5	1	2	ND		**10**	**2.5**	ND		**10**	**2.5**	ND		0.8	0.06	ND		0.8	0.06	ND		**10**	**2.5**	ND		**10**	**2.5**	0.06	J	0.8	0.06
Phenanthrene	85-01-8	50	50	2		2	0.42	2.7		2	0.42	ND		0.1	0.04	ND		0.1	0.04	ND		2	0.42	ND		2	0.42	ND		0.1	0.04
Phenol	108-95-2	1	2	ND		**5**	0.35	ND		**5**	0.35	ND		**5**	0.35	ND		**5**	0.35	ND		**5**	0.35	ND		**5**	0.35	ND		**5**	0.35
Pyrene	129-00-0	50	50	ND		2	0.41	ND		2	0.41	ND		0.1	0.04	ND		0.1	0.04	ND		2	0.41	ND		2	0.41	ND		0.1	0.04
Total SVOCs		NS	NS	23.3	-	-	-	33.2	-	-	-	9.98	-	-	-	7.2	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-

Notes:
All results are reported in micrograms per liter (µg/L)
Bold - Indicates a concentration detected above NY-AWQS
Italicized - Indicates a concentration detected above NY-TOGS-GA
NS - No Applicable Standard
~ - Not Analyzed
- - Not Applicable
ND - Analyzed for but Not Detected at the MDL
Q - Qualifier
J - The concentration was detected at a value equal to or below the RL, but greater than the MDL
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4B

245 West 55th Street
New York, New York

Summary of Semi-Volatile Organic Compounds in Groundwater

SAMPLE ID: LAB ID: COLLECTION DATE:	CAS	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	New York TOGS 111 Groundwater Effluent Limitations (Class GA) (NY-TOGS-GA) (ug/l)	FIELD BLANK L2522485-02 4/11/2025 Result	Q	RL	MDL
SEMIVOLATILE ORGANIC COMPOUNDS							
1,2,4,5-Tetrachlorobenzene	95-94-3	5	5	ND		**10**	0.24
1,2,4-Trichlorobenzene	120-82-1	5	5	ND		5	0.98
1,2-Dichlorobenzene	95-50-1	3	3	ND		2	0.33
1,3-Dichlorobenzene	541-73-1	3	3	ND		2	0.32
1,4-Dichlorobenzene	106-46-7	3	3	ND		2	0.39
2,4,5-Trichlorophenol	95-95-4	NS	NS	ND		5	2.1
2,4,6-Trichlorophenol	88-06-2	NS	NS	ND		5	2.1
2,4-Dichlorophenol	120-83-2	1	2	ND		**5**	**1.7**
2,4-Dimethylphenol	105-67-9	50	2	ND		5	2
2,4-Dinitrophenol	51-28-5	10	2	ND		**20**	**5.4**
2,4-Dinitrotoluene	121-14-2	5	5	ND		5	0.54
2,6-Dinitrotoluene	606-20-2	5	5	ND		5	0.84
2-Chloronaphthalene	91-58-7	10	10	ND		0.2	0.02
2-Chlorophenol	95-57-8	NS	NS	ND		2	0.65
2-Methylnaphthalene	91-57-6	NS	NS	ND		0.1	0.03
2-Methylphenol	95-48-7	NS	NS	ND		5	2.3
2-Nitroaniline	88-74-4	5	5	ND		5	1
2-Nitrophenol	88-75-5	NS	NS	ND		10	2
3,3'-Dichlorobenzidine	91-94-1	5	5	ND		5	1.8
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	NS	NS	ND		5	1.4
3-Nitroaniline	99-09-2	5	5	ND		5	1.2
4,6-Dinitro-o-cresol	534-52-1	NS	NS	ND		10	2.3
4-Bromophenyl phenyl ether	101-55-3	NS	NS	ND		2	0.24
4-Chloroaniline	106-47-8	5	5	ND		5	0.47
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	ND		2	0.39
4-Nitroaniline	100-01-6	5	5	ND		5	1.4
4-Nitrophenol	100-02-7	NS	NS	ND		10	1.4
Acenaphthene	83-32-9	20	20	ND		0.1	0.02
Acenaphthylene	208-96-8	NS	NS	ND		0.1	0.02
Acetophenone	98-86-2	NS	NS	ND		5	0.92
Anthracene	120-12-7	50	50	ND		0.1	0.02
Benzo(a)anthracene	56-55-3	0.002	0.002	0.03	J	**0.1**	**0.03**
Benzo(a)pyrene	50-32-8	0	0	ND		**0.1**	**0.02**
Benzo(b)fluoranthene	205-99-2	0.002	0.002	ND		**0.1**	**0.03**
Benzo(ghi)perylene	191-24-2	NS	NS	0.03	J	0.1	0.02
Benzo(k)fluoranthene	207-08-9	0.002	0.002	ND		**0.1**	**0.03**
Benzoic Acid	65-85-0	NS	NS	ND		50	2.6
Benzyl Alcohol	100-51-6	NS	NS	ND		2	0.38
Biphenyl	92-52-4	NS	NS	ND		2	0.2
Bis(2-chloroethoxy)methane	111-91-1	5	5	ND		5	0.84
Bis(2-chloroethyl)ether	111-44-4	1	1	ND		**2**	0.39
Bis(2-chloroisopropyl)ether	108-60-1	5	5	ND		2	0.4
Bis(2-ethylhexyl)phthalate	117-81-7	5	5	2.2	J	3	1.4
Butyl benzyl phthalate	85-68-7	50	50	ND		5	2.6
Carbazole	86-74-8	NS	NS	ND		2	0.31
Chrysene	218-01-9	0.002	0.002	ND		**0.1**	**0.03**
Di-n-butylphthalate	84-74-2	50	50	ND		5	0.96
Di-n-octylphthalate	117-84-0	50	50	ND		5	2.3
Dibenzo(a,h)anthracene	53-70-3	NS	NS	0.03	J	0.1	0.02
Dibenzofuran	132-64-9	NS	NS	ND		2	0.4
Diethyl phthalate	84-66-2	50	50	ND		5	0.76
Dimethyl phthalate	131-11-3	50	50	ND		5	0.92
Fluoranthene	206-44-0	50	50	ND		0.1	0.03
Fluorene	86-73-7	50	50	ND		0.1	0.03
Hexachlorobenzene	118-74-1	0.04	0.04	ND		**0.8**	**0.01**
Hexachlorobutadiene	87-68-3	0.5	0.5	ND		0.5	0.02
Hexachlorocyclopentadiene	77-47-4	5	5	ND		**20**	1.2
Hexachloroethane	67-72-1	5	5	ND		0.8	0.02
Indeno(1,2,3-cd)pyrene	193-39-5	0.002	0.002	0.03	J	**0.1**	**0.02**
Isophorone	78-59-1	50	50	ND		5	0.86
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	ND		5	0.91
Naphthalene	91-20-3	10	10	ND		0.1	0.02
NDPA/DPA	86-30-6	50	50	ND		2	0.92
Nitrobenzene	98-95-3	0.4	0.4	ND		**2**	0.2
p-Chloro-m-cresol	59-50-7	NS	NS	ND		2	0.61
Pentachlorophenol	87-86-5	1	2	ND		0.8	0.06
Phenanthrene	85-01-8	50	50	ND		0.1	0.04
Phenol	108-95-2	1	2	ND		**5**	0.35
Pyrene	129-00-0	50	50	ND		0.1	0.04
Total SVOCs		NS	NS	2.32	-	-	-

Notes:
All results are reported in micrograms per liter (µg/L)
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Italicized - Indicates a concentration detected above NY-TOGS-GA
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~ - Not Analyzed
- - Not Applicable
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RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Groundwater

SAMPLE ID: LAB ID: COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS)	MW-1 L2471072-06 12/5/2024				MW-1D L2471072-02 12/4/2024				MW-2 L2507953-08 2/13/2025				DUP L2507953-12 2/13/2025			
		(ug/l)	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
ORGANOCHLORINE PESTICIDES BY GC																		
4,4'-DDD	72-54-8	0.3	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.01	ND		0.029	0.01
4,4'-DDE	72-55-9	0.2	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.01	ND		0.029	0.01
4,4'-DDT	50-29-3	0.2	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.013	ND		0.029	0.013
Aldrin	309-00-2	NS	ND		**0.014**	**0.002**	ND		**0.014**	**0.002**	ND		**0.014**	**0.005**	ND		**0.014**	**0.005**
Alpha-BHC	319-84-6	0.01	ND		**0.014**	0.003	ND		**0.014**	0.003	ND		**0.014**	0.005	ND		**0.014**	0.005
Beta-BHC	319-85-7	0.04	ND		0.014	0.004	ND		0.014	0.004	ND		0.02	0.014	ND		0.02	0.014
Chlordane	57-74-9	0.05	ND		**0.143**	0.033	ND		**0.143**	0.033	ND		**0.143**	**0.098**	ND		**0.143**	**0.098**
cis-Chlordane	5103-71-9	NS	ND		0.014	0.005	ND		0.014	0.005	ND		0.02	0.007	ND		0.02	0.007
Delta-BHC	319-86-8	0.04	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.006	ND		0.014	0.006
Dieldrin	60-57-1	0.004	ND		**0.029**	0.003	ND		**0.029**	0.003	ND		**0.029**	0.004	ND		**0.029**	0.004
Endosulfan I	959-98-8	NS	ND		0.014	0.002	ND		0.014	0.002	ND		0.014	0.005	ND		0.014	0.005
Endosulfan II	33213-65-9	NS	ND		0.029	0.004	ND		0.029	0.004	ND		0.029	0.008	ND		0.029	0.008
Endosulfan sulfate	1031-07-8	NS	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.007	ND		0.029	0.007
Endrin	72-20-8	NS	ND		**0.029**	**0.003**	ND		**0.029**	**0.003**	ND		**0.029**	**0.008**	ND		**0.029**	**0.008**
Endrin aldehyde	7421-93-4	5	ND		0.029	0.006	ND		0.029	0.006	ND		0.03	0.018	ND		0.03	0.018
Endrin ketone	53494-70-5	5	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.014	ND		0.029	0.014
Heptachlor	76-44-8	0.04	ND		0.014	0.002	ND		0.014	0.002	ND		0.014	0.005	ND		0.014	0.005
Heptachlor epoxide	1024-57-3	0.03	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.005	ND		0.014	0.005
Lindane	58-89-9	0.05	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.005	ND		0.014	0.005
Methoxychlor	72-43-5	35	ND		0.143	0.005	ND		0.143	0.005	ND		0.143	0.014	ND		0.143	0.014
Toxaphene	8001-35-2	0.06	ND		**0.143**	0.045	ND		**0.143**	0.045	ND		**0.2**	**0.094**	ND		**0.2**	**0.094**
trans-Chlordane	5103-74-2	NS	ND		0.014	0.004	ND		0.014	0.004	ND		0.02	0.011	ND		0.02	0.011
POLYCHLORINATED BIPHENYLS BY GC																		
Aroclor 1016	12674-11-2	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.013	ND		0.071	0.013
Aroclor 1221	11104-28-2	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1232	11141-16-5	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1242	53469-21-9	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1248	12672-29-6	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1254	11097-69-1	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1260	11096-82-5	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1262	37324-23-5	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1268	11100-14-4	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
PCBs, Total	1336-36-3	NS	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.013	ND		0.071	0.013

Notes:

All results are reported in micrograms per liter (µg/L)

Bold - Indicates a concentration detected above NY-AWQS

NS - No Applicable Standard

~ - Not Analyzed

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ND - Analyzed for but Not Detected at the MDL

Q - Qualifier

J - The concentration was detected at a value equal to or below the RL, but greater than the MDL.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank.

RL - Reporting Limit

MDL - Method Detection Limit

RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Groundwater

SAMPLE ID: LAB ID: COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	MW-3 L2471072-07 12/5/2024				MW-4 L2471072-03 12/4/2024				MW-5 L2471072-04 12/4/2024				MW-6 L2471072-01 12/4/2024			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
ORGANOCHLORINE PESTICIDES BY GC																		
4,4'-DDD	72-54-8	0.3	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.003
4,4'-DDE	72-55-9	0.2	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.003
4,4'-DDT	50-29-3	0.2	ND		0.029	0.003	ND		0.029	0.003	0.012	J	0.029	0.003	ND		0.029	0.003
Aldrin	309-00-2	NS	ND		**0.014**	**0.002**	ND		**0.014**	**0.002**	ND		**0.014**	**0.002**	ND		**0.014**	**0.002**
Alpha-BHC	319-84-6	0.01	ND		**0.014**	0.003	ND		**0.014**	0.003	ND		**0.014**	0.003	ND		0.014	0.003
Beta-BHC	319-85-7	0.04	ND		0.014	0.004	ND		0.014	0.004	ND		0.014	0.004	ND		0.014	0.004
Chlordane	57-74-9	0.05	ND		**0.143**	0.033	ND		**0.143**	0.033	ND		**0.143**	0.033	ND		**0.143**	0.033
cis-Chlordane	5103-71-9	NS	ND		0.014	0.005	ND		0.014	0.005	ND		0.014	0.005	ND		0.014	0.005
Delta-BHC	319-86-8	0.04	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.003
Dieldrin	60-57-1	0.004	ND		**0.029**	0.003	ND		**0.029**	0.003	ND		**0.029**	0.003	ND		**0.029**	0.003
Endosulfan I	959-98-8	NS	ND		0.014	0.002	ND		0.014	0.002	ND		0.014	0.002	ND		0.014	0.002
Endosulfan II	33213-65-9	NS	ND		0.029	0.004	ND		0.029	0.004	ND		0.029	0.004	ND		0.029	0.004
Endosulfan sulfate	1031-07-8	NS	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.003
Endrin	72-20-8	NS	ND		**0.029**	**0.003**	ND		**0.029**	**0.003**	ND		**0.029**	**0.003**	ND		**0.029**	**0.003**
Endrin aldehyde	7421-93-4	5	ND		0.029	0.006	ND		0.029	0.006	ND		0.029	0.006	ND		0.029	0.006
Endrin ketone	53494-70-5	5	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.003
Heptachlor	76-44-8	0.04	ND		0.014	0.002	ND		0.014	0.002	ND		0.014	0.002	ND		0.014	0.002
Heptachlor epoxide	1024-57-3	0.03	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.003
Lindane	58-89-9	0.05	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.003
Methoxychlor	72-43-5	35	ND		0.143	0.005	ND		0.143	0.005	ND		0.143	0.005	ND		0.143	0.005
Toxaphene	8001-35-2	0.06	ND		**0.143**	0.045	ND		**0.143**	0.045	ND		**0.143**	0.045	ND		**0.143**	0.045
trans-Chlordane	5103-74-2	NS	ND		0.014	0.004	ND		0.014	0.004	ND		0.014	0.004	ND		0.014	0.004
POLYCHLORINATED BIPHENYLS BY GC																		
Aroclor 1016	12674-11-2	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061
Aroclor 1221	11104-28-2	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061
Aroclor 1232	11141-16-5	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061
Aroclor 1242	53469-21-9	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061
Aroclor 1248	12672-29-6	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061
Aroclor 1254	11097-69-1	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061
Aroclor 1260	11096-82-5	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061
Aroclor 1262	37324-23-5	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061
Aroclor 1268	11100-14-4	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061
PCBs, Total	1336-36-3	NS	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.061

Notes:

All results are reported in micrograms per liter (µg/L)

Bold - Indicates a concentration detected above NY-AWQS

NS - No Applicable Standard

~ - Not Analyzed

- - Not Applicable

ND - Analyzed for but Not Detected at the MDL

Q - Qualifier

J - The concentration was detected at a value equal to or below the RL, but greater than the MDL.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank.

RL - Reporting Limit

MDL - Method Detection Limit

RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Groundwater

SAMPLE ID: / LAB ID: / COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	MW-7 L2471072-08 12/5/2024				DUP L2471072-09 12/5/2024				MW-8 L2522485-03 4/11/2025				DUP L2522485-04 4/11/2025			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
ORGANOCHLORINE PESTICIDES BY GC																		
4,4'-DDD	72-54-8	0.3	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.01	ND		0.029	0.01
4,4'-DDE	72-55-9	0.2	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.01	ND		0.029	0.01
4,4'-DDT	50-29-3	0.2	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.013	ND		0.029	0.013
Aldrin	309-00-2	NS	ND		**0.014**	**0.002**	ND		**0.014**	**0.002**	ND		**0.014**	**0.005**	ND		**0.014**	**0.005**
Alpha-BHC	319-84-6	0.01	ND		**0.014**	0.003	ND		**0.014**	0.003	ND		**0.014**	0.005	ND		**0.014**	0.005
Beta-BHC	319-85-7	0.04	ND		0.014	0.004	ND		0.014	0.004	ND		0.02	0.014	ND		0.02	0.014
Chlordane	57-74-9	0.05	ND		**0.143**	0.033	ND		**0.143**	0.033	ND		**0.143**	0.098	ND		**0.143**	0.098
cis-Chlordane	5103-71-9	NS	ND		0.014	0.005	ND		0.014	0.005	ND		0.02	0.007	ND		0.02	0.007
Delta-BHC	319-86-8	0.04	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.006	ND		0.014	0.006
Dieldrin	60-57-1	0.004	ND		**0.029**	0.003	ND		**0.029**	0.003	ND		**0.029**	0.004	ND		**0.029**	0.004
Endosulfan I	959-98-8	NS	ND		0.014	0.002	ND		0.014	0.002	ND		0.014	0.005	ND		0.014	0.005
Endosulfan II	33213-65-9	NS	ND		0.029	0.004	ND		0.029	0.004	ND		0.029	0.008	ND		0.029	0.008
Endosulfan sulfate	1031-07-8	NS	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.007	ND		0.029	0.007
Endrin	72-20-8	NS	ND		**0.029**	**0.003**	ND		**0.029**	**0.003**	ND		**0.029**	**0.008**	ND		**0.029**	**0.008**
Endrin aldehyde	7421-93-4	5	ND		0.029	0.006	ND		0.029	0.006	ND		0.03	0.018	ND		0.03	0.018
Endrin ketone	53494-70-5	5	ND		0.029	0.003	ND		0.029	0.003	ND		0.029	0.014	ND		0.029	0.014
Heptachlor	76-44-8	0.04	ND		0.014	0.002	ND		0.014	0.002	ND		0.014	0.005	ND		0.014	0.005
Heptachlor epoxide	1024-57-3	0.03	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.005	ND		0.014	0.005
Lindane	58-89-9	0.05	ND		0.014	0.003	ND		0.014	0.003	ND		0.014	0.005	ND		0.014	0.005
Methoxychlor	72-43-5	35	ND		0.143	0.005	ND		0.143	0.005	ND		0.143	0.014	ND		0.143	0.014
Toxaphene	8001-35-2	0.06	ND		**0.143**	0.045	ND		**0.143**	0.045	ND		**0.2**	**0.094**	ND		**0.2**	**0.094**
trans-Chlordane	5103-74-2	NS	ND		0.014	0.004	ND		0.014	0.004	ND		0.02	0.011	ND		0.02	0.011
POLYCHLORINATED BIPHENYLS BY GC																		
Aroclor 1016	12674-11-2	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.013	ND		0.071	0.013
Aroclor 1221	11104-28-2	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1232	11141-16-5	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1242	53469-21-9	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1248	12672-29-6	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1254	11097-69-1	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1260	11096-82-5	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1262	37324-23-5	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1268	11100-14-4	0.09	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
PCBs, Total	1336-36-3	NS	ND		0.071	0.061	ND		0.071	0.061	ND		0.071	0.013	ND		0.071	0.013

Notes:

All results are reported in micrograms per liter (µg/L)

Bold - Indicates a concentration detected above NY-AWQS

NS - No Applicable Standard

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J - The concentration was detected at a value equal to or below the RL, but greater than the MDL.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank.

RL - Reporting Limit

MDL - Method Detection Limit

RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4C

245 West 55th Street
New York, New York

Summary of Pesticides and Polychlorinated Biphenyls (PCBs) in Groundwater

SAMPLE ID: LAB ID: COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	FIELD BLANK L2471072-11 12/5/2024				FIELD BLANK L2507953-11 2/13/2025				FIELD BLANK L2522485-02 4/11/2025			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
ORGANOCHLORINE PESTICIDES BY GC														
4,4'-DDD	72-54-8	0.3	ND		0.029	0.003	ND		0.029	0.01	ND		0.029	0.01
4,4'-DDE	72-55-9	0.2	ND		0.029	0.003	ND		0.029	0.01	ND		0.029	0.01
4,4'-DDT	50-29-3	0.2	ND		0.029	0.003	ND		0.029	0.013	ND		0.029	0.013
Aldrin	309-00-2	NS	ND		**0.014**	**0.002**	ND		**0.014**	**0.005**	ND		**0.014**	**0.005**
Alpha-BHC	319-84-6	0.01	ND		**0.014**	0.003	ND		**0.014**	0.005	ND		**0.014**	0.005
Beta-BHC	319-85-7	0.04	ND		0.014	0.004	ND		0.02	0.014	ND		0.02	0.014
Chlordane	57-74-9	0.05	ND		**0.143**	0.033	ND		**0.143**	0.098	ND		**0.143**	0.098
cis-Chlordane	5103-71-9	NS	ND		0.014	0.005	ND		0.02	0.007	ND		0.02	0.007
Delta-BHC	319-86-8	0.04	ND		0.014	0.003	ND		0.014	0.006	ND		0.014	0.006
Dieldrin	60-57-1	0.004	ND		**0.029**	0.003	ND		**0.029**	0.004	ND		**0.029**	0.004
Endosulfan I	959-98-8	NS	ND		0.014	0.002	ND		0.014	0.005	ND		0.014	0.005
Endosulfan II	33213-65-9	NS	ND		0.029	0.004	ND		0.029	0.008	ND		0.029	0.008
Endosulfan sulfate	1031-07-8	NS	ND		0.029	0.003	ND		0.029	0.007	ND		0.029	0.007
Endrin	72-20-8	NS	ND		**0.029**	**0.003**	ND		**0.029**	**0.008**	ND		**0.029**	**0.008**
Endrin aldehyde	7421-93-4	5	ND		0.029	0.006	ND		0.03	0.018	ND		0.03	0.018
Endrin ketone	53494-70-5	5	ND		0.029	0.003	ND		0.029	0.014	ND		0.029	0.014
Heptachlor	76-44-8	0.04	ND		0.014	0.002	ND		0.014	0.005	ND		0.014	0.005
Heptachlor epoxide	1024-57-3	0.03	ND		0.014	0.003	ND		0.014	0.005	ND		0.014	0.005
Lindane	58-89-9	0.05	ND		0.014	0.003	ND		0.014	0.005	ND		0.014	0.005
Methoxychlor	72-43-5	35	ND		0.143	0.005	ND		0.143	0.014	ND		0.143	0.014
Toxaphene	8001-35-2	0.06	ND		**0.143**	0.045	ND		**0.2**	**0.094**	ND		**0.2**	**0.094**
trans-Chlordane	5103-74-2	NS	ND		0.014	0.004	ND		0.02	0.011	ND		0.02	0.011
POLYCHLORINATED BIPHENYLS BY GC														
Aroclor 1016	12674-11-2	0.09	ND		0.071	0.061	ND		0.071	0.013	ND		0.071	0.013
Aroclor 1221	11104-28-2	0.09	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1232	11141-16-5	0.09	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1242	53469-21-9	0.09	ND		0.071	0.061	ND		0.071	0.015	0.057	J	0.071	0.015
Aroclor 1248	12672-29-6	0.09	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1254	11097-69-1	0.09	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1260	11096-82-5	0.09	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1262	37324-23-5	0.09	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
Aroclor 1268	11100-14-4	0.09	ND		0.071	0.061	ND		0.071	0.015	ND		0.071	0.015
PCBs, Total	1336-36-3	NS	ND		0.071	0.061	ND		0.071	0.013	0.057	JB	0.071	0.013

Notes:

All results are reported in micrograms per liter (µg/L)

Bold - Indicates a concentration detected above NY-AWQS

NS - No Applicable Standard

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ND - Analyzed for but Not Detected at the MDL

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J - The concentration was detected at a value equal to or below the RL, but greater than the MDL.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank.

RL - Reporting Limit

MDL - Method Detection Limit

RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4D

245 West 55th Street
New York, New York

Summary of Per- and Polyfluoroalkyl Substances (PFAS) Results in Groundwater

SAMPLE ID: LAB ID: COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/L)	MW-1 L2471072-06 12/5/2024				MW-1 L2471072-06 R1 12/5/2024				MW-2 L2507953-08 2/13/2025				DUP (MW-2) L2507953-12 2/13/2025				MW-3 L2471072-07 12/5/2024				MW-4 L2471072-03 12/4/2024			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
PERFLUORINATED ALKYL ACIDS BY EPA 1633																										
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	ND		0.0064	0.000448	~		~	~	ND		0.00781	0.000547	ND		0.0106	0.000739	ND		0.00632	0.000442	ND		0.00607	0.000425
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	ND		0.0064	0.00122	~		~	~	ND		0.00781	0.00149	ND		0.0106	0.00202	ND		0.00632	0.00121	ND		0.00607	0.00116
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	ND		0.0064	0.000911	~		~	~	ND		0.00781	0.00111	ND		0.0106	0.0015	ND		0.00632	0.000901	ND		0.00607	0.000866
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	NS	ND		0.0064	0.00481	~		~	~	ND		0.0781	0.0588	ND		0.106	0.0794	ND		0.00632	0.00476	0.00495	J	0.00607	0.00457
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	914637-49-3	NS	ND		0.04	0.00425	~		~	~	ND		0.0488	0.00519	ND		0.066	0.00702	ND		0.0395	0.0042	ND		0.038	0.00404
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	812-70-4	NS	ND		0.04	0.00318	~		~	~	ND		0.0488	0.00389	ND		0.066	0.00525	ND		0.0395	0.00314	ND		0.038	0.00302
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	356-02-5	NS	ND		0.00799	0.000536	~		~	~	ND		0.00976	0.000654	ND		0.0132	0.000884	ND		0.0079	0.000529	ND		0.00759	0.000509
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	ND		0.0064	0.000376	~		~	~	ND		0.00781	0.000459	ND		0.0106	0.00062	ND		0.00632	0.000371	ND		0.00607	0.000357
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	ND		0.0064	0.00044	~		~	~	ND		0.00781	0.000537	ND		0.0106	0.000726	ND		0.00632	0.000434	ND		0.00607	0.000418
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	NS	ND		0.0064	0.0016	~		~	~	ND		0.00781	0.00195	ND		0.0106	0.00264	ND		0.00632	0.00158	ND		0.00607	0.00152
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	NS	ND		0.0016	0.000352	~		~	~	ND		0.00195	0.00043	ND		0.00264	0.00058	ND		0.00158	0.000348	ND		0.00152	0.000334
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	NS	ND		0.016	0.0011	~		~	~	ND		0.0195	0.00135	ND		0.0264	0.00182	ND		0.0158	0.00109	ND		0.0152	0.00105
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	0.00114	J	0.0016	0.00048	~		~	~	0.0114		0.00195	0.000586	0.0115	JF	0.0264	0.00792	ND		0.00158	0.000474	0.00153		0.00152	0.000456
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	NS	ND		0.0016	0.000224	~		~	~	ND		0.00195	0.000273	ND		0.00264	0.000369	ND		0.00158	0.000221	ND		0.00152	0.000213
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	NS	ND		0.016	0.0013	~		~	~	ND		0.0195	0.00159	ND		0.0264	0.00215	ND		0.0158	0.00129	ND		0.0152	0.00124
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	ND		0.0016	0.00048	~		~	~	0.0074		0.00195	0.000586	0.00653		0.00264	0.000792	ND		0.00158	0.000474	ND		0.00152	0.000456
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	NS	ND		0.0032	0.000544	~		~	~	ND		0.0039	0.000664	ND		0.00528	0.000897	ND		0.00316	0.000537	ND		0.00304	0.000516
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	113507-82-7	NS	ND		0.0032	0.000328	~		~	~	ND		0.0039	0.0004	ND		0.00528	0.000541	ND		0.00316	0.000324	ND		0.00304	0.000311
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	377-73-1	NS	ND		0.0032	0.000248	~		~	~	ND		0.0039	0.000303	ND		0.00528	0.000409	ND		0.00316	0.000245	ND		0.00304	0.000235
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	NS	ND		0.0032	0.00036	~		~	~	ND		0.0039	0.000439	0.00124	J	0.00528	0.000594	ND		0.00316	0.000356	ND		0.00304	0.000342
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	0.00979		0.0016	0.0004	~		~	~	0.00687		0.00195	0.000488	0.00653		0.00264	0.00066	0.00235		0.00158	0.000395	0.00592		0.00152	0.00038
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	0.0361		0.0064	0.000528	~		~	~	0.242		0.00781	0.000644	0.225		0.0106	0.000871	0.00794		0.00632	0.000521	0.0129		0.00607	0.000501
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	0.00093	J	0.0016	0.000136	~		~	~	0.0101		0.00195	0.000166	0.00914		0.00264	0.000224	ND		0.00158	0.000134	ND		0.00152	0.000129
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	0.00208		0.0016	0.000208	~		~	~	0.00754		0.00195	0.000254	0.00654		0.00264	0.000343	0.00678		0.00158	0.000205	0.0127		0.00152	0.000197
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	NS	ND		0.0016	0.00024	~		~	~	ND		0.00195	0.000293	ND		0.00264	0.000396	ND		0.00158	0.000237	ND		0.00152	0.000228
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	ND		0.0016	0.000216	~		~	~	ND		0.00195	0.000264	ND		0.00264	0.000356	ND		0.00158	0.000213	ND		0.00152	0.000205
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	0.00703		0.0016	0.0002	~		~	~	0.00709		0.00195	0.000244	0.00641		0.00264	0.00033	0.00084	J	0.00158	0.000198	0.0131		0.00152	0.00019
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	0.0348		0.0016	0.00024	~		~	~	0.0791		0.00195	0.000293	0.0839		0.00264	0.000396	0.0084		0.00158	0.000237	0.083		0.00152	0.000228
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	0.0585		0.0016	0.000136	~		~	~	0.0111		0.00195	0.000166	0.00974		0.00264	0.000224	0.004		0.00158	0.000134	0.0351		0.00152	0.000129
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	0.0473		0.0016	0.000248	~		~	~	0.442		0.00195	0.000303	0.336		0.00264	0.000409	0.0138		0.00158	0.000245	0.0449		0.00152	0.000235
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	ND		0.0016	0.0002	~		~	~	ND		0.00195	0.000244	ND		0.00264	0.00033	ND		0.00158	0.000198	ND		0.00152	0.00019
Perfluorononanoic Acid (PFNA)	375-95-1	NS	0.0106		0.0016	0.000264	~		~	~	0.0293		0.00195	0.000322	0.0249		0.00264	0.000435	0.00407		0.00158	0.000261	0.0128		0.00152	0.00025
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NS	0.0013	J	0.0016	0.000096	~		~	~	0.0153		0.00195	0.000117	0.0123		0.00264	0.000158	0.00124	JF	0.00158	0.000095	0.00096	JF	0.00152	0.000091
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	0.0027	**6.55**	E	0.0016	0.000264	**4.96**		0.032	0.00528	**0.511**		0.00195	0.000322	**0.388**		0.00264	0.000435	**0.163**		0.00158	0.000261	**0.338**		0.00152	0.00025
Perfluorooctanoic Acid (PFOA)	335-67-1	0.0067	**0.272**		0.0016	0.000264	~		~	~	**0.146**		0.00195	0.000322	**0.146**		0.00264	0.000435	**0.0389**		0.00158	0.000261	**0.254**		0.00152	0.00025
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	0.00475		0.0016	0.000208	~		~	~	0.00254		0.00195	0.000254	0.00234	J	0.00264	0.000343	0.00045	J	0.00158	0.000205	0.00841		0.00152	0.000197
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	0.0908		0.0032	0.00036	~		~	~	0.366		0.0039	0.000439	0.281		0.00528	0.000594	0.0161		0.00316	0.000356	0.0252		0.00304	0.000342
Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	NS	ND		0.0016	0.00016	~		~	~	ND		0.00195	0.000195	ND		0.00264	0.000264	ND		0.00158	0.000158	ND		0.00152	0.000152
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	ND		0.0016	0.000184	~		~	~	ND		0.00195	0.000224	ND		0.00264	0.000303	ND		0.00158	0.000182	ND		0.00152	0.000175
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	ND		0.0016	0.000176	~		~	~	0.00348		0.00195	0.000215	0.00251	J	0.00264	0.00029	0.00043	J	0.00158	0.000174	ND		0.00152	0.000167

Notes:
All results are reported in micrograms per liter (µg/L)
Bold - Indicates a concentration detected above NY-AWQS
Italicized - Indicates a concentration detected above NY-TOGS-GA
NS - No Applicable Standard
~ - Not Analyzed
- - Not Applicable
ND - Analyzed for but Not Detected at the MDL
Q - Qualifier
J - The concentration was detected at a value equal to or below the RL, but greater than the MDL.
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard
PPB (µg/L) - Parts per Billion

TABLE 4D

245 West 55th Street
New York, New York

Summary of Per- and Polyfluoroalkyl Substances (PFAS) Results in Groundwater

SAMPLE ID: LAB ID: COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/L)	MW-5 L2471072-04 12/4/2024				MW-6 L2471072-01 12/4/2024				MW-7 L2471072-08 12/5/2024				DUP (MW-7) L2471072-09 12/5/2024				MW-8 L2522485-03 4/11/2025				DUP (MW-8) L2522485-04 4/11/2025			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
PERFLUORINATED ALKYL ACIDS BY EPA 1633																												
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	ND		0.00625	0.000438	ND		0.00674	0.000472	ND		0.00622	0.000436	ND		0.00646	0.000452	ND		0.00597	0.000418	ND		0.00571	0.000399
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	ND		0.00625	0.0012	0.00191	J	0.00674	0.00129	ND		0.00622	0.00119	ND		0.00646	0.00124	ND		0.00597	0.00114	ND		0.00571	0.00109
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	ND		0.00625	0.000891	ND		0.00674	0.00096	ND		0.00622	0.000887	ND		0.00646	0.000921	ND		0.00597	0.00085	ND		0.00571	0.000813
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	NS	0.00488	J	0.00625	0.0047	0.0137		0.00674	0.00507	ND		0.0622	0.0468	ND		0.0646	0.0486	ND		0.00597	0.00449	ND		0.00571	0.00429
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	914637-49-3	NS	ND		0.0391	0.00416	ND		0.0421	0.00448	ND		0.0389	0.00414	ND		0.0404	0.0043	ND		0.0373	0.00397	ND		0.0357	0.0038
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	812-70-4	NS	ND		0.0391	0.00311	ND		0.0421	0.00335	0.0116	J	0.0389	0.0031	0.0121	J	0.0404	0.00321	ND		0.0373	0.00297	ND		0.0357	0.00284
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	356-02-5	NS	ND		0.00781	0.000524	ND		0.00842	0.000564	ND		0.00778	0.000521	ND		0.00808	0.000541	ND		0.00746	0.0005	ND		0.00713	0.000478
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	ND		0.00625	0.000367	ND		0.00674	0.000396	ND		0.00622	0.000366	ND		0.00646	0.00038	ND		0.00597	0.000351	ND		0.00571	0.000335
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	ND		0.00625	0.00043	ND		0.00674	0.000463	ND		0.00622	0.000428	ND		0.00646	0.000444	ND		0.00597	0.00041	ND		0.00571	0.000392
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	NS	ND		0.00625	0.00156	ND		0.00674	0.00168	ND		0.00622	0.00156	ND		0.00646	0.00162	ND		0.00597	0.00149	ND		0.00571	0.00143
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	NS	ND		0.00156	0.000344	ND		0.00168	0.00037	ND		0.00156	0.000342	ND		0.00162	0.000355	ND		0.00149	0.000328	ND		0.00143	0.000314
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	NS	ND		0.0156	0.00108	ND		0.0168	0.00116	ND		0.0156	0.00107	ND		0.0162	0.00111	ND		0.0149	0.00103	ND		0.0143	0.000984
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	0.00334		0.00156	0.000469	0.0256		0.00168	0.000505	0.00463	F	0.00156	0.000467	0.00598		0.00162	0.000485	ND		0.00149	0.000448	ND		0.00143	0.000428
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	NS	ND		0.00156	0.000219	ND		0.00168	0.000236	ND		0.00156	0.000218	ND		0.00162	0.000226	ND		0.00149	0.000209	ND		0.00143	0.0002
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	NS	ND		0.0156	0.00127	ND		0.0168	0.00137	ND		0.0156	0.00127	ND		0.0162	0.00132	ND		0.0149	0.00122	ND		0.0143	0.00116
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	ND		0.00156	0.000469	0.00417		0.00168	0.000505	0.00346		0.00156	0.000467	0.00371		0.00162	0.000485	ND		0.00149	0.000448	ND		0.00143	0.000428
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	NS	ND		0.00312	0.000531	ND		0.00337	0.000573	ND		0.00311	0.000529	ND		0.00323	0.000549	ND		0.00298	0.000507	ND		0.00285	0.000485
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	113507-82-7	NS	ND		0.00312	0.00032	ND		0.00337	0.000345	ND		0.00311	0.000319	ND		0.00323	0.000331	ND		0.00298	0.000306	ND		0.00285	0.000292
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	377-73-1	NS	ND		0.00312	0.000242	ND		0.00337	0.000261	ND		0.00311	0.000241	ND		0.00323	0.00025	ND		0.00298	0.000231	ND		0.00285	0.000221
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	NS	ND		0.00312	0.000352	ND		0.00337	0.000379	0.00075	J	0.00311	0.00035	0.000977	J	0.00323	0.000363	ND		0.00298	0.000336	ND		0.00285	0.000321
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	0.0106		0.00156	0.000391	0.0033		0.00168	0.000421	0.00424		0.00156	0.000389	0.00496		0.00162	0.000404	0.00191		0.00149	0.000373	0.00197		0.00143	0.000357
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	0.0218		0.00625	0.000516	0.00923		0.00674	0.000556	0.203		0.00622	0.000513	0.239		0.00646	0.000533	0.00205	J	0.00597	0.000492	0.00223	J	0.00571	0.000471
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	ND		0.00156	0.000133	0.0103		0.00168	0.000143	ND		0.00156	0.000132	0.000388	J	0.00162	0.000137	ND		0.00149	0.000127	ND		0.00143	0.000121
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	0.00248		0.00156	0.000203	0.00347		0.00168	0.000219	0.00534		0.00156	0.000202	0.00598		0.00162	0.00021	0.0008	J	0.00149	0.000194	0.00059	JF	0.00143	0.000185
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	NS	ND		0.00156	0.000234	ND		0.00168	0.000253	ND		0.00156	0.000233	ND		0.00162	0.000242	ND		0.00149	0.000224	ND		0.00143	0.000214
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	ND		0.00156	0.000211	0.00061	J	0.00168	0.000227	ND		0.00156	0.00021	ND		0.00162	0.000218	ND		0.00149	0.000201	ND		0.00143	0.000193
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	0.0059		0.00156	0.000195	0.00098	J	0.00168	0.00021	0.00296		0.00156	0.000194	0.00296		0.00162	0.000202	0.0007	J	0.00149	0.000186	0.00044	J	0.00143	0.000178
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	0.0381		0.00156	0.000234	0.00534		0.00168	0.000253	0.02		0.00156	0.000233	0.0366		0.0162	0.00242	0.00222		0.00149	0.000224	0.00289		0.00143	0.000214
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	0.0377		0.00156	0.000133	0.00425		0.00168	0.000143	0.00907		0.00156	0.000132	0.0114		0.00162	0.000137	0.00376		0.00149	0.000127	0.00424		0.00143	0.000121
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	0.053		0.00156	0.000242	0.0075		0.00168	0.000261	0.128		0.00156	0.000241	0.155		0.00162	0.00025	0.00385		0.00149	0.000231	0.00421		0.00143	0.000221
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	ND		0.00156	0.000195	ND		0.00168	0.00021	ND		0.00156	0.000194	0.000315	J	0.00162	0.000202	ND		0.00149	0.000186	ND		0.00143	0.000178
Perfluorononanoic Acid (PFNA)	375-95-1	NS	0.00648		0.00156	0.000258	0.00532		0.00168	0.000278	0.00895		0.00156	0.000257	0.00872		0.00162	0.000266	0.00288		0.00149	0.000246	0.00261		0.00143	0.000235
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NS	0.00739	F	0.00156	0.000094	0.025		0.00168	0.000101	0.00358	F	0.00156	0.000093	0.00376	F	0.00162	0.000097	0.0002	JF	0.00149	0.00009	0.00019	J	0.00143	0.000086
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	0.0027	**0.216**		0.00156	0.000258	**0.218**		0.00168	0.000278	**0.263**		0.00156	0.000257	**0.29**		0.00162	0.000266	**0.0196**		0.00149	0.000246	**0.0172**		0.00143	0.000235
Perfluorooctanoic Acid (PFOA)	335-67-1	0.0067	**0.257**		0.00156	0.000258	**0.0587**		0.00168	0.000278	**0.0958**		0.00156	0.000257	**0.113**		0.00162	0.000266	**0.0127**		0.00149	0.000246	**0.0134**		0.00143	0.000235
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	0.0148		0.00156	0.000203	0.00105	J	0.00168	0.000219	0.001	J	0.00156	0.000202	0.00151	J	0.00162	0.00021	0.00026	J	0.00149	0.000194	0.00034	J	0.00143	0.000185
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	0.0332		0.00312	0.000352	0.0103		0.00337	0.000379	0.212		0.00311	0.00035	0.272		0.00323	0.000363	0.00454		0.00298	0.000336	0.00566		0.00285	0.000321
Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	NS	ND		0.00156	0.000156	ND		0.00168	0.000168	ND		0.00156	0.000156	ND		0.00162	0.000162	ND		0.00149	0.000149	ND		0.00143	0.000143
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	ND		0.00156	0.00018	ND		0.00168	0.000194	ND		0.00156	0.000179	ND		0.00162	0.000186	ND		0.00149	0.000172	ND		0.00143	0.000164
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	ND		0.00156	0.000172	0.00167	J	0.00168	0.000185	0.00047	JF	0.00156	0.000171	0.00046	J	0.00162	0.000178	ND		0.00149	0.000164	ND		0.00143	0.000157

Notes:
All results are reported in micrograms per liter (µg/L)
Bold - Indicates a concentration detected above NY-AWQS
Italicized - Indicates a concentration detected above NY-TOGS-GA
NS - No Applicable Standard
~ - Not Analyzed
- - Not Applicable
ND - Analyzed for but Not Detected at the MDL
Q - Qualifier
J - The concentration was detected at a value equal to or below the RL, but greater than the MDL.
E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard
PPB (µg/L) - Parts per Billion

TABLE 4D

245 West 55th Street
New York, New York

Summary of Per- and Polyfluoroalkyl Substances (PFAS) Results in Groundwater

SAMPLE ID: LAB ID: COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/L)	MW-1D L2471072-02 12/4/2024				FIELD BLANK L2471072-11 12/5/2024				FIELD BLANK L2507953-11 2/13/2025				FIELD BLANK L2522485-02 4/11/2025			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
PERFLUORINATED ALKYL ACIDS BY EPA 1633																		
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	ND		0.00605	0.000424	ND		0.00575	0.000402	ND		0.00629	0.00044	ND		0.00603	0.000422
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	ND		0.00605	0.00116	ND		0.00575	0.0011	ND		0.00629	0.0012	ND		0.00603	0.00115
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	ND		0.00605	0.000863	ND		0.00575	0.000819	ND		0.00629	0.000897	ND		0.00603	0.000859
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	NS	0.0101		0.00605	0.00456	ND		0.00575	0.00433	ND		0.00629	0.00473	ND		0.00603	0.00454
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	914637-49-3	NS	ND		0.0378	0.00402	ND		0.0359	0.00382	ND		0.0393	0.00418	ND		0.0377	0.00401
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	812-70-4	NS	ND		0.0378	0.00301	ND		0.0359	0.00286	ND		0.0393	0.00313	ND		0.0377	0.003
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	356-02-5	NS	ND		0.00757	0.000507	ND		0.00719	0.000482	ND		0.00786	0.000527	ND		0.00753	0.000505
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	ND		0.00605	0.000356	ND		0.00575	0.000338	ND		0.00629	0.00037	ND		0.00603	0.000354
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	ND		0.00605	0.000416	ND		0.00575	0.000395	ND		0.00629	0.000432	ND		0.00603	0.000414
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	13252-13-6	NS	ND		0.00605	0.00151	ND		0.00575	0.00144	ND		0.00629	0.00157	ND		0.00603	0.00151
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	NS	ND		0.00151	0.000333	ND		0.00144	0.000316	ND		0.00157	0.000346	ND		0.00151	0.000332
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	NS	ND		0.0151	0.00104	ND		0.0144	0.000992	ND		0.0157	0.00108	ND		0.0151	0.00104
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	0.00143	J	0.00151	0.000454	ND		0.00144	0.000431	ND		0.00157	0.000472	ND		0.00151	0.000452
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	NS	ND		0.00151	0.000212	ND		0.00144	0.000201	ND		0.00157	0.00022	ND		0.00151	0.000211
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	NS	ND		0.0151	0.00123	ND		0.0144	0.00117	ND		0.0157	0.00128	ND		0.0151	0.00123
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	ND		0.00151	0.000454	ND		0.00144	0.000431	ND		0.00157	0.000472	ND		0.00151	0.000452
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	NS	ND		0.00303	0.000514	ND		0.00288	0.000489	ND		0.00315	0.000535	ND		0.00301	0.000512
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	113507-82-7	NS	ND		0.00303	0.00031	ND		0.00288	0.000295	ND		0.00315	0.000322	ND		0.00301	0.000309
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	377-73-1	NS	ND		0.00303	0.000234	ND		0.00288	0.000223	ND		0.00315	0.000244	ND		0.00301	0.000234
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	NS	ND		0.00303	0.00034	ND		0.00288	0.000323	ND		0.00315	0.000354	ND		0.00301	0.000339
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	0.00717		0.00151	0.000378	ND		0.00144	0.000359	ND		0.00157	0.000393	ND		0.00151	0.000377
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	0.0135		0.00605	0.000499	ND		0.00575	0.000474	ND		0.00629	0.000519	ND		0.00603	0.000497
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	0.00038	J	0.00151	0.000129	ND		0.00144	0.000122	ND		0.00157	0.000134	ND		0.00151	0.000128
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	0.00045	J	0.00151	0.000197	ND		0.00144	0.000187	ND		0.00157	0.000204	ND		0.00151	0.000196
Perfluorododecanesulfonic Acid (PFDoS)	79780-39-5	NS	ND		0.00151	0.000227	ND		0.00144	0.000216	ND		0.00157	0.000236	ND		0.00151	0.000226
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	ND		0.00151	0.000204	ND		0.00144	0.000194	ND		0.00157	0.000212	ND		0.00151	0.000203
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	0.0005	JF	0.00151	0.000189	ND		0.00144	0.00018	ND		0.00157	0.000197	ND		0.00151	0.000188
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	0.012		0.00151	0.000227	ND		0.00144	0.000216	ND		0.00157	0.000236	ND		0.00151	0.000226
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	0.00934		0.00151	0.000129	ND		0.00144	0.000122	ND		0.00157	0.000134	ND		0.00151	0.000128
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	0.0181		0.00151	0.000234	ND		0.00144	0.000223	ND		0.00157	0.000244	ND		0.00151	0.000234
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	ND		0.00151	0.000189	ND		0.00144	0.00018	ND		0.00157	0.000197	ND		0.00151	0.000188
Perfluorononanoic Acid (PFNA)	375-95-1	NS	0.00202		0.00151	0.00025	ND		0.00144	0.000237	ND		0.00157	0.00026	ND		0.00151	0.000249
Perfluorooctanesulfonamide (PFOSA)	754-91-6	NS	0.00234	F	0.00151	0.000091	ND		0.00144	0.000086	ND		0.00157	0.000094	ND		0.00151	0.00009
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	0.0027	**0.081**		0.00151	0.00025	ND		0.00144	0.000237	0.00031	J	0.00157	0.00026	ND		0.00151	0.000249
Perfluorooctanoic Acid (PFOA)	335-67-1	0.0067	**0.0836**		0.00151	0.00025	ND		0.00144	0.000237	ND		0.00157	0.00026	ND		0.00151	0.000249
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	0.0018		0.00151	0.000197	ND		0.00144	0.000187	ND		0.00157	0.000204	ND		0.00151	0.000196
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	0.0206		0.00303	0.00034	ND		0.00288	0.000323	ND		0.00315	0.000354	ND		0.00301	0.000339
Perfluorotetradecanoic Acid (PFTeDA)	376-06-7	NS	ND		0.00151	0.000151	ND		0.00144	0.000144	ND		0.00157	0.000157	ND		0.00151	0.000151
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	ND		0.00151	0.000174	ND		0.00144	0.000165	ND		0.00157	0.000181	ND		0.00151	0.000173
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	ND		0.00151	0.000166	ND		0.00144	0.000158	ND		0.00157	0.000173	ND		0.00151	0.000166

Notes:
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NS - No Applicable Standard
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J - The concentration was detected at a value equal to or below the RL, but greater than the MDL.
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RL - Reporting Limit
MDL - Method Detection Limit
RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard
PPB (µg/L) - Parts per Billion

TABLE 4E

245 West 55th Street
New York, New York

Summary of Metals in Groundwater

SAMPLE ID: / LAB ID: / COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	MW-1 L2471072-06 12/5/2024				MW-1 L2507953-07 2/13/2025				MW-1D L2471072-02 12/4/2024				MW-1D L2507953-01 2/12/2025			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																		
Aluminum, Total	7429-90-5	NS	852		100	31.8	~		~	~	134		100	31.8	~		~	~
Antimony, Total	7440-36-0	3	ND		**50**	**7.1**	**~**		**~**	**~**	ND		**50**	**7.1**	**~**		**~**	**~**
Arsenic, Total	7440-38-2	25	2.6	J	5	1.9	~		~	~	2	J	5	1.9	~		~	~
Barium, Total	7440-39-3	1000	117		10	2.1	~		~	~	226		10	2.1	~		~	~
Beryllium, Total	7440-41-7	3	ND		**5**	0.9	~		~	~	ND		**5**	0.9	~		~	~
Cadmium, Total	7440-43-9	5	ND		5	1	~		~	~	ND		5	1	**~**		**~**	**~**
Calcium, Total	7440-70-2	NS	111000		100	35	~		~	~	72800		100	35	~		~	~
Chromium, Total	7440-47-3	50	4.7	J	10	2.1	~		~	~	ND		10	2.1	~		~	~
Cobalt, Total	7440-48-4	NS	3.3	J	20	1.7	~		~	~	ND		20	1.7	~		~	~
Copper, Total	7440-50-8	200	7.7	J	10	2.2	~		~	~	2.2	J	10	2.2	**~**		**~**	**~**
Iron, Total	7439-89-6	300	**1550**		50	9	~		~	~	**6830**		50	9	~		~	~
Lead, Total	7439-92-1	25	ND		10	2.7	~		~	~	ND		10	2.7	~		~	~
Magnesium, Total	7439-95-4	35000	32500		100	15.3	~		~	~	22000		100	15.3	~		~	~
Manganese, Total	7439-96-5	300	**950**		10	1.6	~		~	~	**588**		10	1.6	**~**		**~**	**~**
Mercury, Total	7439-97-6	0.7	ND		0.2	0.09	~		~	~	ND		0.2	0.09	~		~	~
Nickel, Total	7440-02-0	100	18.4	J	25	2.4	~		~	~	ND		25	2.4	~		~	~
Potassium, Total	7440-09-7	NS	9480		2500	237	~		~	~	8210		2500	237	~		~	~
Selenium, Total	7782-49-2	10	ND		10	3.5	~		~	~	ND		10	3.5	**~**		**~**	**~**
Silver, Total	7440-22-4	50	ND		7	2.8	~		~	~	ND		7	2.8	~		~	~
Sodium, Total	7440-23-5	20000	**58400**		2000	120	~		~	~	**49500**		2000	120	~		~	~
Thallium, Total	7440-28-0	0.5	ND		**20**	**2.5**	**~**		**~**	**~**	ND		**20**	**2.5**	~		~	~
Vanadium, Total	7440-62-2	NS	4.2	J	10	2	~		~	~	ND		10	2	**~**		**~**	**~**
Zinc, Total	7440-66-6	2000	10.3	J	50	2.1	~		~	~	3.7	J	50	2.1	~		~	~
GENERAL CHEMISTRY																		
Chromium, Trivalent	16065-83-1	NS	4	J	10	3	~		~	~	ND		10	3	~		~	~
Chromium, Hexavalent	18540-29-9	50	ND		10	3	ND		10	3	ND		10	3	ND		10	3
Cyanide, Total	57-12-5	200	ND		5	1	~		~	~	ND		5	1	~		~	~

Notes:

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RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4E

245 West 55th Street
New York, New York

Summary of Metals in Groundwater

SAMPLE ID: / LAB ID: / COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	MW-2 L2507953-08 2/13/2025				DUP L2507953-12 2/13/2025				MW-3 L2471072-07 12/5/2024				MW-3 L2507953-02 2/12/2025			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																		
Aluminum, Total	7429-90-5	NS	22.5		10	3.27	15.4		10	3.27	246		100	31.8	~		~	~
Antimony, Total	7440-36-0	3	2.06	J	**4**	0.42	ND		**4**	0.42	ND		**50**	**7.1**	**~**		**~**	**~**
Arsenic, Total	7440-38-2	25	0.81		0.5	0.16	0.66		0.5	0.16	ND		5	1.9	~		~	~
Barium, Total	7440-39-3	1000	167.6		0.5	0.17	170		0.5	0.17	94.5		10	2.1	~		~	~
Beryllium, Total	7440-41-7	3	ND		0.5	0.1	ND		0.5	0.1	ND		**5**	0.9	~		~	~
Cadmium, Total	7440-43-9	5	ND		0.2	0.05	ND		0.2	0.05	ND		5	1	~		~	~
Calcium, Total	7440-70-2	NS	111000		100	39.4	113000		100	39.4	66900		100	35	~		~	~
Chromium, Total	7440-47-3	50	0.3	J	1	0.17	0.22	J	1	0.17	24.2		10	2.1	~		~	~
Cobalt, Total	7440-48-4	NS	0.67		0.5	0.16	0.67		0.5	0.16	ND		20	1.7	~		~	~
Copper, Total	7440-50-8	200	ND		1	0.38	ND		1	0.38	4.2	J	10	2.2	~		~	~
Iron, Total	7439-89-6	300	**2580**		50	19.1	**2560**		50	19.1	**440**		50	9	~		~	~
Lead, Total	7439-92-1	25	ND		1	0.34	ND		1	0.34	4.1	J	10	2.7	~		~	~
Magnesium, Total	7439-95-4	35000	17200		70	24.2	18900		70	24.2	10200		100	15.3	~		~	~
Manganese, Total	7439-96-5	300	**2528**		1	0.44	**2674**		1	0.44	32.7		10	1.6	~		~	~
Mercury, Total	7439-97-6	0.7	ND		0.2	0.09	ND		0.2	0.09	ND		0.2	0.09	~		~	~
Nickel, Total	7440-02-0	100	5.33		2	0.55	5.54		2	0.55	3	J	25	2.4	~		~	~
Potassium, Total	7440-09-7	NS	8800		100	30.9	8740		100	30.9	13200		2500	237	~		~	~
Selenium, Total	7782-49-2	10	ND		5	1.73	ND		5	1.73	ND		10	3.5	~		~	~
Silver, Total	7440-22-4	50	ND		0.4	0.16	ND		0.4	0.16	ND		7	2.8	~		~	~
Sodium, Total	7440-23-5	20000	**68700**		500	29.3	**68500**		500	29.3	**60900**		2000	120	~		~	~
Thallium, Total	7440-28-0	0.5	ND		**1**	0.14	ND		**1**	0.14	ND		**20**	**2.5**	**~**		**~**	**~**
Vanadium, Total	7440-62-2	NS	ND		5	1.57	ND		5	1.57	ND		10	2	~		~	~
Zinc, Total	7440-66-6	2000	7.06	J	10	3.41					10.4	J	50	2.1	~		~	~
GENERAL CHEMISTRY																		
Chromium, Trivalent	16065-83-1	NS	ND		50	15	ND		10	3	6	J	10	3	~		~	~
Chromium, Hexavalent	18540-29-9	50	ND		50	15	ND		10	3	18		10	3	20		10	3
Cyanide, Total	57-12-5	200	11		5	1	11		5	1	ND		5	1	~		~	~

Notes:

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TABLE 4E

245 West 55th Street
New York, New York

Summary of Metals in Groundwater

SAMPLE ID: / LAB ID: / COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	MW-4 L2471072-03 12/4/2024				MW-4 L2507953-05 2/12/2025				MW-5 L2471072-04 12/4/2024				MW-5 L2507953-04 2/12/2025			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																		
Aluminum, Total	7429-90-5	NS	252		100	31.8	~		~	~	169		100	31.8	~		~	~
Antimony, Total	7440-36-0	3	ND		**50**	**7.1**	**~**		**~**	**~**	ND		**50**	**7.1**	**~**		**~**	**~**
Arsenic, Total	7440-38-2	25	3.7	J	5	1.9	~		~	~	2.6	J	5	1.9	~		~	~
Barium, Total	7440-39-3	1000	144		10	2.1	~		~	~	228		10	2.1	~		~	~
Beryllium, Total	7440-41-7	3	ND		**5**	0.9	~		~	~	ND		**5**	0.9	~		~	~
Cadmium, Total	7440-43-9	5	ND		5	1	~		~	~	ND		5	1	~		~	~
Calcium, Total	7440-70-2	NS	102000		100	35	~		~	~	138000		100	35	~		~	~
Chromium, Total	7440-47-3	50	ND		10	2.1	~		~	~	ND		10	2.1	~		~	~
Cobalt, Total	7440-48-4	NS	ND		20	1.7	~		~	~	ND		20	1.7	~		~	~
Copper, Total	7440-50-8	200	4.2	J	10	2.2	~		~	~	2.7	J	10	2.2	~		~	~
Iron, Total	7439-89-6	300	**307**		50	9	~		~	~	**1110**		50	9	~		~	~
Lead, Total	7439-92-1	25	ND		10	2.7	~		~	~	ND		10	2.7	~		~	~
Magnesium, Total	7439-95-4	35000	16900		100	15.3	~		~	~	21400		100	15.3	~		~	~
Manganese, Total	7439-96-5	300	**366**		10	1.6	~		~	~	**1720**		10	1.6	~		~	~
Mercury, Total	7439-97-6	0.7	ND		0.2	0.09	~		~	~	ND		0.2	0.09	~		~	~
Nickel, Total	7440-02-0	100	7.9	J	25	2.4	~		~	~	10	J	25	2.4	~		~	~
Potassium, Total	7440-09-7	NS	17100		2500	237	~		~	~	21000		2500	237	~		~	~
Selenium, Total	7782-49-2	10	ND		10	3.5	~		~	~	ND		10	3.5	~		~	~
Silver, Total	7440-22-4	50	ND		7	2.8	~		~	~	ND		7	2.8	~		~	~
Sodium, Total	7440-23-5	20000	**75400**		2000	120	~		~	~	**82200**		2000	120	~		~	~
Thallium, Total	7440-28-0	0.5	ND		**20**	**2.5**	**~**		**~**	**~**	ND		**20**	**2.5**	**~**		**~**	**~**
Vanadium, Total	7440-62-2	NS	3.9	J	10	2	~		~	~	3.8	J	10	2	~		~	~
Zinc, Total	7440-66-6	2000	3.5	J	50	2.1	~		~	~	4.7	J	50	2.1	~		~	~
GENERAL CHEMISTRY																		
Chromium, Trivalent	16065-83-1	NS	ND		10	3	~		~	~	ND		10	3	~		~	~
Chromium, Hexavalent	18540-29-9	50	ND		10	3	ND		10	3	ND		10	3	ND		10	3
Cyanide, Total	57-12-5	200	ND		5	1	~		~	~	22		5	1	~		~	~

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RL/MDL - Bold RL/MDL indicates that the RL/MDL is greater than the NY TOGS/AWQS standard

TABLE 4E

245 West 55th Street
New York, New York

Summary of Metals in Groundwater

SAMPLE ID: LAB ID: COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS)	MW-6 L2471072-01 12/4/2024				MW-6 L2507953-09 2/13/2025				MW-7 L2471072-08 12/5/2024				DUP L2471072-09 12/5/2024			
		(ug/l)	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																		
Aluminum, Total	7429-90-5	NS	3410		100	31.8	~		~	~	230		100	31.8	56.2	J	100	31.8
Antimony, Total	7440-36-0	3	ND		**50**	**7.1**	**~**		**~**	**~**	ND		**50**	**7.1**	ND		**50**	**7.1**
Arsenic, Total	7440-38-2	25	4.3	J	5	1.9	~		~	~	4.5	J	5	1.9	4.9	J	5	1.9
Barium, Total	7440-39-3	1000	95.5		10	2.1	~		~	~	208		10	2.1	201		10	2.1
Beryllium, Total	7440-41-7	3	ND		**5**	0.9	~		~	~	ND		**5**	0.9	ND		**5**	0.9
Cadmium, Total	7440-43-9	5	ND		5	1	~		~	~	ND		5	1	ND		5	1
Calcium, Total	7440-70-2	NS	37900		100	35	~		~	~	114000		100	35	104000		100	35
Chromium, Total	7440-47-3	50	11		10	2.1	~		~	~	ND		10	2.1	ND		10	2.1
Cobalt, Total	7440-48-4	NS	2.6	J	20	1.7	~		~	~	ND		20	1.7	ND		20	1.7
Copper, Total	7440-50-8	200	19.1		10	2.2	~		~	~	2.2	J	10	2.2	ND		10	2.2
Iron, Total	7439-89-6	300	**5860**		50	9	~		~	~	**10600**		50	9	**9100**		50	9
Lead, Total	7439-92-1	25	10.2		10	2.7	~		~	~	ND		10	2.7	ND		10	2.7
Magnesium, Total	7439-95-4	35000	4870		100	15.3	~		~	~	19500		100	15.3	18000		100	15.3
Manganese, Total	7439-96-5	300	169		10	1.6	~		~	~	**2090**		10	1.6	**1930**		10	1.6
Mercury, Total	7439-97-6	0.7	ND		0.2	0.09	~		~	~	ND		0.2	0.09	ND		0.2	0.09
Nickel, Total	7440-02-0	100	7.7	J	25	2.4	~		~	~	ND		25	2.4	ND		25	2.4
Potassium, Total	7440-09-7	NS	7280		2500	237	~		~	~	7790		2500	237	7200		2500	237
Selenium, Total	7782-49-2	10	ND		10	3.5	~		~	~	ND		10	3.5	ND		10	3.5
Silver, Total	7440-22-4	50	ND		7	2.8	~		~	~	ND		7	2.8	ND		7	2.8
Sodium, Total	7440-23-5	20000	**34800**		2000	120	~		~	~	**63200**		2000	120	**60400**		2000	120
Thallium, Total	7440-28-0	0.5	ND		**20**	**2.5**	**~**		**~**	**~**	ND		**20**	**2.5**	ND		**20**	**2.5**
Vanadium, Total	7440-62-2	NS	15.7		10	2	~		~	~	4.3	J	10	2	3.7	J	10	2
Zinc, Total	7440-66-6	2000	36.7	J	50	2.1	~		~	~	8.7	J	50	2.1	4.3	J	50	2.1
GENERAL CHEMISTRY																		
Chromium, Trivalent	16065-83-1	NS	11		10	3	~		~	~	ND		10	3	ND		10	3
Chromium, Hexavalent	18540-29-9	50	ND		10	3	ND		10	3	ND		10	3	ND		10	3
Cyanide, Total	57-12-5	200	16		5	1	~		~	~	18		5	1	8		5	1

Notes:

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TABLE 4E

245 West 55th Street
New York, New York

Summary of Metals in Groundwater

SAMPLE ID: / LAB ID: / COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	MW-7 L2507953-03 2/12/2025				MW-8 L2522485-03 4/11/2025				DUP L2522485-04 4/11/2025				FIELD BLANK L2471072-11 12/5/2024			
			Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS																		
Aluminum, Total	7429-90-5	NS	~		~	~	17.7		10	3.27	21.5		10	3.27	ND		100	31.8
Antimony, Total	7440-36-0	3	**~**		**~**	**~**	ND		**4**	0.42	ND		**4**	0.42	ND		**50**	**7.1**
Arsenic, Total	7440-38-2	25	~		~	~	0.23	J	0.5	0.16	0.24	J	0.5	0.16	ND		5	1.9
Barium, Total	7440-39-3	1000	~		~	~	138.1		0.5	0.17	125.5		0.5	0.17	ND		10	2.1
Beryllium, Total	7440-41-7	3	~		~	~	ND		0.5	0.1	ND		0.5	0.1	ND		**5**	0.9
Cadmium, Total	7440-43-9	5	~		~	~	ND		0.2	0.05	ND		0.2	0.05	ND		5	1
Calcium, Total	7440-70-2	NS	~		~	~	84400		100	39.4	85000		100	39.4	61.6	J	100	35
Chromium, Total	7440-47-3	50	~		~	~	0.43	J	1	0.17	0.23	J	1	0.17	ND		10	2.1
Cobalt, Total	7440-48-4	NS	~		~	~	0.61		0.5	0.16	0.62		0.5	0.16	ND		20	1.7
Copper, Total	7440-50-8	200	~		~	~	ND		1	0.38	ND		1	0.38	ND		10	2.2
Iron, Total	7439-89-6	300	~		~	~	**1370**		50	19.1	**1180**		50	19.1	ND		50	9
Lead, Total	7439-92-1	25	~		~	~	ND		1	0.34	ND		1	0.34	ND		10	2.7
Magnesium, Total	7439-95-4	35000	~		~	~	28000		70	24.2	29100		70	24.2	ND		100	15.3
Manganese, Total	7439-96-5	300	~		~	~	**1120**		1	0.44	**1134**		1	0.44	ND		10	1.6
Mercury, Total	7439-97-6	0.7	~		~	~	ND		0.2	0.09	ND		0.2	0.09	ND		0.2	0.09
Nickel, Total	7440-02-0	100	~		~	~	7.9		2	0.55	7.68		2	0.55	ND		25	2.4
Potassium, Total	7440-09-7	NS	~		~	~	7080		100	30.9	7260		100	30.9	ND		2500	237
Selenium, Total	7782-49-2	10	~		~	~	ND		5	1.73	ND		5	1.73	ND		10	3.5
Silver, Total	7440-22-4	50	~		~	~	ND		0.4	0.16	ND		0.4	0.16	ND		7	2.8
Sodium, Total	7440-23-5	20000	~		~	~	**33900**		500	29.3	**34600**		500	29.3	134	J	2000	120
Thallium, Total	7440-28-0	0.5	**~**		**~**	**~**	ND		**1**	0.14	ND		**1**	0.14	ND		**20**	**2.5**
Vanadium, Total	7440-62-2	NS	~		~	~	ND		5	1.57	ND		5	1.57	ND		10	2
Zinc, Total	7440-66-6	2000	~		~	~	13.21		10	3.41	13.64		10	3.41	ND		50	2.1
GENERAL CHEMISTRY																		
Chromium, Trivalent	16065-83-1	NS	~		~	~	ND		10	3	ND		10	3	ND		10	3
Chromium, Hexavalent	18540-29-9	50	ND		10	3	ND		10	3	ND		10	3	ND		10	3
Cyanide, Total	57-12-5	200	~		~	~	ND		5	1	ND		5	1	ND		5	1

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TABLE 4E

245 West 55th Street
New York, New York

Summary of Metals in Groundwater

SAMPLE ID: LAB ID: COLLECTION DATE:	CAS Number	New York TOGS 111 Ambient Water Quality Standards (NY-AWQS) (ug/l)	FIELD BLANK L2507953-11 2/13/2025				FIELD BLANK L2522485-02 4/11/2025			
			Result	Q	RL	MDL	Result	Q	RL	MDL
TOTAL METALS										
Aluminum, Total	7429-90-5	NS	ND		10	3.27	ND		10	3.27
Antimony, Total	7440-36-0	3	ND		**4**	0.42	ND		**4**	0.42
Arsenic, Total	7440-38-2	25	ND		0.5	0.16	ND		0.5	0.16
Barium, Total	7440-39-3	1000	0.23	J	0.5	0.17	0.23	J	0.5	0.17
Beryllium, Total	7440-41-7	3	ND		0.5	0.1	ND		0.5	0.1
Cadmium, Total	7440-43-9	5	ND		0.2	0.05	ND		0.2	0.05
Calcium, Total	7440-70-2	NS	50.8	J	100	39.4	ND		100	39.4
Chromium, Total	7440-47-3	50	ND		1	0.17	ND		1	0.17
Cobalt, Total	7440-48-4	NS	ND		0.5	0.16	ND		0.5	0.16
Copper, Total	7440-50-8	200	ND		1	0.38	ND		1	0.38
Iron, Total	7439-89-6	300	ND		50	19.1	ND		50	19.1
Lead, Total	7439-92-1	25	ND		1	0.34	ND		1	0.34
Magnesium, Total	7439-95-4	35000	ND		70	24.2	ND		70	24.2
Manganese, Total	7439-96-5	300	ND		1	0.44	ND		1	0.44
Mercury, Total	7439-97-6	0.7	ND		0.2	0.09	ND		0.2	0.09
Nickel, Total	7440-02-0	100	ND		2	0.55	ND		2	0.55
Potassium, Total	7440-09-7	NS	38.7	J	100	30.9	ND		100	30.9
Selenium, Total	7782-49-2	10	ND		5	1.73	ND		5	1.73
Silver, Total	7440-22-4	50	ND		0.4	0.16	ND		0.4	0.16
Sodium, Total	7440-23-5	20000	283	J	500	29.3	ND		500	29.3
Thallium, Total	7440-28-0	0.5	ND		**1**	0.14	ND		**1**	0.14
Vanadium, Total	7440-62-2	NS	ND		5	1.57	ND		5	1.57
Zinc, Total	7440-66-6	2000	ND		10	3.41	12.28		10	3.41
GENERAL CHEMISTRY										
Chromium, Trivalent	16065-83-1	NS	ND		10	3	ND		10	3
Chromium, Hexavalent	18540-29-9	50	ND		10	3	ND		10	3
Cyanide, Total	57-12-5	200	ND		5	1	ND		5	1

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TABLE 5

Estimated Remedial Costs
245 West 55th Street
New York, New York
Remedial Action Work Plan
C231157

REMEDIAL ALTERNATIVE COST ANALYSIS			
TRACK 1 Remedy for Unrestricted Use Soil Cleanup Objectives			
Soil and Groundwater			
Mobilization/Installation of Excavation Support	$	800,000	Includes Slide Rail and Mini-Caisson Support Systems for support of excavation
Excavation	$	165,000	Assumes 15 days to excavate soils across the 6,000 sq. ft of basement at depths up to 18 ft-bs
Dewatering	$	80,000	Includes permitting and on-Site treament system with a capacity of 25 GPM
Post Verification Sampling - Soil	$	35,000	Collection of 25 bottom and sidewall soil and QA/QC samples for full scan laboratory analysis, data validiation and preparation of EDDs
Post Verification Sampling - Groundwater	$	85,000	Re-installation of five monitoring wells. Collection of two rounds of confirmatory sampling, laboratory analysis, data validation and preparation of EDDs
Imported Fill and Compaction Testing	$	460,000	Includes placement of 5,000 tons of 3/4" QP stone as fill, slide rail removal, and compaction testing
Transportion and Disposal of Impacted soils	$	425,000	Includes 5,000 tons of non hazardous disposal
Remedial Oversight	$	45,000	Oversight by EL and Remedial Engineer including Daily/Monthly Reporting
Demobilization	$	35,700	
Reporting			
Reporting (FER)	$	40,000	Reporting to NYSDEC
Track 1 Total Estimated Costs	***$***	***2,170,700***	

TABLE 5

Estimated Remedial Costs
245 West 55th Street
New York, New York
Remedial Action Work Plan
C231157

TRACK 4 Remedy for a Restricted-Residentual Use Soil Cleanup Objectives			
Soils			
Engineering Controls	$	108,000	Installation of Cover System (Basement Slab)
Groundwater			
Groundwater Treatment	$	135,000	Installation of 14 Injection points and Chemical Injections
Remedial Oversight	$	75,000	Oversight by EL and Remedial Engineer including Daily/Monthly Reporting
Post Verification Sampling - Groundwater	$	79,000	Collection of five round of sampling, laboratory analysis, data validation and preparation of EDDs
Post Verification Sampling - Indoor Air	$	15,000	Collection of indoor air samples, laboraotory analysis, data validation and preparation of EDDs
Long-term Groundwater Monitoring	$	94,800	Six quarters of groundwater sampling for VOCs from monitoring wells; annual reporting
Soil Vapor			
Engineering Controls (SSDS)	$	180,000	Installation of SSDS
Engineering Controls (SVE)	$	150,000	Pilot Test and Installation of SVE System
Reporting			
SVE Design Document	$	25,000	Reporting to NYSDEC
Reporting (SMP, FER)	$	60,000	Reporting to NYSDEC
Track 4 Total Estimated Costs	***$***	***921,800***	

Notes

sq. ft = square feet

feet-bs = feet below the basement surface

GPM = gallons per minute

SSDS = sub slab depressurization system

EDDs = electronic data deliverables

TABLE 6

Remedial Action Schedule
245 West 55th Street
New York, New York
Remedial Action Work Plan
C231157

Milestone	Weeks from Remedial Action Start	Milestone Duration (weeks)
Approval of RAWP	--	0
Fact Sheet Announcing Start of Remedial Action	0	1
Mobilization	4	1
Remedial Action (chemical injections for treatment of groundwater)	6	2
Excavation assocaited with Building Foundation Elements during Construction	8	2
Initial post remedial action groundwater sampling event	12	1
Second post remedial action groundwater sampling event	24	1
Submittal of Draft Site Management Plan (SMP)	36	--
Submital of Draft Final Engineering Report (FER)	36	--
Submit Final Engineering Report (FER) and Site Management Plan (SMP)	52*	--
Obtain Certificate of Completion (COC)	--	--

Notes

* - Final submission assumes 180 days from completion of Remedial Actions detailed in the RAWP.

FIGURES



NEW YORK
QUADRANGLE LOCATION

USGS The National Map
USGS 7.5 Minute Series Topographic Map of Central Park, New York

GRAPHIC SCALE

0 1,000 2,000 4,000

(IN FEET)

N
W E
S

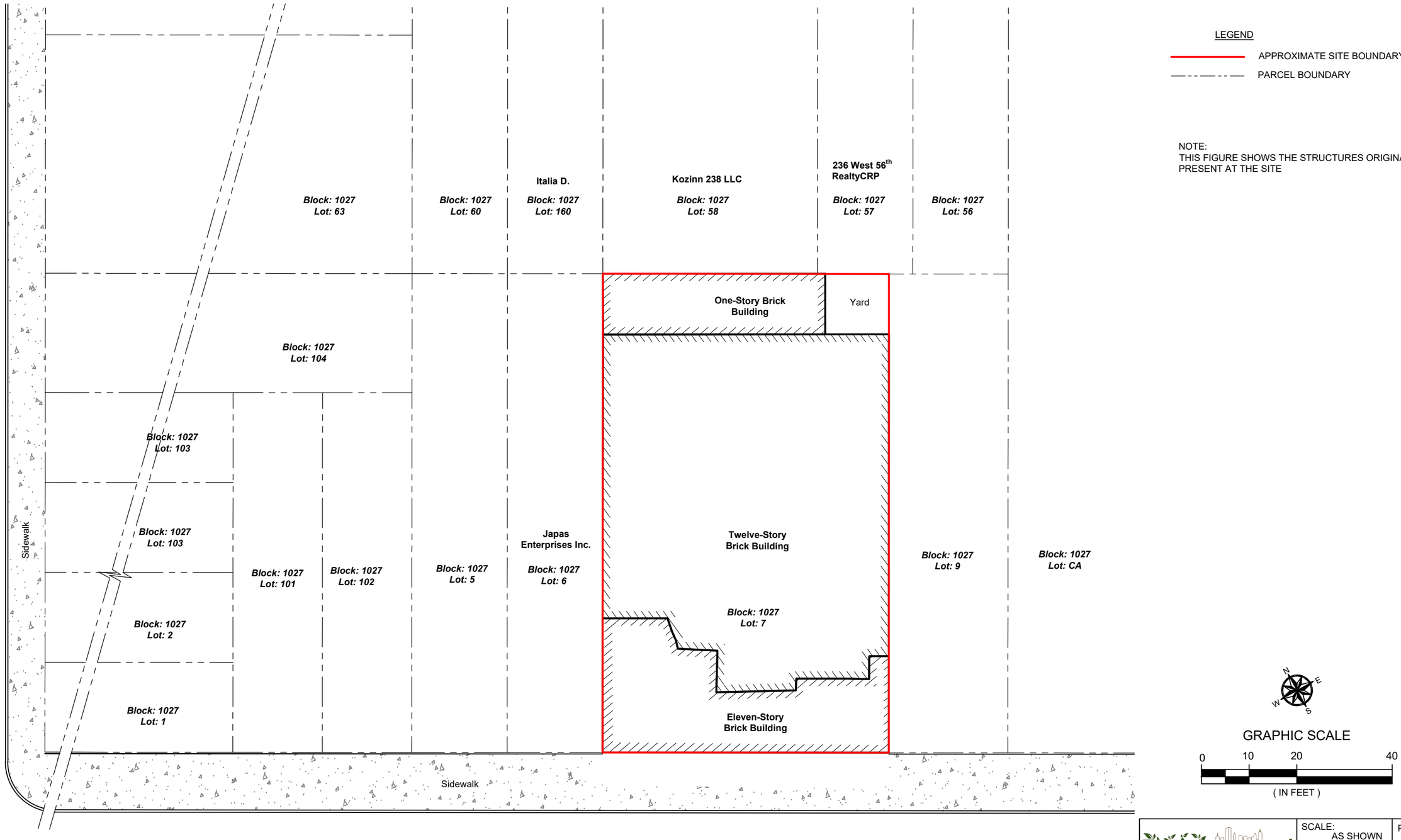
Environmental LOGIC
15 Princess Road Suite K,
Lawrenceville, NJ 08648

Scale: AS SHOWN		PROJECT: 23-0001
Date: 6/14/23		
Drawn By: PM	Checked By: BM	

SITE LOCATION MAP ON USGS QUADRANGLE
245 WEST 55TH STREET
BLOCK 1027, LOT 7
MANHATTAN, NEW YORK

FIGURE # 1

PM File: 245W55_ManhattenNY-F1_SLM.mxd



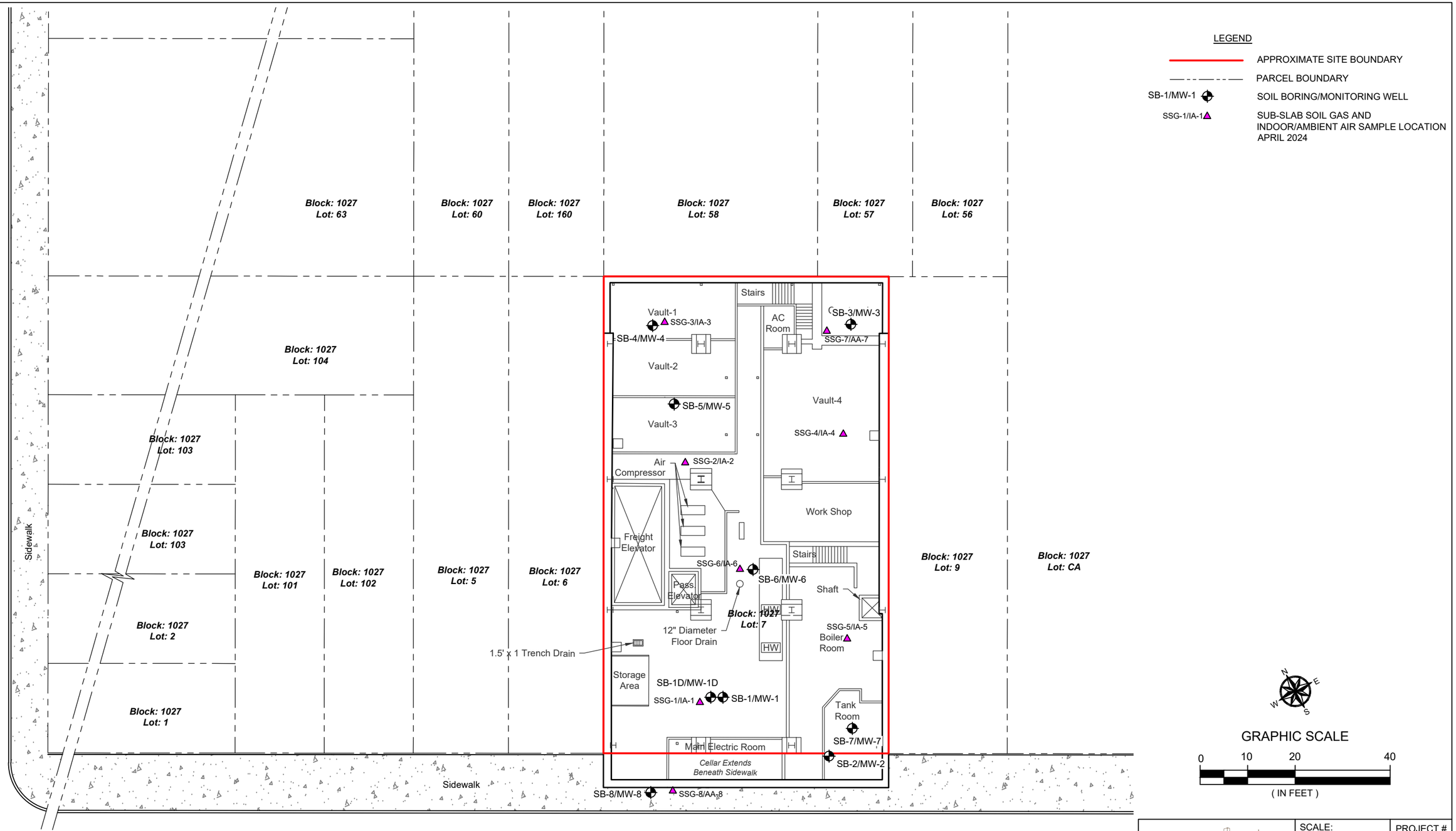
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15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN		PROJECT # 23-0001
DATE: 1/9/26		
DRAWN BY: PM	CHECKED BY: LM	

SITE MAP
245 WEST 55TH STREET
MANHATTAN, NEW YORK

FIGURE # 2A

File: X:\Environmental Logic\Manhatten_NY\245W55thStreet\Drawings\245W55_ManhattanNY_RIR.dwg; F2A_SM



File: X:\EnvironmentalLogic\Manhattan_NY\245W55thStreet\Drawings\245W55_ManhattanNY_RIR.dwg, F2B_SM

Environmental LOGIC
15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN		PROJECT # 23-0001
DATE: 1/9/26		
DRAWN BY: PM	CHECKED BY: LM	

SITE MAP - CELLAR LEVEL
245 WEST 55TH STREET
MANHATTAN, NEW YORK

FIGURE # 2B

SAMPLE ID:	IA-2	SSG-2	NYSDOH Matrices Decision
COLLECTION DATE:	4/10/2024	4/10/2024	
SAMPLE MATRIX:	IA	SSG	
	Result	Result	
VOLATILE ORGANICS IN AIR			
1,1,1-Trichloroethane	0.78	105	NFA
1,1-Dichloroethane	<0.809	5.18	~
1,1-Dichloroethene	<0.079	1.2	NFA
1,2,4-Trimethylbenzene	3.42	3.78	NFA
1,2-Dichloroethane	<0.809	<0.809	~
1,3,5-Trimethylbenzene	<0.983	1.07	NFA
2,2,4-Trimethylpentane	<0.934	<0.934	NFA
2-Butanone	4.31	4.93	~
4-Ethyltoluene	<0.983	<0.983	~
Acetone	189	268	~
Benzene	0.882	0.76	NFA
Carbon disulfide	<0.623	<0.623	~
Carbon tetrachloride	0.484	<1.26	NFA
Chloroethane	<0.528	<0.528	~
Chloroform	<0.977	4.83	~
Chloromethane	0.997	<0.413	~
cis-1,2-Dichloroethene	0.079	56.3	NFA
Cyclohexane	<0.688	0.75	NFA
Dichlorodifluoromethane	2.19	2.13	~
Ethanol	59.7	39.6	~
Ethyl Acetate	2.28	<1.8	~
Ethylbenzene	<0.869	<0.869	NFA
Freon-113	<1.53	7.23	~
Heptane	0.865	0.881	NFA
Isopropanol	7.1	5.68	~
Methylene chloride	<1.74	<1.74	NFA
n-Hexane	6.34	4.09	NFA
Naphthalene	<1.05	<1.05	NFA
o-Xylene	1.44	1.55	NFA
p/m-Xylene	3.27	3.46	NFA
Tertiary butyl Alcohol	<1.52	<1.52	~
Tetrachloroethene	1.47	10.3	NFA
Tetrahydrofuran	6.93	5.84	~
Toluene	1.99	2.13	NFA
trans-1,2-Dichloroethene	<0.793	1.55	~
Trichloroethene	0.167	5.24	NFA
Trichlorofluoromethane	1.4	1.44	~
Vinyl chloride	<0.051	<0.511	NFA

SAMPLE ID:	IA-3	SSG-3	NYSDOH Matrices Decision
COLLECTION DATE:	4/10/2024	4/10/2024	
SAMPLE MATRIX:	IA	SSG	
	Result	Result	
VOLATILE ORGANICS IN AIR			
1,1,1-Trichloroethane	0.687	109	NFA
1,1-Dichloroethane	<0.809	<0.809	~
1,1-Dichloroethene	<0.079	<0.793	NFA
1,2,4-Trimethylbenzene	2.19	2.87	NFA
1,2-Dichloroethane	<0.809	<0.809	~
1,3,5-Trimethylbenzene	<0.983	<0.983	NFA
2,2,4-Trimethylpentane	<0.934	<0.934	NFA
2-Butanone	4.34	4.95	~
4-Ethyltoluene	<0.983	<0.983	~
Acetone	209	266	~
Benzene	0.85	0.652	NFA
Carbon disulfide	<0.623	<0.623	~
Carbon tetrachloride	0.51	<1.26	NFA
Chloroethane	<0.528	<0.528	~
Chloroform	<0.977	1.61	~
Chloromethane	0.995	<0.413	~
cis-1,2-Dichloroethene	<0.079	<0.793	NFA
Cyclohexane	<0.688	0.971	NFA
Dichlorodifluoromethane	2.07	2.26	~
Ethanol	63.3	40.1	~
Ethyl Acetate	3.64	<1.8	~
Ethylbenzene	<0.869	<0.869	NFA
Freon-113	<1.53	<1.53	~
Heptane	0.861	0.873	NFA
Isopropanol	8.33	4.74	~
Methylene chloride	<1.74	<1.74	NFA
n-Hexane	5.5	3.74	NFA
Naphthalene	<1.05	<1.05	NFA
o-Xylene	1.26	1.21	NFA
p/m-Xylene	2.83	2.82	NFA
Tertiary butyl Alcohol	<1.52	<1.52	~
Tetrachloroethene	0.929	5.24	NFA
Tetrahydrofuran	6.87	5.75	~
Toluene	1.91	1.81	NFA
trans-1,2-Dichloroethene	<0.793	<0.793	~
Trichloroethene	0.118	<1.07	NFA
Trichlorofluoromethane	1.39	1.43	~
Vinyl chloride	<0.051	<0.511	NFA

SAMPLE ID:	AA-7	SSG-7
COLLECTION DATE:	4/10/2024	4/10/2024
SAMPLE MATRIX:	AA	SV
	Result	Result
VOLATILE ORGANICS IN AIR		
1,1,1-Trichloroethane	0.376	1.1
1,1-Dichloroethane	<0.809	<0.809
1,1-Dichloroethene	<0.079	<0.793
1,2,4-Trimethylbenzene	3.09	1.69
1,2-Dichloroethane	<0.809	<0.809
1,3,5-Trimethylbenzene	<0.983	<0.983
2,2,4-Trimethylpentane	<0.934	<0.934
2-Butanone	1.9	3.6
4-Ethyltoluene	<0.983	<0.983
Acetone	75.1	193
Benzene	0.946	0.652
Carbon disulfide	<0.623	0.841
Carbon tetrachloride	0.465	<1.26
Chloroethane	<0.528	<0.528
Chloroform	<0.977	<0.977
Chloromethane	0.863	<0.413
cis-1,2-Dichloroethene	<0.079	1.39
Cyclohexane	<0.688	<0.688
Dichlorodifluoromethane	2.23	2.21
Ethanol	62.4	328
Ethyl Acetate	<1.8	1.83
Ethylbenzene	<0.869	<0.869
Freon-113	<1.53	<1.53
Heptane	<0.82	<0.82
Isopropanol	5.51	5.85
Methylene chloride	<1.74	<1.74
n-Hexane	2.99	2.3
Naphthalene	<1.05	<1.05
o-Xylene	1.35	<0.869
p/m-Xylene	3.38	<1.74
Tertiary butyl Alcohol	<1.52	1.73
Tetrachloroethene	0.671	<1.36
Tetrahydrofuran	3.75	3.83
Toluene	1.88	1.41
trans-1,2-Dichloroethene	<0.793	<0.793
Trichloroethene	<0.107	<1.07
Trichlorofluoromethane	1.31	1.56
Vinyl chloride	<0.051	<0.511

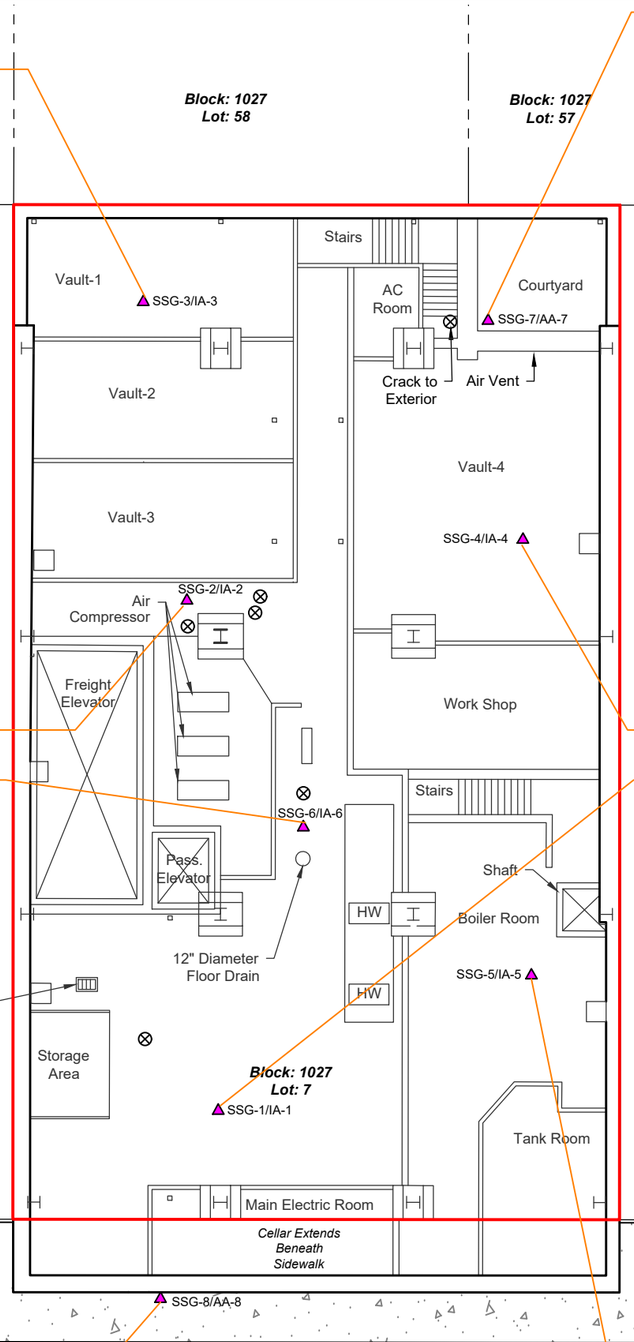
SAMPLE ID:	IA-4	SSG-4	NYSDOH Matrices Decision
COLLECTION DATE:	4/10/2024	4/10/2024	
SAMPLE MATRIX:	IA	SSG	
	Result	Result	
VOLATILE ORGANICS IN AIR			
1,1,1-Trichloroethane	0.72	9.71	NFA
1,1-Dichloroethane	<0.809	<0.809	~
1,1-Dichloroethene	<0.079	<0.793	NFA
1,2,4-Trimethylbenzene	3.17	3.73	NFA
1,2-Dichloroethane	<0.809	<0.809	~
1,3,5-Trimethylbenzene	<0.983	1.01	NFA
2,2,4-Trimethylpentane	<0.934	<0.934	NFA
2-Butanone	4.72	5.6	~
4-Ethyltoluene	<0.983	<0.983	~
Acetone	234	259	~
Benzene	0.872	0.677	NFA
Carbon disulfide	<0.623	<0.623	~
Carbon tetrachloride	0.465	<1.26	NFA
Chloroethane	<0.528	<0.528	~
Chloroform	<0.977	<0.977	~
Chloromethane	1.02	<0.413	~
cis-1,2-Dichloroethene	<0.079	<0.793	NFA
Cyclohexane	<0.688	0.967	NFA
Dichlorodifluoromethane	2.19	2.08	~
Ethanol	61.2	38.1	~
Ethyl Acetate	3.17	2.45	~
Ethylbenzene	<0.869	<0.869	NFA
Freon-113	<1.53	1.74	~
Heptane	0.861	1	NFA
Isopropanol	7.72	5.41	~
Methylene chloride	<1.74	<1.74	NFA
n-Hexane	7.96	5.67	NFA
Naphthalene	<1.05	<1.05	NFA
o-Xylene	1.43	1.55	NFA
p/m-Xylene	3.1	3.37	NFA
Tertiary butyl Alcohol	<1.52	<1.52	~
Tetrachloroethene	1.09	1.48	NFA
Tetrahydrofuran	6.58	5.69	~
Toluene	1.9	2.05	NFA
trans-1,2-Dichloroethene	<0.793	<0.793	~
Trichloroethene	0.113	<1.07	NFA
Trichlorofluoromethane	1.42	1.33	~
Vinyl chloride	<0.051	<0.511	NFA

SAMPLE ID:	AA-8	SSG-8
COLLECTION DATE:	4/10/2024	4/10/2024
SAMPLE MATRIX:	AA	SV
	Result	Result
VOLATILE ORGANICS IN AIR		
1,1,1-Trichloroethane	0.333	<1.09
1,1-Dichloroethane	<0.809	<0.809
1,1-Dichloroethene	<0.079	<0.793
1,2,4-Trimethylbenzene	5.01	3.55
1,2-Dichloroethane	<0.809	1.82
1,3,5-Trimethylbenzene	1.33	1.16
2,2,4-Trimethylpentane	1.36	<0.934
2-Butanone	3.66	31.9
4-Ethyltoluene	<0.983	0.993
Acetone	108	591
Benzene	1.11	6.77
Carbon disulfide	<0.623	2.53
Carbon tetrachloride	0.503	<1.26
Chloroethane	<0.528	<0.528
Chloroform	<0.977	<0.977
Chloromethane	0.977	1.11
cis-1,2-Dichloroethene	<0.079	<0.793
Cyclohexane	<0.688	2.39
Dichlorodifluoromethane	2.13	2.1
Ethanol	52.8	416
Ethyl Acetate	1.93	8.32
Ethylbenzene	1.22	2.22
Freon-113	<1.53	<1.53
Heptane	1.08	2.51
Isopropanol	6.42	14.9
Methylene chloride	<1.74	2.15
n-Hexane	2.27	23.5
Naphthalene	<1.05	<1.05
o-Xylene	1.98	3.41
p/m-Xylene	4.78	8.56
Tertiary butyl Alcohol	<1.52	11.3
Tetrachloroethene	1.02	<1.36
Tetrahydrofuran	3.83	10.6
Toluene	2.51	7.35
trans-1,2-Dichloroethene	<0.793	<0.793
Trichloroethene	0.107	<1.07
Trichlorofluoromethane	1.28	1.42
Vinyl chloride	<0.051	<0.511

SAMPLE ID:	IA-6	SSG-6	NYSDOH Matrices Decision
COLLECTION DATE:	4/10/2024	4/10/2024	
SAMPLE MATRIX:	IA	SSG	
	Result	Result	
VOLATILE ORGANICS IN AIR			
1,1,1-Trichloroethane	0.818	1190	Mitigate
1,1-Dichloroethane	<0.809	94.3	~
1,1-Dichloroethene	<0.079	45.2	NFA
1,2,4-Trimethylbenzene	3.33	<13.6	NFA
1,2-Dichloroethane	<0.809	<11.2	~
1,3,5-Trimethylbenzene	<0.983	<13.6	NFA
2,2,4-Trimethylpentane	<0.934	<12.9	NFA
2-Butanone	4.72	<20.4	~
4-Ethyltoluene	<0.983	<13.6	~
Acetone	205	349	~
Benzene	0.856	<8.82	NFA
Carbon disulfide	<0.623	<8.59	~
Carbon tetrachloride	0.516	<17.4	NFA
Chloroethane	<0.528	9.97	~
Chloroform	<0.977	77.2	~
Chloromethane	1.02	<5.7	~
cis-1,2-Dichloroethene	<0.079	4200	Mitigate
Cyclohexane	<0.688	<9.5	NFA
Dichlorodifluoromethane	2.09	<13.6	~
Ethanol	57.7	<130	~
Ethyl Acetate	3.5	<24.9	~
Ethylbenzene	<0.869	<12	NFA
Freon-113	<1.53	90.4	~
Heptane	0.877	<11.3	NFA
Isopropanol	7.96	<17	~
Methylene chloride	<1.74	<24	NFA
n-Hexane	6.2	15.2	NFA
Naphthalene	<1.05	<14.5	NFA
o-Xylene	1.38	<12	NFA
p/m-Xylene	2.98	<24	NFA
Tertiary butyl Alcohol	<1.52	<20.9	~
Tetrachloroethene	1.31	110	NFA
Tetrahydrofuran	6.96	<20.4	~
Toluene	1.85	<10.4	NFA
trans-1,2-Dichloroethene	<0.793	89.2	~
Trichloroethene	0.15	90.8	Mitigate
Trichlorofluoromethane	1.42	<15.5	~
Vinyl chloride	<0.051	85.9	Mitigate

SAMPLE ID:	IA-1	SSG-1	NYSDOH Matrices Decision
COLLECTION DATE:	4/10/2024	4/10/2024	
SAMPLE MATRIX:	IA	SSG	
	Result	Result	
VOLATILE ORGANICS IN AIR			
1,1,1-Trichloroethane	0.917	19600	Mitigate
1,1-Dichloroethane	<0.809	2360	~
1,1-Dichloroethene	<0.079	440	Mitigate
1,2,4-Trimethylbenzene	4.57	<71.3	NFA
1,2-Dichloroethane	<0.809	<58.7	~
1,3,5-Trimethylbenzene	1.17	<71.3	NFA
2,2,4-Trimethylpentane	<0.934	<67.7	NFA
2-Butanone	5.04	<107	~
4-Ethyltoluene	<0.983	<71.3	~
Acetone	205	340	~
Benzene	0.875	<46.3	NFA
Carbon disulfide	<0.623	<45.2	~
Carbon tetrachloride	0.528	<91.2	NFA
Chloroethane	<0.528	47.2	~
Chloroform	<0.977	<70.8	~
Chloromethane	0.981	<29.9	~
cis-1,2-Dichloroethene	0.091	82.5	Mitigate
Cyclohexane	0.709	<49.9	NFA
Dichlorodifluoromethane	2	<71.7	~
Ethanol	65.8	<684	~
Ethyl Acetate	<1.8	<131	~
Ethylbenzene	0.943	<63	NFA
Freon-113	<1.53	706	~
Heptane	0.926	<59.4	NFA
Isopropanol	6.56	<89.2	~
Methylene chloride	<1.74	<126	NFA
n-Hexane	6.45	<51.1	NFA
Naphthalene	<1.05	<76	NFA
o-Xylene	1.75	<63	NFA
p/m-Xylene	3.75	<126	NFA
Tertiary butyl Alcohol	<1.52	<110	~
Tetrachloroethene	1.38	652	NFA
Tetrahydrofuran	11.6	<107	~
Toluene	2.06	<54.6	NFA
trans-1,2-Dichloroethene	<0.793	<57.5	~
Trichloroethene	0.145	161	Mitigate
Trichlorofluoromethane	1.36	<81.5	~
Vinyl chloride	<0.051	<37.1	NFA

SAMPLE ID:	IA-5	SSG-5	NYSDOH Matrices Decision
COLLECTION DATE:	4/10/2024	4/10/2024	
SAMPLE MATRIX:	IA	SSG	
	Result	Result	
VOLATILE ORGANICS IN AIR			
1,1,1-Trichloroethane	0.742	94.9	NFA
1,1-Dichloroethane	<0.809	11.8	~
1,1-Dichloroethene	<0.079	4	NFA
1,2,4-Trimethylbenzene	4.15	23.4	NFA
1,2-Dichloroethane	<0.809	1.15	~
1,3,5-Trimethylbenzene	1.15	5.95	NFA
2,2,4-Trimethylpentane	<0.934	<0.934	NFA
2-Butanone	5.22	8.52	~
4-Ethyltoluene	<0.983	3.57	~
Acetone	247	261	~
Benzene	0.895	0.978	NFA
Carbon disulfide	<0.623	<0.623	~
Carbon tetrachloride	0.497	<1.26	NFA
Chloroethane	<0.528	1.9	~
Chloroform	<0.977	19.3	~
Chloromethane	0.995	<0.413	~
cis-1,2-Dichloroethene	<0.079	1.28	NFA
Cyclohexane	0.723	11.6	NFA
Dichlorodifluoromethane	2.1	2.01	~
Ethanol	76.3	43.3	~
Ethyl Acetate	<1.8	<1.8	~
Ethylbenzene	0.986	3.62	NFA
Freon-113	<1.53	11.3	~
Heptane	0.934	1.57	NFA
Isopropanol	6.34	5.01	~
Methylene chloride	<1.74	<1.74	NFA
n-Hexane	6.34	287	Monitor
Naphthalene	<1.05	1.17	NFA
o-Xylene	1.79	7.64	NFA
p/m-Xylene	4.04	15.6	NFA
Tertiary butyl Alcohol	<1.52	<1.52	~
Tetrachloroethene	1.13	1.65	NFA
Tetrahydrofuran	7.73	6.4	~
Toluene	2.05	3.44	NFA
trans-1,2-Dichloroethene	<0.793	<0.793	~
Trichloroethene	0.145	<1.07	NFA
Trichlorofluoromethane	1.42	1.51	~
Vinyl chloride	<0.051	<0.511	NFA



LEGEND

- APPROXIMATE SITE BOUNDARY
- PARCEL BOUNDARY
- SSG-1/IA-1 ▲ SUB-SLAB SOIL GAS AND INDOOR/AMBIENT AIR SAMPLE LOCATION APRIL 2024
- ⊗ FLOOR CRACK / HOLE

NOTES

Result - Bolded results indicate compounds detected above NYSDOH Air Guideline Value. Applies to indoor air and ambient air sample results only

(µg/m3) - Micrograms per meter cubed

IA - Indoor Air

SSG - Sub- Slab Soil Gas

AA - Ambient Air

SV - Soil Vapor

RECOMMENDATIONS BASED ON NYSDOH SOIL VAPOR / INDOOR AIR (SVI/IA) MATRICES A THROUGH E (LAST REVISED FEBRUARY 2024)

- Mitigate
- Monitor

NFA - No Further Action per NYSDOH Decision Matrix

~ - No NYSDOH Decision Matrix for this compound

Paramater	NYSDOH Air Guideline Value (µg/m3)
Methylene chloride	60
Tetrachloroethene	30
Trichloroethene	2

GRAPHIC SCALE

0 7.5 15 30

(IN FEET)

Environmental LOGIC

15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN

DATE: 4/9/26

PROJECT # 23-0001

DRAWN BY: PM

CHECKED BY: NM

VAPOR INTRUSION SAMPLE LOCATIONS - APRIL 2024
245 WEST 55TH STREET
MANHATTAN, NEW YORK

FIGURE # 3

File: X:\Environmental Logic\Manhatten_NY\245W55thStreet\Drawings\245W55_ManhattanNY_2025-F3_VIAD(April2024).dwg, Layout1

SB-4	11/18/2024	11/19/2024	11/18/2024	11/18/2024	11/18/2024
	0-0.5'	1-1.5'	3-3.5'	5-5.5'	7-7.5'
VOCs					
1,1,1-TCA	ND	ND	ND	ND	ND
1,1-DCA	ND	ND	ND	ND	ND
1,1-DCE	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND
cis-1,2-DCE	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND
p-Diethylbenzene	ND	ND	ND	ND	ND
p-Isopropyltoluene	ND	ND	ND	ND	ND
p/m-Xylene	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND
PCE	ND	0.0023	0.0012	0.00037 J	ND
TCE	ND	ND	ND	ND	ND
All Others	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO

SB-5	11/18/2024	11/19/2024	11/18/2024	11/18/2024	11/18/2024	11/18/2024
	0-0.5'	1-1.5'	3-3.5'	5-5.5'	7-7.5'	7-7.5' (DUP-1)
VOCs						
1,1,1-TCA	0.00034 J	ND	ND	ND	ND	ND
1,1-DCA	ND	ND	ND	ND	ND	ND
1,1-DCE	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND
cis-1,2-DCE	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND
p/m-Xylene	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND
PCE	0.0069	0.003	0.0055	0.0015	0.0012	0.0022
TCE	ND	ND	ND	ND	ND	ND
All Others	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO

SB-6	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024
	0-0.5'	1-1.5'	3-3.5'	5-5.5'	7-7.5'	9-9.5'
VOCs						
1,1,1-TCA	0.0025	0.0012	0.00056 J	0.0092	0.0063	0.0029
1,1-DCA	0.00035 J	0.00022 J	ND	0.0011	0.00092 J	0.00024 J
1,1-DCE	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	0.0054 J	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND
Chloroform	0.00032 J	0.00022 J	ND	0.00063 J	0.00049 J	0.00019 J
cis-1,2-DCE	0.034	0.022	0.009	0.044	0.05	0.024
Isopropylbenzene	ND	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND
p/m-Xylene	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND
PCE	0.037	0.023	0.0098	0.095	0.038	0.086
TCE	0.0035	0.0021	0.00089	0.0043	0.003	0.0032
All Others	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO

SB-1D	11/20/2024	11/20/2024	11/20/2024	11/20/2024	11/20/2024	11/20/2024
	0-0.5'	1-1.5'	3-3.5'	5-5.5'	7-7.5'	9-9.5'
VOCs						
1,1,1-TCA	0.035	0.015	0.0043	0.0012	0.0034	0.018
1,1-DCA	0.0054	0.0025	0.00059 J	0.00024 J	0.00048 J	0.0011
1,1-DCE	ND	ND	ND	ND	ND	0.00042 J
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND
Chloroform	0.00024 J	ND	ND	ND	ND	0.0011 J
cis-1,2-DCE	ND	ND	ND	ND	ND	0.0012
Isopropylbenzene	ND	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND
p/m-Xylene	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND
PCE	0.024	0.014	0.0072	0.005	0.015	0.14
TCE	0.00058	0.00036 J	0.0011	ND	0.00038 J	0.004
All Others	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO

PE-1	11/18/2024
	0-0.5'
VOCs	
1,1,1-TCA	ND
1,1-DCA	ND
1,1-DCE	ND
1,2,4,5-Tetramethylbenzene	ND
1,2-Dichlorobenzene	ND
1,3,5-Trimethylbenzene	ND
Acetone	ND
Bromomethane	ND
Chloroform	ND
cis-1,2-DCE	ND
Isopropylbenzene	ND
n-Butylbenzene	ND
n-Propylbenzene	ND
Naphthalene	ND
o-Xylene	ND
p-Diethylbenzene	ND
p-Isopropyltoluene	ND
p/m-Xylene	ND
sec-Butylbenzene	ND
tert-Butylbenzene	ND
PCE	ND
TCE	ND
All Others	ND

SB-3	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024
	0-0.5'	1-1.5'	3-3.5'	5-5.5'	7-7.5'	9-9.5'
VOCs						
1,1,1-TCA	ND	ND	ND	ND	ND	ND
1,1-DCA	ND	ND	ND	ND	ND	ND
1,1-DCE	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND
cis-1,2-DCE	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND
p/m-Xylene	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND
PCE	ND	0.00021 J	0.0011	0.00072	0.0019	0.0018
TCE	ND	ND	ND	ND	ND	ND
All Others	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO

PE-B	11/18/2024	11/18/2024
	0-0.5'	0-0.5' (DUP-2)
VOCs		
1,1,1-TCA	ND	ND
1,1-DCA	ND	ND
1,1-DCE	ND	ND
1,2,4,5-Tetramethylbenzene	ND	ND
1,2-Dichlorobenzene	ND	ND
1,3,5-Trimethylbenzene	ND	ND
Acetone	ND	ND
Bromomethane	ND	ND
Chloroform	ND	ND
cis-1,2-DCE	ND	ND
Isopropylbenzene	ND	ND
n-Butylbenzene	ND	ND
n-Propylbenzene	ND	ND
Naphthalene	ND	ND
o-Xylene	ND	ND
p-Diethylbenzene	ND	ND
p-Isopropyltoluene	ND	ND
p/m-Xylene	ND	ND
sec-Butylbenzene	ND	ND
tert-Butylbenzene	ND	ND
PCE	ND	ND
TCE	ND	ND
All Others	ND	ND

PE-2	11/18/2024
	0-0.5'
VOCs	
1,1,1-TCA	ND
1,1-DCA	ND
1,1-DCE	ND
1,2,4,5-Tetramethylbenzene	ND
1,2-Dichlorobenzene	ND
1,3,5-Trimethylbenzene	ND
Acetone	ND
Bromomethane	ND
Chloroform	ND
cis-1,2-DCE	ND
Isopropylbenzene	ND
n-Butylbenzene	ND
n-Propylbenzene	ND
Naphthalene	ND
o-Xylene	ND
p-Diethylbenzene	ND
p-Isopropyltoluene	ND
p/m-Xylene	ND
sec-Butylbenzene	ND
tert-Butylbenzene	ND
PCE	ND
TCE	ND
All Others	ND

SB-1	11/20/2024	11/20/2024	11/20/2024	11/20/2024	11/20/2024	11/20/2024	11/20/2024
	0-0.5'	1-1.5'	3-3.5'	3-3.5' (DUP-3)	5-5.5'	7-7.5'	9-9.5'
VOCs							
1,1,1-TCA	0.027	0.01	0.0045	0.034	0.0046	0.0021	0.005
1,1-DCA	0.0057	0.002	0.00082 J	0.0061	0.00094 J	0.00071 J	0.00044 J
1,1-DCE	ND	ND	ND	0.00025 J	ND	ND	ND
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND
Chloroform	0.00022 J	ND	ND	0.00018 J	ND	ND	0.0014 J
cis-1,2-DCE	0.00026 J	ND	ND	0.00042 J	ND	ND	0.00093 J
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND
p/m-Xylene	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND
PCE	0.016	0.0099	0.02	0.061	0.02	0.012	0.21
TCE	0.00068	0.0007	0.00043 J	0.00081	0.0012	0.00034 J	0.0032
All Others	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO

SB-7	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024
	0-0.5'	1-1.5'	3-3.5'	5.5-6'	7-7.5'	8.5-9'	9.5-10'	16.5-17'	16.5-17'	19.5-20'
VOCs										
1,1,1-TCA	ND	ND	ND	ND	0.00032 J	ND	ND	ND	~	~
1,1-DCA	ND	ND	0.00023 J	ND	0.00042 J	ND	ND	0.0027	~	~
1,1-DCE	ND	ND	ND	ND	ND	ND	ND	0.00069 J	~	~
1,2,4,5-Tetramethylbenzene	0.0014 J	ND	0.00084 J	0.0027	5.9	17	7.8	ND	~	~
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	~	~
1,3,5-Trimethylbenzene	0.00078 J	ND	ND	ND	0.0019 J	ND	ND	ND	~	~
Acetone	ND	ND	ND	0.0089 J	0.018	ND	ND	0.061	0.045	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	~	~
Chloroform	ND	ND	0.00016 J	ND	ND	ND	ND	ND	~	~
cis-1,2-DCE	ND	ND	ND	ND	ND	ND	ND	0.0094	~	~
Isopropylbenzene	ND	ND	ND	ND	0.54	3.8	1.2	ND	~	~
n-Butylbenzene	0.00027 J	ND	0.00018 J	0.00085 J	2.4	7.9	3	ND	~	~
n-Propylbenzene	0.0003 J	ND	ND	0.00036 J	1.8	10	3.1	ND	~	~
Naphthalene	0.0018 J	ND	ND	ND	0.011	0.33	0.22	ND	~	~
o-Xylene	0.0011 J	ND	ND	ND	0.0024	0.026 J	ND	ND	~	~
p-Diethylbenzene	0.0019 J	ND	ND	0.00038 J	2	5.7	2.1	ND	~	~
p-Isopropyltoluene	ND	ND	ND	ND	ND	0.022 J	0.0075 J	ND	~	~
p/m-Xylene	0.00098 J	ND	ND	ND	ND	ND	ND	ND	~	~
sec-Butylbenzene	ND	ND	ND	0.00045 J	1.8	6.3	2	ND	~	~
tert-Butylbenzene	ND	ND	ND	ND	0.14	0.6	0.21	0.0017 J	~	~
PCE	ND	ND	ND	ND	ND	ND	ND	ND	~	~
TCE	ND	ND	ND	ND	ND	ND	ND	0.0005 J	~	~
All Others	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO

SB-8	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025
	5-5.5'	7-7.5'	9-9.5'	11-11.5'	13-13.5'	15-15.5'	17-17.5'	19-19.5'	19-19.5' (DUP)	21-21.5'	23-23.5'
VOCs											
1,1,1-TCA	ND	ND	ND	ND	0.00076	0.003	ND	0.00025 J	0.001	ND	0.00071 J
1,1-DCA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DCE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	0.025	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-DCE	ND	ND	ND	ND	0.00037 J	0.0036	0.001 J	0.0016	0.0027	0.0008 J	0.001 J
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p/m-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	LM	ND	ND	ND	ND	ND	ND
PCE	0.00051	0.00057	0.00079	0.0016	0.013	0.036	0.014	0.018	0.049	0.012	0.054
TCE	ND	ND	ND	ND	0.0015	0.0057	0.0029	0.0037	0.0061	0.0023	0.0065
All Others	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO

SB-2	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025
	0-0.5'	1-1.5'	3-3.5'	5-5.5'	7-7.5'	7-7.5' (DUP)	9.5-10'
VOCs							
1,1,1-TCA	ND	ND	ND	ND	ND	ND	ND
1,1-DCA	ND	ND	0.00066 J	ND	ND	0.0003 J	ND
1,1-DCE	ND	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetramethylbenzene	0.014	2.2	ND	3.5	14	ND	1.8
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	0.00023 J
1,3,5-Trimethylbenzene	ND	0.00031 J	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND	0.012
Bromomethane	ND	ND	ND	ND	ND	0.00066 J	ND
Chloroform	ND	ND	0.00033 J	ND	ND	ND	ND
cis-1,2-DCE	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	0.2	1.5	ND	0.15
n-Butylbenzene	ND	ND	ND	0.82	5.6	ND	0.52
n-Propylbenzene	ND	ND	ND	0.46	4	ND	0.42
Naphthalene	0.0025 J	0.38	ND	0.38	0.41	ND	0.2 J
o-Xylene	ND	ND	ND	ND	0.038 J	ND	0.00056 J
p-Diethylbenzene	0.0011 J	0.24	ND	0.97	3.8	ND	0.36
p-Isopropyltoluene	0.00015 J	0.018 J	ND	ND	ND	ND	0.00015 J
p/m-Xylene	ND	0.00093 J	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	0.00077 J	ND	0.82	4.2	ND	0.38
tert-Butylbenzene	ND	0.014 J	ND	0.1 J	0.36	ND	0.03 J
PCE	ND	0.0032	0.0006	ND	ND	ND	ND
TCE	ND	ND	ND	ND	ND	ND	ND
All Others	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO	ND or <SCO

LEGEND

- APPROXIMATE SITE BOUNDARY
- PARCEL BOUNDARY
- THE PREVIOUSLY ELEVATED COURTYARD WAS INITIALLY 54" HIGHER THAN THE CURRENT BASEMENT SLAB GRADE. APPROXIMATELY 54" OF SOIL WAS REMOVED TO BRING THE COURTYARD AREA ELEVATION TO CURRENT BASEMENT GRADE. POST-EXCAVATION (PE) SAMPLES WERE COLLECTED AT CURRENT BASEMENT SLAB GRADE
- SB-1 ● SOIL BORING
- PE-B ▲ COURTYARD POST EXCAVATION SAMPLE

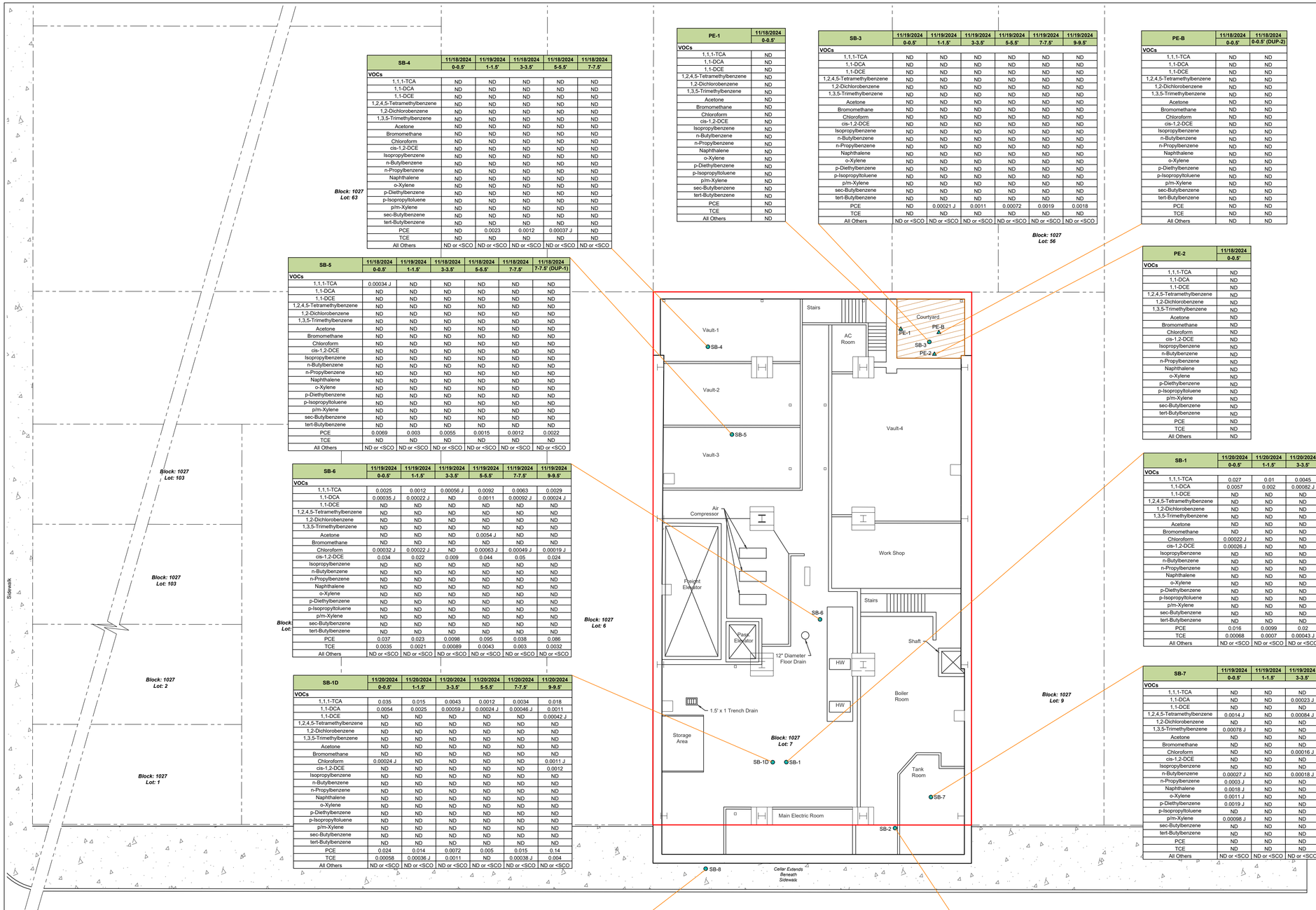
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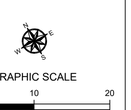
ALL RESULTS REPORTED IN MILLIGRAM PER KILOGRAM (MG/KG)

- 10 RESULTS EXCEED UUSCO
- 10 RESULTS EXCEED RRUSCO
- 10 RESULTS EXCEED PGWSCO AND AWQS
- SCO SOIL CLEANUP OBJECTIVE
- VOC VOLATILE ORGANIC COMPOUND
- J THE RESULT IS LESS THAN THE DETECTION LIMIT, BUT GREATER THAN ZERO
- ~ NOT ANALYZED
- ND ANALYZED FOR BUT NOT DETECTED AT THE MDL
- NS NO APPLICABLE STANDARD
- TICs TENTATIVELY IDENTIFIED COMPOUNDS
- RL REPORTING LIMIT
- MDL METHOD DETECTION LIMIT
- **RL/MDL** BOLD RL/MDL INDICATES THAT THE RL/MDL IS GREATER THAN A SRS

*SB-8 SAMPLE DEPTHS MEASURED FROM SIDEWALK GROUND SURFACE. ALL OTHER SAMPLE DEPTHS MEASURED FROM CELLAR GROUND SURFACE.

Compound	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)
VOCs			
1,1,1-Trichloroethane (1,1,1-TCA)	0.68	100	0.68
1,1-Dichloroethane (1,1-DCA)	0.27	47	0.27
1,1-Dichloroethene (1,1-DCE)	0.24	0.98	0.33
1,2,4,5-Tetramethylbenzene	NS	NS	NS
1,2-Dichlorobenzene	1.1	100	1.1
1,3,5-Trimethylbenzene	3.1	100	3.1
Acetone	0.03	100	0.03
Bromomethane	NS	NS	NS
Chloroform	0.37	24	0.37
cis-1,2-Dichloroethene (cis-1,2-DCE)	0.19	41	0.19
Isopropylbenzene	NS	NS	NS
n-Butylbenzene	18	100	18
n-Propylbenzene	5	100	5
Naphthalene	12	100	12
o-Xylene	NS	NS	NS
p-Diethylbenzene	NS	NS	NS
p-Isopropyltoluene	NS	NS	NS
p/m-Xylene	NS	NS	NS
sec-Butylbenzene	25	100	25
tert-Butylbenzene	11	100	11
Tetrachloroethene (PCE)	1.3	18	1.3
Trichloroethene (TCE)	0.47	6.4	0.47





Environmental LOGIC
15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE:	AS SHOWN	PROJECT #	23-0001
DATE:	1/28/26		
DRAWN BY:	PM		
CHECKED BY:	LM		

SOIL VOC RESULTS
245 WEST 55TH STREET
MANHATTAN, NEW YORK

FIGURE # 4

File: K:\Environmental\Logic\Mauricette_NY\2456\Workset\Drawings\245955_ManuVocRuN_2025.dwg, EB_SB_VOC

SB-4	11/18/2024	11/18/2024	11/18/2024	11/18/2024
	0-2'	2-4'	4-6'	6-8'
BNs				
Dibenzofuran	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides				
4,4'-DDE	**0.0139**	**0.00819**	ND	ND
Perfluorinated Alkyl Acids				
PFOS	0.186 J	0.1 J	0.191 J	**1.28**
PFOA	0.214	0.2420	0.109 J	0.167 J
Metals				
Barium, Total	**500**	**498**	24.5	29.4
Lead, Total	7.05	6.13	3.33 J	4.3 J
Manganese, Total	**3160**	**2700**	210	241
Mercury, Total	ND	ND	ND	ND
Nickel, Total	17.30	12.30	7.84	9.42
Silver, Total	0.453 J	ND	ND	ND
General Chemistry				
Chromium Trivalent	15.10	11.50	6.40	7.65
Chromium Hexavalent	ND	ND	ND	ND

SB-5	11/18/2024	11/18/2024	11/18/2024	11/18/2024
	0-2'	2-4'	4-6'	6-8'
BNs				
Dibenzofuran	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides				
4,4'-DDE	0.000917 J	ND	ND	ND
Perfluorinated Alkyl Acids				
PFOS	0.136 J	0.108 J	0.158 J	0.186 J
PFOA	0.163 J	0.104 J	0.107 J	0.129 J
Metals				
Barium, Total	64.3	37.8	23.3	28.8
Lead, Total	6.76	4.42	2.77 J	3.55 J
Manganese, Total	163	257	282	275
Mercury, Total	ND	ND	ND	ND
Nickel, Total	10.80	9.40	7.09	8.03
Silver, Total	ND	ND	ND	ND
General Chemistry				
Chromium Trivalent	10.10	7.74	5.37	6.31
Chromium Hexavalent	ND	ND	ND	ND

SB-6	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024
	0-2'	2-4'	4-6'	6-8'	8-10'
BNs					
Dibenzofuran	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides					
4,4'-DDE	ND	ND	ND	ND	ND
Perfluorinated Alkyl Acids					
PFOS	**1.44**	**0.972**	**2.81**	**2.84**	**2.42**
PFOA	0.153 J	0.177 J	0.266	0.125 J	0.16 J
Metals					
Barium, Total	131	78.6	21.2	36.4	53.8
Lead, Total	18.2	4.16 J	2.55 J	3.99 J	5.48
Manganese, Total	342	246	212	254	315
Mercury, Total	ND	ND	ND	ND	ND
Nickel, Total	13.10	8.08	5.98	7.80	10.80
Silver, Total	ND	0.264	0.851	ND	ND
General Chemistry					
Chromium Trivalent	14.70	8.99	11.2 J	8.29 J	9.51 J
Chromium Hexavalent	ND	ND	0.335 J	0.391 J	0.324 J

SB-1D	11/20/2024	11/20/2024	11/20/2024	11/20/2024	11/20/2024
	0-2'	2-4'	4-6'	6-8'	8-10'
BNs					
Dibenzofuran	ND	ND	ND	ND	ND
Phenanthrene	ND	0.046 J	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides					
4,4'-DDE	0.000552 J	0.00104 J	0.000489 J	ND	ND
Perfluorinated Alkyl Acids					
PFOS	**2.44**	**5.98**	**41.7**	**64.8**	**18.9**
PFOA	0.295	0.314	0.602	0.607	0.289
Metals					
Barium, Total	232	301	27.4	36.4	55.7
Lead, Total	10.4	7.52	3.92 J	4.82	6.44
Manganese, Total	**2020**	**1620**	260	325	257
Mercury, Total	ND	ND	ND	ND	ND
Nickel, Total	17	14.1	10.2	11.5	13
Silver, Total	ND	0.699	0.574	0.392 J	ND
General Chemistry					
Chromium Trivalent	19.2	15.5	15.9 J	17.7 J	11.7
Chromium Hexavalent	ND	ND	0.508 J	0.909 J	ND

PE-1	11/18/2024
	0-0.5'
BNs	
Dibenzofuran	ND
Phenanthrene	0.29
PCBs	All compounds ND or < SCO
Pesticides	
4,4'-DDE	ND
Perfluorinated Alkyl Acids	
PFOS	0.758
PFOA	0.078 J
Metals	
Barium, Total	66.6
Lead, Total	57.6
Manganese, Total	388
Mercury, Total	**0.241**
Nickel, Total	12.4
Silver, Total	0.697
General Chemistry	
Chromium Trivalent	16.20
Chromium Hexavalent	ND

SB-3	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024
	0-2'	2-4'	4-6'	6-8'	8-10'
BNs					
Dibenzofuran	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides					
4,4'-DDE	ND	ND	ND	ND	ND
Perfluorinated Alkyl Acids					
PFOS	0.567	**1.56**	**3.33**	**3.53**	0.72
PFOA	0.157 J	0.409	0.289	0.149 J	ND
Metals					
Barium, Total	77.1	61.3	51.5	48.1	79.7
Lead, Total	31.3	39.6	21.7	14.4	7.59
Manganese, Total	392	345	234	201	270
Mercury, Total	0.125	0.118	0.158	ND	ND
Nickel, Total	11.70	12	10.70	11	9.44
Silver, Total	ND	0.802	ND	ND	ND
General Chemistry					
Chromium Trivalent	13.8	13.1	12.6	26.7	**36.5 J**
Chromium Hexavalent	ND	ND	ND	ND	0.934 J

PE-B	11/18/2024
	0-0.5'
BNs	
Dibenzofuran	ND
Phenanthrene	ND
PCBs	All compounds ND or < SCO
Pesticides	
4,4'-DDE	ND
Perfluorinated Alkyl Acids	
PFOS	0.392
PFOA	0.08 J
Metals	
Barium, Total	48.2
Lead, Total	10.5
Manganese, Total	327
Mercury, Total	0.077 J
Nickel, Total	9.77
Silver, Total	ND
General Chemistry	
Chromium Trivalent	10
Chromium Hexavalent	ND

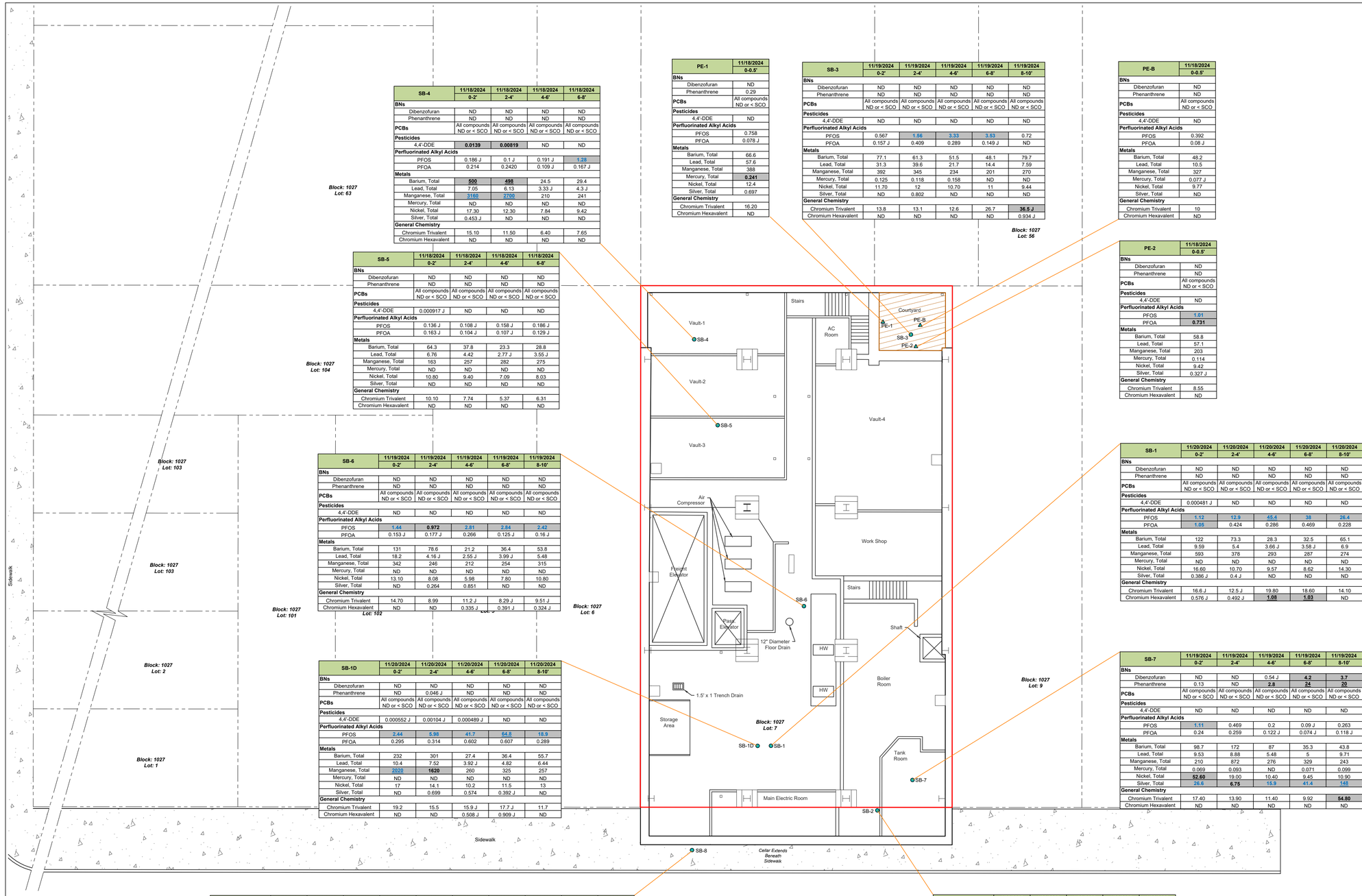
PE-2	11/18/2024
	0-0.5'
BNs	
Dibenzofuran	ND
Phenanthrene	ND
PCBs	All compounds ND or < SCO
Pesticides	
4,4'-DDE	ND
Perfluorinated Alkyl Acids	
PFOS	**1.01**
PFOA	**0.731**
Metals	
Barium, Total	58.8
Lead, Total	57.1
Manganese, Total	203
Mercury, Total	0.114
Nickel, Total	9.42
Silver, Total	0.327 J
General Chemistry	
Chromium Trivalent	8.55
Chromium Hexavalent	ND

SB-1	11/20/2024	11/20/2024	11/20/2024	11/20/2024	11/20/2024
	0-2'	2-4'	4-6'	6-8'	8-10'
BNs					
Dibenzofuran	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides					
4,4'-DDE	0.000481 J	ND	ND	ND	ND
Perfluorinated Alkyl Acids					
PFOS	**1.12**	**12.9**	**45.4**	**38**	**26.4**
PFOA	**1.05**	0.424	0.286	0.469	0.228
Metals					
Barium, Total	122	73.3	28.3	32.5	65.1
Lead, Total	9.59	5.4	3.66 J	3.58 J	6.9
Manganese, Total	593	378	293	287	274
Mercury, Total	ND	ND	ND	ND	ND
Nickel, Total	16.60	10.70	9.57	8.62	14.30
Silver, Total	0.386 J	0.4 J	ND	ND	ND
General Chemistry					
Chromium Trivalent	16.6 J	12.5 J	19.80	18.60	14.10
Chromium Hexavalent	0.576 J	0.492 J	**1.08**	**1.03**	ND

SB-7	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024
	0-2'	2-4'	4-6'	6-8'	8-10'	16-18'
BNs						
Dibenzofuran	ND	ND	0.54 J	**4.2**	**3.7**	0.025 J
Phenanthrene	0.13	ND	**2.8**	**24**	**20**	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides						
4,4'-DDE	ND	ND	ND	ND	ND	ND
Perfluorinated Alkyl Acids						
PFOS	**1.11**	0.469	0.2	0.09 J	0.263	**3.42**
PFOA	0.24	0.259	0.122 J	0.074 J	0.118 J	0.03 J
Metals						
Barium, Total	98.7	172	87	35.3	43.8	68.2
Lead, Total	9.53	8.88	5.48	5	9.71	7.64
Manganese, Total	210	872	276	329	243	243
Mercury, Total	0.069	0.093	ND	0.071	0.099	ND
Nickel, Total	**52.60**	19.00	10.40	9.45	10.90	14.10
Silver, Total	**26.6**	**6.75**	**15.9**	**41.4**	**148**	ND
General Chemistry						
Chromium Trivalent	17.40	13.90	11.40	9.92	**54.80**	12.60
Chromium Hexavalent	ND	ND	ND	ND	ND	ND

SB-8	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025
	4-6'	6-8'	8-10'	10-12'	12-14'	14-16'	16-18'	18-20'	20-22'	22-24'
BNs										
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides										
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluorinated Alkyl Acids										
PFOS	**1.35**	**1.73**	**1.54**	0.835	0.407	0.54	0.281 F	0.355	0.429	0.1 J
PFOA	0.12 J	0.132 J	0.402	0.214	0.196 J	0.239	0.546	**1.62**	**0.936**	0.06 J
Metals										
Barium, Total	58.3	51.8	36.8	46.1	42.1	63.1	31.6	21.5	20	16.3
Lead, Total	**96.3**	25	43.8	24.3	12.7	16.3	4.66	4.87	5.21	5.15
Manganese, Total	253	221	231	293	717	890	245	419	129	186
Mercury, Total	**0.299**	0.122	0.168	**0.202**	ND	ND	ND	ND	ND	ND
Nickel, Total	15.8	16.2	14.2	12	13.9	12.7	6.91	12.8	9.03	8.83
Silver, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
General Chemistry										
Chromium Trivalent	12 J	13.2	10.9	11	13.6	15.3	7.6	7.31	7.31	7.06
Chromium Hexavalent	0.327 J	ND	ND	ND	ND	ND	ND	ND	ND	ND

SB-2	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025
	0-2'	2-4'	4-6'	6-8'	8-10'
BNs					
Dibenzofuran	0.22	ND	**2.7**	**4.6**	**3.5**
Phenanthrene	**1.7**	0.1 J	**9.7**	**12**	**11**
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides					
4,4'-DDE	ND	ND	ND	ND	ND
Perfluorinated Alkyl Acids					
PFOS	**3.93**	**2.67**	**1.42**	0.822	0.335
PFOA	0.574	0.36	0.326	0.073 J	0.081 J
Metals					
Barium, Total	85.4	157	93.2	41.9000	52.6
Lead, Total	36.2	17.3	9.77	4.1 J	6.24
Manganese, Total	241	344	244	269	263
Mercury, Total	0.115	0.072	0.054	ND	0.057
Nickel, Total	12.5	18.9	12.5	10.3	13
Silver, Total	**14.9**	**5.63**	**2.86**	**4.96**	**5.18**
General Chemistry					
Chromium Trivalent	12.7	12.0	10.7	7.3	9.63
Chromium Hexavalent	ND	ND	ND	ND	ND



LEGEND

- APPROXIMATE SITE BOUNDARY
- PARCEL BOUNDARY
- THE PREVIOUSLY ELEVATED COURTYARD WAS INITIALLY 54" HIGHER THAN THE CURRENT BASEMENT SLAB GRADE. APPROXIMATELY 54" OF SOIL WAS REMOVED TO BRING THE COURTYARD AREA ELEVATION TO CURRENT BASEMENT GRADE. POST-EXCAVATION (PE) SAMPLES WERE COLLECTED AT CURRENT BASEMENT SLAB GRADE
- SB-1 SOIL BORING
- PE-B COURTYARD POST EXCAVATION SAMPLE

NOTES:

- PFAS RESULTS ARE REPORTED IN µG/KG
- ALL OTHER RESULTS REPORTED IN MILLIGRAM PER KILOGRAM (MG/KG)
- ONLY EXCEEDANCES ARE SHOWN
- 10 RESULTS EXCEED UUSCO / UUGV
- 10 RESULTS EXCEED RRUSCO / RRUGV
- 10 RESULTS EXCEED PGWSCO / PGWGV AND NY-AWQS

NY-AWQS	NEW YORK TOGS 111 AMBIENT WATER QUALITY STANDARDS
SCO	SOIL CLEANUP OBJECTIVE
VOC	VOLATILE ORGANIC COMPOUND
BNs	BASE NEUTRAL EXTRACTABLES
~	COMPOUND NOT ANALYZED
ND	NONE DETECT
NS	NO STANDARD
<	PRECEDES METHOD DETECTION LIMIT, DENOTES NO DETECTION
J	THE RESULT IS LESS THAN THE DETECTION LIMIT, BUT GREATER THAN ZERO.
F	THE RESULT IS CONSIDERED AN ESTIMATED MAXIMUM CONCENTRATION.

*SB-8 SAMPLE DEPTHS MEASURED FROM SIDEWALK GROUND SURFACE. ALL OTHER SAMPLE DEPTHS MEASURED FROM CELLAR GROUND SURFACE.

Compound	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)
BNs			
Dibenzofuran	2.1	18	110
Phenanthrene	1.1	4.9	1000
Pesticides			
4,4'-DDE (mg/kg)	0.0033	3.4	9.3
Metals			
Barium, Total (mg/kg)	410	410	820
Lead, Total (mg/kg)	63	400	450
Manganese, Total (mg/kg)	1600	2000	2000
Mercury, Total (mg/kg)	0.18	0.3	0.730
Nickel, Total (mg/kg)	30	320	130
Silver, Total (mg/kg)	2	110	8.3
General Chemistry			
Chromium Trivalent (mg/kg)	30	110	NS
Chromium Hexavalent (mg/kg)	1	1	19

Compound	Guidance Values for Anticipated Site Use - Unrestricted (UUGV)	Guidance Values for Anticipated Site Use - Restricted-Residential (RRUGV)	Guidance Values for Anticipated Site Use - Protection of Groundwater (PGWGV)
Perfluorinated Alkyl Acids			
PFOS (µg/kg)	0.88	44	1
PFOA (µg/kg)	0.66	33	0.8

GRAPHIC SCALE

0 5 10 20

(IN FEET)

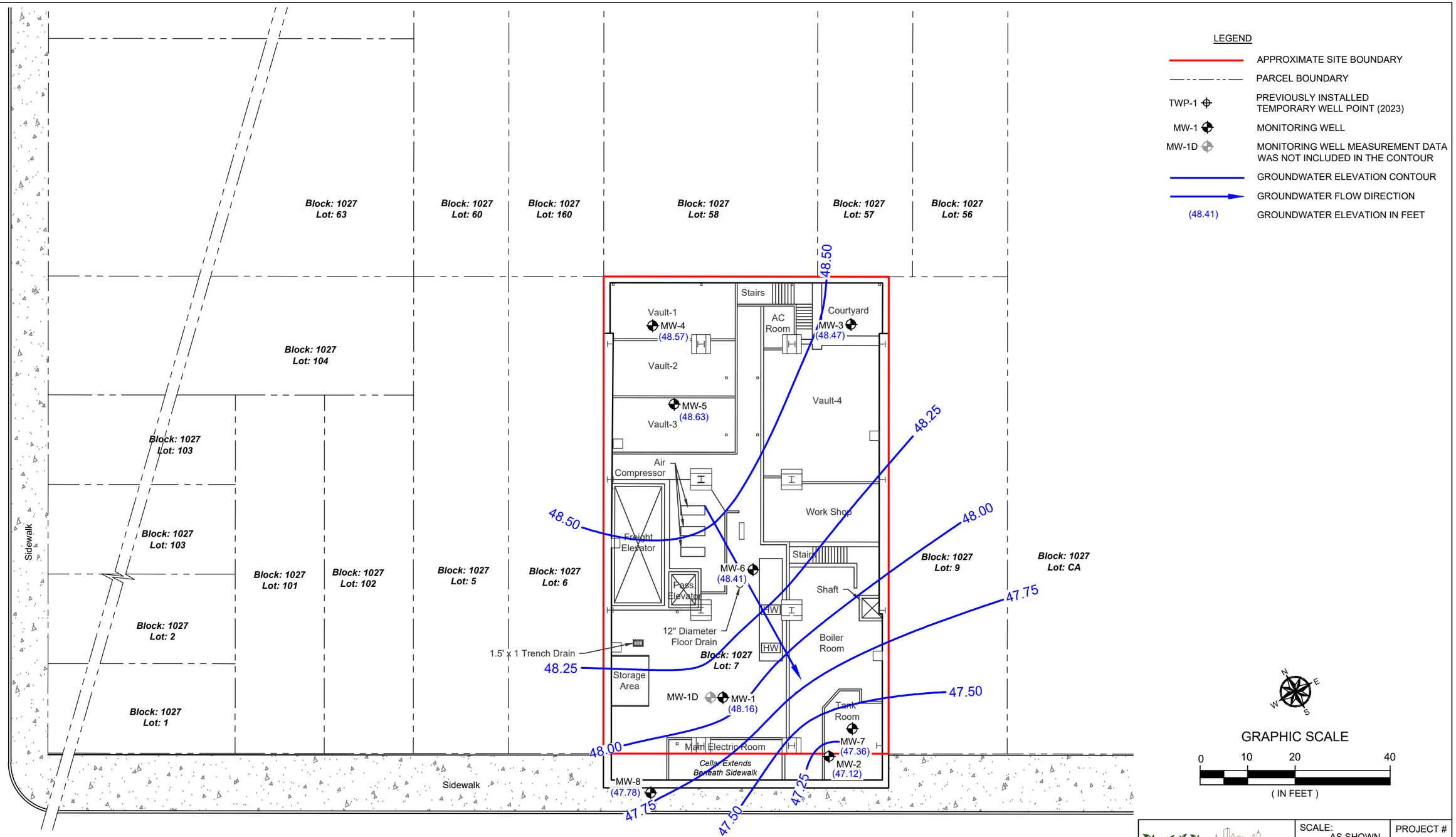
Environmental LOGIC
15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN	PROJECT # 23-0001
DATE: 1/28/26	
DRAWN BY: PM	
CHECKED BY: LM	

SOIL ANALYTICAL RESULTS
245 WEST 55TH STREET
MANHATTAN, NEW YORK

FIGURE # 5

File: X:\Environmental\Job Numbers_NY\24\0506\Dwg\24-0506_Manhattan.DWG Mar 17, 2026



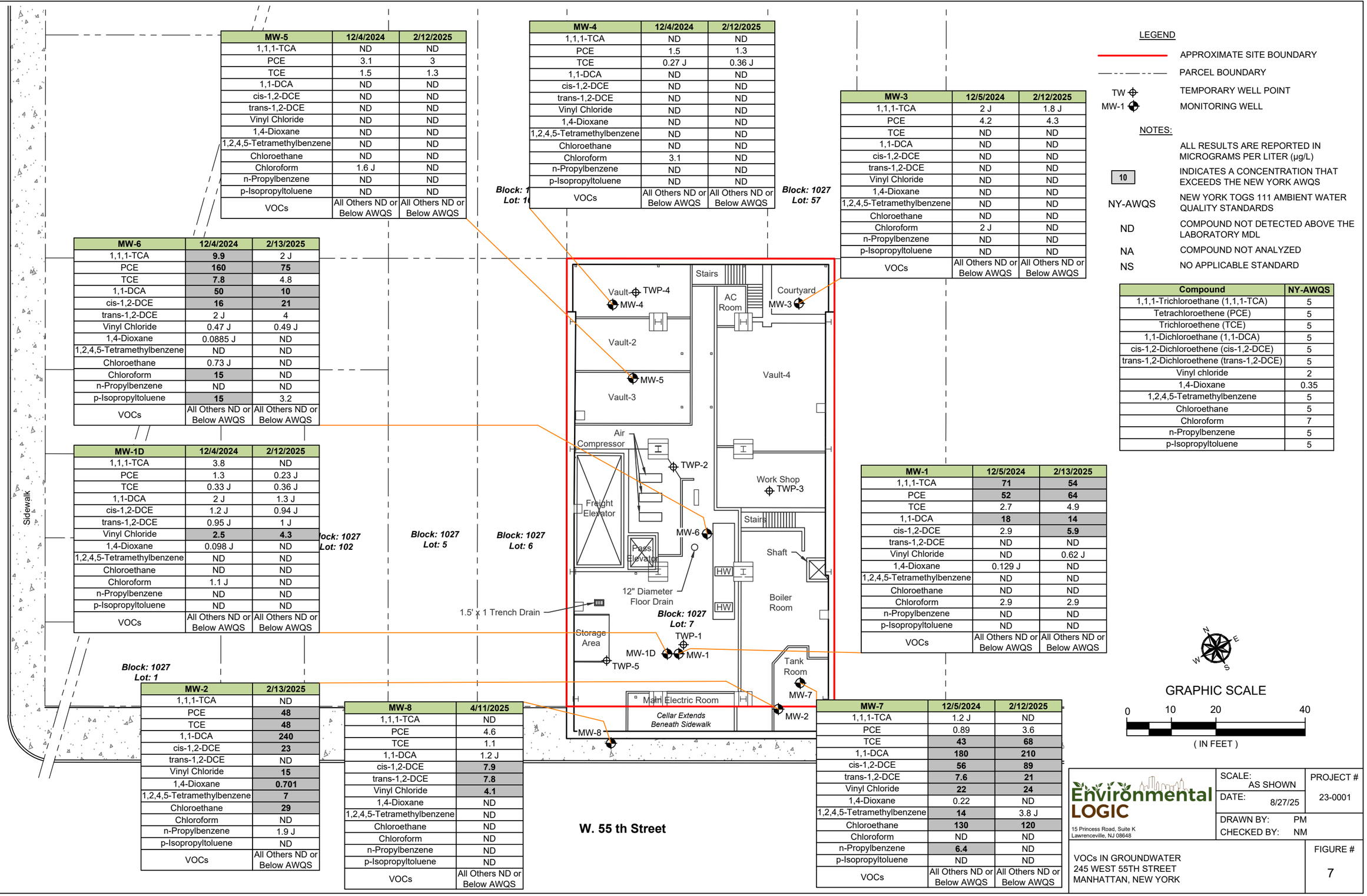
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Environmental LOGIC
15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN		PROJECT # 23-0001
DATE: 9/18/25		
DRAWN BY: PM	CHECKED BY: ST	

GROUNDWATER ELEVATION CONTOURS - APRIL 11, 2025
245 WEST 55TH STREET
MANHATTAN, NEW YORK

FIGURE # 6



MW-5	12/4/2024	2/12/2025
1,1,1-TCA	ND	ND
PCE	3.1	3
TCE	1.5	1.3
1,1-DCA	ND	ND
cis-1,2-DCE	ND	ND
trans-1,2-DCE	ND	ND
Vinyl Chloride	ND	ND
1,4-Dioxane	ND	ND
1,2,4,5-Tetramethylbenzene	ND	ND
Chloroethane	ND	ND
Chloroform	1.6 J	ND
n-Propylbenzene	ND	ND
p-Isopropyltoluene	ND	ND
VOCs	All Others ND or Below AWQS	All Others ND or Below AWQS

MW-4	12/4/2024	2/12/2025
1,1,1-TCA	ND	ND
PCE	1.5	1.3
TCE	0.27 J	0.36 J
1,1-DCA	ND	ND
cis-1,2-DCE	ND	ND
trans-1,2-DCE	ND	ND
Vinyl Chloride	ND	ND
1,4-Dioxane	ND	ND
1,2,4,5-Tetramethylbenzene	ND	ND
Chloroethane	ND	ND
Chloroform	3.1	ND
n-Propylbenzene	ND	ND
p-Isopropyltoluene	ND	ND
VOCs	All Others ND or Below AWQS	All Others ND or Below AWQS

MW-3	12/5/2024	2/12/2025
1,1,1-TCA	2 J	1.8 J
PCE	4.2	4.3
TCE	ND	ND
1,1-DCA	ND	ND
cis-1,2-DCE	ND	ND
trans-1,2-DCE	ND	ND
Vinyl Chloride	ND	ND
1,4-Dioxane	ND	ND
1,2,4,5-Tetramethylbenzene	ND	ND
Chloroethane	ND	ND
Chloroform	2 J	ND
n-Propylbenzene	ND	ND
p-Isopropyltoluene	ND	ND
VOCs	All Others ND or Below AWQS	All Others ND or Below AWQS

MW-6	12/4/2024	2/13/2025
1,1,1-TCA	**9.9**	2 J
PCE	**160**	**75**
TCE	**7.8**	4.8
1,1-DCA	**50**	**10**
cis-1,2-DCE	**16**	**21**
trans-1,2-DCE	2 J	4
Vinyl Chloride	0.47 J	0.49 J
1,4-Dioxane	0.0885 J	ND
1,2,4,5-Tetramethylbenzene	ND	ND
Chloroethane	0.73 J	ND
Chloroform	**15**	ND
n-Propylbenzene	ND	ND
p-Isopropyltoluene	**15**	3.2
VOCs	All Others ND or Below AWQS	All Others ND or Below AWQS

MW-1D	12/4/2024	2/12/2025
1,1,1-TCA	3.8	ND
PCE	1.3	0.23 J
TCE	0.33 J	0.36 J
1,1-DCA	2 J	1.3 J
cis-1,2-DCE	1.2 J	0.94 J
trans-1,2-DCE	0.95 J	1 J
Vinyl Chloride	**2.5**	**4.3**
1,4-Dioxane	0.098 J	ND
1,2,4,5-Tetramethylbenzene	ND	ND
Chloroethane	ND	ND
Chloroform	1.1 J	ND
n-Propylbenzene	ND	ND
p-Isopropyltoluene	ND	ND
VOCs	All Others ND or Below AWQS	All Others ND or Below AWQS

MW-2	2/13/2025
1,1,1-TCA	ND
PCE	**48**
TCE	**48**
1,1-DCA	**240**
cis-1,2-DCE	**23**
trans-1,2-DCE	ND
Vinyl Chloride	**15**
1,4-Dioxane	**0.701**
1,2,4,5-Tetramethylbenzene	**7**
Chloroethane	**29**
Chloroform	ND
n-Propylbenzene	1.9 J
p-Isopropyltoluene	ND
VOCs	All Others ND or Below AWQS

MW-8	4/11/2025
1,1,1-TCA	ND
PCE	4.6
TCE	1.1
1,1-DCA	1.2 J
cis-1,2-DCE	**7.9**
trans-1,2-DCE	**7.8**
Vinyl Chloride	**4.1**
1,4-Dioxane	ND
1,2,4,5-Tetramethylbenzene	ND
Chloroethane	ND
Chloroform	ND
n-Propylbenzene	ND
p-Isopropyltoluene	ND
VOCs	All Others ND or Below AWQS

MW-1	12/5/2024	2/13/2025
1,1,1-TCA	**71**	**54**
PCE	**52**	**64**
TCE	2.7	4.9
1,1-DCA	**18**	**14**
cis-1,2-DCE	2.9	**5.9**
trans-1,2-DCE	ND	ND
Vinyl Chloride	ND	0.62 J
1,4-Dioxane	0.129 J	ND
1,2,4,5-Tetramethylbenzene	ND	ND
Chloroethane	ND	ND
Chloroform	2.9	2.9
n-Propylbenzene	ND	ND
p-Isopropyltoluene	ND	ND
VOCs	All Others ND or Below AWQS	All Others ND or Below AWQS

MW-7	12/5/2024	2/12/2025
1,1,1-TCA	1.2 J	ND
PCE	0.89	3.6
TCE	**43**	**68**
1,1-DCA	**180**	**210**
cis-1,2-DCE	**56**	**89**
trans-1,2-DCE	**7.6**	**21**
Vinyl Chloride	**22**	**24**
1,4-Dioxane	0.22	ND
1,2,4,5-Tetramethylbenzene	**14**	3.8 J
Chloroethane	**130**	**120**
Chloroform	ND	ND
n-Propylbenzene	**6.4**	ND
p-Isopropyltoluene	ND	ND
VOCs	All Others ND or Below AWQS	All Others ND or Below AWQS

LEGEND

- APPROXIMATE SITE BOUNDARY
- PARCEL BOUNDARY
- TW ⊕ TEMPORARY WELL POINT
- MW-1 ⊕ MONITORING WELL

NOTES:

- ALL RESULTS ARE REPORTED IN MICROGRAMS PER LITER (µg/L)
- 10 INDICATES A CONCENTRATION THAT EXCEEDS THE NEW YORK AWQS
- NY-AWQS NEW YORK TOGS 111 AMBIENT WATER QUALITY STANDARDS
- ND COMPOUND NOT DETECTED ABOVE THE LABORATORY MDL
- NA COMPOUND NOT ANALYZED
- NS NO APPLICABLE STANDARD

Compound	NY-AWQS
1,1,1-Trichloroethane (1,1,1-TCA)	5
Tetrachloroethene (PCE)	5
Trichloroethene (TCE)	5
1,1-Dichloroethane (1,1-DCA)	5
cis-1,2-Dichloroethene (cis-1,2-DCE)	5
trans-1,2-Dichloroethene (trans-1,2-DCE)	5
Vinyl chloride	2
1,4-Dioxane	0.35
1,2,4,5-Tetramethylbenzene	5
Chloroethane	5
Chloroform	7
n-Propylbenzene	5
p-Isopropyltoluene	5

GRAPHIC SCALE

0 10 20 40

(IN FEET)

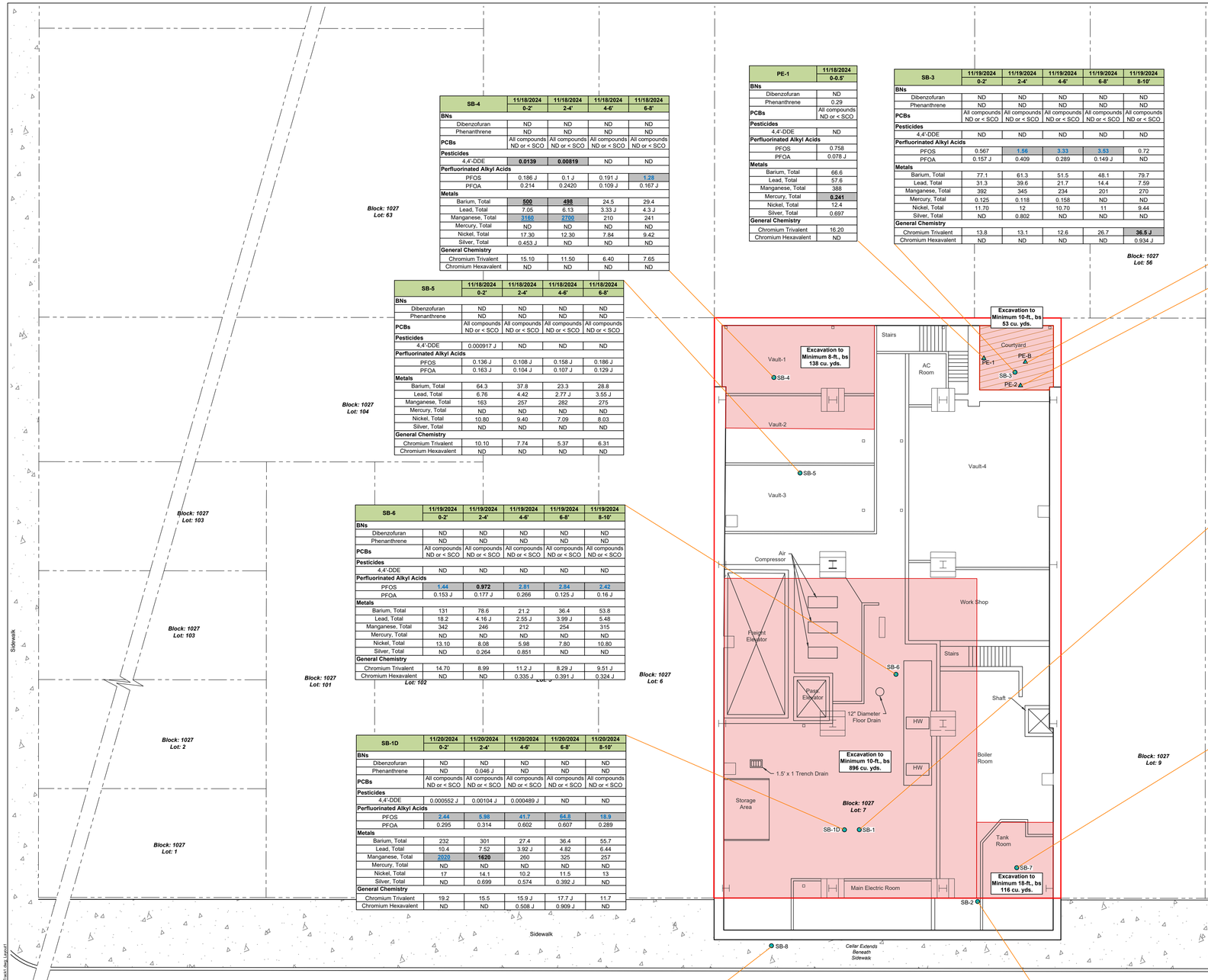
Environmental LOGIC
15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN
DATE: 8/27/25
PROJECT # 23-0001
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CHECKED BY: NM

VOCs IN GROUNDWATER
245 WEST 55TH STREET
MANHATTAN, NEW YORK

FIGURE # 7

File: X:\EnvironmentalLogic\Manhatten_NY\245W55thStreet\Drawings\245W55_ManhattanNY_2025.dwg, F12_GWAD(VOC)



SB-4	11/18/2024	11/18/2024	11/18/2024	11/18/2024
	0-2'	2-4'	4-6'	6-8'
BNs				
Dibenzofuran	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides				
4,4'-DDE	**0.0139**	**0.00819**	ND	ND
Perfluorinated Alkyl Acids				
PFOS	0.186 J	0.1 J	0.191 J	**1.28**
PFOA	0.214	0.2420	0.109 J	0.167 J
Metals				
Barium, Total	**500**	**498**	24.5	29.4
Lead, Total	7.05	6.13	3.33 J	4.3 J
Manganese, Total	**3160**	**2700**	210	241
Mercury, Total	ND	ND	ND	ND
Nickel, Total	17.30	12.30	7.84	9.42
Silver, Total	0.453 J	ND	ND	ND
General Chemistry				
Chromium Trivalent	15.10	11.50	6.40	7.65
Chromium Hexavalent	ND	ND	ND	ND

SB-5	11/18/2024	11/18/2024	11/18/2024	11/18/2024
	0-2'	2-4'	4-6'	6-8'
BNs				
Dibenzofuran	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides				
4,4'-DDE	0.000917 J	ND	ND	ND
Perfluorinated Alkyl Acids				
PFOS	0.136 J	0.108 J	0.158 J	0.186 J
PFOA	0.163 J	0.104 J	0.107 J	0.129 J
Metals				
Barium, Total	64.3	37.8	23.3	28.8
Lead, Total	6.76	4.42	2.77 J	3.55 J
Manganese, Total	163	257	282	275
Mercury, Total	ND	ND	ND	ND
Nickel, Total	10.80	9.40	7.09	8.03
Silver, Total	ND	ND	ND	ND
General Chemistry				
Chromium Trivalent	10.10	7.74	5.37	6.31
Chromium Hexavalent	ND	ND	ND	ND

SB-6	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024
	0-2'	2-4'	4-6'	6-8'	8-10'
BNs					
Dibenzofuran	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides					
4,4'-DDE	ND	ND	ND	ND	ND
Perfluorinated Alkyl Acids					
PFOS	**1.44**	**0.972**	**2.81**	**2.84**	**2.42**
PFOA	0.153 J	0.177 J	0.266	0.125 J	0.16 J
Metals					
Barium, Total	131	78.6	21.2	36.4	53.8
Lead, Total	18.2	4.16 J	2.55 J	3.99 J	5.48
Manganese, Total	342	246	212	254	315
Mercury, Total	ND	ND	ND	ND	ND
Nickel, Total	13.10	8.08	5.98	7.80	10.80
Silver, Total	ND	0.264	0.851	ND	ND
General Chemistry					
Chromium Trivalent	14.70	8.99	11.2 J	8.29 J	9.51 J
Chromium Hexavalent	ND	ND	0.335 J	0.391 J	0.324 J

SB-1D	11/20/2024	11/20/2024	11/20/2024	11/20/2024	11/20/2024
	0-2'	2-4'	4-6'	6-8'	8-10'
BNs					
Dibenzofuran	ND	ND	ND	ND	ND
Phenanthrene	ND	0.046 J	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides					
4,4'-DDE	0.000552 J	0.00104 J	0.000489 J	ND	ND
Perfluorinated Alkyl Acids					
PFOS	**2.44**	**5.98**	**41.7**	**64.8**	**18.9**
PFOA	0.295	0.314	0.602	0.607	0.289
Metals					
Barium, Total	232	301	27.4	36.4	55.7
Lead, Total	10.4	7.52	3.92 J	4.82	6.44
Manganese, Total	**2020**	**1620**	260	325	257
Mercury, Total	ND	ND	ND	ND	ND
Nickel, Total	17	14.1	10.2	11.5	13
Silver, Total	ND	0.699	0.574	0.392 J	ND
General Chemistry					
Chromium Trivalent	19.2	15.5	15.9 J	17.7 J	11.7
Chromium Hexavalent	ND	ND	0.508 J	0.909 J	ND

PE-1	11/18/2024
	0-0.5'
BNs	
Dibenzofuran	ND
Phenanthrene	0.29
PCBs	All compounds ND or < SCO
Pesticides	
4,4'-DDE	ND
Perfluorinated Alkyl Acids	
PFOS	0.758
PFOA	0.078 J
Metals	
Barium, Total	66.6
Lead, Total	57.6
Manganese, Total	388
Mercury, Total	**0.241**
Nickel, Total	12.4
Silver, Total	0.697
General Chemistry	
Chromium Trivalent	16.20
Chromium Hexavalent	ND

SB-3	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024
	0-2'	2-4'	4-6'	6-8'	8-10'
BNs					
Dibenzofuran	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides					
4,4'-DDE	ND	ND	ND	ND	ND
Perfluorinated Alkyl Acids					
PFOS	0.567	**1.56**	**3.33**	**3.53**	0.72
PFOA	0.157 J	0.409	0.289	0.149 J	ND
Metals					
Barium, Total	77.1	61.3	51.5	48.1	79.7
Lead, Total	31.3	39.6	21.7	14.4	7.59
Manganese, Total	392	345	234	201	270
Mercury, Total	0.125	0.118	0.158	ND	ND
Nickel, Total	11.70	12	10.70	11	9.44
Silver, Total	ND	0.802	ND	ND	ND
General Chemistry					
Chromium Trivalent	13.8	13.1	12.6	26.7	**36.5 J**
Chromium Hexavalent	ND	ND	ND	ND	0.934 J

PE-B	11/18/2024
	0-0.5'
BNs	
Dibenzofuran	ND
Phenanthrene	ND
PCBs	All compounds ND or < SCO
Pesticides	
4,4'-DDE	ND
Perfluorinated Alkyl Acids	
PFOS	0.392
PFOA	0.08 J
Metals	
Barium, Total	48.2
Lead, Total	10.5
Manganese, Total	327
Mercury, Total	0.077 J
Nickel, Total	9.77
Silver, Total	ND
General Chemistry	
Chromium Trivalent	10
Chromium Hexavalent	ND

PE-2	11/18/2024
	0-0.5'
BNs	
Dibenzofuran	ND
Phenanthrene	ND
PCBs	All compounds ND or < SCO
Pesticides	
4,4'-DDE	ND
Perfluorinated Alkyl Acids	
PFOS	**1.01**
PFOA	**0.731**
Metals	
Barium, Total	58.8
Lead, Total	57.1
Manganese, Total	203
Mercury, Total	0.114
Nickel, Total	9.42
Silver, Total	0.327 J
General Chemistry	
Chromium Trivalent	8.55
Chromium Hexavalent	ND

SB-1	11/20/2024	11/20/2024	11/20/2024	11/20/2024	11/20/2024
	0-2'	2-4'	4-6'	6-8'	8-10'
BNs					
Dibenzofuran	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides					
4,4'-DDE	0.000481 J	ND	ND	ND	ND
Perfluorinated Alkyl Acids					
PFOS	**1.12**	**12.9**	**45.4**	**38**	**26.4**
PFOA	**1.05**	0.424	0.286	0.469	0.228
Metals					
Barium, Total	122	73.3	28.3	32.5	65.1
Lead, Total	9.59	5.4	3.66 J	3.58 J	6.9
Manganese, Total	593	378	293	287	274
Mercury, Total	ND	ND	ND	ND	ND
Nickel, Total	16.60	10.70	9.57	8.62	14.30
Silver, Total	0.386 J	0.4 J	ND	ND	ND
General Chemistry					
Chromium Trivalent	16.6 J	12.5 J	19.80	18.60	14.10
Chromium Hexavalent	0.576 J	0.492 J	**1.08**	**1.03**	ND

SB-7	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024	11/19/2024
	0-2'	2-4'	4-6'	6-8'	8-10'	16-18'
BNs						
Dibenzofuran	ND	ND	0.54 J	**4.2**	**3.7**	0.025 J
Phenanthrene	0.13	ND	**2.8**	**24**	**20**	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides						
4,4'-DDE	ND	ND	ND	ND	ND	ND
Perfluorinated Alkyl Acids						
PFOS	**1.11**	0.469	0.2	0.09 J	0.263	**3.42**
PFOA	0.24	0.259	0.122 J	0.074 J	0.118 J	0.03 J
Metals						
Barium, Total	98.7	172	87	35.3	43.8	68.2
Lead, Total	9.53	8.88	5.48	5	9.71	7.64
Manganese, Total	210	872	276	329	243	243
Mercury, Total	0.069	0.093	ND	0.071	0.099	ND
Nickel, Total	**52.60**	19.00	10.40	9.45	10.90	14.10
Silver, Total	**26.6**	**6.75**	**15.9**	**41.4**	**148**	ND
General Chemistry						
Chromium Trivalent	17.40	13.90	11.40	9.92	**54.80**	12.60
Chromium Hexavalent	ND	ND	ND	ND	ND	ND

SB-8	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025
	4-6'	6-8'	8-10'	10-12'	12-14'	14-16'	16-18'	18-20'	20-22'	22-24'
BNs										
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides										
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluorinated Alkyl Acids										
PFOS	**1.35**	**1.73**	**1.54**	0.835	0.407	0.54	0.281 F	0.355	0.429	0.1 J
PFOA	0.12 J	0.132 J	0.402	0.214	0.196 J	0.239	0.546	**1.62**	**0.936**	0.06 J
Metals										
Barium, Total	58.3	51.8	36.8	46.1	42.1	63.1	31.6	21.5	20	16.3
Lead, Total	**96.3**	25	43.8	24.3	12.7	16.3	4.66	4.87	5.21	5.15
Manganese, Total	253	221	231	293	717	890	245	419	129	186
Mercury, Total	**0.299**	0.122	0.168	**0.202**	ND	ND	ND	ND	ND	ND
Nickel, Total	15.8	16.2	14.2	12	13.9	12.7	6.91	12.8	9.03	8.83
Silver, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
General Chemistry										
Chromium Trivalent	12 J	13.2	10.9	11	13.6	15.3	7.6	7.31	7.31	7.06
Chromium Hexavalent	0.327 J	ND	ND	ND	ND	ND	ND	ND	ND	ND

SB-2	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025
	0-2'	2-4'	4-6'	6-8'	8-10'
BNs					
Dibenzofuran	0.22	ND	**2.7**	**4.6**	**3.5**
Phenanthrene	**1.7**	0.1 J	**9.7**	**12**	**11**
PCBs	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO	All compounds ND or < SCO
Pesticides					
4,4'-DDE	ND	ND	ND	ND	ND
Perfluorinated Alkyl Acids					
PFOS	**3.93**	**2.67**	**1.42**	0.822	0.335
PFOA	0.574	0.36	0.326	0.073 J	0.081 J
Metals					
Barium, Total	85.4	157	93.2	41.9000	52.6
Lead, Total	36.2	17.3	9.77	4.1 J	6.24
Manganese, Total	241	344	244	269	263
Mercury, Total	0.115	0.072	0.054	ND	0.057
Nickel, Total	12.5	18.9	12.5	10.3	13
Silver, Total	**14.9**	**5.63**	**2.86**	**4.96**	**5.18**
General Chemistry					
Chromium Trivalent	12.7	12.0	10.7	7.3	9.63
Chromium Hexavalent	ND	ND	ND	ND	ND

LEGEND

- APPROXIMATE SITE BOUNDARY
- PARCEL BOUNDARY
- THE PREVIOUSLY ELEVATED COURTYARD WAS INITIALLY 54" HIGHER THAN THE CURRENT BASEMENT SLAB GRADE. APPROXIMATELY 54" OF SOIL WAS REMOVED TO BRING THE COURTYARD AREA ELEVATION TO CURRENT BASEMENT GRADE. POST-EXCAVATION (PE) SAMPLES WERE COLLECTED AT CURRENT BASEMENT SLAB GRADE
- EXCAVATION AREA
- SB-1 SOIL BORING
- PE-B COURTYARD POST EXCAVATION SAMPLE

NOTES:

PFAS RESULTS ARE REPORTED IN µG/KG

ALL OTHER RESULTS REPORTED IN MILLIGRAM PER KILOGRAM (MG/KG)

ONLY EXCEEDANCES ARE SHOWN

- **10** RESULTS EXCEED UUSCO / UUGV
- 10 RESULTS EXCEED RRUSCO / RRUGV
- 10 RESULTS EXCEED PGWSCO / PGWGV AND NY-AWQS

NY-AWQS NEW YORK TOGS 111 AMBIENT WATER QUALITY STANDARDS

SCO SOIL CLEANUP OBJECTIVE

VOC VOLATILE ORGANIC COMPOUND

BNs BASE NEUTRAL EXTRACTABLES

~ COMPOUND NOT ANALYZED

ND NONE DETECT

NS NO STANDARD

< PRECEDES METHOD DETECTION LIMIT, DENOTES NO DETECTION

J THE RESULT IS LESS THAN THE DETECTION LIMIT, BUT GREATER THAN ZERO.

F THE RESULT IS CONSIDERED AN ESTIMATED MAXIMUM CONCENTRATION.

*SB-8 SAMPLE DEPTHS MEASURED FROM SIDEWALK GROUND SURFACE. ALL OTHER SAMPLE DEPTHS MEASURED FROM CELLAR GROUND SURFACE.

Compound	Part 375 - Unrestricted Use Soil Cleanup Objectives (UUSCO)	Part 375 - Restricted-Residential Use Soil Cleanup Objective (RRUSCO)	Part 375 - Restricted Use Cleanup Objective - Protection of Groundwater (PGWSCO)
BNs			
Dibenzofuran	2.1	18	110
Phenanthrene	1.1	4.9	1000
Pesticides			
4,4'-DDE (mg/kg)	0.0033	3.4	9.3
Metals			
Barium, Total (mg/kg)	410	410	820
Lead, Total (mg/kg)	63	400	450
Manganese, Total (mg/kg)	1600	2000	2000
Mercury, Total (mg/kg)	0.18	0.3	0.730
Nickel, Total (mg/kg)	30	320	130
Silver, Total (mg/kg)	2	110	8.3
General Chemistry			
Chromium Trivalent (mg/kg)	30	110	NS
Chromium Hexavalent (mg/kg)	1	1	19

Compound	Guidance Values for Anticipated Site Use - Unrestricted (UUGV)	Guidance Values for Anticipated Site Use - Restricted-Residential (RRUGV)	Guidance Values for Anticipated Site Use - Protection of Groundwater (PGWGV)
Perfluorinated Alkyl Acids			
PFOS (µg/kg)	0.88	44	1
PFOA (µg/kg)	0.66	33	0.8

GRAPHIC SCALE

0 5 10 20

(IN FEET)

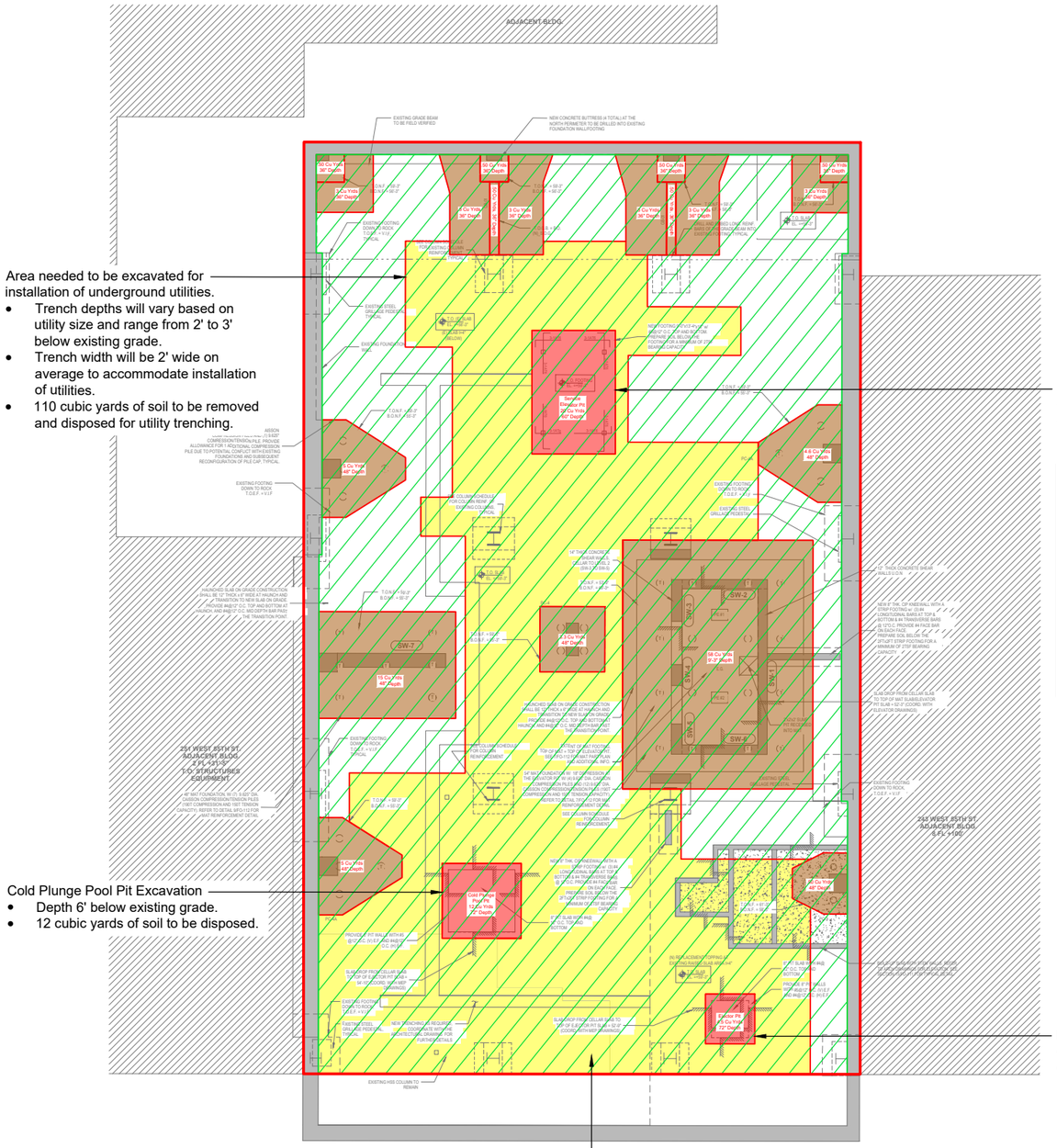
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15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN	PROJECT # 23-0001
DATE: 4/7/26	
DRAWN BY: PM	
CHECKED BY: LM	

REMEDIAL EXCAVATION FOR TRACK 1 REMEDY
245 WEST 55TH STREET
MANHATTAN, NEW YORK

FIGURE # 8

File: X:\Environmental\Job Numbers_NY\24\0506\Drawings\24050505_ManhattanNY_20250424.rvt - Remedial Excavation Track 1.dwg, Layout1



Area needed to be excavated for installation of underground utilities.

- Trench depths will vary based on utility size and range from 2' to 3' below existing grade.
- Trench width will be 2' wide on average to accommodate installation of utilities.
- 110 cubic yards of soil to be removed and disposed for utility trenching.

Service Elevator Pit Excavation

- 5' below existing grade.
- 20 cubic yards of soil to be excavated and disposed.

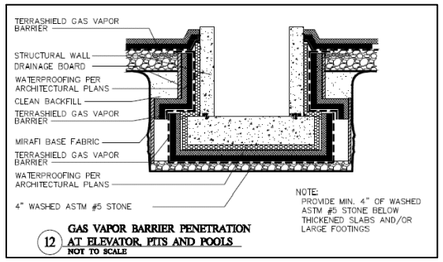
Cold Plunge Pool Pit Excavation

- Depth 6' below existing grade.
- 12 cubic yards of soil to be disposed.

Ejector Pit Excavation

- Depth 6' below existing grade
- 4.5 cubic yards of soil to be disposed

59.25' Anticipated final elevation of poured slab section



12 GAS VAPOR BARRIER PENETRATION AT ELEVATOR, PITS AND POOLS
NOT TO SCALE

LEGEND

- APPROXIMATE SITE BOUNDARY
- PARCEL BOUNDARY
- COMPLETED DEVELOPMENTAL EXCAVATION AREAS
- PROPOSED EXCAVATION AREA FOR UTILITIES
- PROPOSED PIT EXCAVATION AREA
- PROPOSED FILL AREA (ASTM #5 STONE)

NOTES

BUILDING LAYOUT SOURCE: FOGARTY FINGER ARCHITECTURE | INTERIORS. SHEET FO-101.01. CELLAR FRAMING PLAN. DATED 12/8/2025.

GRAPHIC SCALE

0 7.5 15 30

(IN FEET)

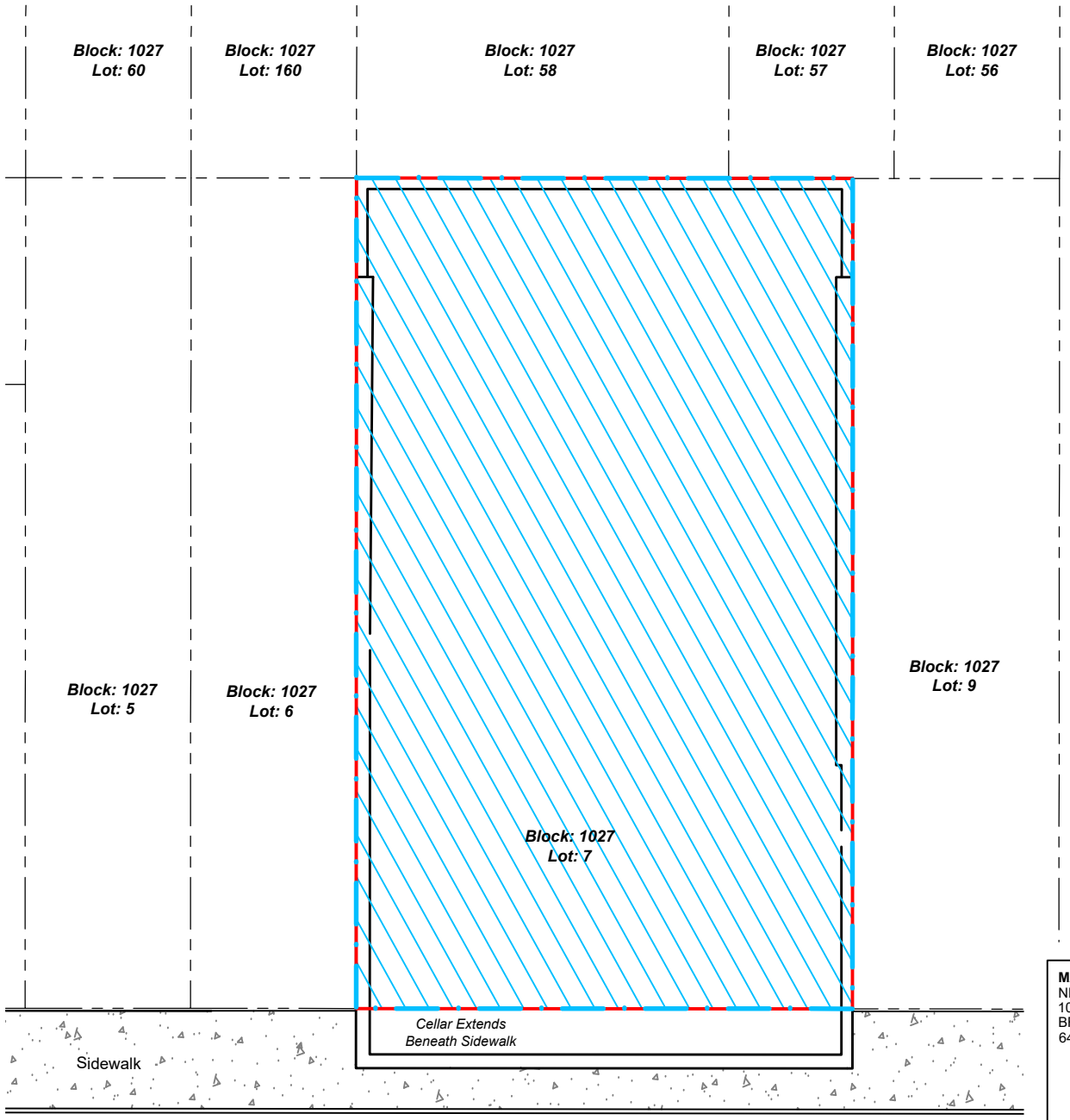
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15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN		PROJECT # 23-0001
DATE: 4/8/26		
DRAWN BY: PM	CHECKED BY: LM	

PROPOSED DEVELOPMENT EXCAVATION AND FILL AREAS
245 WEST 55TH STREET
MANHATTAN, NEW YORK

FIGURE # 9

File: X:\EnvironmentalLogic\Manhatten, NY\245W55thStreet\Drawings\245W55_ManhattanNY_PropExcavation(Apr2026).dwg, Layout1



LEGEND

- APPROXIMATE SITE BOUNDARY
- PARCEL BOUNDARY
- MW-1 MONITORING WELL
- PROPOSED ENVIRONMENTAL EASEMENT AREA
- PROPOSED COVER SYSTEM (CONCRETE BUILDING SLAB AND BUILDING WALLS)

GRAPHIC SCALE

0 10 20 40

(IN FEET)

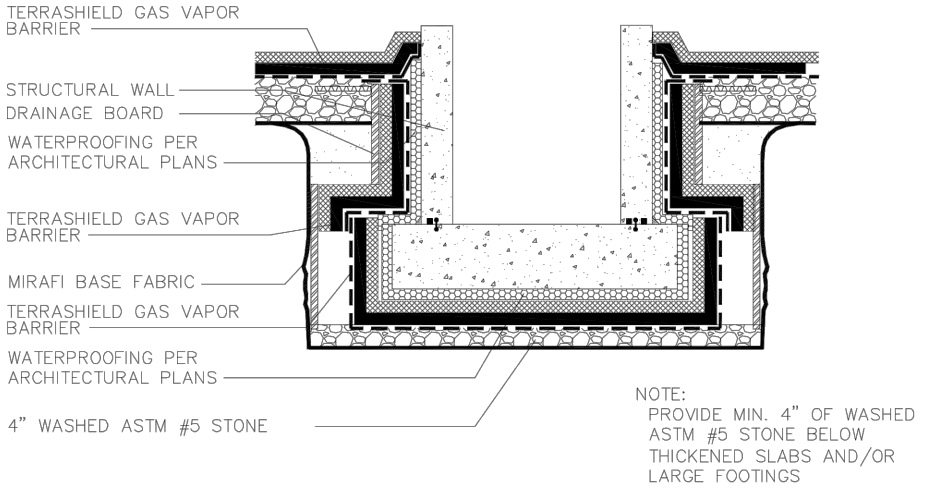
MATTHEW CARROLL, PE
NEW YORK LICENSE NO. 091629
1085 SACKETT AVENUE
BRONX, NY 10461
646-606-2332

STATE OF NEW YORK
MATTHEW M. CARROLL
091629
LICENSED PROFESSIONAL ENGINEER

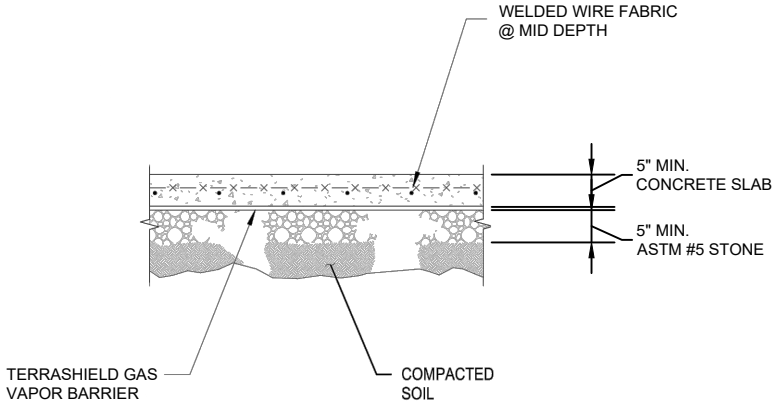
PROPOSED SOIL COVER SYSTEM
(POST REMEDIAL ENGINEERING CONTROLS)
245 WEST 55TH STREET
MANHATTAN, NEW YORK

SCALE:	As noted	FIGURE 10
DATE:	4/7/26	
DRAWN BY:	PM	
CHECKED BY:	LM	
DRAWING #	245W55_ManhattanNY_2025RAW	

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#1 DETAIL — GAS VAPOR BARRIER PENETRATION AT ELEVATOR, PITS AND SUMPS
SCALE: N.T.S.



#2 DETAIL — TYPICAL SLAB ON GROUND DETAIL
SCALE: N.T.S.

REFERENCES:
1. 245 WEST 55TH STREET NEW YORK, NY 10019. SHEET VD-1.0. ACTIVE VAPOR INTRUSION MITIGATION SYSTEM. DATED 1/28/2025. REVISED 2/27/2026.
2. FOGARTY FINGER ACHITECTURE AND INTERIORS. 245 WEST 55TH STREET. SHEET FO-111.01. FOUNDATION DETAILS. DATED 12/15/2023. REVISED 2/17/2025.

MATTHEW CARROLL, PE
NEW YORK LICENSE NO. 091629
1085 SACKETT AVENUE
BRONX, NY 10461
646-606-2332

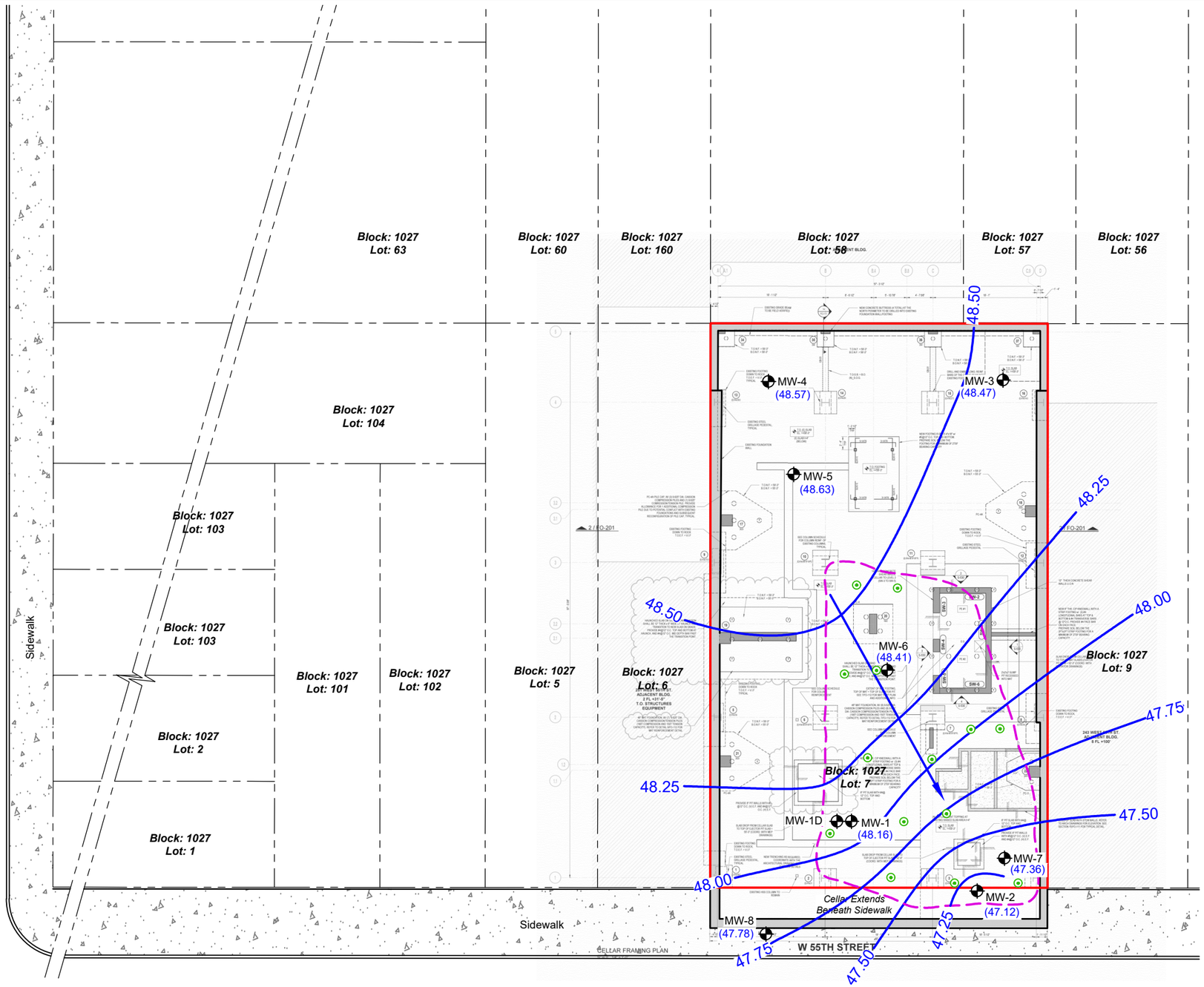
STATE OF NEW YORK · MATTHEW M. CARROLL · LICENSED PROFESSIONAL ENGINEER · 091629

COVER SYSTEM - CROSS SECTION OF ENGINEERING CONTROLS
245 WEST 55TH STREET
MANHATTAN, NEW YORK

SCALE:	N.T.S	FIGURE 11
DATE:	4/8/26	
DRAWN BY:	PM	
CHECKED BY:	LM	

DRAWING # 245W55_ManhattanNY-Fx_CoverSystemXS

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W. 55 th Street

LEGEND

- APPROXIMATE SITE BOUNDARY
- PARCEL BOUNDARY
- MW-1 — MONITORING WELL
- DPT INJECTION POINT
- REMEDIAL AREA
- GROUNDWATER ELEVATION CONTOUR (APRIL 2025)
- GROUNDWATER FLOW DIRECTION
- (48.41) — GROUNDWATER ELEVATION IN FEET

NOTES

1. BUILDING LAYOUT SOURCE: FOGARTY FINGER ARCHITECTURE | INTERIORS. CELLAR FRAMING PLAN. DATED 12/15/2023.

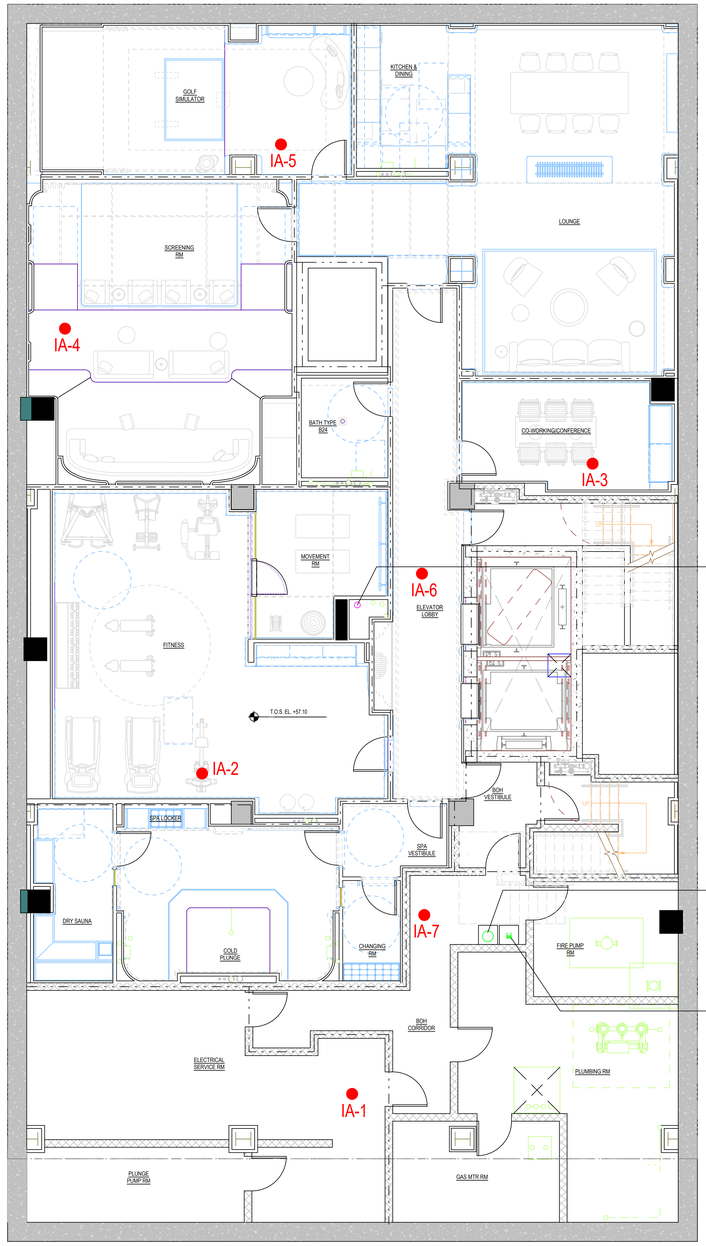
GRAPHIC SCALE

0 10 20 40

(IN FEET)

Environmental LOGIC 15 Princess Road, Suite K Lawrenceville, NJ 08648	SCALE: AS SHOWN DATE: 1/30/26 DRAWN BY: PM CHECKED BY: LM	PROJECT # 23-0001
PROPOSED GROUNDWATER INJECTION LOCATIONS 245 WEST 55TH STREET MANHATTAN, NEW YORK		FIGURE # 12

File: X:\EnvironmentalLogic\Manhatten_NY\2451W55thStreet\Drawings\2451W55_ManhattanNY_2025RAW.dwg, F9_ProjInject



CELLAR PLAN

N TRUE

N PLAN

0 5' 15'

2'-6" 10' 20'

GRAPHIC SCALE

LEGEND

- 6" GALV. METAL RISER PER PLANS
- PPM MONITORING PANEL – ACTIVE
- VAPOR GUARDIAN MONITORING PANEL
- IA-1 PROPOSED INDOOR AIR (IA) SAMPLE LOCATION
- AA PROPOSED OUTDOOR / AMBIENT SAMPLE LOCATION (LOCATION TO BE ADJUSTED BASED ON FIELD CONDITIONS)

245 WEST 55TH ST.
NEW YORK, NY 10019

Figure 13

Post-Confirmatory Indoor Air Sample Locations

No.	Description	Date
Rev 1	Active System	2-27-26

MATTHEW CARROLL, PE
NEW YORK LICENSE NO. 091629
1085 SACKETT AVENUE
BRONX, NY 10461
646-606-2332

ACTIVE VAPOR INTRUSION MITIGATION SYSTEM

NEW YORK, NY

DRAWING TITLE:

CELLAR RISER PLAN

PE Seal

Date	1-28-25
Scale	3/16" = 1'-0"
Drawn By	DAB
Checked By	MC

V-1.1

Block: 1027
Lot: 63

Block: 1027
Lot: 60

Block: 1027
Lot: 160

Block: 1027
Lot: 58

Block: 1027
Lot: 57

Block: 1027
Lot: 56

Block: 1027
Lot: 104

Block: 1027
Lot: CA

Block: 1027
Lot: 101

Block: 1027
Lot: 102

Block: 1027
Lot: 5

Block: 1027
Lot: 6

Block: 1027
Lot: 7

Block: 1027
Lot: 9

MW-4
MW-3
MW-5
MW-6
MW-1
MW-1D
MW-7
MW-2
MW-8

SVE-1
SVE-2
SVE-3
SVE-4
SVE-5

Cellar Extends Beneath Sidewalk

Sidewalk

W. 55 th Street

LEGEND

- APPROXIMATE SITE BOUNDARY
- PARCEL BOUNDARY
- MW-1 — MONITORING WELL
- SVE-1 — PROPOSED SVE WELL LOCATION
- PROPOSED AREA OF ON-SITE DEPRESSURIZATION
- ASSUMED RADIUS OF INFLUENCE (15 FEET)

NOTES

1. THE BASE MAP IS FROM THE APPROVED CELLAR PLAN A-100.00
2. THE SVE EXTRACTION WELLS WILL BE INSTALLED 3-8 FEET BELOW BASEMENT SLAB.
3. ACTUAL NUMBER AND PLACEMENT OF WELLS WILL BE DETERMINED BASED ON THE PILOT TEST RESULTS AND SITUATED TO ENSURE CONTAMINANT VAPOR CAPTURE IN THE HATCHED AREA.

N E S W

GRAPHIC SCALE

0 7.5 15 30

(IN FEET)

Environmental LOGIC
15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN		PROJECT # 23-0001
DATE: 4/9/26		
DRAWN BY: PM	CHECKED BY: LM	

SOIL VAPOR EXTRACTION SYSTEM -
CONCEPTUAL LAYOUT - CELLAR LEVEL
245 WEST 55TH STREET
MANHATTAN, NEW YORK

FIGURE # 14

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ATTACHMENTS

ATTACHMENT A

Confirmation of Direct Engagement of Engineer

| **MATTHEW CARROLL, P.E.** |
1085 Sackett Avenue – Bronx, NY 10461

DATE: December 16, 2024

TO: Erick Bower, Assistant Geologist
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-1010

Re: Confirmation of Direct Engagement of Engineer
245 West 55th Street – New York, NY
BCP Site No. C231157

Mr. Bower,

As requested in your December 13, 2024 email, this letter serves as confirmation in writing that I, Matthew Carroll, P.E., have been directly engaged by, and am providing engineering services directly to, the Applicant, 245 West 55th Street LLC, with respect to the above-referenced project.

Regards,



Matthew Carroll, P.E.

DIRECT ENGAGEMENT ALSO VERIFIED BY:

Michael Mandelbaum, Esq., Manager

245 West 55th Street LLC
354 Eisenhower Parkway, Suite 1900
Livingston NJ 07039

ATTACHMENT B

Vapor Intrusion Work Plan and NYSDEC approval dated March 22, 2024

Lisa Mastripolito

From: Gary Weissberger
Sent: Tuesday, April 16, 2024 9:55 AM
To: Lisa Mastripolito
Subject: 245 w55 VI Sampling Plan approval

VI Workplan approval date – March 22 ,2024

From: Bower, Erick R (DEC) <Erick.Bower@dec.ny.gov>
Sent: Friday, March 22, 2024 12:11 PM
To: Gary Weissberger <gweissberger@env-logic.com>
Cc: Bill Major <bmajor@env-logic.com>; Adam van Eeckhout <Adam@madigandevelopment.com>; Lou Madigan <lmadigan@madigandevelopment.com>; Bennett, William B (DEC) <william.bennett@dec.ny.gov>; Budd, Christopher (HEALTH) <Christopher.Budd@health.ny.gov>; Kenney, Julia M (HEALTH) <julia.kenney@health.ny.gov>
Subject: RE: VI Sampling Plan

Good afternoon,

Based on a cursory review by NYSDEC and NYSDOH, we accept the Vapor Intrusion Investigation Workplan (dated March 2024) for the 245 West 55th Street site (C231157), with the following modifications:

- **Modification 1, Throughout Document:** Please change "near slab" to "soil vapor sample" throughout the work plan.
- **Modification 2, Section 1 (Introduction):** Please indicate in the text whether you are a Volunteer or a Participant in the BCP.
- **Modification 3, Section 3.0 (Vapor Intrusion Investigation Workplan):** Please specify in the text that you will identify and document any preferential pathways (cracks, perforations, sumps, drains, etc.) in the basement walls as well as in the slab.
- **Modification 4, Section 3.3 (Sub-Slab and Indoor Air Paired Sampling Points):** Please indicate if SUMMA canisters will be batch certified clean or individual certified clean.

Once these modifications have been made, please provide us a final copy of the work plan.

Additionally, we wanted to state that we do not object to the applicant immediately proceeding with this work plan at this time.

Thank you,
Erick Bower

Erick Bower
Geologist Trainee
Project Manager, Remedial Bureau B, Section B

New York State Department of Environmental Conservation
625 Broadway, Albany, NY 12233-1010
518-402-9824 | erick.bower@dec.ny.gov

www.dec.ny.gov | | |

NEW YORK STATE | Department of Environmental Conservation

From: Gary Weissberger <gweissberger@env-logic.com>
Sent: Thursday, March 21, 2024 5:03 PM
To: Bower, Erick R (DEC) <Erick.Bower@dec.ny.gov>; Bennett, William B (DEC) <william.bennett@dec.ny.gov>
Cc: Bill Major <bmajor@env-logic.com>; Adam van Eeckhout <Adam@madigandevelopment.com>; Lou Madigan <lmadigan@madigandevelopment.com>
Subject: VI Sampling Plan

ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Erick,

Attached is the VI sampling plan we discussed yesterday. If you can get NYSDOH approval quickly, we should be able to complete the sampling next week and before the end of the prescribed heating season.

Feel free to reach out with any questions or comments.

Gary Weissberger
Environmental LOGIC www.env-logic.com
Environmental Logic
15 Princess Road, Suite K
Lawrenceville, New Jersey 08648
Phone (609) 910-0720 x405
Direct (609) 910-0451
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Fax (609) 896-1746
Email: gweissberger@env-logic.com

VAPOR INTRUSION INVESTIGATION WORKPLAN

FOR

245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
EL PROJECT NUMBER 23-0001

NYSDEC SITE NO.: C231157

MARCH 2024

Environmental LOGIC www.env-logic.com

15 Princess Road, Suite K | Lawrenceville, NJ 08648

REMEDIAL INVESTIGATION WORKPLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
NYSDEC SITE NO.: C231157

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- 2.2 Site Geology and Hydrogeology 4
- 2.3 Site Features and Use 4

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- 3.1 Vapor Intrusion Investigation Scope 5
- 3.2 Health and Safety Plan 6
- 3.3 Sub-Slab and Indoor Air Paired Sampling Points 6
- 3.4 Laboratory Analysis 8
- 3.5 Data Evaluation 8
- 3.6 Project Scheduling and Reporting 8

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TABLES

1. Proposed Sampling Summary Table

FIGURES

1. Site Location Map on USGS Central Park, NY Quadrangle
2. Site Map with Proposed Vapor Intrusion Sampling Locations

ATTACHMENT

1. NYSDOH Structure Sampling Questionnaire and Building Inventory

REMEDIAL INVESTIGATION WORKPLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
NYSDEC SITE NO.: C231157

1.0 INTRODUCTION

This Soil Vapor Intrusion Investigation Workplan was prepared on behalf of 245 WEST 55TH ST LLC to support additional vapor intrusion (VI) investigations at the Site located at 245 West 55th Street (Block 1027, Lot 7), located in New York, New York (herein referred to as the "Site"). 245 WEST 55TH ST LLC is enrolled as a Volunteer in the New York State Brownfield Cleanup Program (BCP), pursuant to the Brownfield Cleanup Agreement (BCA) number C231157.

Of note, the building is undergoing renovation. A sub-slab depressurization system and vapor barrier will be installed as part of the renovation activities.

As detailed in the attachments to the Brownfields Cleanup Application package, Soil vapor intrusion sampling was conducted in October 2022 and Chlorinated Volatile Organic Compounds CVOCs were detected in all sub-slab soil vapor samples and all indoor air samples collected across in the basement of the on-Site building. The compound 1,1,1-TCA was the VOC detected at the highest concentrations. 1,1,1-TCA is a compound historically associated with the cleaning of photographic films, and the presence of this compound in soil vapor and indoor air is likely due to historical Site usage for this purpose.

Based on review of the data, and as discussed in the New York State Department of Environmental Conservation (NYSDEC) March 20, 2023, comment letter, the NYSDEC and New York State Department of Health (NYSDOH) request that additional VI evaluation be conducted. This Work Plan provides a proposed scope of work for conducting additional VI investigation confirming the previous 2022 sampling results at select locations and at additional locations requested by NYSDEC and NYSDOH.

2.0 SITE INFORMATION AND BACKGROUND

2.1 Site Location and Setting

The Site is located in a C6-4/C6-6 Commercial District in Manhattan, approximately 1,000 feet southwest of Central Park. The Site is bordered to the north, east, and west by mixed-use

commercial/residential properties, and is bordered to the south by West 55th Street and additional mixed-use commercial/residential properties.

The Site elevation is generally flat. A United States Geological Survey (USGS) 7.5-minute topographic map showing the Site location and surrounding area is provided on Figure 1.

The property is a rectangle-shaped parcel comprised of 0.14 acres and identified on tax maps of Manhattan NY as Block 1027, Lot 7. The Site is currently owned by 245 WEST 55TH ST LLC.

2.2 Site Geology and Hydrogeology

Based on soil sampling conducted by EL in January and February 2023, shallow soils consisted of sands and silty sands underlain by more clayey material. One soil boring was advanced to the presumed depth of bedrock, approximately 35 feet below the basement floor (i.e., approximately 48 to 50 feet below grade). Bedrock observed in this boring consisted of weathered schist at approximately 32.5 feet below the basement floor. Bedrock underlying the site consists of the Hartland Formation, which is comprised of a dark grey, medium- to coarse-grained muscovite-biotite-garnet (mica) schist and grey fine-grained quartz feldspar granulite biotite and garnet, with localized concentrations of granite and intrusions of coarse-grained granitic pegmatite. Based on ground water sampling conducted by Environmental Logic in January 2023, ground water at the Site was encountered at approximately 27 feet below grade.

2.3 Site Features and Use

The Site is fully developed with a 12-story commercial and office building with a basement which is currently vacant.

The Site was formerly owned and utilized by DuArt Media Services/DuArt Film Labs (DuArt) for cinematographic film cleaning and film processing from approximately 1922 through 2011. Film production including voiceover work, audio recording, and film editing continued to take place at the Site until 2021. Cinematographic film cleaning operations utilized cleaning and degreasing compounds including the chlorinated volatile organic compounds (CVOCs) tetrachloroethene (PCE) and 1,1,1-trichloroethane (1,1,1-TCA) to remove dirt, grease, and minor scratches from film negatives prior to print.

A Site Map is included as Figure 2.

3.0 VAPOR INTRUSION INVESTIGATION WORKPLAN

The objective of this Vapor Intrusion Investigation Workplan is to evaluate the previously identified VI pathway and potential VI risk at the site. As noted in Section 3.3, field staff will identify and document any preferential VI pathways (cracks, perforations, sumps, drains, etc.) in the basement walls as well as in the slab during VI sampling activities.

3.1 Vapor Intrusion Investigation Scope

The scope of the VI Investigation will include the collection of Site data to satisfy NYSDEC and NYSDOH requirements. To accomplish this, the SOW for the VI Investigation will include the following:

- The completion of Site reconnaissance. Reviewing property conditions and conducting a building inventory for indoor locations prior to sample collection;
- The installation of a total of eight (8) temporary soil gas monitoring points (6 sub-slab soil gas and 2 soil vapor);
- The collection of six (6) indoor air samples paired with 6 indoor sub-slab soil gas samples;
- The collection of two (2) outdoor ambient air samples paired with 2 outside soil vapor samples; and
- Preparation of a VI Summary Report for submission to NYSDEC and NYSDOH.

Sampling will be conducted in accordance with the NYSDOH's Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH 2006, rev. 2024). Contingent upon Work Plan approval, sampling will tentatively be performed during the 2023/2024 heating season.

Per the NYSDOH Guidance, sub-slab vapor samples and, unless immediate sampling is appropriate, indoor air samples are typically collected during the heating season because soil vapor intrusion is more likely to occur when a building's heating system is in operation and doors and windows are closed. In New York State, heating systems are generally expected to be operating routinely from November 15th to March 31st. However, these dates are not absolute; The timeframe for sampling may vary depending on factors such as the location of the site (e.g., upstate versus downstate) and the weather conditions for a particular year.

A soil vapor intrusion investigation at a building may be conducted outside of the heating season if the concern for vapor intrusion is greater during another time of year. This may occur at certain industrial buildings, for instance, where HVAC systems are actively managed to control the ratio of recirculated indoor air to make-up air from outside the building.

See Section 3.6 for details regarding the project schedule.

The sections below present a detailed discussion of the scope of the investigation and support activities.

3.2 Health and Safety Plan

A site-specific Health and Safety Plan will be prepared containing the health and safety procedures, methods, and requirements that will apply to field personnel during implementation of the field work. Field activities will be conducted using Modified Level D personal protective equipment. All personnel who work in areas where they may be exposed to site contaminants will be trained as required. Health and safety procedures will be compliant with the Occupational Safety and Health Administration's Hazardous Waste Operations and Emergency Response standards, as described in 29 Code of Federal Regulations 1910.120. All VI field staff will abstain from using or having contact with fuels, solvent cleaners, aerosol sprays and avoid smoke/vapor exposure for 24 hours prior to conducting sampling activities.

3.3 Sub-Slab and Indoor Air Paired Sampling Points

Building surveys and reconnaissance will be completed on Site prior to sampling activities on those properties. The purpose of the survey and reconnaissance will be to document information that will be used to evaluate the VI results. Field personnel will complete the NYSDOH Structure Sampling Questionnaire and Building Inventory (presented in Attachment 1) prior to conducting the indoor air sampling. This will be done in conjunction with evaluating slab perforations, obtaining information on building space use, evaluating the operating conditions of the heating/ventilation/air conditioning system, and identifying the type and location of chemical products that could influence indoor air results. Field personnel will identify and document any preferential pathways (cracks, perforations, sumps, drains, etc.) in the basement walls as well as in the slab.

A photoionization detector (PID), equipped with a 11.7 electron volt lamp, will be used to complete a real-time vapor survey to screen for the presence of detectable vapor-phase chemicals within the breathing zone and for any floor penetrations. Any products identified during the survey that could impact the results of the indoor air sampling will be removed from the area prior to sampling, if possible.

The temporary sub-slab and exterior soil vapor points will be installed at the locations depicted on Figure 2. These proposed sampling locations may be changed, as necessary, based on building access and the location of any utilities.

The sub-slab and exterior soil vapor points will be installed using a hand-held hammer drill and a High-Efficiency Particulate Air (HEPA) dust collection vacuum to collect dust generated during drilling activities. A ⅜-inch core hole will be advanced through the concrete slab and approximately 3 inches into the sub-slab material to create an open cavity.

Sub-slab soil gas sampling will be performed utilizing the following procedural steps and a tracer gas test will be performed on each vapor point prior to sampling in accordance with the procedures outlined in the NYSDOH Guidance (October 2006):

1. The sample tubing will be connected to a Teflon-lined “T” connector, three-way assembly, with one end of the “T” connector leading to a vacuum pump and the other end leading to a pre-evacuated Summa canister with a calibrated regulator.

2. The Summa canisters will be batch certified as clean by the laboratory providing the sampling canisters.

3. The soil gas sample tubing will be purged of approximately three volumes of air using a vacuum pump set at a rate of approximately 0.2 liters per minute.

4. Tracer gas testing will be conducted on all monitoring points to verify that ambient air did not dilute the soil gas sample during collection. To conduct the test, a plastic container (i.e., bucket) will be placed over the monitoring point with a seal, and helium (i.e., the tracer gas) will be injected into the bucket during purging of the monitoring point to enrich the interior of the bucket with the tracer gas. The three-way valves at the monitoring points will also be placed under the shroud (i.e., the bucket enclosure), and included in the tracer gas verification. This will be done to ensure that the valves do not provide a potential means by which ambient air would enter the canister and possibly dilute the sample. Both the purge volume from the sample tubing (i.e., also the air that passed through the three-way valve), and the helium enriched area within the bucket will be screened for the tracer gas. The tracer gas will be measured utilizing a direct-read helium detector, which will be used to measure the rate of helium leakage at the surface or the concentration of helium in a container. If the screening results show that the rate or concentration of helium detected in the sample tubing is greater than 10% of that found in the bucket, the seals around the sampling equipment will be reset and the sample tubing purged again. This process of resetting and purging will continue until the tracer gas is no longer detected at levels greater than 10% of the enriched area. The screening data will be recorded on soil gas sampling field forms.

5. Following the purging and tracer gas verification steps, the valve leading to the pump will be closed, the pump will be turned off, and the soil gas will be directed to a 6-liter Summa canister for sample collection. A laboratory-supplied flow controller calibrated to collect the sample over an 8-hour collection period will be used.

Paired building indoor air samples (Figure X; Table X) will be collected concurrently (over the same 8-hour time period) and in the general vicinity of the sub-slab soil vapor sample points shown on Figure 2.

Ambient air samples collocated with the exterior soil vapor samples will also be collected will be collected over the same time period (8 hours) as the sub-slab and indoor air samples.

Indoor air and ambient air samples will be collected from an intake height of approximately 4 to 5 feet above the ground/slab.

3.4 Laboratory Analysis

All soil gas samples will be collected using batch-certified, pre-cleaned 6-liter Summa canisters with calibrated regulators and analyzed by Alpha Analytical, Mansfield, MA a NYSDOH Environmental Laboratory Approval Program (ELAP ID 11627) certified laboratory using USEPA Analytical Method TO-15 for VOCs.

All data will be produced in accordance with NYSDEC ASP Category B deliverables. All analytical data will be reviewed by an independent data validator, and a Data Usability Summary Report (DUSR) will be prepared.

3.5 Data Evaluation

Sub-slab soil gas and indoor air samples will be compared to the NYSDOH Guidance Soil Vapor/Indoor Air Matrices. The results of the comparison will be provided in the VI Summary Report

3.6 Project Scheduling and Reporting

The proposed sampling will occur as soon as practicable upon receipt of NYSDEC's and NYSDOH's written approval of the Work Plan.

Depending on the date of Departmental approval and the impeding end of the heating season (March 31) as detailed in the 2006 NYSDOH Guidance, sampling may occur several days after the

defined heating season. As the building is currently vacant, and the HVAC system is not operating, this variance should not influence the results of the sampling.

A VI Investigation Summary Report will be prepared and submitted to NYSDEC and NYSDOH within 45 days of the receipt of validated laboratory data. The report will include a detailed synopsis of all work performed; figures depicting the layout of the sampling locations, figures presenting the analytical results and analyses performed, tables presenting all laboratory data results, results of the screening level comparison, laboratory data packages, a DUSR, and soil gas field forms.

4.0 CERTIFICATION

I, Gary Weissberger, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Report (the August 2023 Remedial Investigation Work Plan) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).



Gary Weissberger, Associate
Environmental Logic

TABLES

Table 1

245 West 55th Street
New York, New York

VI Sampling Workplan - Proposed Sampling Summary Table

Sample ID	Matrix	Sampling Method	Analysis
IA-1	Indoor Air	Summa Cannister	EPA TO-15
SSG-1	Soil Gas	Summa Cannister	EPA TO-15
IA-2	Indoor Air	Summa Cannister	EPA TO-15
SSG-2	Soil Gas	Summa Cannister	EPA TO-15
IA-3	Indoor Air	Summa Cannister	EPA TO-15
SSG-3	Soil Gas	Summa Cannister	EPA TO-15
IA-4	Indoor Air	Summa Cannister	EPA TO-15
SSG-4	Soil Gas	Summa Cannister	EPA TO-15
IA-5	Indoor Air	Summa Cannister	EPA TO-15
SSG-5	Soil Gas	Summa Cannister	EPA TO-15
IA-6	Indoor Air	Summa Cannister	EPA TO-15
SSG-6	Soil Gas	Summa Cannister	EPA TO-15
AA-7	Ambient Air	Summa Cannister	EPA TO-15
SSG-7	Soil Gas	Summa Cannister	EPA TO-15
AA-8	Ambient Air	Summa Cannister	EPA TO-15
SSG-8	Soil Gas	Summa Cannister	EPA TO-15

Environmental LOGIC

FIGURES



NEW YORK
QUADRANGLE LOCATION

GRAPHIC SCALE

0 1,000 2,000 4,000

(IN FEET)

N
W E
S

USGS The National Map
USGS 7.5 Minute Series Topographic Map of Central Park, New York

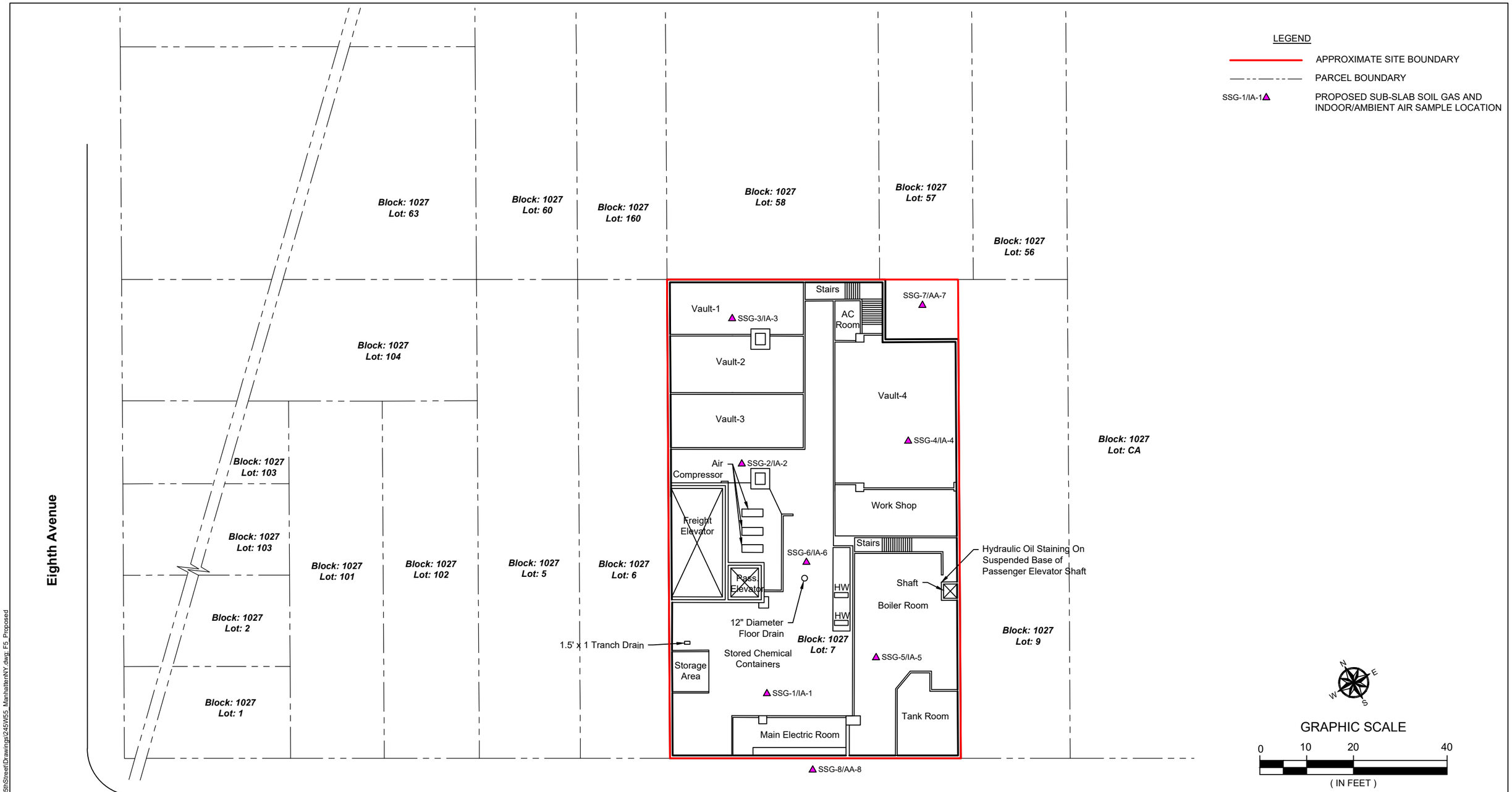
Environmental LOGIC
11 Princess Road Suite B,
Lawrenceville, NJ 08648

Scale: AS SHOWN		PROJECT: 23-0001
Date: 6/14/23		
Drawn By: PM	Checked By: BM	

SITE LOCATION ON USGS QUADRANGLE
245 WEST 55TH STREET
BLOCK 1027, LOT 7
MANHATTEN, NEW YORK

FIGURE # 1

PM File: 245W55_ManhattenNY-F1_SLM.mxd



Environmental LOGIC
15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN	PROJECT # 23-0001
DATE: 3/21/24	
DRAWN BY: PM	
CHECKED BY: BM	

PROPOSED VAPOR INTRUSION SAMPLING LOCATIONS
245 WEST 55TH STREET
MANHATTEN, NEW YORK

FIGURE # 2

File: X:\Environmental Logic\Manhatten_NY\245W55thStreet\Drawings\245W55_ManhattenNY.dwg, F5_Proposed

ATTACHMENT 1

NYSDOH Structure Sampling Questionnaire and Building Inventory

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors_____ Building age_____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	_____
1st Floor	_____
2nd Floor	_____
3rd Floor	_____
4th Floor	_____

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y / N

b. Does the garage have a separate heating unit? Y / N / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA Please specify_____

d. Has the building ever had a fire? Y / N When?_____

e. Is a kerosene or unvented gas space heater present? Y / N Where? _____

f. Is there a workshop or hobby/craft area? Y / N Where & Type? _____

g. Is there smoking in the building? Y / N How frequently? _____

h. Have cleaning products been used recently? Y / N When & Type? _____

i. Have cosmetic products been used recently? Y / N When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____

l. Have air fresheners been used recently? Y / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / N If yes, where vented?_____

n. Is there a bathroom exhaust fan? Y / N If yes, where vented?_____

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type?_____

Are there odors in the building? Y / N
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	Public Water	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	Public Sewer	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:

First Floor:

12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y / N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

ATTACHMENT C

Community Air Monitoring Program

COMMUNITY AIR MONITORING PLAN

FOR

245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
EL PROJECT NUMBER 23-0001

REVISED APRIL 2026

Environmental LOGIC www.env-logic.com

15 Princess Road, Suite K | Lawrenceville, NJ 08648

COMMUNITY AIR MONITORING PLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK

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Attachment 2 – Daily Perimeter Air Monitoring Form and
Daily Air Monitoring Weather Conditions Log

COMMUNITY AIR MOITORING PLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK

1.0 INTRODUCTION

1.1 General

This Community Air Monitoring Plan (CAMP) has been developed to provide general procedures and specific requirements for community air monitoring to be followed by Environmental Logic (EL) personnel who will be monitoring and observing the Remedial Action (RA) activities at 245 West 55th Street (Block 1027, Lot 7), located in New York, New York (herein referred to as the "Site"). All work will be conducted under the direction and supervision of the remedial engineer.

This CAMP incorporates *Appendix 1A New York State Department of Health Generic Community Air Monitoring Plan* included within the New York State Department of Environmental Conservation (NSYDEC) DER-10 Technical Guidance for Site Investigation and Remediation (issued May 3, 2010). A copy of the generic CAMP is included as Attachment 1.

This CAMP will be available for inspection by NYSDOH and NYSDEC and will be reviewed by EL employees while work activities are underway.

1.2 Site Location and Background

The subject property is located at 245 West 55th Street (Block 1027, Lot 7), in the borough of Manhattan New York (herein referred to as the "Site"). The Site is fully developed with a 12-story commercial and office building with a basement which is currently vacant. The existing building is currently being renovated to include the construction of a 6-story addition atop the existing building. The planned renovation is for residential use with utilities, storage, and amenities spaces in the basement. The existing basement will be renovated by removing and replacing the interior walls. The basement floor slab will be removed and replaced as part of the renovations.

1.3 Scope of Work

While the building is under construction and open to the outside community and the public, CAMP will be implemented for the proposed scope of work documented within the Remedial Action Work Plan. This scope of work includes the following:

- Groundwater remedial injections
    - Installation of temporary or permanent injection wells using direct push drilling methods
    - Monitoring and observation of the groundwater remedy which consists of enhanced in-situ dichlorination (EISD)
    - Conducting quarterly groundwater monitoring following the remedial action. This includes sampling of monitoring wells (plus QA/QC samples) for laboratory analysis (while building is under construction and open to the outside)
- Installation of a Sub-Slab Depressurization System (SSDS)
- Installation of a Soil Vapor Extraction System (SVE)
- Installation of a Cover System

2.0 COMMUNITY AIR MONITORING PROGRAM

2.1 Applicability

Real-time monitoring of volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area during the RA activities. The objective of the CAMP is to provide a measure of protection for the off-site receptors including residences and businesses and on-site workers not directly involved with the work activities, from potential airborne contaminant releases as a direct result of the RA activities.

In accordance with the above scope of work, the majority of the RA activities will take place inside the building. Per the DER-10 CAMP guidance regarding indoor work, there are no co-located residences or facilities as the building is currently vacant. Any potentially exposed individuals will be kept at a safe distance greater than 20 feet from the RA activities. If applicable, worker zone air monitoring will follow the protocols documented in the Site Specific Health & Safety Plan (HASP).

The CAMP includes continuous and periodic monitoring as follows:

Continuous monitoring will be required for all ground intrusive activities. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil or ground water samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening of a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location.

Exceedances of the monitoring criteria detailed below observed during CAMP activities will be reported to applicable NYSDEC and NYSDOH Project Managers.

2.2 VOC Monitoring, Response Levels, and Action

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e. the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present (i.e., PID for Volatile Contaminants).

The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work zone or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the total organic vapor levels is above 25 ppm at the perimeter of the work zone, activities will be shutdown.

All 15-minute readings will be recorded and available for NYSDOH and NYSDEC personnel to review upon request. Instantaneous readings, if any, used for decision purposes will also be recorded on the attached form (see **Attachment 2**).

2.3 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind particulate level is 100 micrograms per cubic meter (µg/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression must be employed. Work may continue with dust suppression techniques provided that downwind PM10 levels do not exceed 150 µg/m³ above the background level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM10 levels are greater than 150 µg/m³ above the background level, work must be stopped and a re- evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM10 concentration to within 150 µg/m³ of the upwind level and in preventing visible dust migration.

- All readings will be downloaded and available for New York State Department of Health (NYSDOH) and NYSDEC personnel to review upon request. Instantaneous readings, if any, used for decision purposes will also be recorded (see **Attachment 2**).

3.0 REPORTING

Results of the community air monitoring program will be included in a forthcoming Remedial Investigation Report.

ATTACHMENTS

Attachment 1

New York State Department of Health Generic Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Attachment 2

Daily Perimeter Air Monitoring Form
Daily Air Monitoring Weather Conditions Log

DAILY PERIMETER AIR MONITORING DATA FORM

Project Name: _____ ***of*** _____

Site Location: _____ ***Date:*** ___/___/___

Project Number: _____ ***Personnel.:*** /

Site Activities:

☐ Excavating / Loading	☐ Decontamination	☐ Compacting
☐ Backfilling	☐ Installing/pulling slide rail	☐ Drilling
☐ Water Treatment	☐	☐ No Work
☐	☐	☐

Time **Hour:Minute**	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----

	Monitoring Location	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**
PARTICULATES (mg/m^3)												

	Monitoring Location	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**
VOCs (ppm)												

	Monitoring Location	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**
__ __ __ __ __ __ (units)												

Notes / Comments:

See CHASP for Action Levels

Daily Air Monitoring Weather Conditions Log

Project Name: _____ ***Page:*** _____ ***of*** _____

Site Location: _____ ***Date:*** ____/____/____

Project #: _____ ***Field Air Crew:*** _____

Weather Conditions

Cloud Cover: S = Sunny (Clear); PC = Partly Cloudy; H = Hazy

Time	Temp. (ºF)	Barometric Pressure (in. Hg)	Precipitation (check one)						Humidity (%)	Wind		Cloud Cover
			None	Rain	Drizzle	Fog	Sleet	Snow		Speed	Dir.*	

Note: * Wind Direction is the direction from which the wind is coming **from**.

Completed By: _____ **Date:** _____

ATTACHMENT D

Soils/Materials Management Plan

SOILS/MATERIAL MANAGEMENT PLAN

FOR

245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
EL PROJECT NUMBER 23-0001

NYSDEC SITE NO.: C231157

Revised April 2026

SOIL/MATERIALS MANAGEMENT PLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
NYSDEC SITE NO.: C231157

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FIGURES

1. Site Location Map on USGS Central Park, NY Quadrangle
2. Site Plan

ATTACHMENTS

A. Areas of Proposed Soil Removal and Fill During Construction
B. NYSDEC Request to Import/Reuse Fill or Soil Form
C. Community Air Monitoring Plan

SOIL/MATERIALS MANAGEMENT PLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
NYSDEC SITE NO.: C231157

1.0 INTRODUCTION

1.1 Purpose

Environmental Logic (EL), on behalf of 245 WEST 55TH ST LLC, has prepared this Soil/Materials Management Plan (SMMP) for the proposed redevelopment of the Site building located at 245 West 55th Street (Block 1027, Lot 7), New York, New York (herein referred to as the "Site"). 245 WEST 55TH ST LLC is enrolled as a Volunteer in the New York State Brownfield Cleanup Program (BCP), pursuant to the Brownfield Cleanup Agreement (BCA) number C231157.

245 WEST 55TH ST LLC is currently redeveloping the existing 12 story, 6,000 square foot commercial building on Site. Construction activities include the demolition of the existing 12th story and bulkhead, construction of an additional six stories to the 11 stories and altering the building to residential use. The following Remedial Actions are proposed for the site:

- Injection of enhanced in-situ Dechlorination (EISD) reagents to reduce ground water contaminant concentrations.
- Installation of sub-slab depressurization system (SSDS) and vapor barrier is proposed to be installed as part of the building renovation activities to mitigate potential vapor intrusion.
- Excavation of foundation elements and off-site disposal of any potentially contaminated soils in these areas
- Installation of a new concrete basement slab as an engineering control to prevent exposure to any remaining soil contamination.

Minimal soil generation is anticipated during construction and implementation of the SSDS. However, redevelopment activities that must take place inside the building before the SSDS can be installed will generate soils that will require management and off-site disposal. These activities include but are not limited to, pile and pile installation cap installation and elevator pit installations. This SMMP describes soil handling procedures to be implemented during building SSDS installation and concurrent construction activities. A figure showing areas to be excavated is included in **Attachment A** of this SMMP.

1.2 Site Location

The Site is located in a C6-4/C6-6 Commercial District in Manhattan, approximately 1,000 feet southwest of Central Park. The Site is bordered to the north, east, and west by mixed-use

commercial/residential properties, and is bordered to the south by West 55th Street and additional mixed-use commercial/residential properties.

The Site elevation is generally flat. A United States Geological Survey (USGS) 7.5-minute topographic map showing the Site location and surrounding area is provided on Figure 1.

The property is a rectangle-shaped parcel comprised of 0.14 acres and identified on tax maps of Manhattan NY as Block 1027, Lot 7. The Site is currently owned by 245 WEST 55TH ST LLC.

2.0 SOIL/MATERIALS MANAGEMENT PLAN

Soil management activities are specific to the handling, transportation, and disposal of excess soils generated during the installation of the proposed SSDS and building foundation elements including piles, pile caps, and elevator pits. EL will monitor and document the handling of material exported from the site that is transported and disposed of in accordance with applicable laws and regulations. Excavated material will be stockpiled on-site, pending disposal. No soil reuse is proposed.

The Applicant and its contractors are solely responsible for the safe execution of ground-intrusive activities performed under this SMMP. The Applicant and its contractors are solely responsible for the identification of utilities and/or easements that might be affected by the work conducted under this SMMP.

2.1 Soil Stockpiles

Stockpiles will be constructed as necessary to separate and stage excavated soils pending loading or characterization sampling in accordance with applicable federal and state laws and regulations, including regulations governing hazardous and solid waste.

At a minimum, the following stockpile management methods will be followed:

- Excavated soil will be staged on poly sheeting.
- Stockpiles will be covered at the end of each day, when not in use.
- If evidence (odors, staining, etc.) of contamination beyond or in excess of what has been identified during remedial investigation activities is observed during Site activities, these soils will be segregated and stockpiled to further evaluate waste characterization and disposal.

Stockpiles will be staged indoors in the basement area and/or 1st floor of the Site building. Due to the on-Site building occupying the majority of the property, outdoor staging of stockpiles are not feasible. Stormwater runoff control measures, such as haybales, will be used if there is potential for the soil stockpiles to be exposed to precipitation.

2.2 Characterization of Excavated Materials

Soil that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Contained in determinations will be obtained, as needed, for disposal of IDW as non-hazardous. Sampling and analytical methods, sampling frequency, analytical results, and QA/QC results will be reported in the Final Engineering Report (FER).

2.3 Soil Load Out and Off-Site Disposal

A field representative under the supervision of the Remedial Engineer (RE) will monitor load out of excavated soil. It is anticipated that soil will be loaded into containers staged along West 55th Street.

The excess soils generated from SSDS installation, and the building foundation construction activities will be transported from the basement level to the street level and be loaded onto trucks and/or dumpsters that are staged along West 55th Street. Measures will be taken to ensure that all egress points for truck and equipment transport from the site will be kept clean and free of project-related soils.

Vehicles leaving the site will not be overloaded. The RE's representative will make reasonable efforts to observe that vehicles are not loaded beyond their NYSDOT weight rating and that material is secured beneath the truck bed cover.

Disposal facilities will be determined at a later date and will be reported to the NYSDEC Project Manager prior to off-site transport and disposal of excavated material. Soil excavated and removed from the site will be handled, transported and disposed of in accordance with local, state (including 6 NYCRR Part 360) and federal regulations. The following documentation will be obtained and reported to each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the site conforms to applicable laws:

- A description of the material to be disposed of and requesting formal written acceptance of the material, including waste characterization data for the material being transported.

- A letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material.

The FER will include an accounting of the quantity of soil removed from the site during SSDS installation and foundation construction. Documentation associated with disposal will also include records and approvals for receipt of the material at the disposal facility.

A Bill of Lading, manifest, or equivalent, will be used for off-site movement of non-hazardous soils. This information will be reported in the FER. Hazardous waste derived from the site, if any, will be stored, transported, and disposed of in compliance with applicable local, state, and federal regulations.

Appropriately licensed haulers, in compliance with applicable local, state, and federal regulations, will be used to transport the material removed from this Site.

2.4 Import of Backfill Soil from Offsite Sources

2.4.1 Sources

This Section presents the requirements for imported fill materials to be used during the project. Import of material from offsite is anticipated for the purposes of this SMMP pertaining to SSDS installation and associated foundation construction activities. A process will be established to evaluate sources of backfill to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

Imported stone (from a NYSDEC permitted mine or quarry) is anticipated to be used as the backfill to raise the basement slab elevation. Virgin stone will not require analytical data, unless required by NYSDEC.

All materials received for import to the Site will be approved by the Remedial Engineer and will comply with applicable City, State and Federal laws and requirements. Prior to importing any fill materials, an import request will be submitted to NYSDEC for approval (as required under DER-10 Section 5.4 (e) 6). For each import request, a Request to Import/Reuse Fill or Soil Form will be submitted and include relevant supporting documentation. A copy of the Form is included as Attachment B.

While not anticipated, if any other fill materials are required, the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where this backfill was placed will be reported to DEC at the end of construction activities. If clean soil is required, all imported soils will meet DEC-approved backfill soil quality objectives for this Site. The backfill soil quality objectives are the lesser of the relevant NYSDEC 6 NYCRR Part 375-6.8 Restricted Use Class SCOs and the NYSDEC 6 NYCRR Part 375-6.8 groundwater protection SCOs.

2.4.2 Screening and Testing

Inspection of imported fill material (other than virgin quarry stone) will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;

- A representative of the RE is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and

- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Where required, composite samples of imported fill material or soil will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

While its use is not anticipated, if used, recycled concrete aggregate (RCA) and non-virgin quarry stone will be imported from facilities permitted or registered by NYSDEC or other out of state permitted facilities. Facilities will be reported to DEC at the end of construction activities. A designated representative of the RE will be responsible for ensuring that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA.

RCA and non-virgin quarry stone imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for and will not be used as cover material at the Site.

2.5 Community Air Monitoring Plan

As discussed above, the stockpiles will be staged within the building either in the basement level of the on-Site building and/or 1st floor (Street level). Community Air Monitoring Plan (CAMP) activities will be conducted during ground intrusive activities (i.e. excavation of elevator pits or pile caps) and the soil loading activities for the disposal of any excess soils from the SSDS, pile, pile cap, and elevator pit installation. CAMP activities will be conducted in accordance with the CAMP included within the NYSDEC approved RIWP. A copy is provided in **Attachment C**.

3.0 DUST, VAPOR AND NUISANCE ODOR CONTROL PLAN

3.1 Odor Control Plan

While not anticipated, if necessary, specific odor control methods to be used on a routine basis will include application of foam suppressants or tarps over the odor or VOC source areas, if encountered. Odor controls will be on-Site and ready to use if needed, with qualified personnel trained to implement.

If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Applicants' PE, who is responsible for certifying the FER. Application of odor controls is the responsibility of the Contractor on Site.

3.2 Dust Control Plan

Dust suppression, if needed, will be achieved through the use water and sawdust-based dust suppressants. Additionally, stockpiles of excess soils awaiting transportation and disposal, will be covered when not in use and maintained in accordance with Section 2.1.

3.3 Other Nuisances

Noise control will be exercised during the project. All work will conform, at a minimum, to NYC noise control standards.

4.0 REPORTING

4.1 Daily Reports

Daily reports for soil load out and disposal will be prepared and submitted to the NYSDEC and NYSDOH project managers within 24 hours of the reporting period for each day that the environmental consultant is conducting or overseeing work at the Site and will include:

- An update of progress made during the reporting day;
- Photographic documentation of the activities completed during the reporting day;
- Identification of samples collected during the reporting day, if applicable;
- A summary of CAMP data, including elevated concentrations and response actions, if any;
- A summary of issues or concerns; and
- Public interactions/interest.

Daily reports are not intended to notify the NYSDEC of emergencies (e.g., accident, spill), request changes to the RIWP, or communicate other sensitive or time-critical information. However, such conditions will also be included in the daily reports. Emergency conditions and changes to the SMMP will be communicated directly to the NYSDEC Project Manager.

FIGURES



NEW YORK
QUADRANGLE LOCATION

USGS The National Map
USGS 7.5 Minute Series Topographic Map of Central Park, New York

GRAPHIC SCALE

0 1,000 2,000 4,000

(IN FEET)

N
W E
S

Environmental LOGIC
15 Princess Road Suite K,
Lawrenceville, NJ 08648

Scale: AS SHOWN		PROJECT: 23-0001
Date: 6/14/23		
Drawn By: PM	Checked By: BM	

SITE LOCATION MAP ON USGS QUADRANGLE
245 WEST 55TH STREET
BLOCK 1027, LOT 7
MANHATTAN, NEW YORK

FIGURE # 1

PM File: 245W55_ManhattenNY-F1_SLM.mxd

LEGEND

APPROXIMATE SITE BOUNDARY

PARCEL BOUNDARY

Block: 1027
Lot: 63

Block: 1027
Lot: 60

Italia D.
Block: 1027
Lot: 160

Kozinn 238 LLC
Block: 1027
Lot: 58

236 West 56th
RealtyCRP
Block: 1027
Lot: 57

Block: 1027
Lot: 56

One-Story Brick
Building

Yard

Block: 1027
Lot: 104

Block: 1027
Lot: CA

Block: 1027
Lot: 103

Block: 1027
Lot: 103

Block: 1027
Lot: 101

Block: 1027
Lot: 102

Block: 1027
Lot: 5

Japas
Enterprises Inc.
Block: 1027
Lot: 6

Twelve-Story
Brick Building
Block: 1027
Lot: 7

Block: 1027
Lot: 9

Block: 1027
Lot: 2

Block: 1027
Lot: 1

Eleven-Story
Brick Building

Concrete Sidewalk

Concrete Sidewalk

Eighth Avenue

W. 55 th Street

GRAPHIC SCALE

0 10 20 40

(IN FEET)

Environmental LOGIC
15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN		PROJECT # 23-0001
DATE: 6/15/23		
DRAWN BY: PM		
CHECKED BY: BM		

SITE MAP
245 WEST 55TH STREET
BLOCK 1027, LOT 7
MANHATTAN, NEW YORK

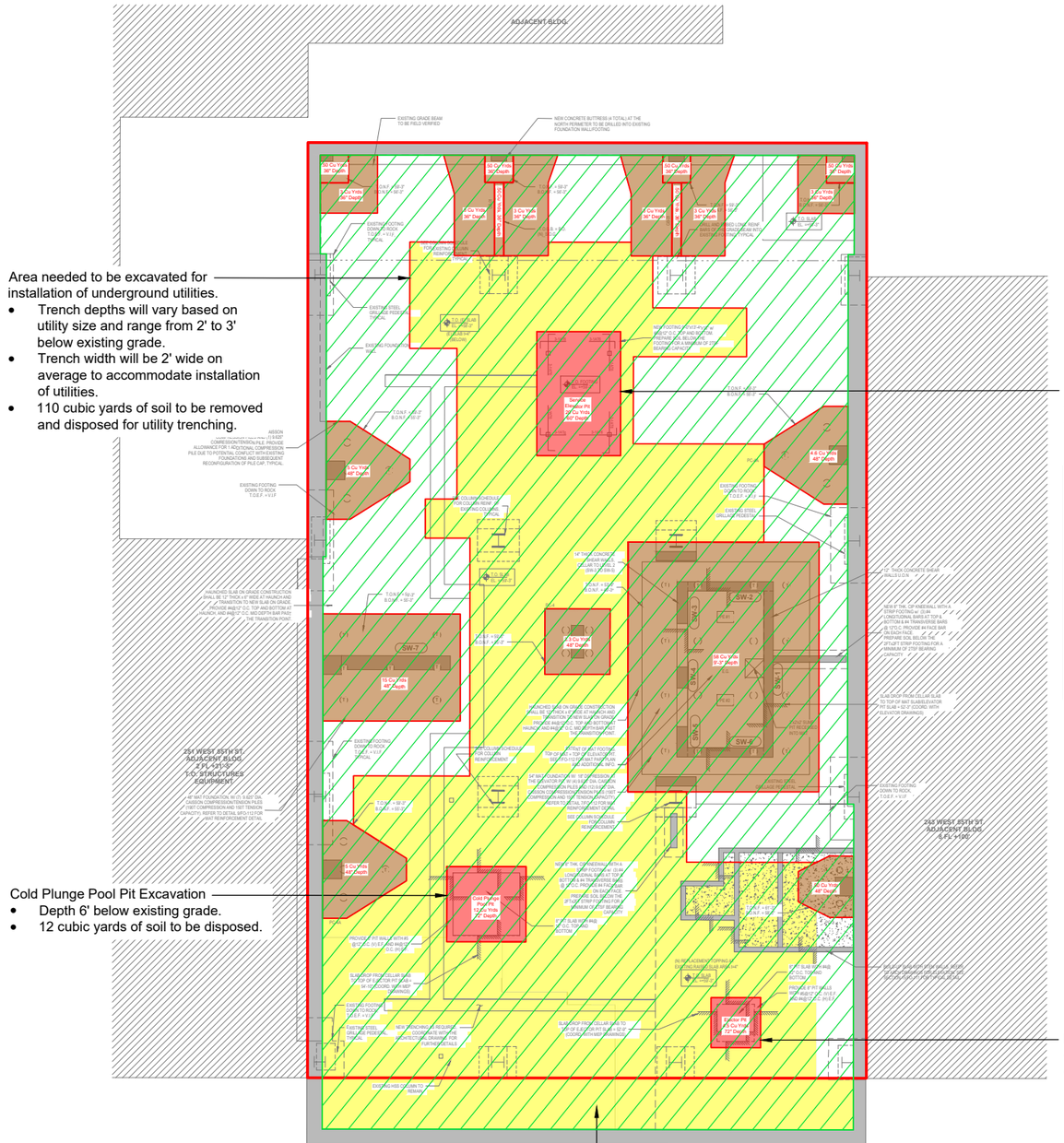
FIGURE # 2

File: X:\EnvironmentalLogic\Manhatten_NY\245W55thStreet\Drawings\245W55_ManhattenNY.dwg, F2_SM

ATTACHMENTS

Attachment A

Areas of Proposed Soil Removal and Fill During Construction


ADJACENT BLDG.
W 55TH STREET
245 WEST 55TH ST
ADJACENT BLDG
6 FL +100'
251 WEST 55TH ST
ADJACENT BLDG
4 FL +90'
T/S: STRUCTURES
EQUIPMENT
50 Cu Yrds
36" Depth
3 Cu Yrds
48" Depth
1 Cu Yrds
36" Depth
3 Cu Yrds
36" Depth
5 Cu Yrds
48" Depth
4.6 Cu Yrds
48" Depth
1 Cu Yrds
48" Depth
58 Cu Yrds
9'-0" Depth
15 Cu Yrds
48" Depth
Service Elevator Pit
20 Cu Yrds
60" Depth
Cold Plunge Pool Pit
12 Cu Yrds
72" Depth
Ejector Pit
4.5 Cu Yrds
72" Depth
20 Cu Yrds
48" Depth
SW-1
SW-2
SW-3
SW-4
SW-5
SW-6
EXISTING GRADE BEAM TO BE FIELD VERIFIED
NEW CONCRETE BUTTRESS (4 TOTAL) AT THE NORTH PERIMETER TO BE DRILLED INTO EXISTING FOUNDATION WALL/FOOTING
EXISTING FOOTING DOWN TO ROCK T.O.E.F. +113'
EXISTING STEEL GRILLAGE PEDESTAL
EXISTING FOUNDATION WALL
T.O.S.L.= 100.0'
B.O.S.L.= 98.0'
T.O.M.= 99.0'
B.O.M.= 98.0'
T.O.F.= 100.0'
B.O.F.= 98.0'
T.O.F.= 102.0'
B.O.F.= 101.0'
T.O.M.= 98.0'
B.O.M.= 97.0'
T.O.F.= 97.0'
B.O.F.= 96.0'
T.O.F.= 102.0'
B.O.F.= 101.0'
T.O.F.= 102.0'
B.O.F.= 101.0'
T.O.F.= 102.0'
B.O.F.= 101

Attachment B

NYSDEC Request to Import/Reuse Fill or Soil Form

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil

This form is based on the information required by DER-10, Section 5.4(e) and 6NYCRR Part 360.13. Use of this form is not a substitute for reading the applicable regulations and Technical Guidance document.

SECTION 1 – SITE BACKGROUND

The allowable site use is: Choose an item

Have Ecological Resources been identified? Choose an item

Is this soil originating from the site? Choose an item

How many cubic yards of soil will be imported/reused? Choose an item

If greater than 1000 cubic yards will be imported, enter volume to be imported:

SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? Choose an item

Does it contain less than 10%, by weight, material that passes a size 100 sieve? Choose an item

Is this virgin material from a permitted mine or quarry? Choose an item

Is this material recycled concrete or brick from a DEC registered processing facility? Choose an item

SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.4(e)5 (other material), no chemical testing needed.

SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.

If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Location where fill was obtained:

Identification of any state or local approvals as a fill source:

If no approvals are available, provide a brief history of the use of the property that is the fill source:

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

_____ _____

Signature Date

_____

Print Name

_____

Firm

Revised April 2023

Attachment C

Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN

FOR

245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
EL PROJECT NUMBER 23-0001

REVISED APRIL 2026

Environmental LOGIC www.env-logic.com

15 Princess Road, Suite K | Lawrenceville, NJ 08648

COMMUNITY AIR MONITORING PLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK

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1.2 Site Location and Background 1
1.3 Scope of Work 1
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3.0 REPORTING 5

Attachments

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Attachment 2 – Daily Perimeter Air Monitoring Form and
Daily Air Monitoring Weather Conditions Log

COMMUNITY AIR MOITORING PLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK

1.0 INTRODUCTION

1.1 General

This Community Air Monitoring Plan (CAMP) has been developed to provide general procedures and specific requirements for community air monitoring to be followed by Environmental Logic (EL) personnel who will be monitoring and observing the Remedial Action (RA) activities at 245 West 55th Street (Block 1027, Lot 7), located in New York, New York (herein referred to as the "Site"). All work will be conducted under the direction and supervision of the remedial engineer.

This CAMP incorporates *Appendix 1A New York State Department of Health Generic Community Air Monitoring Plan* included within the New York State Department of Environmental Conservation (NSYDEC) DER-10 Technical Guidance for Site Investigation and Remediation (issued May 3, 2010). A copy of the generic CAMP is included as Attachment 1.

This CAMP will be available for inspection by NYSDOH and NYSDEC and will be reviewed by EL employees while work activities are underway.

1.2 Site Location and Background

The subject property is located at 245 West 55th Street (Block 1027, Lot 7), in the borough of Manhattan New York (herein referred to as the "Site"). The Site is fully developed with a 12-story commercial and office building with a basement which is currently vacant. The existing building is currently being renovated to include the construction of a 6-story addition atop the existing building. The planned renovation is for residential use with utilities, storage, and amenities spaces in the basement. The existing basement will be renovated by removing and replacing the interior walls. The basement floor slab will be removed and replaced as part of the renovations.

1.3 Scope of Work

While the building is under construction and open to the outside community and the public, CAMP will be implemented for the proposed scope of work documented within the Remedial Action Work Plan. This scope of work includes the following:

- Groundwater remedial injections
    - Installation of temporary or permanent injection wells using direct push drilling methods
    - Monitoring and observation of the groundwater remedy which consists of enhanced in-situ dichlorination (EISD)
    - Conducting quarterly groundwater monitoring following the remedial action. This includes sampling of monitoring wells (plus QA/QC samples) for laboratory analysis (while building is under construction and open to the outside)
- Installation of a Sub-Slab Depressurization System (SSDS)
- Installation of a Soil Vapor Extraction System (SVE)
- Installation of a Cover System

2.0 COMMUNITY AIR MONITORING PROGRAM

2.1 Applicability

Real-time monitoring of volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area during the RA activities. The objective of the CAMP is to provide a measure of protection for the off-site receptors including residences and businesses and on-site workers not directly involved with the work activities, from potential airborne contaminant releases as a direct result of the RA activities.

In accordance with the above scope of work, the majority of the RA activities will take place inside the building. Per the DER-10 CAMP guidance regarding indoor work, there are no co-located residences or facilities as the building is currently vacant. Any potentially exposed individuals will be kept at a safe distance greater than 20 feet from the RA activities. If applicable, worker zone air monitoring will follow the protocols documented in the Site Specific Health & Safety Plan (HASP).

The CAMP includes continuous and periodic monitoring as follows:

Continuous monitoring will be required for all ground intrusive activities. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil or ground water samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening of a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location.

Exceedances of the monitoring criteria detailed below observed during CAMP activities will be reported to applicable NYSDEC and NYSDOH Project Managers.

2.2 VOC Monitoring, Response Levels, and Action

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e. the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present (i.e., PID for Volatile Contaminants).

The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work zone or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the total organic vapor levels is above 25 ppm at the perimeter of the work zone, activities will be shutdown.

All 15-minute readings will be recorded and available for NYSDOH and NYSDEC personnel to review upon request. Instantaneous readings, if any, used for decision purposes will also be recorded on the attached form (see **Attachment 2**).

2.3 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind particulate level is 100 micrograms per cubic meter (µg/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression must be employed. Work may continue with dust suppression techniques provided that downwind PM10 levels do not exceed 150 µg/m³ above the background level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM10 levels are greater than 150 µg/m³ above the background level, work must be stopped and a re- evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM10 concentration to within 150 µg/m³ of the upwind level and in preventing visible dust migration.

- All readings will be downloaded and available for New York State Department of Health (NYSDOH) and NYSDEC personnel to review upon request. Instantaneous readings, if any, used for decision purposes will also be recorded (see **Attachment 2**).

3.0 REPORTING

Results of the community air monitoring program will be included in a forthcoming Remedial Investigation Report.

ATTACHMENTS

Attachment 1

New York State Department of Health Generic Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Attachment 2

Daily Perimeter Air Monitoring Form
Daily Air Monitoring Weather Conditions Log

DAILY PERIMETER AIR MONITORING DATA FORM

Project Name: _____ ***of*** _____

Site Location: _____ ***Date:*** ___/___/___

Project Number: _____ ***Personnel.:*** /

Site Activities:

☐ Excavating / Loading	☐ Decontamination	☐ Compacting
☐ Backfilling	☐ Installing/pulling slide rail	☐ Drilling
☐ Water Treatment	☐	☐ No Work
☐	☐	☐

Time **Hour:Minute**	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----

	Monitoring Location	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**
PARTICULATES (mg/m^3)												

	Monitoring Location	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**
VOCs (ppm)												

	Monitoring Location	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**
__ __ __ __ __ __ (units)												

Notes / Comments:

See CHASP for Action Levels

Daily Air Monitoring Weather Conditions Log

Project Name: _____ ***Page:*** _____ ***of*** _____

Site Location: _____ ***Date:*** ____/____/____

Project #: _____ ***Field Air Crew:*** _____

Weather Conditions

Cloud Cover: S = Sunny (Clear); PC = Partly Cloudy; H = Hazy

Time	Temp. (ºF)	Barometric Pressure (in. Hg)	Precipitation (check one)						Humidity (%)	Wind		Cloud Cover
			None	Rain	Drizzle	Fog	Sleet	Snow		Speed	Dir.*	

Note: * Wind Direction is the direction from which the wind is coming **from**.

Completed By: _____ **Date:** _____

ATTACHMENT E

Health And Safety Plan

HEALTH AND SAFETY PLAN (HASP)

FOR

REMEDIAL ACTION ACTIVITIES

FOR

245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
EL PROJECT NUMBER 23-0001

REVISED APRIL 2026

Environmental LOGIC www.env-logic.com

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HEALTH AND SAFETY PLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK

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GLOSSARY OF COMMON HASP ACRONYMS

ACGIH - American Conference of Governmental Industrial Hygienists
ANSI - American National Standards Institute
APR - Air Purifying Respirator
CFR - Code of Federal Regulations
CGI - Combustible Gas Indicator
CSEP - Confined Space Entry Permit
DECON - Decontamination
FID - Flame Ionization Detector
CHASP - Health and Safety Plan
IDLH - Immediately Dangerous to Life and Health
MSDS - Material Safety Data Sheets
LEL - Lower Explosive Limit
NIOSH - National Institute for Occupational Safety and Health
OSHA - Occupational Safety and Health Administration
OVA - Organic Vapor Analyzer
PID - Photoionization Detector
PEL - Permissible Exposure Limit
PPE - Personal Protective Equipment
SCBA - Self Contained Breathing Apparatus
SOP - Standard Operating Procedure
SPCC - Spill Prevention Controls and Countermeasures
TLV - Threshold Limit Value
TWA - Time Weighted Average
UEL - Upper Explosive Limit
ACGIH – American Conference of Governmental Industrial Hygienists
CNS – Central Nervous System

HEALTH AND SAFETY PLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK

1.0 INTRODUCTION

On-site workers have the potential to be exposed to risks from soil and groundwater contaminants identified during subsurface investigations performed at 245 West 55th Street, Block 1027, Lot 7, New York, New York (Site). This Health and Safety Plan (HASP) has been prepared to minimize the possibility of work-related injury through qualified supervision, health and safety training, medical monitoring, use of appropriate personal protective equipment, and the following activity specific safety protocols contained in this Site-Specific Health and Safety Plan (HASP).

This HASP, which applies to personnel actually or potentially exposed to safety or health hazards, describes emergency response procedures for actual and potential physical and chemical hazards. This HASP is also intended for use by all personnel entering the work area or an established exclusion zone. All people are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy by signing off upon review of the document (**Appendix 1**). Contractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees.

1.1 Purpose

This document describes the health and safety guidelines for investigation and remediation work at the property located at 245 West 55th Street, Block 1027, Lot 7, New York, New York (Site) to protect on-site personnel, visitors, and the public from potential physical harm and potential exposure to hazardous materials or wastes.

In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this HASP, including the attachments, addresses safety and health hazards relating to implementation of environmental investigation and remediation activities and is based on the best information available.

This document is not, nor does it purport to be, a complete description of all safety and health requirements applicable to work performed at the Site. Rather, the HASP is a general overview of the compliance policies and work practices applicable to the primary tasks and hazards associated with the environmental assessment and remediation, as well as a recitation of minimum safety and health compliance obligations for contractors, subcontractors and workers performing environmental investigation and remediation at the site. All subcontractors of any tier operating at the worksite are obligated to implement and maintain comprehensive safety and

health plans for their own employees and to ensure that their employees comply with all applicable safety and health requirements. All subcontractors operating at the worksite should refer to the applicable specific OSHA Standards for detailed requirements. If subcontractors adopt this document in its entirety, or any portion thereof, as their own, they do so after fully reviewing this document to ensure that their own requirements for ensuring the safety of themselves, their employees, and their subcontractors are met.

The HASP may be revised upon receipt of new information regarding site conditions.

1.2 Site Safety Plan Acceptance and Acknowledgement

A Site Health and Safety Officer (HSO) should be designated during field activities. The HSO is responsible for informing all personnel entering the work area of the contents of this plan and ensuring that each person signs the safety plan acknowledging the potential on-site hazards and procedures required to minimize exposure to adverse effects of these hazards. Any amendments to the HASP should be acknowledged by completing forms included in **Appendix 2.**

1.3 Daily Safety Meetings

Each day before work begins, the HSO will hold safety (i.e. tailgate or toolbox) meetings to ensure that all on-site personnel understand the site conditions and operating procedures and to address safety questions and concerns. Meeting minutes and attendance will be recorded. If exclusion and/or decontamination zones are present, all personnel eligible to enter the exclusion and decontamination zones must attend the meetings. Project staff will discuss and remedy any health and safety issues at these meetings.

1.4 Roles and Responsibilities

A project manager (PM)/field team leader and HSO should be designated. The project manager/field team leader is responsible for overall project administration and, with guidance from the HSO, supervising the implementation of this HASP. All relevant OSHA health and safety standards will apply. The site safety office should conduct daily i.e. (tail gate or toolbox) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, then the project manager/field team leader will be consulted.

The HSO is also responsible for coordinating and enforcing health and safety activities on-site. The HSO must meet the emergency response and hazardous materials training requirements of OSHA 29 CFR Part 1910.120; must have completed OSHA supervisor training, 29 CFR 1910.120 (e) 4; and must have appropriate experience to the related site work. The HSO is authorized to suspend the site work based on safety concerns and is responsible for the following.

1. Educating personnel about all the information in this HASP and any other safety requirements to be observed during site operations, including, but not limited to, site orientation, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.

2. Take immediate action to correct at-risk or inappropriate behaviors on the part of Site personnel, resolve safety concerns that may arise promptly, and verify that corrective actions are implemented.

3. Coordinating site safety decisions with the project superintendent and the project manager.

4. Designating, managing, and maintaining exclusion, decontamination, and support zones daily.

5. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality-monitoring program specified in this HASP.

6. Maintaining exclusion zone entry/exit log and site entry/exit log if required.

7. Maintaining records of safety problems, corrective measures and documentation of any chemical exposures or physical injuries (the HSO will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

8. Provide project personnel with technical guidance for conducting fieldwork and construction activities in a safe and healthy manner.

9. Provide project personnel with technical guidance for conducting fieldwork and construction activities in a safe and healthy manner.

Any person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the HSO or appropriate key personnel. It is the fundamental responsibility of Site personnel to become familiar with the provisions of this HASP and conduct all aspects of their work in accordance with its guidance and their own task specific work practices and safety plans.

1. Take reasonable precautions to prevent injury to themselves and to fellow employees.

2. Attend pre-entry H&S briefings and daily safety tailgate meetings.

3. Immediately report the occurrence of work-related incidents, injuries, illnesses, near misses, or unsafe conditions to the HSO.

4. Inspect equipment, tools, and work areas and maintain safe working conditions by repairing and reporting deficiencies.

5. Stop their work when unforeseen hazards are encountered.

6. Notify their HSO of any limitations in their ability to conduct their work safely, and any requirements for special accommodation while working on the Site.

7. In an unknown situation, always assume the worst reasonable conditions.

8. Be observant of their immediate surroundings and the surroundings of others. It is a team effort to notice and warn of dangerous situations. Stopping work to reassess a potentially hazardous situation or procedure is the preferred course of action.

9. Conflicting situations may arise concerning safety requirements, procedures and/or working conditions. These issues must be addressed and resolved immediately by the HSO and PM, through communication with other responsible parties, to ensure that work will be conducted safely, and established safety policies/protocols are followed.

10. Unauthorized deviations from specified safety protocols are prohibited. Workers unwilling or unable to comply with the established procedures will be immediately dismissed and escorted from the Site.

11. Minimize contact with project-derived materials (soil, sediments, water, debris from the canal, and related objects and materials) that may be impacted with hazardous substances. Refrain from placing equipment/tools on the ground. Do not sit or kneel on potentially contaminated surfaces.

12. Smoking, eating, or drinking after entering the work zone and before decontamination is prohibited.

13. Employees and/or subcontractors who are suspected of being under the influence of illegal drugs or alcohol will be removed from the Site. Workers taking prescribed medication that may cause drowsiness shall not operate heavy equipment and are prohibited from performing tasks where Level C or B PPE is required.

14. Practice good housekeeping. Keep work zones orderly and take appropriate actions to mitigate potentially harmful situations.

15. Use of contact lenses may not be allowed under certain hazardous working conditions, such as hot work or if corrosive materials are encountered.

1.5 Site Orientation

An initial safety orientation will be provided by the HSO or superintendent to review potential hazards, current Site conditions, and the contents of this HASP. Subcontractors are responsible

for reviewing all sections of their Site-Specific HASP with their personnel. All site workers must review their company's HASP and acknowledge the review and understanding of the HASP by signing the acknowledgement page. Attendance at the initial safety orientation meeting, plus review and acknowledgement of their company's HASP is required by each site worker prior to their commencing work.

2.0 SITE BACKGROUND AND SCOPE OF WORK

The subject property is located at 245 West 55th Street (Block 1027, Lot 7), in the borough of Manhattan, New York (herein referred to as the "Site"). The Site is fully developed with a 12-story commercial and office building with a basement, which is currently vacant.

Renovations of the existing building are underway to construct a 6-story addition atop the existing building. The planned renovation is for residential use with utilities, storage, and amenities spaces in the basement. The existing basement will be renovated by removing and replacing the interior walls. The basement floor slab will be removed and replaced as part of the renovations.

As part of pre-purchase/pre-renovation due-diligence activities, a Phase II Subsurface Investigation was conducted at the site to identify and characterize potential contaminants within the surface/subsurface soils and groundwater at the Site. Results from this investigation were used to help determine what actions may be required, if any, to prevent exposure to on-site contaminants from the change in use of the site.

2.1 Site History and Background

The Site was formerly owned and utilized by DuArt Media Services/DuArt Film Labs (DuArt) for cinematographic film cleaning and film processing from approximately 1922 through 2011. Film production including voiceover work, audio recording, and film editing continued to take place at the Site until 2021. Cinematographic film cleaning operations utilized cleaning and degreasing compounds including the chlorinated volatile organic compounds (CVOCs) tetrachloroethene (PCE) and 1,1,1-trichloroethane (1,1,1-TCA) to remove dirt, grease, and minor scratches from film negatives prior to print.

2.2 Soil Quality

Based on the results of soil sampling conducted to date, select compounds including metals (mercury, nickel, silver, and trivalent and hexavalent chromium), n-propylbenzene, and 4-4-DDE were detected above Unrestricted Use Soil Cleanup Objectives (UUSCOs) and Protection of Groundwater Soil Cleanup Objectives PGWSCOs. Barium and manganese, two naturally occurring compounds, were detected above and Restricted Residential Use Soil Cleanup Objectives (RRUSCOs). The proposed remedy for soils includes institutional and engineering controls detailed within the Remedial Action Work Plan (RAWP).

2.3 Ground Water Quality

Groundwater sampling has been conducted in December 2024 and February 2025 from Site monitoring wells. Results indicated that concentrations of 1,1,1-TCA, PCE, 1-1-DCE, vinyl chloride, TCE, trans-1,2-DCE, and cis-1,2-DCE were identified in groundwater above standards. The proposed remedy for groundwater includes injection of Enhanced In-Situ Dechlorination

(EISD) amendments to the ground water to and post verification sampling, as described within the RAWP.

2.4 Sub-Slab Vapor Quality

Vapor Intrusion sampling was mostly recently conducted in April 2024. Results of the sampling were documented within the VI Investigation Summary Report (Revised November 2024) and approved by NYSDEC in a letter dated November 25, 2024. Comparison of the results to the New York State Department of Health (NYSDOH) Soil Vapor/Indoor Air (SV/IA) decision matrices in May 2017 and February 2024 indicated mitigation was required for 1,1-Dichloroethene (1,1-DCE), Cis-1,2-dichloroethene (cis-1,2-DCE), Trichloroethene (TCE), 1,1,1-Trichloroethane (1,1,1-TCA), and vinyl chloride. Installation of a sub-slab depressurization (SSDS) is proposed as detailed within the RAWP.

2.5 Scope of Work

This HASP applies to the proposed RA field tasks which include the following activities:

The RA field tasks are discussed in more detail in the SAP-QAPP (Attachment G of the RAWP) and generally consist of the following activities:

- Groundwater remedial injections
    - Installation of temporary or permanent injection wells using direct push drilling methods
    - Monitoring and observation of the groundwater remedy which consists of enhanced in-situ dichlorination (EISD)
    - Conducting quarterly groundwater monitoring following the remedial action. This includes sampling of monitoring wells (plus QA/QC samples) for laboratory analysis (while building is under construction and open to the outside)
- Installation of a Sub-Slab Depressurization System (SSDS)
- Installation of a Soil Vapor Extraction System (SVE)
- Installation of a Cover System

Should additional remediation activities be required, this HASP also addresses the following potential future activities:

- Excavation of soil (i.e. for installation of foundations or elevator pits)
- Site Grading Activities
- Dewatering activities
- Loading of excavated material into trucks for off-site transport
- Subsurface Drilling

3.0 HAZARD ASSESSMENT

This section identifies the hazards associated with site operations and the standard operating procedures (SOPs) that should be implemented to reduce the hazards; identifies general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

3.1 Remedial Action Field Activities

Proposed Remedial Action (RA) activities include installation of temporary injection wells, injection of Enhanced In-Situ Dechlorination (EISD) aquifer amendments, Utility Survey, monitoring well installation, groundwater sampling, indoor air sampling and sub-slab soil gas sampling, and excavation of soils as necessary for concurrent construction activities.. The physical hazards of this operation are primarily associated, with operation of the coring equipment, drilling equipment, excavation equipment and contact with material brought up from the subsurface during drilling.

3.1.1 Groundwater Remedy Implementation – Field Activities

The goal of the in-situ chemical treatment for the Site is to reduce cVOC contaminants in groundwater. The remediation approach consists of injecting a combination of EISD amendments into the shallow overburden aquifer. The EISD amendments are designed to apply short-term, aggressive treatment to groundwater, incorporate abiotic dechlorination mechanisms to reduce the generation of harmful daughter products, and include persistent reagents for long-term treatment (3 to 5+ years) to minimize the potential for rebound.

The selected reagents are listed below. Safety Data Sheets associated with these amendments are include as **Appendix 3**.

- Sodium lactate
- Emulsified Vegetable Oil (EVO)
- Zero Valent Iron (ZVI):
- Bioaugmentation Cultures
- Custom blend of nutrients and additives, including nitrogen, phosphorus, and soluble sulfate
- pH Buffers

In general, the overburden aquifer treatment will include the advancement of up to 15 injection points within an approximately 2,000 SF treatment area. The amendments will be delivered via temporary injection points or injection wells, described below.

3.1.2 Injection Points

Temporary injection points or permanent injection wells will be installed in accordance with the RAWP. Drill cuttings may be generated during the RA field activities. Drill cuttings will be placed in a 55-gallon drums at the drilling locations. The drums may be moved, if necessary, and temporarily staged at the Site at a location convenient for transportation from the Site. At the conclusion of RA field activities, these materials will be appropriately characterized and, after receiving the necessary approvals, will be transported off Site for treatment and/or disposal at a permitted facility.

Potential health hazards and contaminants

Hazards generally associated with coring and drilling operations include noise levels exceeding the OSHA PEL of 90 dBA that are both a hazard and a hindrance to communication, carbon monoxide from the drill rig, and overhead electrical and telephone wires which can be hazardous when the drill rig boom is in the upright position. Moving parts on the drill rig may catch clothing. Free or falling parts from the cat head may cause head injury. High pressure hydraulic lines and air lines used on drill rigs are hazardous when they are in disrepair or incorrectly assembled. There may be underground utilities in the area where drilling is being performed (see Section 3.5.2)

During the retrieval of augers/drilling rods, the possibility exists for splashing of exposed subsurface materials onto the workers and release of dust containing volatile materials onto workers' bodies and into the workers' breathing zones.

Operation of gas/diesel powered drilling rigs or other equipment without proper controls and/or venting may cause a build-up of carbon monoxide and other gasses that may be hazardous (see Section 3.2, below).

Hazard and contaminant control

General PPE requirements presented in Section 5 apply to this task. Personnel must wear Level D PPE including earmuffs and/or ear plugs when working near operating heavy machinery (see Section 3.5.2.). Modified Level D PPE will be worn during drilling and when there is a need to handle or work with potentially impacted soil or liquid. Prior to approaching a drill rig, loose clothing will be secured and the boom position will be checked.

When outdoor activities are completed, personnel will remain upwind from the vehicle exhausts unless required by sampling work. Wet methods should be used when coring concrete or other hard surfaces. During drilling, if wet methods are not used, air in the breathing zone of the worker

will be monitored for total dust using a real- time air meter (RAM) at approximately five-minute intervals. Air will be screened for volatile organic vapors using a PID at approximately five-minute intervals. Subsequent air monitoring and respirator wear will be in accordance with Section 6 of this HASP.

The drilling subcontractor will be required to inspect chains, lines, cables, and high-pressure lines daily for weak spots, frays, and other signs of wear. The drilling subcontractor will be required to make repairs as necessary.

To avoid contact with overhead lines, the drilling subcontractor will be required to lower the drill rig boom prior to moving the rig. The drilling subcontractor will be required to verify the location of underground utilities with the local power and utility companies prior to drilling. Overhead and underground utilities will be considered "live" until verified otherwise.

Equipment that is potentially contaminated will be cleaned to the satisfaction of the HSO. The field sampling equipment will be cleaned and decontaminated using the equipment decontamination procedures outlined in the RIW / Sampling and Analysis Plan (SAP). The field decontamination wastes will be collected and disposed of properly according to the SAP.

3.1.3 Groundwater Sampling

Potentially contaminated groundwater will be generated during groundwater sampling activities. The water will initially be placed in a 55-gallon drum and temporarily staged at the Site at a location convenient for transportation from the Site. At the conclusion of field activities, these materials will be appropriately characterized described above and, after receiving the necessary approvals, will be transported off Site for treatment and/or disposal at a permitted facility.

Potential health hazards and contaminants

Potential health hazards and contaminants are consistent with those identified with this Section and Section 4.0 of this HASP for chemicals hazardous. Additional exposures include contact with preservatives in laboratory sample bottles during the collection of groundwater water samples.

Hazard and contaminant control

Hazards and contaminant control are consistent with those in previous sections. Initially, Modified Level D PPE, to prevent contact with groundwater, sample bottle preservatives, will be provided. Employing proper lifting and bailing techniques while developing wells and sampling wells will prevent back strain. Heavy equipment, such as pumps and generators, will only be lifted with the legs, preferably using two or three personnel.

3.2 Emissions from Fuel Combustion

Inhalation exposure hazards may result from use of fuel-powered vehicles in close proximity to a work area, or in lower levels of the building without proper ventilation. Other fuel-powered equipment may include propane heaters, fuel-powered portable generators, heavy equipment, drill rig, etc. Typical fuels in such equipment may include gasoline, diesel fuel, and propane or natural gas. Inhalation hazards from fuel-powered equipment included carbon monoxide, asphyxiation (in enclosed spaces), and generation of combustion-related airborne hazards (soot, carbon, organic compounds, etc.). The following practices shall be observed when inhalation hazards are present as the result of emissions from fuel combustion:

- Position outdoor personnel upwind of exhaust source.
- Use blowers and fans to provide fresh air to work area and dissipate atmospheric hazards.
- Where possible, use ducts and/or fans to capture and exhaust emission to the outdoors.
- Use respiratory protection for high levels of smoke, exhaust particulates, soot.
- Conduct air monitoring for carbon monoxide, as appropriate.

3.3 Excavation/Earthwork

Soil excavation and off-site disposal will occur from construction related activities, including the installation of footers, trenches, an elevator and injector pit. The Occupational Safety and Health Administration (OSHA) 29 CFR 1926 subpart P established construction industry standards relating to excavation work. These standards include shoring and cutback requirements, equipment specifications, entry requirements, etc. These standards must be followed for all excavation activities. Confirm that an OSHA competent person is available for excavations and trenching. An OSHA competent person is someone with enough training to identify soil types and other excavation hazards and authority to take prompt corrective actions.

To avoid exposure to site-specific contaminants and to ensure acceptable atmospheric conditions, the following additional requirements apply:

- Air quality should be screened and/or tested before employees enter excavations over four feet deep if a hazardous atmosphere exists or is suspected to exist. If the HSO determines that excavations are, by OSHA's definition, "confined space," OSHA's confined space or permit required confined space entry policies will be followed.
- Open excavations will be backfilled as soon as practicable. While excavations remain open, appropriate warnings will be posted, and barricades will be erected to protect site personnel. Where possible, excavation side walls will be cut at a gradual slope to

maximize egress and access. Workers will not enter excavations unless absolutely required.

- To ensure atmospheric quality, screening and/or testing should be conducted continuously while the excavation is occupied – i.e. screening with a multiple sensor meter designed for confined space entry.

- If and when the HSO identifies hazardous atmospheres, emergency rescue equipment and PPE must be on the work site (Level C PPE) and readily accessible to employees (29 CFR 1926.651(g)(2)(I)).

- Daily site safety inspections should be conducted by the HSO.

3.4 Dust Control and Monitoring During Earthwork

The primary sources of dust will be heavy equipment use (i.e drill rigs, excavators, etc.) No contaminated soil is expected to be excavated as part of investigation and remediation activities. Based on soil samples collected at the site, it is not expected that any dust generated during site activities will contain contaminants associated with the site. However, as a precautionary measure, it is recommended that the site Contractor(s) control any dust generated during drilling or any potential soil excavation or earthwork activities by wetting the working surface with water or equivalent dust suppression methods.

In accordance with the American Conference of Governmental Industrial Hygienists (ACGIH) established recommendations, airborne dust concentrations should be kept below 3 mg/m³ (respirable particles) and 10 mg/m³ (inhalable particles) for insoluble particles of low toxicity for which no TLV has been established.

Particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (µg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 µg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 µg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression

measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 µg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and or data logged and be documented in a daily air monitoring report during dust generating activities.

If this threshold is exceeded, the HSO will take corrective actions as defined herein, including increasing the amount of water applied to the material and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges. The OSHA Small Entity Compliance Guide for the Respiratory Protection Standard is included in **Appendix 4**. Please refer to this document for additional information regarding respirator use and training. If workers must wear respiratory protection, they shall also participate in a periodic medical monitoring program and be fit tested.

3.5 General Site Hazards

Applicable OSHA 29 CFR 1910.120(m) standards for illumination shall apply. All outdoor work is to be conducted during daylight hours whenever possible.

All electrical power must be provided through a ground fault circuit interrupter. All equipment that will enter an excavation must be suitable and approved (i.e. intrinsically safe) for use in potentially explosive environments. Applicable OSHA 29 CFR 1926 Subpart K standards for use of electricity shall apply.

Work where there is a fall hazard will be performed using appropriate ladders and/or protection (e.g. body harness and lifeline). All work should be conducted at the ground surface or in trench excavations.

In accordance with 29 CFR 1910.151(c), workers involved in operations where there is the risk of eye injury, (chemical splash, etc.), must have ready access to an approved eye wash unit. Protective eyewear shall be donned in Level D, when directed by the HSO. (Note: the full-face APR required by Level C and the pressure demand self-contained breathing apparatus mask required by Level B provide eye protection.)

Operations where there is a potential for fire will be conducted in a manner that minimizes risk. Non-sparking tools and fire extinguishers shall be used or available as directed by the HSO when work is in potentially explosive atmospheres. Ignition sources shall be removed from work areas. Explosion-proof instruments and/or bonding and grounding will be used to prevent fire or explosion when the HSO directs their use.

Overhead and underground utilities shall be identified and/or inspected and appropriate safety precautions taken before conducting operations where there is any potential for contact or interference.

3.5.1 Work in Extreme Temperatures

Working under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress. The heat and cold stress safety protocols are detailed in **Appendix 5.**

3.5.2 Heavy Equipment

Hazards associated with the use of heavy equipment include the potential for an operator nearby personnel to be struck-by, run-over, or caught between pinch points associated with the heavy equipment. Hazards associated with overhead and buried utility lines, fluid leaks, and fueling also exist. Safety procedures related to overhead and underground utility lines are provided in Section 3.2.3, “Utility Hazards.”

When working near heavy equipment, personnel must follow safe working procedures such that personnel are not getting into a potential crush situation below or between equipment. Personnel must always yield to heavy equipment and are to stay clear of, or restrict access to, swing radius and travel path of equipment. Personnel should use hand signals to communicate with the heavy equipment operator. Eye contact should be made with the operator before approaching equipment. High visibility vests must be worn by all personnel in construction vehicle work areas, on-Site roadways and travel lanes. Park personal and support vehicles in a location as to not obstruct travel lanes or other Site operations.

Only trained and qualified persons are permitted to operate heavy equipment. These qualified personnel are to perform a visual inspection and walk around parked heavy equipment before moving to assure that equipment is in good condition and that there are no personnel on the ground that could be injured or objects that could be damaged by vehicle movement. No passengers on moving and/or operating equipment is permitted except where passenger seatbelts or other means of restraint is present. Passengers are not permitted to ride in or on any portion of the backhoe, bulldozer, forklift or back of a pickup truck. Operators must use hand rails and footholds when mounting and dismounting equipment and maintain three points of contact at all times. Operators are required to use seatbelts. If applicable, roll over protection must be used. Equipment must be inspected daily upon mobilization and maintained in good repair. Brakes, steering, clutches and controls shall be tested. Backup alarms are required for all heavy equipment including smaller vehicles such as fork lifts and skid steers. Leaks or defective safety equipment must be repaired before use. When not in use, equipment is to be locked and secured with brakes set and buckets/forks lowered. Temporary roadways must be marked clearly where needed. Operators must watch for workers in the path of their equipment and must provide warning prior to moving their equipment.

Maximum safe slope for each vehicle will be followed. Do not use heavy equipment on slopes with steepness exceeding 3H:1V unless operations are consistent with manufacturer’s

recommendations (if the Owner's Manual is not with the equipment or does not specify slope operating procedures, see the SHSO). While on slopes, operate equipment with booms, blades, buckets, beds, etc., lowered or in a stable position. Safety cables tethered to appropriate anchors shall be used for equipment working on steep slopes, where appropriate.

When refueling gasoline-operated equipment, motors must be shut off. Spill equipment will be available for fuel and hydraulic fluid leaks.

If a malfunction occurs, the operator shall lower hydraulic systems (e.g., blades, etc.) to the ground, set brakes, and shut down equipment. When heavy equipment is in need of repair, slings or support hoists or jacks must be used. Heavy equipment must be blocked or cribbed before working underneath.

3.5.3 Underground Utilities

This section describes the process necessary to investigate, and to the extent practical, identify utilities in work areas for the purpose of avoiding the utilities, protecting utilities and Site personnel, and mitigating impacts to Site operations.

The traditional method of using existing "as built" plans and maps (if available) and probing in the field (i.e., "hunt and hope") is not sufficient to provide adequate assurance that utilities are not impacted during Site activities. Site personnel must implement guidance found in this section prior to conducting intrusive Site activities (i.e., drilling, well installation, trenching, excavation, hand auguring, etc.).

Typical underground utility clearance practices are as follows:

- Identify the location of the planned intrusive activities.
- Mark the planned work area with white water based marking paint. If work area is not visible from the street either because of obstruction or distance, provide distance from street to work area (i.e., 150 feet north).
- Contact DigAlert or dial 811 (nationwide) to identify utilities in your work area. http://www.digalert.org/ (811) provides a link to the local state operated "Call-Before-You-Dig" service. New York City is covered by the New York City One-Call service (www.newyork-811.com).
- It is important to note that the NYCDEP does not participate in the New York 811 program and must be contacted directly. NYCDEP utility maps may be required through formal requested online at:

  http://www.nyc.gov/html/dep/html/forms_and_permits/locations.shtml

- Review existing utility maps with facility personnel and determine the approximate numbers and types of utilities within the project area. This is inclusive of below-ground utilities that may be encountered during intrusive operations as well as overhead utilities that may be encountered during operations (i.e., drilling mast and overhead power lines).

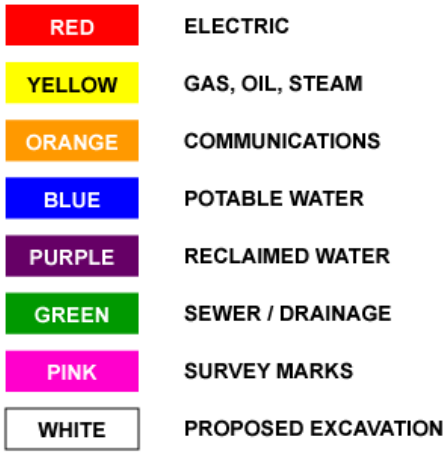
- Most "Call-Before-You-Dig" services will only mark below-ground utilities leading to a utility meter. With the exception of high priority utilities (as defined above), utilities present after passing through a meter may be left without adequate inspection. In such cases, the use of a private utility location firm may be prudent to ensure thorough identification of utilities.

- Retain the services of a private utility locating company that can identify metallic utilities and anomalies in the vicinity of the work area. Private utility location firms use a variety of location techniques. The suspected types of utilities should be discussed with the private utility location firm to ensure that proper techniques are used. Improper techniques may result in missed or improperly identified utilities.

- DigAlert must be called at least 48 hours prior to the start of work to complete a utility inspection. (For example, if you notify DigAlert on Tuesday at 9:43 a.m. no work can begin until Thursday at 9:43 a.m.). Intrusive work must begin within 10 working days of the mark out. If intrusive work does not start within 10 working days, DigAlert must be notified for a request to re-mark the utilities.

- Record the inspection confirmation number. Confirm that the inspection was conducted prior to the start of work. The inspection confirmation number is critical in the event that an unmarked utility is encountered, or if a utility identified during the inspection request did not mark the Site for the presence or absence of the utility (no-show). If a no-show occurs with it may be possible that the utility operator sent a facsimile care of the project manager (identified during utility inspection request) indicating that there are no conflicts in the planned work area. However, if there is any question, contact DigAlert immediately and request that the missing utility please call to confirm presence or absence of utility in work area or schedule a meeting time at the Site.

- After below-ground utilities are identified, the utilities should be marked. The most common marking method is paint or pin flags. The following marking colors are generally widely accepted to demarcate specific types of utilities, but should be confirmed.



- Be observant of above-ground features at a site that may be indicative of an underground utility line. An example of this would be noticing two fire hydrants and noting that there is likely a buried water line between them, signs of trenching activities, asphalt or concrete patches, or linear depressions in the ground surface.

- Following the completion of the utility marking, the work area should be inspected by all members of the project team (client, engineer, and contractor) to inspect and discuss the finding. Adjustments to Site operations, if necessary, should be discussed and agreed upon by the project team prior to initiation of Site work. If possible, work areas should be re-located away from utilities.

- If conditions allow, consider using vacuum excavation.

- Due to the prevalence of unknown or unmarked utilities in the NYC area, low impact soil removal techniques (potholing) must be implemented to either confirm the presence of utilities or to provide protection of utilities before invasive activities. In such cases, hand excavation, hand auguring, vacuum excavation, water jet removal, or other low impact removal techniques may be necessary to a depth of 8 feet. Hand excavations for utility clearance purposes must be restricted to non-conductive hand tools such as fiber glass or wooden tools. The use of a jack hammer is permitted only for the breakup of surface pavement. In cases where a high priority utility is located within 10 feet of the work area, documentation from the utility owner must be obtained allowing potholing before any work can be conducted. If the utility is not found after potholing is conducted, contact DigAlert and the utility owner immediately to request additional information as to the location of the utility. It is necessary to conduct potholing activities before any work can be conducted in the vicinity (within 10 feet) of the high priority utility.

- If utility location markings are lost, damaged, or faded, a new utility location survey should be conducted to replace the missing or damaged markings. Please note that some municipalities require that all utility markings be removed after work is completed. Black spray paint may be used to cover up utility markings in the street but must be removed from sidewalks.

- In all cases, State, local, utility-specific requirements, facility-specific controls, permits, and operations should be considered and incorporated into the THA.
- Utility protection should be addressed during each tailgate or job briefing in order to reinforce below-ground utility location and the avoidance of above-ground utilities.

4.0 CHEMICAL HAZARDS

Based on the results of soil sampling conducted to date, soils are impacted with select compounds including metals (mercury, nickel, silver, and trivalent and hexavalent chromium), n-propylbenzene, and 4-4-DDE at concentrations detected above UUSCOs and/or PGWSCOs but below the RRUSCOs. Barium and manganese were also detected above RRUSCOs.

Ground water is present approximately 10 feet below the basement floor. Groundwater samples collected from beneath the site contain VOCs, primarily 1,1,1-trichloroethane (1,1,1-TCA), tetrachloroethylene (PCE), trichloroethene (TCE), 1,1-Dichloroethane (1,1-DCA), ,2-Dichloroethylene (1,2-DCE) cis and trans, chloroethane, and vinyl chloride (VC), at concentrations exceeding the NY GWQS. This water is not suitable for drinking/consumption and/or washing. Work where contact with potentially contaminated groundwater requires overboots and nitrile gloves to avoid direct contact with skin. Prior to exiting the exclusion zone, proper decontamination of PPE will be conducted.

Appendix 6 includes Safety Data Sheets (SDS) and pertinent health information from the National Institute for Occupational Safety and Health (NIOSH, 2007).

Table 4 summarizes the exposure limits and health hazards for expected contaminants.

Chemical	OSHA PEL	Primary Health Hazard (Organs)
1,2,4,5-Tetramethylbenzene	None	Resp, ingestion, skin, eyes
1,1,1-Trichloroethane	350 ppm	Suspect human carcinogen, skin, eyes
Tetrachloroethylene	100 ppm (200 ppm for 5 min)	Eyes, skin, resp sys, liver, kidneys, CNS
Tetrachloroethene	100 ppm (200 ppm for 5 min)	Suspect human carcinogen, skin
Trichloroethylene	100 ppm	Eyes, skin, resp sys, liver, kidney, CNS
Trichloroethene	100 ppm (200 ppm for 5 min)	Suspect human carcinogen, skin, eye
Vinyl Chloride	1 ppm	Liver, CNS, blood, resp syst, lymphatic sys
1,1-Dichloroethane	100 ppm	Skin, liver, kidneys, lungs, CNS
1,2-Dichloroethylene (cis, trans)	200 ppm	Eyes, resp system, CNS
Chloroethane	1000 ppm	Eyes, kidneys, liver, cardiovascular system, CNS

Chemical	OSHA PEL	Primary Health Hazard (Organs)
Barium	0.5 mg/m³	Eyes, skin, rep, kidney
Chromium, Trivalent	0.5 mg/m^3	Eyes, skin
Chromium, Hexavalent	5 µg/m3	Eyes, resp, kidney, nose, skin, liver, carcinogen
Copper	1 mg/m^3	Eyes, skin, resp, liver, kidney
Lead	0.050 mg/m^3	Eye, gastrointestinal, CNS, kidney, blood
Manganese	1 mg/m^3	Resp, CNS, blood, kidney
Mercury	0.1 mg/m^3	Eyes, skin, resp, CNS, kidney
Silver	0.01 mg/m^3	Nasal, skin, eyes
Zinc	15 mg/m^3	Resp system
n-propylbenzene	None	Resp, skin, eyes, kidney
4'4-DDE	None	Carcinogen, resp, skin

Notes:
CNS = Central nervous system
Resp – respiratory system

4.1 Respirable Dust

Dust may be generated from drilling or other remediation activities other than soil excavation. However, as noted above soil excavation activities have the potential to disturb soils with contaminants of concern at the site. The dust control monitoring activities detailed in Section 3.1.3 should be followed to ensure protection from potentially impacted dust.

If this threshold is exceeded, the HSO will take corrective actions as defined herein, including increasing the amount of water applied to the material and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges. Please refer to the OSHA Small Entity Compliance Guide for the Respiratory Protection Standard in **Appendix 4** for additional information regarding respirator use and training.

4.2 Organic Vapors

Based on the initial subsurface investigation sampling results, organic vapors may be encountered during drilling, excavation or other sub-surface activities. The HSO will monitor

organic vapors in the breathing zone with a photo-ionization detector (PID) during all activities involving soil excavation to determine whether organic vapor concentrations exceed the following action levels.

Volatile organic compounds (VOCs) should be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise determined by the HSO.

Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 1 parts per million (ppm) above background for a 15 minute average, work activities must be temporarily halted. Screening for Vinyl Chloride should be conducted. If no Vinyl Chloride is detected above 1 ppm work activities can resume with continued monitoring for total VOCs. If Vinyl Chloride is detected at a concentration greater than 1 ppm, stop work, withdrawal from work area, institute engineering controls and/or respiratory protection as appropriate.

2. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for a 15 minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background (and no Vinyl Chloride is present above 1 ppm), work activities can resume with continued monitoring.

3. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels more than 5 ppm over background but less than 25 ppm (and no Vinyl Chloride is present above 1 PPM), work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions or don appropriate respiratory protection and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background (and no Vinyl Chloride is present above 1 ppm) for a 15-minute average.

4. If the organic vapor level is 25 ppm above background at the perimeter of the work area, activities must be shutdown and appropriate institutional controls implemented.

5. All 15-minute readings must be recorded and be available for review. Instantaneous readings, if any, used for decision purposes should also be recorded in the log sheets included in **Appendix 7**.

4.3 Crystalline Silica

Any drilling, cutting, grinding, or jackhammering of basement concrete slabs may generate crystalline silica dust. Any such work involving powered equipment will follow Table 1—Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica found in CFR 1926.1153 – Respirable Crystalline Silica Standard. Demolition or remedial work involving concrete will require respiratory protection when work activities create an employee exposure above 25 µg/m^3 over an 8-hour time-weighted average. Respiratory protection will be required based on Table 1 of the Silica Standard and will not be based on dust readings in the work zone. All measures to control dust will be employed including equipment with integrated water delivery systems, proper operation, dust collectors (if available), installed shrouds, and supplemental water application.

5.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120(c), (g), and 1910.132. Protective equipment shall be NIOSH-approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133, 1910.134, and 1926.1153 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only true difference among the levels of protection from D thru B is the addition of the type of respiratory protection.

5.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- standard work uniform, or coveralls, as needed;
- steel toe and steel shank work boots;
- hard hat;
- gloves, as needed;
- safety glasses;
- hearing protection.

5.2 Level C

Level C PPE shall be donned when the concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a PID, or equivalent), and are continuously 5 ppm above background, or otherwise when required by OSHA's respiratory protection guidelines (See **Appendix 4**)

The specifications on the APR filters used must be appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned. hen the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- chemical resistant or coated Tyvek coveralls;
- steel-toe and steel-shank work boots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves (surgical gloves);
- disposable outer gloves;
- full-face APR fitted with organic vapor/dust and mist filters or filters appropriate for the identified or expected contaminants;

- hard hat;
- splash shield, as needed; and,
- ankles/wrists taped with duct tape.

The HSO will verify if Level C is appropriate by checking organic vapor concentrations using compound and/or class-specific detector tubes or taking air samples for laboratory testing.

5.3 Level B

Level B PPE shall be donned when the contaminants have not been identified and/or the concentrations of unknown measured total organic vapors in the breathing zone exceed 25 ppm above background (using a PID, or equivalent).

Level B PPE shall be donned if the IDLH of a known contaminant is exceeded. If a contaminant is identified or is expected to be encountered for which NIOSH and/or OSHA recommend the use of a positive pressure self-contained breathing apparatus (SCBA) when that contaminant is present, In this instance (exceedance of IDLH) Level B PPE shall be donned even though the total organic vapors in the breathing zone may not exceed 25 ppm.

Level B shall be donned for confined space entry, and when the atmosphere is oxygen deficient (oxygen less than 19.5%) or potentially oxygen deficient.

If Level B PPE is required for a task, at least three people shall be donned in Level B at any one time during that task. PPE shall only be donned at the direction of the HSO. Level B PPE consists of:

- supplied air SCBA or airline system with five-minute egress system;
- chemical resistant coveralls;
- steel-toe and steel-shank work boots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves;
- disposable outer gloves;
- hard hat; and,
- ankles/wrists taped.

The exact PPE ensemble is decided on a site-by-site basis by the Health and Safety Officer with the intent to provide the most protective and efficient worker PPE.

5.4 Activity-Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based on air monitoring results (Sections 3 and 4) and properties of identified or expected contaminants. Positive displacement ventilation equipment for work within the building will allow workers engaged in excavation activities to remain in Level D. All other sitework will be conducted in Level D, with the possibility of upgrade to Level C as directed by the HSO.

6.0 COMMUNITY AIR MONITORING PROGRAM

A community air monitoring program (CAMP) has been prepared for the Site in accordance with *Appendix 1A New York State Department of Health Generic Community Air Monitoring Plan* included within the New York State Department of Environmental Conservation (NSYDEC) DER-10 Technical Guidance for Site Investigation and Remediation (issued May 3, 2010).

7.0 SITE CONTROL

7.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the HSO will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The HSO will outline these locations before work begins and when zones change. The HSO records this information in the site logbook.

Remedial investigation and remediation of this site may involve handling of material and environmental media which requires 40-hour HAZWOPER training. Personnel entering the work zone (aka exclusion zone) must have OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training if potential exposure to hazardous materials is anticipated during any of the proposed activities, and current 8-hour refresher HAZWOPER training. The exclusion zone is defined by the HSO but will typically be a 50-foot area around work activities. Gross decontamination (as determined by the HSO) is conducted in the exclusion zone, all other decontamination is performed in a designated decontamination zone.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated according to the procedures outlined in Section 9.0. All personnel and equipment exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, hand washing station, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating and drinking, in combination with standard hygiene procedures (hand washing), are permitted only in the support zone. Smoking is not permitted on construction sites, including demolition in NYC. When a decontamination trailer is not provided, the eye wash unit, hand washing station, first aid equipment, and drinking water are kept at a central location designated by the HSO.

7.2 General Field Safety and Standard Operating Procedures

These policies are to control hazards at all site areas by limiting entrance to the work site to essential personnel and by implementing the following rules:

- Non-essential (as judged by the HSO) personnel and unauthorized persons will not enter the exclusion or decontamination zone.

- Before entering the exclusion or decontamination zones, all personnel must be familiar with emergency response procedures (Section 10.0), site safety locations, first aid and communication equipment, and the location of the map to the hospital and the list of emergency telephone numbers.
- The buddy system will be used at all times by field personnel in the exclusion zone; no one is to perform work within the exclusion zone alone. When in Level D or C, visual contact or radio contact shall be maintained at all times. In Level B, visual contact shall be maintained at all times, and radio contact shall be maintained with the decontamination and/or support zone.
- Contact with contaminated and potentially contaminated surfaces should be avoided. Walk around (not through) puddles and discolored surfaces. Do not kneel on the ground or place equipment on the ground. Protect equipment from contamination.
- All personnel exiting the exclusion zone must exercise the decontamination procedures described in Section 8.0 of this CHASP.
- Beards or other facial hair that interferes with respirator fit will preclude admission to the exclusion zone. Contact lenses shall not be worn in the exclusion or decontamination zones, or if the worker may be expected to enter these zones under routine or emergency situations.
- Eating and drinking is permitted only in designated areas in the support zone.
- Each worker must be supplied with and maintain his/her own personal protective equipment.

Note: These policies will be enforced by the designated HSO.

8.0 DECONTAMINATION PROCEDURES

All equipment and PPE exiting the exclusion zone must be decontaminated or properly discarded upon exit. All personnel must enter and exit the exclusion zone through the decontamination area. The exclusion and decontamination zones may change depending on the nature of the site work. Plastic bags containing personal protective clothing and equipment will be placed in designated receptacles.

All boots and other potentially contaminated garments that have come in contact with hazardous materials will be cleaned in wash tubs with detergent/water solution and rinsed with water and must remain on site. The wash water, rinse water, and residues will be collected and properly stored until sampling results are received and the final method of disposal can be determined. Disposable PPE, including spent respirator cartridges and canisters, will be properly bagged and disposed of. All contaminated boots, clothing, and equipment (e.g. leather boots, equipment carrying straps) that cannot be decontaminated will be disposed of with the disposable garments or left on site in the decontamination trailer.

The *minimum* measures for Level B doffing and decontamination are:

- deposit equipment on plastic drop cloths;
- scrub reusable outer boots and gloves with a water and detergent solution and rinse;
- remove outer boots and outer gloves. Discard disposable outer garments in receptacle provided;
- remove SCBA and face piece and place on rack provided;
- remove tyvek/outer garment and place in receptacle provided;
- remove inner gloves and deposit in receptacle provided; and,
- shower/wash face and hands.

The *minimum* measures for Level C doffing and decontamination are:

- deposit equipment on plastic drop cloths;
- scrub reusable outer boots and gloves (if worn) with a water and detergent solution and rinse;
- remove outer boots and outer gloves. Discard disposable outer garments in receptacle provided;
- remove tyvek/outer garment and place in receptacle provided;
- remove first pair of inner gloves;
- remove respirator (using “clean” inner gloves) and place on rack provided;
- remove last pair of inner gloves and deposit in receptacle provided; and,
- shower/wash face and hands.

The second to last item to be removed is the APR, and the last item to be removed is the last of several pairs of surgical gloves. Wearing several pairs of inner gloves permits layers to be removed as needed during various stages of the doffing procedure, and if the APR inadvertently becomes contaminated, inner gloves guard against bare hands contacting the APR.

Equipment that comes into contact with site contaminants is decontaminated according to manufacturer specifications. Decontamination is done in the exclusion or decontamination zones.

9.0 CONTINGENCY PLAN/EMERGENCY RESPONSE PLAN

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment. These will be outlined in the site specific ECHASP.

9.1 Emergency Equipment On-site

Private telephones:	Site personnel.
Two-way radios:	Site personnel where necessary.
Emergency Alarms:	On-site vehicle horns*.
First aid kits:	On-site, in vehicles or office.
Fire extinguisher:	On-site, in office or on equipment.

* Horns: Air horns will be supplied to personnel at the discretion of the project superintendent or HSO.

9.2 Emergency Telephone Numbers

General Emergencies	**911**
New York City Police	**911**
New York City Police (non-emergency)	**1-212 767-8400**
Midtown North Precinct	
NYSDEC Spills Division	**1-800-457-7362**
NYSDEC Hazardous Waste Division	**1-718-482-4994**
	1-718-482-4098
NYCDEP	**311 or**
	1-212-639-9675
NYC Department of Health	**311 or**
	1-212-639-9675
NYC Fire Department	**911 or 311**
New York Fire Department (non-emergency)	**1-718-999-2222**
National Response Center	**1-800-424-8802**
Poison Control	**1-212-340-4494**
Hospital - Mount Sinai West	**1-212-636-3375**

A copy of this page shall be posted in the office and a copy is provided in **Appendix 8**.

9.3 Personnel Responsibilities During an Emergency

The project superintendent is primarily responsible for responding to and correcting any emergency situations. However, in the absence of the project superintendent, the HSO shall act as the project superintendent's on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, evacuate and secure the site, or upgrade/downgrade the level of protective clothing and respiratory protection;

- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;

- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;

- Determine the cause of incidents and make recommendations to prevent recurrence;

and,

- Ensure that all required reports have been prepared.

9.4 Medical Emergencies

Any person who becomes ill or injured in the exclusion zone will be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination will be completed and first aid administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (**Appendix 10**) must be filled out for any injury.

Any person transporting an injured/exposed person to a clinic or hospital for treatment will take the directions to the hospital (**Appendix 10**) and information on the chemical(s) to which they may have been exposed.

9.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. The HSO or his designated alternate will advise the fire commander of the location, nature and identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- Use fire-fighting equipment available on site; or,

- Remove or isolate flammable or other hazardous materials that may contribute to the fire.

9.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will follow these instructions:

- Keep upwind of smoke, vapors, or spill location.

- Exit through the decontamination corridor if possible.

- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.

- The HSO will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.

- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

- Gather at the established muster point and direct emergency services to the same rendezvous location.

9.7 Spill Control Procedures

In the event of a leak or a release, site personnel will:

- inform their supervisor immediately;

- locate the source of the spillage and stop the flow if it can be done safely; and,

- begin containment and recovery of the spilled materials.

Field monitoring equipment and spill control equipment available at each site will be outlined in the site specific CHASP.

9.8 Vapor Release Plan

If work zone organic vapor (excluding methane) exceeds 5 ppm (1 ppm if Vinyl Chloride is detected), then a downwind reading will be made either 200 feet from the work zone or at the property line, whichever is closer. If readings at this location exceed 5 ppm over background, the work will be stopped.

If 5 ppm of volatile organics are recorded over background on a PID at the property line, then an off-site reading will be taken within 20 feet of the nearest residential or commercial property, whichever is closer. If efforts to mitigate the emission source are unsuccessful for 30 minutes, then the designated HSO will:

- contact the local police;

- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two successive readings are below 5 ppm (non-methane), off-site air monitoring will be halted.

- all property line and off-site air monitoring locations and results associated with vapor releases will be recorded in the site safety log book.

APPENDICES

APPENDIX 1

Site Safety Acknowledgement Form

HEALTH AND SAFETY PLAN

APPENDIX 1 – SITE SAFETY ACKNOWLEDGEMENT FORM

SITE NAME/PROJECT NUMBER: 245 WEST 55th STREET – PROJECT NO. 23-0001

LOCATION: 245 West 55th Street, Manhattan, New York

ENVIRONMENTAL LOGIC FIELD SUPERVISOR: _____

I have read, understood, and agreed to comply with the provisions of the above referenced job site Construction Health and Safety Plan for work activities on this site.

Name (Print)	Company	Signature	Date

APPENDIX 2

Site Safety Plan Amendments

ENVIRONMENTAL LOGIC
SITE SAFETY PLAN AMENDMENTS

SITE SAFETY PLAN AMENDMENT # _____: _____

SITE NAME: _____

REASON FOR AMENDMENT: _____

_____

_____

ALTERNATE PROCEDURES: _____

_____

_____

REQUIRED CHANGES IN PPE: _____

_____

_____

_____ _____
HEALTH & SAFETY OFFICER DATE

_____ _____
CONTRACTOR REPRESENTATIVE DATE

APPENDIX 3

Groundwater Injection Program – Safety Data Sheets

Patented *Injection Ready* 60% SRS®-SD Small Droplet Emulsified Vegetable Oil (EVO) Substrate for Maximum Radius of Influence

United States Patent #RE40,448

SAFETY DATA SHEET

1. Product Identification

Synonyms:	60% Small Droplet Slow-Release Substrate (SRS®-SD) Emulsified Vegetable Oil Substrate (EVO)
Recommended Use:	Treatment of groundwater contaminated with chlorinated solvents and other anaerobically degradable compounds.
Supplier:	Terra Systems, Inc. 130 Hickman Road, Suite 1 Claymont, Delaware 19703 Telephone (302) 798-9553 Fax (302) 798-9554 www.terrasystems.net

2. Hazards Identification

Emergency Overview	
Caution:	May cause eye irritation.
Health Rating:	1 - Slight
Flammability Rating:	1 - Slight
Reactivity Rating:	1 - Slight
Contact Rating:	1 - Slight
Protective Equipment:	Goggles; Proper Gloves
Storage Color Code:	Green (General Storage)
Potential Health Effects	
Inhalation:	Not expected to be a health hazard. If heated, may produce vapors or mists that irritate the mucous membranes and cause irritation, dizziness, and nausea. Remove to fresh air.
Ingestion:	Not expected to be a health hazard via ingestion. Large doses may produce abdominal spasms or diarrhea.
Skin Contact:	No adverse effects expected. May cause irritation or sensitization in sensitive individuals.
Eye Contact:	May cause mild irritation, possible reddening.
Chronic Exposure:	No information found.
Aggravation of Pre-existing Conditions:	No information found.

3. Composition/Information on Ingredients

Ingredient	Synonyms	CAS #	Percent	Hazardous
Soy bean oil	Soya oil	8001-22-7	60%	No
Emulsifiers and proprietary nutrient package containing nitrogen, phosphorus and vitamin B_{12}		Mixture	7.5 - 10%	No
a quick release food grade soluble substrate such as lactate or glycerol	2-hydroxpropionic acid sodium salt or propane-1,2,3-triol	72-17-3 or 56-81-5	5.5%	Yes
Water		7732-18-5	Difference	No

The emulsifiers and nutrient package mixture is a trade secret and consists of ingredients of unknown acute toxicity.

4. First Aid Measures

Inhalation: Not expected to require first aid measures. Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion: If large amounts were swallowed, give water to drink and get medical advice.

Skin Contact: Not expected to require first aid measures. Wash exposed area with soap and water. Get medical advice if irritation develops.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

5. Fire Fighting Measures

Fire: Flash point: >200 C (>392 F). Not considered to be a fire hazard. Isolate from heat and open flame.

Explosion: Not considered to be an explosion hazard. Closed containers may explode if exposed to extreme heat.

Fire Extinguishing Media: Dry chemical, foam, or carbon dioxide. Water spray may be ineffective on fire but can protect fire-fighters and cool closed containers. Use fog nozzles if water is used.

Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Clean-up personnel may require protective clothing. Absorb in sand, paper towels, “Oil Dry”, or other inert material. Scoop up and containerize for disposal. Flush trace residues to sewer with soap and water. Containerized waste may be sent to an approved waste disposal facility.

7. Handling and Storage

Store in a cool, dry, ventilated area. Do not store in sunlight or above 32 C (90 F). Keep container tightly closed and upright when not in use to prevent leakage. Observe all warnings and precautions listed for the product. Protect against physical damage.

If container begins to bulge, open cap slowly to release carbon dioxide from biological activity on the SRS-SD and call TSI.

Containers of this material are not hazardous when empty since they do not contain vapors or harmful substances; if drum or tote is observed to bulge, keep cap off as pressurization can occur on empty container with caps in place unless container is thoroughly rinsed.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:	None established.
Ventilation System:	Not expected to require any special ventilation.
Personal Respirators (NIOSH Approved):	Not expected to require personal respirator usage.
Skin Protection:	Wear protective gloves and clean body-covering clothing.
Eye Protection:	Use chemical safety goggles and/or a full-face shield where splashing is possible. Provide readily accessible eye wash stations and safety showers.
Slips, Trips, and Falls:	Material is slippery when spilled. Clean up with sand, paper towels, “Oil Dry”, or other inert material.

9. Physical and Chemical Properties

Appearance:	White liquid.
Odor:	Vegetable oil.
Solubility:	Miscible in water.
Specific Gravity (water=1):	0.95-0.98. 8.09 pounds per gallon.
pH:	6-7 (40% aqueous solution)
% Volatiles by volume @ 21C (70F):	Negligible.
Boiling Point:	≥ 100C (≥ 212F)
Melting Point:	No information found.
Flash Point (F):	No information found.
Autoignition Temperature:	No information found.
Decomposition Temperature:	No information found.
Vapor Density (Air=1):	No information found.
Vapor Pressure (mm Hg):	< 1.0 @ 20C (68F).

Evaporation Rate (BuAc=1):	No information found.
Viscosity @23 C (73 F):	213 centipoises (1.2 centipoises diluted 1:10)
Partition Coefficient (octanol/water):	No information found.

10. Stability and Reactivity

Stability:	Stable under ordinary conditions of use and storage.
Reactivity:	Not reactive under ordinary conditions.
Hazardous Decomposition Products:	Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:	Will not occur.
Incompatibilities:	Strong oxidizers, acids.
Conditions to Avoid:	Incompatibles. Isolate from heat and open flame.

11. Toxicological Information

Soybean Oil:	No information found on toxicology. It is not a carcinogen listed by IARC, NTP, NIOSH, OSHA, or ACGIH.
Emulsifier/Nutrient Mixture:	No information found on toxicology. It is not a carcinogen listed by IARC, NTP, NIOSH, OSHA, or ACGIH.
Sodium Lactate:	Oral rat LD50: 2,000 mg/kg. 100 mg caused mild irritation to rabbit eye in Draize test. This compound is not listed as a carcinogen by IARC, NRP, NIOSH, OSHA, or ACGIM.
SRS-SD:	The toxicity of the mixture has not been measured.

12. Ecological Information

Environmental Fate:	No information found.
Environmental Toxicity:	No information found.
Degradability:	This product is completely biodegradable under both aerobic and anaerobic conditions.
Soil Mobility:	This compound will move with groundwater until the adsorbed onto the soil. Degradation products may be mobile.
Bioaccumulation Potential:	No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

OSHA STATUS: This product is not hazardous under the criteria of the Federal OSHA hazard Communication Standard 29 CFR 1910.1200. However, thermal processing and decomposition fumes from this product may be hazardous as noted in Section 10.

TSCA STATUS: No component of this product is listed on the TSCA inventory.

CERCLA (Comprehensive Response Compensation, and Liability Act): Not reportable.

SARA TITLE III (Superfund Amendments and Reauthorization Act)
Section 312 Extremely Hazardous Substances: None
Section 311/312 Hazard Categories: Non-hazardous Under Section 311/312
Section 313 Toxic Chemicals: None

RCRA STATUS: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

CALIFORNIA PROPOSITION 65: The following statement is made in order to comply with the California safe Drinking Water and Toxic Enforcement Act of 1986. The product contains no chemicals known to the State of California to cause cancer.

16. Other Information

NFPA Ratings:	Health: **1** Flammability: **1** Reactivity: **1**
Date Prepared:	September 11, 2019
Revision Information:	SDS Section(s) changed since last revision of document include: Updated Section 3 Composition/Information on Ingredients.
Disclaimer:	Terra Systems, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. TERRA SYSTEMS, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE

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Prepared by: Terra Systems, Inc.
Phone Number: (302) 798-9553 (U.S.A.)

Injection Ready 60% QRS-SL™ Sodium Lactate Quick Release Substrate
SAFETY DATA SHEET

Effective Date: 01-01-2020

1. Product Identification

Synonyms:	Quick Release Substrate (QRS™-SL); Sodium Lactate; Propanoic acid, 2-Hydroxy Monosodium salt; L-Lactic Acid, Sodium Salt
Recommended Use:	Treatment of groundwater contaminated with chlorinated solvents and other anaerobically degradable compounds.
Supplier:	Terra Systems, Inc. 130 Hickman Road, Suite 1 Claymont, Delaware 19703 Telephone (302) 798-9553 Fax (302) 798-9554 www.terrasystems.net

2. Hazards Identification

Emergency Overview	
Caution:	May cause eye irritation.
Health Rating:	1 - Slight
Flammability Rating:	0 - None
Reactivity Rating:	0 - None
Contact Rating:	1 - Slight
Protective Equipment:	Goggles; Proper Gloves
Storage Color Code:	Orange (General Storage)
Potential Health Effects	
Inhalation:	Not expected to be a health hazard
Ingestion:	Not expected to be a health hazard via ingestion
Skin Contact:	No adverse effects expected
Eye Contact:	May cause irritation, possible reddening
Chronic Exposure:	No information found
Aggravation of Pre-existing Conditions:	No information found

3. Composition/Information on Ingredients

Ingredient	CAS#	Percent	Hazardous
Sodium Lactate	72-17-3	60	Yes
Water	7732-18-5	40	No

4. First Aid Measures

Inhalation: Not expected to require first aid measures. Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion: If large amounts were swallowed, give water to drink and get medical advice.

Skin Contact: Not expected to require first aid measures. Wash exposed area with soap and water. Get medical advice if irritation develops.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

5. Fire Fighting Measures

Fire: Flash point: 110 C (230 F). Not considered to be a fire hazard.

Explosion: Not considered to be an explosion hazard.

Fire Extinguishing Media: Use any means suitable for extinguishing surrounding fire.

Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Clean-up personnel may require protective clothing. Absorb in sand, paper towels, “Oil Dry”, or other inert material. Scoop up and containerize for disposal. Flush trace residues to sewer with soap and water. Containerized waste may be sent to an approved waste disposal facility.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Avoid long storage times. Containers of this material may be hazardous when empty since they do retain product residues (vapors, liquid). Observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:	None established.
Ventilation System:	Not expected to require any special ventilation.
Personal Respirators (NIOSH Approved):	Not expected to require personal respirator usage.
Skin Protection:	Wear protective gloves and clean body-covering clothing.
Eye Protection:	Use chemical safety goggles and/or a full face shield where splashing is possible. Provide readily accessible eye wash stations and safety showers.
Slips, Trips, and Falls:	Material is slippery when spilled. Clean up with sand, paper towels, or other inert material.

9. Physical and Chemical Properties

Appearance:	Colorless to yellow liquid.
Odor:	Odorless
Solubility:	100% soluble in water.
Specific Gravity (water=1):	1.32. (11.01 pounds per gallon)
pH:	6.5-8.5
% Volatiles by volume @ 21C (70F):	No information found.
Boiling Point:	110 C (230 F)
Melting Point:	17 C (63 F)
Flash Point (F):	No information found
Autoignition Temperature:	No information found
Decomposition Temperature:	No information found.
Vapor Density (Air=1):	0.7
Vapor Pressure (mm Hg):	14 @ 20 C (68 F)
Evaporation Rate (BuAc=1):	No information found
Viscosity @23 C (73 F):	100 centipoises
Partition Coefficient (octanol/water):	No information found

10. Stability and Reactivity

Stability:	Stable under ordinary conditions of use and storage.
Reactivity:	Not reactive under ordinary conditions.
Hazardous Decomposition Products:	Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:	Will not occur.
Incompatibilities:	Strong oxidizers, acids.
Conditions to Avoid:	Incompatibles. Isolate from heat and open flame.

11. Toxicological Information

Oral rat LD50: 2000 mg/Kg. Irritation Data for Sodium Lactate: (Std Draize, rabbit, eye): 100 mg - mild.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Sodium Lactate (72-17-3)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate: Mobile with water and readily biodegradable

Environmental Toxicity: Ecological injuries are not known or expected under normal use; (No effect on Daphnia @ 10g/L)

Degradability: This product is completely biodegradable under both aerobic and anaerobic conditions.

Soil Mobility: This compound will move with groundwater until the adsorbed onto the soil. Degradation products may be mobile.

Bioaccumulation Potential: No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

Terra Systems, Inc.
130 Hickman Road, Suite 1, Claymont, Delaware 19703
Contact: Michael Free, VP, Sales and Marketing
Office: 302-798-9553; Cell: 484-889-2214 Email: mfree@terrasystems.net

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Sodium Lactate (72-17-3)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

	--Canada--			
Ingredient	Korea	DSL	NDSL	Phil.
Sodium Lactate (72-17-3)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

	-SARA 302-		------SARA 313------	
Ingredient	RQ	TPQ	List	Chemical Catg.
Sodium Lactate (72-17-3)	No	No	No	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

	-RCRA-	-TSCA-	
Ingredient	CERCLA	261.33	8(d)
Sodium Lactate (72-17-3)	No	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

16. Other Information

NFPA Ratings: Health: **1** Flammability: **0** Reactivity: **0**

Date Prepared: March 28, 2014

Revision Information: SDS Section(s) changed since last revision of document include: None.

Disclaimer: Terra Systems, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the

material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. TERRA SYSTEMS, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, TERRA SYSTEMS, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Prepared by: Terra Systems, Inc.
Phone Number: (302) 798-9553 (U.S.A.)

Terra Systems, Inc.
130 Hickman Road, Suite 1, Claymont, Delaware 19703
Contact: Michael Free, VP, Sales and Marketing
Office: 302-798-9553; Cell: 484-889-2214 Email: mfree@terrasystems.net

Safety Data Sheet

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: TCA-20B microbial consortium.

Manufacturer Aptim 17 Princess Road, Lawrenceville, NJ 08648. Phone (609) 895-5340

CAS #: N/A (Not Applicable)

Product Use: For remediation of contaminated groundwater (environmental applications).

Material Description: Non-toxic, naturally occurring, non-pathogenic, non-genetically altered anaerobic microbes in a water-based medium.

IN CASE OF EMERGENCY CALL CHEMTREC 24 HOUR EMERGENCY RESPONSE PHONE NUMBER (800) 424-9300

SECTION 2 – COMPOSITIONS AND INFORMATION ON INGREDIENTS

Components	%	OSHA PEL	ACGIH TLV	OTHER LIMITS
Non-Hazardous Ingredients	100	N/A	N/A	N/A

Based on Microbial Insights QuantArray®-Chlor analysis, the TCA-20B microbial consortium is comprised of microorganisms of the genera *Dehalobacter (DCM), Dehalococcoides (DHC), Desulfitobacterium (DSB),* and *Dehalobium chlorocoercia (DECO),* as well as sulfate reducing bacteria (APS) and methanogenic archaebacteria (MGN).

SECTION 3 – HAZARDS IDENTIFICATION

The available data indicates no known hazards associated with exposure to this product. Nevertheless, individuals who are allergic to enzymes or other related proteins should avoid exposure and handling. Health effects associated with exposure to similar organisms are listed below.

Ingestion: Ingestion of large quantities may result in abdominal discomfort including nausea, vomiting, cramps, diarrhea, and fever.

Inhalation: Hypersensitive individuals may experience breathing difficulties after inhalation of aerosols.

Skin Absorption: May cause irritation upon prolonged contact. Hypersensitive individuals may experience allergic reactions.

Eye contact: May cause irritation unless immediately rinsed.

SECTION 4 – FIRST AID MEASURES

Ingestion: Thoroughly rinse mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Get immediate medical attention. Never give anything by mouth to an unconscious or convulsing person.

Inhalation: Get medical attention if allergic symptoms develop.

Skin Absorption: N/A

Skin Contact: Wash affected area with soap and water. Get medical attention if allergic symptoms develop.

Eye Contact: Flush eyes with plenty of water for at least 15 minutes using an eyewash fountain, if available. Get medical attention if irritation occurs.

NOTE TO PHYSICIANS: All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this material may have occurred.

SECTION 5 – FIRE AND EXPLOSION DATA

Flammability of the Product: Non-flammable

Flash Point: N/A

Flammable Limits: N/A

Fire Hazard in Presence of Various Substances: N/A

Explosion Hazard in Presence of Various Substances: N/A

Extinguishing Media: Foam, carbon dioxide, water

Special Fire Fighting Procedures: None

Unusual Fire and Explosion Hazards: None

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Reportable quantities (in lbs of EPA Hazardous Substances): N/A

No emergency results from spillage. However, spills should be cleaned up promptly. Absorb with an inert material and put the spilled material in an appropriate waste disposal container. All personnel involved in the cleanup must wear protective clothing and avoid skin contact. After clean-up, disinfect all cleaning materials and storage containers that come in contact with the spilled liquid.

SECTION 7 – HANDLING AND STORAGE

Avoid breathing breathe aerosol. Avoid contact with skin. Use personal protective equipment recommended in Section 8.
Keep containers tightly closed in a cool, well-ventilated area. The TCA-20B microbial consortium is typically supplied in stainless steel kegs equipped with pressure relief valves. The kegs are pressurized with Nitrogen gas (N_2) up to the pressure of 15 psi. **Do not exceed pressure of 15 psi during transfer of TCA-20B microbial consortium from kegs.** Don't open keg if content of the keg is under pressure.

TCA-20B microbial consortium may be stored for up to 3 weeks at temperature 2-4°C without aeration. Avoid freezing.

SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

Hand Protection: Rubber, nitrile, or vinyl gloves.

Eye Protection: Safety goggles or glasses with side splash shields.

Protective Clothing: Use adequate clothing to prevent skin contact.

Respiratory Protection: N95 respirator if aerosols might be generated.

Ventilation: Provide adequate ventilation to remove odors.

Other Precautions: An eyewash station in the work area is recommended.

SECTION 9 – PHYSICAL/CHEMICAL CHARACTERISTICS

Physical state and appearance: Light greenish murky liquid. Musty odor.

Boiling Point: 100°C (water)

Specific Gravity (H_2O = 1): 0.9 - 1.1

Vapor Pressure @ 25°C: 24 mm Hg (water)

Melting Point: 0°C (water)

Vapor Density: N/A

Evaporation Rate (H_2O = 1): 0.9 - 1.1

Solubility in Water: Soluble

Water Reactive: No

pH: 6.0 - 8.0

SECTION 10 – STABILITY AND REACTIVITY DATA

Stability: Stable

Conditions to Avoid: None

Incompatibility (Materials to Avoid): Water-reactive materials

Hazardous Decomposition Byproducts: None

SECTION 11 – TOXICOLOGICAL INFORMATION

This product contains no toxic ingredients.
TCA-20B consortium has tested negative for pathogenic microorganisms such as *Bacillus cereus, Listeria monocytogens, Salmonella* sp., Fecal Coliforms, Total Coliforms, Yeast and Mold and *Pseudomonas* sp.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity: this material will degrade in the environment.

SECTION 13 – DISPOSAL CONSIDERATIONS

Waste Disposal Method: No special disposal methods are required. The material is compatible with all known biological treatment methods. To reduce odors and permanently inactivate microorganisms, mix 100 parts (by volume) of TCA-20B consortium with 1 part (by volume) of bleach. Dispose of in accordance with local, state and federal regulations.

SECTION 14 – TRANSPORT INFORMATION

DOT Classification: N/A
Labeling: NA
Shipping Name: Not regulated

SECTION 15 – REGULATORY INFORMATION

Federal and State Regulations: N/A

SECTION 16 – OTHER INFORMATION

MSDS Code: ENV 1100
MSDS Creation Date: May 05, 2024

While the information and recommendations set forth herein are believed to be accurate as of the date hereof, APTIM MAKES NO WARRANTY WITH RESPECT HERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

Safety Data Sheet

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: DHC microbial consortium (SDC-9)

Manufacturer Aptim 17 Princess Road, Lawrenceville, NJ 08648. Phone (609) 895-5340

CAS #: N/A (Not Applicable)

Product Use: For remediation of contaminated groundwater (environmental applications).

Material Description: Non-toxic, naturally occurring, non-pathogenic, non-genetically altered anaerobic microbes in a water-based medium.

IN CASE OF EMERGENCY CALL CHEMTREC 24 HOUR EMERGENCY RESPONSE PHONE NUMBER (800) 424-9300

SECTION 2 – COMPOSITIONS AND INFORMATION ON INGREDIENTS

Components	%	OSHA PEL	ACGIH TLV	OTHER LIMITS
Non-Hazardous Ingredients	100	N/A	N/A	N/A

DHC microbial consortium (SDC-9) comprised of microorganism of the genus *Dehalococcoides, Desulfovibrio, Desulfitobacterium,* and methanogenic archaebacteria.

SECTION 3 – HAZARDS IDENTIFICATION

The available data indicates no known hazards associated with exposure to this product. Nevertheless, individuals who are allergic to enzymes or other related proteins should avoid exposure and handling. Health effects associated with exposure to similar organisms are listed below.

Ingestion: Ingestion of large quantities may result in abdominal discomfort including nausea, vomiting, cramps, diarrhea, and fever.

Inhalation: Hypersensitive individuals may experience breathing difficulties after inhalation of aerosols.

Skin Absorption: May cause irritation upon prolonged contact. Hypersensitive individuals may experience allergic reactions..

Eye contact: May cause irritation unless immediately rinsed.

SECTION 4 – FIRST-AID MEASURES

Ingestion: Thoroughly rinse mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Get immediate medical attention. Never give anything by mouth to an unconscious or convulsing person.

Inhalation: Get medical attention if allergic symptoms develop.

Skin Absorption: N/A

Skin Contact: Wash affected area with soap and water. Get medical attention if allergic symptoms develop.

Eye Contact: Flush eyes with plenty of water for at least 15 minutes using an eyewash fountain, if available. Get medical attention if irritation occurs.

NOTE TO PHYSICIANS: All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this material may have occurred.

SECTION 5 – FIRE-FIGHTING MEASURES

Flammability of the Product: Non-flammable

Flash Point: N/A

Flammable Limits: N/A

Fire Hazard in Presence of Various Substances: N/A

Explosion Hazard in Presence of Various Substances: N/A

Extinguishing Media: Foam, carbon dioxide, water

Special Fire Fighting Procedures: None

Unusual Fire and Explosion Hazards: None

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Reportable quantities (in lbs of EPA Hazardous Substances): N/A

No emergency results from spillage. However, spills should be cleaned up promptly. Absorb with an inert material and put the spilled material in an appropriate waste disposal container. All personnel involved in the cleanup must wear protective clothing and avoid skin contact. After clean-up, disinfect all cleaning materials and storage containers that come in contact with the spilled liquid.

SECTION 7 – HANDLING AND STORAGE

Avoid breathing breathe aerosol. Avoid contact with skin. Use personal protective equipment recommended in Section 8.

Keep containers tightly closed in a cool, well-ventilated area. The DHC microbial consortium (SDC-9) can be supplied in stainless steel kegs designed for maximum working pressure of 130 psi and equipped with pressure relief valves. The kegs are pressurized with Nitrogen up to the pressure of 15 psi. Do not exceed pressure of 15 psi during transfer of DHC microbial consortium (SDC-9) from kegs. Don't open keg if content of the keg is under pressure.

DHC microbial consortium (SDC-9) may be stored for up to 4 weeks at temperature 2-4°C without aeration. Avoid freezing.

SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

Hand Protection: Rubber, nitrile, or vinyl gloves.

Eye Protection: Safety goggles or glasses with side splash shields.

Protective Clothing: Use adequate clothing to prevent skin contact.

Respiratory Protection: N95 respirator if aerosols might be generated.

Ventilation: Provide adequate ventilation to remove odors.

Other Precautions: An eyewash station in the work area is recommended.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: Light greenish murky liquid. Musty odor.

Boiling Point: 100°C (water)

Specific Gravity (H_2O = 1): 0.9 - 1.1

Vapor Pressure @ 25°C: 24 mm Hg (water)

Melting Point: 0°C (water)

Vapor Density: N/A

Evaporation Rate (H_2O = 1): 0.9 - 1.1

Solubility in Water: Soluble

Water Reactive: No

pH: 6.0 - 8.0

SECTION 10 – STABILITY AND REACTIVITY

Stability: Stable

Conditions to Avoid: None

Incompatibility (Materials to Avoid): Water-reactive materials

Hazardous Decomposition Byproducts: None

SECTION 11 – TOXICOLOGICAL INFORMATION

This product contains no toxic ingredients.
SDC-9 consortium has tested negative for pathogenic microorganisms such as Bacillus cereus, Listeria monocytogens, Salmonella sp., Fecal Coliform, Total Coliform, Yeast and Mold and Pseudomonas sp.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity: this material will degrade in the environment.

SECTION 13 – DISPOSAL CONSIDERATIONS

Waste Disposal Method: No special disposal methods are required. The material is compatible with all known biological treatment methods. To reduce odors and permanently inactivate microorganisms, mix 100 parts (by volume) of SDC-9 consortium with 1 part (by volume) of bleach. Dispose of in accordance with local, state and federal regulations.

SECTION 14 – TRANSPORT INFORMATION

DOT Classification:	N/A
Labeling:	NA
Shipping Name:	Not regulated

SECTION 15 – REGULATORY INFORMATION

Federal and State Regulations: N/A

SECTION 16 – OTHER INFORMATION

MSDS Code: ENV 1033
MSDS Creation Date: 10/06/2003
Last Revised: July 31, 2017.

While the information and recommendations set forth herein are believed to be accurate as of the date hereof, APTIM MAKES NO WARRANTY WITH RESPECT HERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

SAFETY DATA SHEET

Version 4.9
Revision Date 04/27/2017
Print Date 05/16/2017

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Sodium bicarbonate

Product Number : S5761
Brand : Sigma

CAS-No. : 144-55-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : Sodium hydrogen carbonate

Formula : $CHNaO_3$
Molecular weight : 84.01 g/mol
CAS-No. : 144-55-8
EC-No. : 205-633-8
Registration number : 01-2119457606-32-XXXX

No components need to be disclosed according to the applicable regulations.

4. FIRST AID MEASURES

4.1 Description of first aid measures

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration.

In case of skin contact
Wash off with soap and plenty of water.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapours, mist or gas.
For personal protection see section 8.

6.2 Environmental precautions
No special environmental precautions required.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls
General industrial hygiene practice.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
No special environmental precautions required.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	300 °C (572 °F)

f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	2.160 g/cm3
n)	Water solubility	50 g/l
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Exposure to moisture

10.5 Incompatible materials
Strong acids, Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sodium oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 4,220 mg/kg

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
Skin - Human
Result: Mild skin irritation - 3 d

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation - 30 s

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: VZ0950000

Exposure to large amounts can cause:, Gastrointestinal disturbance, Heavy or prolonged skin exposure may result in the absorption of harmful amounts of material.
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Sodium hydrogencarbonate	144-55-8	

New Jersey Right To Know Components

	CAS-No.	Revision Date
Sodium hydrogencarbonate	144-55-8	

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the

product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.9 Revision Date: 04/27/2017 Print Date: 05/16/2017

SRS®-Z_{VI}-S (4 µm)
Combined Emulsified Vegetable Oil Substrate and 4 µm Sulfidated Zero Valent Iron
SAFETY DATA SHEET

January 1st, 2021

1. Product Identification

Synonyms: Combined Emulsified Vegetable Oil Substrate and 4 µm Sulfidated Zero Valent Iron [SRS®-Z_{VI}-S (4 µm)]; Emulsified Vegetable Oil (EVO) and Zero Valent Iron (ZVI)

Recommended Use: Treatment of groundwater contaminated with DNAPL level concentrations of chlorinated solvents and other anaerobically degradable compounds.

Supplier:
Terra Systems, Inc.
130 Hickman Road, Suite 1
Claymont, Delaware 19703
Telephone (302) 798-9553
Fax (302) 798-9554
www.terrasystems.net

2. Hazards Identification

Emergency Overview

Caution: May cause eye irritation.

Health Rating: 1 - Slight

Flammability Rating: 1 - Slight

Reactivity Rating: 1 - Slight

Contact Rating: 1 - Slight

Protective Equipment: Goggles; Proper Gloves

Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation: Not expected to be a health hazard. May irritate lungs and mucous membranes and cause irritation, dizziness, and nausea. Remove to fresh air.

Ingestion: Not expected to be a health hazard via ingestion. Large doses may produce abdominal spasms, diarrhea.

Skin Contact: No adverse effects expected. May cause irritation or sensitization in sensitive individuals.

Eye Contact: May cause irritation, watering, and possible reddening.

Chronic Exposure: No information found.

Aggravation of Pre-existing

Conditions: No information found.

3. Composition/Information on Ingredients

Ingredient	Synonyms	CAS #	Percent	Hazardous
Soybean oil	Soya oil	8001-22-7	36-54%	No
Iron suspension	ZVI	7439-89-6	10-40%	No
60% Sodium Lactate	2-hydroxpropionic acid sodium salt	72-17-3	3-5%	No
Ferrous sulfide	Iron(II) sulfide	1317-79-9	0-1	No
Emulsifiers and proprietary nutrient package containing nitrogen, phosphorus and vitamin B_{12}		Mixture	4-7%	No

The emulsifiers are a trade secret and consists of ingredients of unknown acute toxicity.

4. First Aid Measures

Inhalation: Not expected to require first aid measures. Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion: If large amounts were swallowed, give water to drink and get medical advice.

Skin Contact: Not expected to require first aid measures. Wash exposed area with soap and water. Get medical advice if irritation develops.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

5. Fire Fighting Measures

Fire: The zero valent iron powder, when dry, may self-combust and has the potential to catch paper towels, rags, etc. on fire. Avoid airborne dispersion of fine powder in an enclosed area to reduce potential dust ignition. Keep SRS®-Z_{VI}-S wet and avoid contact with combustible materials.

Explosion: May generate hydrogen gas vapors that can cause explosion when exposed to a spark or flame. Closed containers may explode if exposed to extreme heat.

Fire Extinguishing Media: Dry chemical, sand, foam, graphite, or carbon dioxide. Water spray may be ineffective on fire but can protect fire-fighters and cool closed containers. Use fog nozzles if water is used.

Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face

piece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Clean-up personnel may require protective clothing. Absorb in sand, paper towels, “Oil Dry”, or other inert material. Scoop up and containerize for disposal. Flush trace residues to sewer with soap and water. Containerized waste may be sent to an approved waste disposal facility.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material are not hazardous when empty since they do not contain vapors or harmful substances; observe all warnings and precautions listed for the product. Do not store above 49 C (120 F). Keep container tightly closed and upright when not in use to prevent leakage.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:	None established.
Ventilation System:	Not expected to require any special ventilation.
Personal Respirators (NIOSH Approved):	Not expected to require personal respirator usage.
Skin Protection:	Wear protective gloves and clean body-covering clothing.
Eye Protection:	Use chemical safety goggles and/or a full-face shield where splashing is possible. Provide readily accessible eye wash stations and safety showers.
Slips, Trips, and Falls:	Material is slippery when spilled. Clean up with sand, paper towels, “Oil Dry”, or other inert material.

9. Physical and Chemical Properties

Appearance:	Gray viscous liquid.
Odor:	Vegetable oil.
Solubility:	Not soluble in water.
Specific Gravity (water=1):	1.06-1.44 (8.81-11.97 pounds per gallon)
pH:	6-8
% Volatiles by volume @ 21C (70F):	Negligible.
Boiling Point:	≥ 100C (≥ 212F)
Melting Point:	No information found.
Flash Point (F):	No information found.
Autoignition Temperature:	No information found.
Decomposition Temperature:	No information found.
Vapor Density (Air=1):	No information found.
Vapor Pressure (mm Hg):	< 1.0 @ 20C (68F).
Evaporation Rate (BuAc=1):	No information found.

Viscosity @23 C (73 F):	440-1,942 centipoises
Partition Coefficient (octanol/water):	No information found.

10. Stability and Reactivity

Stability:	Stable under ordinary conditions of use and storage. May generate hydrogen gas.
Reactivity:	Not reactive under ordinary conditions.
Hazardous Decomposition Products:	Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:	Will not occur.
Incompatibilities:	Strong oxidizers, acids.
Conditions to Avoid:	Incompatibles. Isolate from heat and open flame.

11. Toxicological Information

Soybean Oil:	No information found on toxicology. It is not a carcinogen listed by IARC, NTP, NIOSH, OSHA, or ACGIH.
Emulsifier/Nutrient Mixture:	No information found on toxicology. It is not a carcinogen listed by IARC, NTP, NIOSH, OSHA, or ACGIH.
Sodium Lactate:	Oral rat LD50: 2000 mg/kg. Irritation for sodium lactate: standard Draize 100 mg - mild. This compound is not listed as a carcinogen by IARC, NRP, NIOSH, OSHA, or ACGIM.
Zero Valent Iron:	No information found on toxicology. It is not a carcinogen listed by IARC, NTP, NIOSH, OSHA, or ACGIH.
Sodium Lactate:	Practically non-toxic.
Ferrous Sulfide:	Acute toxicity not classified. Skin and eye irritant.
SRS-Z_{VI}-S:	The toxicity of the mixture has not been measured.

12. Ecological Information

Environmental Fate:	No information found.
Environmental Toxicity:	No information found.
Degradability:	SRS is completely biodegradable under both aerobic and anaerobic conditions.
Soil Mobility:	SRS will move with groundwater until the adsorbed onto the soil. Degradation products may be mobile. The ZVI portion will not be mobile.
Bioaccumulation Potential:	No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use, or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal

disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

OSHA STATUS: This product is not hazardous under the criteria of the Federal OSHA hazard Communication Standard 29 CFR 1910.1200. However, thermal processing and decomposition fumes from this product may be hazardous as noted in Section 10.

TSCA STATUS: No component of this product is listed on the TSCA inventory.

CERCLA (Comprehensive Response Compensation, and Liability Act): Not reportable.

SARA TITLE III (Superfund Amendments and Reauthorization Act)
Section 312 Extremely Hazardous Substances: None
Section 311/312 Hazard Categories: Non-hazardous Under Section 311/312
Section 313 Toxic Chemicals: None

RCRA STATUS: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

CALIFORNIA PROPOSITION 65: The following statement is made in order to comply with the California safe Drinking Water and Toxic Enforcement Act of 1986. The product contains no chemicals known to the State of California to cause cancer.

16. Other Information

NFPA Ratings:	Health: **1** Flammability: **1** Reactivity: **1**
Date Revised:	January 1, 2021
Revision Information:	SDS Section(s) changed since last revision of document include: None.
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Prepared by: Terra Systems, Inc.
Phone Number: (302) 798-9553 (U.S.A.)

APPENDIX 4

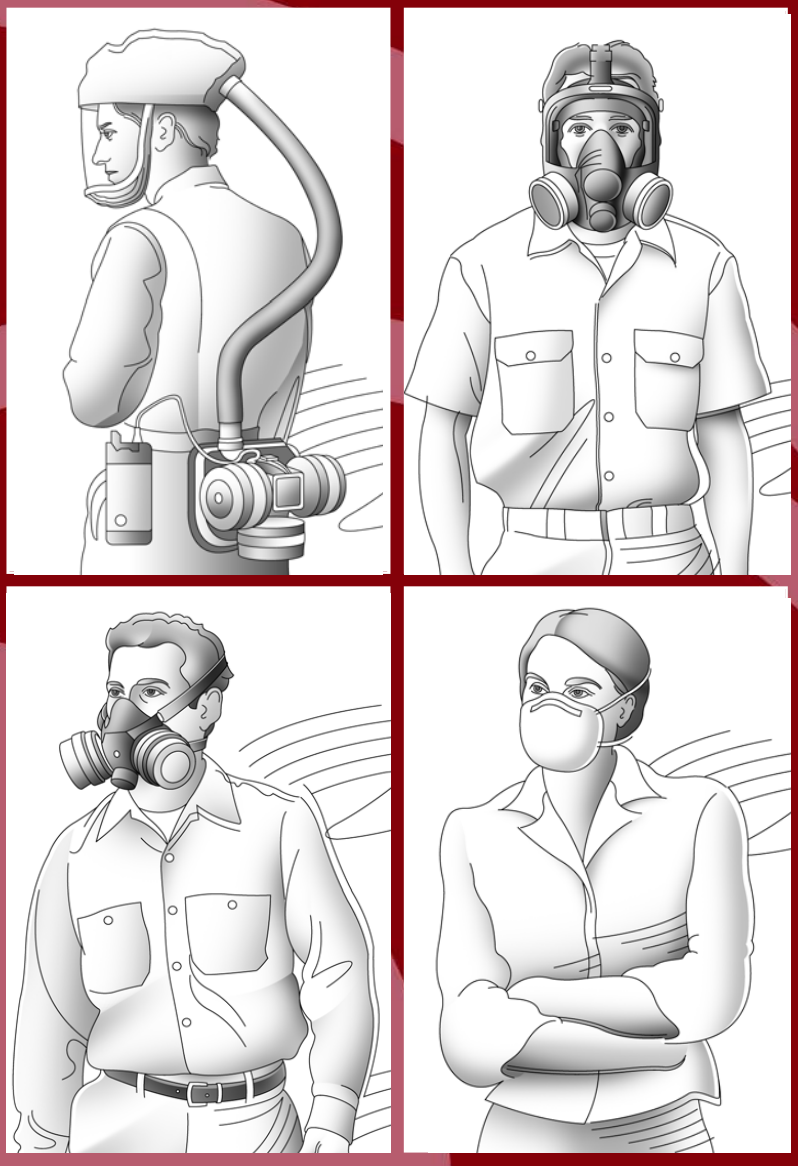
Respiratory Protection Policy

OSHA®

Occupational Safety and Health Administration

www.osha.gov

Small Entity Compliance Guide for the Respiratory Protection Standard



OSHA 3384 09 2011



Occupational Safety and Health Act of 1970

"To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in their efforts to assure safe and healthful working conditions; by providing for research, information, education, and training in the field of occupational safety and health."

This publication provides a general overview of a particular standards-related topic. This publication does not alter or determine compliance responsibilities which are set forth in OSHA standards and the *Occupational Safety and Health Act*. Moreover, because interpretations and enforcement policy may change over time, for additional guidance on OSHA compliance requirements, the reader should consult current administrative interpretations and decisions by the Occupational Safety and Health Review Commission and the courts.

This document is intended to provide relevant information to employers and employees in determining whether respirators are needed, and, if so, how the respirators should be selected and used. This publication does not replace the official Respiratory Protection standard (29 CFR 1910.134).

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This information will be made available to sensory-impaired individuals upon request. Voice phone: (202) 693-1999; teletypewriter (TTY) number: 1-877-889-5627.

Small Entity Compliance Guide for the Respiratory Protection Standard

Occupational Safety and Health Administration
U.S. Department of Labor

OSHA 3384-09
2011



Original cover illustrations created by Attiliis & Associates

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Agencies are required to prepare and publish one or more guides to assist small entities in complying with regulations for which an agency is required to prepare a final regulatory flexibility analysis. (Requirement is in the *Small Business Regulatory Enforcement Fairness Act*, (P.L. 104-121, March 29, 1996, as amended by P.L.110-128, May 25, 2007).

Introduction

Agencies are required to prepare and publish one or more guides to assist small entities in complying with regulations for which an agency is required to prepare a regulatory flexibility analysis. *(See the Small Business Regulatory Enforcement Fairness Act, (P.L. 104-121, March 29, 1996, as amended by the P.L.110-128, May 25, 2007).)*

This Small Entity Compliance Guide (SECG) is intended to help small businesses comply with the Occupational Safety and Health Administration's (OSHA) Respiratory Protection standard (63 FR 1152; January 8, 1998). While the guide is for small entities, the guide itself is not small. OSHA's goal for this document is to provide small entities with a comprehensive step-by-step guide complete with checklists and commonly asked questions that will aid both employees and employers in small businesses with a better understanding of OSHA's respiratory protection standard. The reader should be advised that OSHA also has other shorter documents and visual aids that may be used to better understand respiratory protection and the OSHA standard itself. That information can be found on OSHA's website at www.osha.gov.

If the employees of a small business are only exposed to nuisance dusts and relatively non-toxic chemicals and use only a few types of relatively simple respirators, knowledge of the guide and materials supplied by the respirator manufacturer may be sufficient for the small business owner or an employee to become qualified as a program administrator. If more dangerous chemicals or high exposures are present, or sophisticated respirators are used, the program administrator must have more knowledge or experience. In these circumstances, it may be necessary for the administrator to seek out the expertise needed or to obtain appropriate training.

OSHA's original Respiratory Protection standard was adopted in 1971 from an existing American National Standards Institute (ANSI) standard. On October 5, 1998, OSHA issued a revised standard that updated and replaced that 1971 standard. At that time, in 1998, OSHA reserved the definition under *(d) (respirator selection)* for the *Assigned Protection Factors (APFs)*, and *Maximum Use Concentrations (MUCs)* and *Table I: Assigned Protection Factors* values until further rulemaking was completed.

In addition, the revised 1998 Respiratory Protection standard included a new provision that allowed the development of new fit tests. In compliance with this provision, OSHA approved and adopted an additional quantitative fit testing protocol, the controlled negative pressure (CNP) REDON fit testing protocol, in 2004. *(See Appendix A of the standard.)*

In August 2006, OSHA again revised the standard by adding definitions for APF and MUC and a table (Table I) of APF values. This guide provides a discussion of these APF provisions and their role in the overall Respiratory Protection standard.

History of OSHA's Respiratory Protection Standard

Year	*Event*
1971	The existing American National Standards Institute (ANSI) standard adopted as OSHA's Respiratory Protection standard
1998	OSHA's Final Revised Respiratory Protection Standard (Assigned Protection Factors reserved)
2004	CNP REDON Fit Test Approved for Use
2006	Final *Assigned Protection Factors Rulemaking (APF)* including APFs, MUCs, Table I: Assigned Protection Factors (71 Fed. Reg. 50122)

OSHA's Respiratory Protection standard specifies only the minimum requirements for an effective respiratory protection program. Under the standard, OSHA may require you to establish a respiratory protection program when exposure to an airborne contaminant or to low oxygen levels can cause illness or injury to an employee and when these health effects can be prevented by the use of adequate engineering and administrative controls and/or the appropriate selection and use of a respirator. OSHA may also require you to establish a respiratory protection program while these engineering and administrative controls are being installed or maintained and repaired, or for emergencies. You are encouraged to exceed these minimum criteria if doing so enhances the safety and health of your employees. This SECG provides a sample respirator program to guide small business administrators. *(See Attachment 4 of this guide.)*

This document is advisory in nature, informational in content, and is intended to assist employers by using plain English to explain each provision of the standard, whenever possible. However, technical terms that apply to respiratory protection have legal definitions, as set forth in the Respiratory Protection standard. In this guide, whenever these terms are used, they are used only as they are legally defined. A list of these terms can be found under *(b)(definitions)* of the Respiratory Protection standard. A copy of the standard is included in this guide under Attachment 3.

The Respiratory Protection standard (29 CFR 1910.134) establishes, in one place, the required program for properly selecting and using respirators. All mandatory respirator use is covered by the Respiratory Protection standard. The Respiratory

Protection standard also applies to: Shipyards (29 CFR 1915.154); Marine Terminals (29 CFR 1917.92); Longshoring (29 CFR 1918.102); and, Construction (29 CFR 1926.103). The final standard covers required respiratory protection for use against hazardous airborne workplace exposures, including biological hazards.

The audience for this guide

You should read this guide if it is likely that you will need to establish and implement a respiratory protection program for your business. This guide is intended to assist program administrators, employers who need to develop a program, employees who may be required to wear respirators, and licensed medical professionals who must evaluate an employee's ability to wear respirators, among others.

Program administrators need to develop a written respiratory protection program that covers procedures for the use of respirators in any work area in which employees are exposed to airborne hazards. This guide provides information on procedures that will help the administrator develop a program for the particular workplace. The program needs to cover each provision of the standard. All required elements of the respiratory protection program must be in writing unless a particular element does not apply to your workplace. For example, if no employees volunteer to wear respirators, then the program administrator does not need to develop procedures for that type of respirator use. Employees themselves will find useful information in this guide on training and medical examinations. Licensed healthcare providers will find additional information in this guide on the timing of medical examinations and follow-up exams for employees who use respirators, as well as information about the types of respirators that are available.

This document provides guidance only, and does not alter or determine compliance responsibilities, which are set forth in the *Occupational Safety and Health (OSH) Act (29 U.S.C. 655)*. The guide does not replace the official *Respiratory Protection standard (29 CFR 1910.134)*. A copy of the Respiratory Protection standard is provided in Attachment 3 of this guide. You must refer to the standard to ensure compliance. Lists of appendices for this guide and for the Respiratory Program standard are provided under "How to use this guide."

There are two limitations to the use of this guide. First, interpretations and enforcement policy may change over time. To stay up-to-date on interpretations and enforcement policies, you should consult current administrative interpretations and decisions by the Occupational Safety and Health Review Commission and the courts for additional guidance on OSHA compliance requirements. And second, new fit tests may be approved through Section 6(b)(7) rulemaking.

In 27 states and territories, occupational respiratory requirements are enforced by the state agency responsible for the OSHA-approved State Plan. These states are: Alaska, Arizona, California, Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Washington, and Wyoming. Connecticut, Illinois, New Jersey, New York, and the Virgin Islands operate OSHA-approved State Plans that apply to state and local government employees only.

State Plan states are required to adopt and enforce respiratory protection standards that are either identical to or at least as effective as the Federal OSHA standards. These states are also required to extend the coverage of their respiratory protection standard to state and local government employees, including paid, and in some states, volunteer firefighters who are otherwise not covered by the Federal standard. The information in this guide should be equally applicable to you if you are located in a State Plan state, although you should check to see if there are any unique or additional requirements that may apply.

How to use this guide

This guide is divided into the same sections that appear in the final Respiratory Protection standard. *(See Attachment 3.)* The organization of the guide follows the same organization as the corresponding provision of the standard, proceeding from paragraph (a)(Permissible Practice) to mandatory appendices of the Respiratory Protection standard (§ 1910.134.) A special feature of the electronic version of this guide on OSHA's webpage is included in the Table of Contents. This feature allows you to "click" on the section of interest to you in the Table of Contents and go directly to that portion of the guide.

References to the appendices to the Respiratory Protection standard are in italics in the text of this guide.

§ 1910.134 Respiratory Protection Standard
Section (a) – Permissible Practice
Section (b) – Definitions
Section (c) – Respiratory Protection Program
Section (d) – Respirator Selection
Table I: Assigned Protection Factors
Table II: Oxygen Deficient Atmospheres
Section (e) – Medical Evaluation
Section (f) – Fit Testing
Section (g) – Use of Respirators
Section (h) – Maintenance and Care of Respirators
Section (i) – Breathing Air Quality and Use
Section (j) – Identification of Filters, Cartridges and Canisters

Section (k) – Training and Information
Section (l) – Program Evaluation
Section (m) – Recordkeeping
Section (n) – Effective dates
Section (o) – Appendices

The appendices to the Respiratory Protection standard are:

Appendix A to § 1910.134: Fit Testing Procedures (Mandatory)
- Part I. OSHA-Accepted Fit Test Protocols
  - Table A-1: CNP REDON Quantitative Fit Testing Protocol
- Part II. New Fit Test Protocols

Appendix B-1 to § 1910.134: User Seal Check Procedures (Mandatory)

Appendix B-2 to § 1910.134: Respirator Cleaning Procedures (Mandatory)

Appendix C to § 1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)
- Part A. Section 1. (Mandatory)
- Part A. Section 2. (Mandatory)

Appendix D to § 1910.134: Information for Employees Using Respirators When Not Required Under the Standard (Mandatory)

The attachments in this guide are:

Attachment 1 – the glossary and list of definitions from the Assigned Protection Factor rule

Attachment 2 – a complete set of the checklists used in this guide

Attachment 3 – a copy of the Respiratory Protection standard

Attachment 4 – a Sample Program

Attachment 5 – NIOSH MultiVapor Information

Attachment 6 – NIOSH tables of cartridges and canisters by APFs (modified to OSHA's APFs)

Citations to the standard provided in each section enable you to compare the text in this guide with the standard. *(See Attachment 3 of this guide for a copy of the Respiratory Protection standard.)* For example, to review the new assigned protection factors and maximum use concentrations in the final standard, at *(d)(3)(ii)(A)-(B),* it might be useful to know that you will need to begin with *section (d)* and proceed through *(d)(1)* and *(d)(2)* to *(d)(3)* and then through *(d)(3)(i)* to *(d)(3)(ii),* and so forth.

Citation for Assigned Protection Factors and Maximum Use Concentrations, under *paragraph (d) Selection of Respirators*

Citation to the standard	Name of Section in Standard	Small Entity Compliance Guide
Paragraph *(d)(1)-(2)*	*Respirator Selection*	Employers need to know specific information on: NIOSH certification, unknown exposures; workplace factors; user factors, the two major types of respirators; respirators for oxygen deficient, and other IDLH atmospheres. *Table II: Oxygen Deficient Atmospheres*, is described in (d)(2).
Paragraph *(d)(3)-(d)(3)(i)*	*Respirators for non-IDLH atmospheres*	When providing respirators, employers must provide respirators that are adequate to protect employee health and ensure compliance with all other OSHA requirements under routine and reasonably foreseeable emergency situations.
Paragraph *(d)(3)(i)(A)*	*Respirators for IDLH atmospheres* *(A) Assigned Protection Factors (APFs)* Employers must use the assigned protection factors listed in Table I to select a respirator that meets or exceeds the required level of employee protection.	Employers need to know specific instructions on how to select respirators using *Table I. Assigned Protection Factors*. *Table I. Assigned Protection Factors* is described in this paragraph.
Paragraph *(d)(3)(i)(B)*	*Respirators for IDLH atmospheres* *Maximum Use Concentrations (MUCs)*	The employee's exposure must be at or below the MUC when the exposure is measured outside the respirator. Instructions on how to select respirators using MUCs, including the limitations of MUCs, are provided.
Paragraph *(d)(3)(ii)-(iv)*	Respirator selection for chemical and physical form of contaminant, and other provisions.	

In the final Respiratory Protection standard, *Table I: Assigned Protection Factors* is at the end of section *(d)(3)(iv)*. From this example, it is clear that major provisions, such as those covering APFs and MUCs, are actually subparagraphs of the larger selection citation provision for non-IDLH hazards. It is these citations to the standard that are included in the text of this guide, as appropriate.

Respiratory protection equipment

Respirators are devices that protect employees from inhaling harmful substances, including chemical, biological, and radiological agents. These substances can be in the form of airborne vapors, gases, dust, fogs, fumes, mists, smokes, or sprays. Some respirators also ensure that employees do not breathe air that contains dangerously low levels of oxygen or that is otherwise immediately dangerous to life or health (IDLH), (e.g., life-threatening exposures during interior structural firefighting.) Respirators may be used to provide protection during routine operations where engineering controls and work practices are not able to provide sufficient protection from these hazards, or in emergencies.

In situations in which employees are exposed to harmful airborne hazards, respirators must "seal off" and isolate the user's respiratory system from the contaminated environment. The risk that a user will experience an adverse health outcome when relying on respiratory protection is a function of the toxicity or hazardous nature of the air contaminants present, the concentrations of the contaminants in the air, the duration of exposure, and the degree of isolation provided by the respirator. When respirators fail or do not provide the degree of protection expected by the user, the user is placed at an increased risk of any adverse health effects that are associated with exposure to the respiratory hazards present. Furthermore, the margin for error in IDLH atmospheres is slight or nonexistent because an equipment malfunction or employee mistake can, without warning, expose the employee to an atmosphere incapable of supporting human life. Such exposure may disable the employee and require an immediate rescue if the employee's life is to be saved. Therefore, it is critical that respirators are properly selected and used in compliance with the Respiratory Protection standard (29 CFR 1910.134).

Respirators provide protection from respiratory hazards only when they are properly selected and used in compliance with the *Respiratory Protection standard (29 CFR 1910.134 and 29 CFR 1926.103)*. The final Respiratory Protection standard applies to general industry, construction, longshoring, shipyard, and marine terminal workplaces. A copy of the standard is provided in Attachment 3.

Atmosphere-supplying respirators are used to provide breathing air from a source independent of the ambient atmosphere. Respirators that supply breathing air are generally used in highly hazardous work environments. It is critical that such respirator systems provide breathing air of optimal quality and that the equipment operates reliably.

The two types of such equipment are:

- Self-contained breathing apparatus (SCBA) units, for which air is supplied from a tank (a cylinder of compressed air or oxygen). For this type of respirator, the source of the breathing air is designed to be transported by or with the equipment user.
- Supplied-air respirators (SARs) (also known as airline respirators), which receive air from a connecting hose. The source of air is either a pressurized cylinder or an air compressor. Because the employee does not carry the air on his or her back when using a SAR, breathing air can be provided over a longer time period than is the case with an SCBA.

Examples of atmosphere-supplying respirators with tight-fitting facepieces and positive pressure characteristics include:

Self-contained breathing apparatus (SCBA), supplied-air respirator (SAR) and full elastomeric facepiece;

Abrasive-blasting SAR in the continuous mode and full elastomeric facepiece; and

Supplied-air respirator (SAR) with an escape bottle and full elastomeric facepiece.

Pressure-demand respirators are positive pressure atmosphere-supplying respirators that admit breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

An air-purifying respirator (APR) is a respirator which removes contaminants from the air. An atmosphere-supplying respirator, or Supplied-air respirator (SAR), is one which provides clean breathing air from an uncontaminated source.

Elastomeric facepieces include facepieces made from Natural or Synthetic Rubber (e.g., EPDM); EPDM is an acronym for a specific type of rubber; that is, Ethylene propylene diene M-class rubber.

Examples of an air-purifying respirator and an atmosphere-supplying respirator

Air-purifying respirators (APR) remove contaminants from the air



Half mask filtering facepiece
Dust Mask

Supplied-air respirators (SAR) or Atmosphere-supplying respirators provide clean air from an uncontaminated source



Self-contained Breathing Apparatus (SCBA) Full facepiece Elastomeric

OSHA's Respiratory Protection Standard

The Respiratory Protection standard requires employers to establish and maintain a respiratory protection program to protect their respirator-wearing employees. OSHA revised the original 1971 Respiratory Protection standard in 1998. The new standard incorporates scientific principles and technologies that emerged since 1971. Because of advances in technology, many areas covered by the previous standard had become outdated.

The final revision of the Respiratory Protection standard is intended to:

- Enhance the protection of employee health.
- Promote more effective use of respirators.
- Make it easier for you to comply with its provisions.
- Make it easier to understand the policy and procedures you must follow when implementing a respiratory protection program.
- Supersede most respiratory provisions in existing standard.

The Respiratory Protection Program

A respiratory protection program is a cohesive collection of written worksite-specific procedures and policies that, taken together, address all respiratory protection elements required by the standard. For example, a respiratory protection program must contain specific procedures describing how respirators will be selected, fitted, used, maintained and inspected in a particular workplace. Section (c) of this guide contains more information on respiratory protection programs.

When respirators are used during operations where exposures exceed OSHA's permissible exposure limit (PEL), use of properly functioning respirators is essential to ensure that employees are not placed at significant risk of material impairment of health. Respiratory protection is necessary in situations where engineering and administrative controls are insufficient to reduce airborne hazards, in emergencies, in situations in which engineering and other controls are being installed or maintained, in oxygen deficient atmospheres, or for internal structural firefighting. The final Respiratory Protection standard establishes the minimum elements of a comprehensive program that are necessary to ensure effective performance of a respirator.

When to use the Respiratory Protection Program

Generally, you are required to establish a respiratory protection program whenever you or OSHA requires your employees to wear respirators. For example, you may need to establish a respiratory protection program:

- If your employees work in situations where the level of oxygen is insufficient or potentially insufficient.
- If your employees are potentially exposed to harmful levels of hazardous gases or vapors.
- If your employees are exposed to other potential respiratory hazards, such as dust, airborne biological hazards, mists, fumes, sprays, and other airborne particles.

You need to supply employees with respirators when all preferred methods of protecting them from breathing contaminated air have been determined to be insufficient to reduce the contamination to non-hazardous levels. You must also consider the potential for emergencies, that is, for reasonably foreseeable emergencies, when evaluating the respiratory hazards in the workplace. These preferred methods include:

- Engineering controls, such as: local or general dilution ventilation, change of the work process, isolation or enclosure, or substitution, and
- Administrative controls, such as: employee rotation, or scheduling major maintenance for weekends or times when few employees are present.

If you have any questions about when to supply your employees with respirators, refer to the copy of the standard in Attachment 3.

Updates to OSHA's Respiratory Protection Standard

In the final Assigned Protection Factor rule, OSHA revised its existing Respiratory Protection standard to add definitions and requirements for Assigned Protection Factors (APFs) and Maximum Use Concentrations (MUCs). The revisions also supersede the respirator selection provisions of existing substance-specific standards with these new APFs (except for the respirator selection provisions of the 1, 3-Butadiene Standard). As part of the final Assigned Protection Factor rule, pertinent provisions of the substance-specific standards that were superseded were modified in each individual substance-specific standard to make clear where the Respiratory Protection standard is to be followed, thereby reducing any confusion when referring to those substance-specific standards.

The Agency developed the final APFs after thoroughly reviewing the available literature, including chamber simulation studies and workplace protection factor studies, comments submitted to the record, and hearing testimony. The final APFs provide employers with critical information to use when selecting respirators for employees exposed to atmospheric contaminants found in general industry, construction, shipyards, longshoring, and marine terminal workplaces. Proper respirator selection using APFs is an important component of an effective respiratory protection program. Accordingly, OSHA concludes that the final APFs are necessary to protect employees who must use respirators to protect them from airborne contaminants.

Major new provisions and other non-mandatory changes included in the final standard.

The Respiratory Protection standard has been updated and now includes the following important new provision:

- Assigned Protection Factors (APFs), Maximum Use Concentrations (MUCs), and APF Table I.

And other changes:

- New fit test procedures – Controlled Negative Pressure REDON (CNP REDON)

Assigned Protection Factors (APFs) and Maximum Use Concentrations (MUCs)

OSHA published the final Respiratory Protection standard in January 1998, and reserved the APF provisions, (i.e., the APF and MUC definitions and the Table of APFs) (63 FR 1203). The rulemaking on the reserved APFs of the Respiratory Protection standard was completed on August 24, 2006 (71 FR 50122). The rule amends *29 CFR 1910.134(d)(3)(i)(A)* and *(d)(3)(i)(B)* of the Respiratory Protection standard by specifying a set of APFs for each class of respirators. The new provisions for APFs, MUCs, and Table I cover selection procedures for respiratory protection. These procedures are discussed in more detail in the following section on respirator selection. The APFs specify the highest multiple of a contaminant's permissible exposure limit (PEL) at which an employee can use a respirator.

New Fit Test Procedures - Controlled Negative Pressure REDON (CNP REDON)

The 1998 revised Respiratory Protection standard allowed the development of new fit tests. This provision is contained in *Part II of Appendix A of the standard*. A copy of the Respiratory Protection standard is provided in this guide under Attachment 3. This provision for new fit test procedures specified, in part, the procedure individuals must follow to submit new fit testing protocols for the Agency's consideration. In compliance with this provision, OSHA has approved and has adopted an additional quantitative fit testing protocol, the controlled negative pressure (CNP) REDON fit testing protocol, for inclusion in *Appendix A of the Respiratory Protection standard. (69 FR 46986) (See Section (f) of this guide.)*

The benefits of the Respiratory Protection Standard

The updated standard now provides:

- A complete set of definitions that will eliminate confusion about terminology and how these terms

apply to respirators and their use. *(See: Attachment 1 of this guide (APF Glossary of Definitions); and the definitions under Section (b) of the standard).*

- Criteria for selecting respirators. *(See Section (d) of this guide.)*
- *General information*
- *Assigned Protection Factors*
- *Table I: Assigned Protection Factors*
- *Maximum Use Concentrations*

When issuing the 1998 rule, OSHA estimated that compliance with the standard would prevent hundreds of deaths and thousands of illnesses in U.S. workplaces each year (63 FR 1173). The APFs in the final rulemaking help ensure that these benefits are achieved, as well as provide an additional degree of protection. These new APFs reduce employee exposures in some instances to several Section (6)(b)(5) chemicals covered by standards with outdated APF criteria, thereby reducing exposures to chemicals such as asbestos, lead, cotton dust, and arsenic. While the Agency did not quantify these benefits, it estimated that thousands of employees would have a higher degree of respiratory protection under this APF standard. The Respiratory Protection standard has been determined to be economically and technologically feasible for covered industries.

In addition to health benefits, OSHA believes that other benefits result from the harmonization of APF specifications, thereby making compliance with the respirator rule easier for employers. Employers no longer have to consult several sources and several OSHA standards to determine the best choice of respirator, but can make their choices based on a single, easily found regulation. In addition to having only one set of numbers (i.e., APFs) to assist them with respirator selection for nearly all substances, some employers may be able to streamline their respirator stock by using one respirator class to meet their respirator needs instead of several respirator classes. The increased ease of compliance also yields additional health benefits to employees using respirators.

The revised APFs clarify when employers can safely place employees in respirators that impose less stress on the cardiovascular system (e.g., filtering facepiece respirators). Many of these alternative respirators may have the additional benefit of being less expensive to purchase and operate. OSHA estimated that over 15,000 employees used respirators that fall into this group (i.e., employees that may safely shift to a less expensive respirator).

Points of Contact for additional information

For additional assistance in establishing and implementing a respiratory protection program, contact the OSHA area office nearest you. If you are unable to contact your local OSHA area office, you may contact the appropriate OSHA regional office for information or assistance. A list of OSHA regional offices is at page 119.

Section (a): Permissible practice

When engineering controls are not feasible, or while engineering controls are being put in place, appropriate respirators must be used.

(a)(1) Engineering controls

To prevent illness or diseases caused by breathing hazardous air in the workplace, you must use engineering controls to the extent feasible to prevent contamination of the workplace atmosphere. When engineering controls are not feasible, or while engineering controls are being put in place, appropriate respirators must be used.

How to know if the atmosphere in your workplace is hazardous

An atmosphere is hazardous if it does not contain sufficient oxygen, or if it contains chemical, biological, or radiological contaminants in sufficient quantity to harm the health of employees. Section (d) of this guide contains information on how to identify and evaluate respiratory hazards in your workplace.

What are engineering and administrative controls?

Engineering controls physically change the work environment to reduce employee exposure to air contaminants. Such engineering controls may include:

- Change of the work process
- Isolation or enclosure of the work process or of employees
- Local exhaust or general dilution ventilation
- Substitution of less hazardous substances for harmful materials

Administrative controls involve changes in the length of time or the time of day in which an employee can be exposed. Examples of administrative controls are:

- Employee rotation
- Rescheduling work in area to times when air contaminant levels are low

What guidance is available on the type of engineering and administrative controls that may need to be put in place?

Potential sources for this type of information include:

- Trade associations.
- Manufacturers or suppliers of materials or equipment associated with the creation of air contaminants.
- Your workers' compensation insurance carrier.
- OSHA Consultation Program (See www.osha.gov/consultation) for the list of:
  - states with consultation programs
  - industrial hygiene consultants.

(a)(2) Providing employees with respirators

You must provide respirators when such equipment is necessary to protect the health of employees. The respirator provided must be suitable for its intended purpose. When you are required to provide respirators, you must establish and maintain a respiratory protection program.

The requirements for a respiratory protection program are described in Section (c) of this guide.

How do I know if the Respiratory Protection standard applies to me?

You should use the information collected through the steps covered in *paragraph (a)(1)* to determine whether the Respiratory Protection standard applies to you. For example, information on the type and levels of hazardous airborne exposures in your workplace and on the engineering and administrative controls available to you should be used when evaluating the need for a respirator program.

The vendor who supplies your engineering controls may be able to help you determine whether the controls will adequately protect your employees from respiratory hazards. You must evaluate the level of contamination in your workplace after the engineering controls are installed, as explained in Section (d) of this guide.

How do I know what type of respirator is suitable for protecting the employees' health?

Proper selection of respiratory protection equipment involves the evaluation of the workplace environment, types of job functions that are performed in the workplace, identification of reasonably foreseeable emergencies, employee health conditions, and unique facial characteristics that may affect proper use. Section (d) of this guide provides further information about selecting a suitable respirator.

CHECKLIST FOR PERMISSIBLE PRACTICE

√ Check all that apply:

Hazard Determination

Is there a hazardous atmosphere in your workplace, which has (check all that apply):

❑ Insufficient oxygen

❑ Harmful levels of chemical, biological, or radiological contaminants

❑ Known and reasonably foreseeable emergencies related to...

❑ Unknown exposure levels or exposures to substances without an OSHA PEL

If you did not check any of the boxes above, the Respiratory Protection standard **does not** apply to your workplace.

If you checked any of the boxes above, the Respiratory Protection standard **may** apply to your workplace.

OSHA requires use of the following methods to control the hazardous atmosphere(s) in your workplace:

❑ Engineering controls, such as ventilation, isolation or enclosure of the work process, or substitution of non-hazardous materials for the materials that pose respiratory hazards; and

❑ Administrative controls, such as worker rotation, or scheduling major maintenance for weekends or times when few workers are present.

When engineering controls are not feasible, or while engineering controls are being installed or maintained, or whenever there is an emergency, appropriate respirators **must** be used.

Does your workplace have (check the box to indicate yes, and check all that apply):

❑ Sufficient engineering controls to prevent illness or diseases caused by breathing hazardous air in the workplace

❑ Sufficient administrative controls to prevent illness

If you did not check **both** of the boxes above, the Respiratory Protection standard **does apply** to your workplace, and you must develop a written respiratory protection program that is specific to your workplace.

Is employee rotation acceptable as an interim administrative control while engineering control measures are being developed and implemented?

Rotation is an acceptable practice for less-toxic contaminants. It is never permitted for protection against cancer-causing substances. In addition, many of OSHA's substance-specific health standards contain ceiling limits that may limit the use of employee rotation. If respirators are also necessary to protect the health of the employee while engineering controls are being developed, they must be provided.

Section (b): Definitions

This section of the Respiratory Protection standard contains definitions of terms used in the text of the standard. The definitions clarify the requirements of the standard. The definitions from the final Respiratory Protection standard (63 FR 1152; January 8, 1998), and from the final Assigned Protection Factors standard (71 FR 50122; August 24, 2006), have been combined under Attachment 1 to facilitate ease of use.

The terms are contained in *paragraph (b)* of the standard. The full text of the final *Respiratory Protection standard (63 FR 1152)*, with the new definitions and Table of APF values *(Assigned Protection Factors standard), 71 FR 50122,* is provided in Attachment 3.

As OSHA developed this Small Entity Compliance Guide, the sections were written using the terms from the standard. As you review this document, if you have any questions about a term that is used, you should review the definition of the term in Attachment 1 to clarify exactly what is being discussed. The terms Permissible Exposure Limit (PEL) and Employee Exposure are both defined (see Attachment 1 of this guide.) PELs are OSHA's enforceable exposure limit values and should not be confused with threshold limit/exposure limit values (TLVs) or recommended exposure limits (RELs). These and other terms from the APF standard can be found in Attachment 1 of this guide.

Section (c): Respiratory protection program

Whenever respirator use is required by the employer or by OSHA, this section of the Respiratory Protection standard dictates that the employer must:

- Develop a written respiratory protection program with procedures that are specific to your worksite;
- Implement the program and update it as necessary; and
- Assign a qualified program administrator to run and evaluate the program.

Additionally, you are required to ensure that certain requirements of the respiratory protection program are followed by employees who wear a respirator voluntarily (that is, they wear respirators even though respirator use is not required by either you or OSHA).

(c)(1) Program development and implementation

You are required to develop and implement a written respiratory protection program and to update it as necessary.

Program Development

You must develop a written respiratory protection program that includes procedures for the use of respirators in any work area where protection from airborne hazards is required. The procedures in your program must be specific to your particular workplace. All required elements of the respiratory protection program must be in writing.

Why a written program?

The program must be in writing because health and safety programs are usually more effectively implemented and evaluated if the procedures are available in a written form for study and review. Also, a written respiratory protection program is the best way to ensure that the unique characteristics of the worksite are taken into account. Developing the written program encourages you to thoroughly assess and document information pertaining to respiratory hazards posed to your employees both during normal operating conditions and during reasonably foreseeable emergencies.

Program Content

You are required to include procedures for the following elements (as applicable) in your respiratory protection program:

- Selecting appropriate respirators for use in the workplace.
- Training employees in the proper use of respirators (including putting them on and removing them), the limitations on their use, and their maintenance.
- Providing medical evaluation of employees who must use respirators.
- Fit testing tight-fitting respirators.
- Using respirators properly in routine situations as well as in reasonably foreseeable emergencies.
- Ensuring adequate air supply, quantity, and flow of breathing air for atmosphere-supplying respirators.
- Establishing and adhering to schedules for cleaning, disinfecting, storing, inspecting, repairing, removing from service or discarding, and otherwise maintaining respirators.

- Regularly evaluating the effectiveness of the program.

The checklist in this section on establishing a written respiratory protection program at page 16 provides a quick list to use for guidance on the required content of the respiratory protection program.

Program Implementation and Updating

Once you have established a written program that covers all the required elements that apply to your workplace, you then must ensure that the program is appropriately implemented. Implementation of the program must be administered and overseen by your program administrator.

Once your program has been implemented you must ensure that it is updated *as necessary* to reflect relevant changes in the workplace. That is, you need to revise the elements of the program that have been affected by changes that relate to respiratory hazards in work areas. For example, you need to revise the appropriate sections of your written program if new processes or new chemicals are introduced into the workplace that could impact respirator use.

In addition, if you make any changes in the types of respirators used or in any of the other elements of the respiratory protection program, you must make appropriate revisions to the written program and ensure that they are implemented.

(c)(2) Where respirator use is not required

Voluntary use is when an employee chooses to wear a respirator even though the use of a respirator is not required by either you or by an OSHA standard.

What is meant by voluntary use of respirator equipment?

Where respirator use is not required, you must ensure that all employees who use a respirator voluntarily are provided with certain basic information on proper respirator use. Additionally, you must ensure that employees are included in your program provisions for medical evaluations, and for cleaning, storage, and maintenance of respirators, as applicable.

Providing basic information to voluntary respirator users

You may allow an employee to use a respirator voluntarily if you determine that the respirator itself will not present: a hazard to the employee due to misuse; other hazards or conditions in the workplace; or a hazard to an individual employee, based on medical conditions. In such cases, you may provide employees with respirators or allow them to use their own respiratory protection. *(See (c)(2) of the standard.)* If you allow such use of a respirator, you must provide the voluntary respirator user with the advisory information in *Appendix D* of the standard. This appendix provides basic information on the proper use of respirators for employees who are voluntary users of the equipment and thus are not required to undergo training. These precautions can be presented to the employee either verbally or in a written form. *(See Section (k) of this guide on Training and information.)*

Applicable components of the respiratory protection program

You must ensure that the following elements of your respiratory protection program are implemented for voluntary respirator users:

(i) If filtering facepieces are the only respirator being worn voluntarily, you are only required to provide the employee with a copy of *Appendix D* and make sure that the respirator itself is not creating a hazard, such as dermatitis from a dirty respirator.

(ii) Elements of the program that apply to voluntary users (using respirators other than filtering facepieces (i.e., dust masks) involve:

- Provisions for medical evaluation of employees.
- Establishing and adhering to schedules for cleaning, disinfecting, storing, inspecting, repairing, removing from service or discarding, and otherwise maintaining respirators.

Implementation of the elements of the program for a voluntary respirator user will ensure that the respirator is used properly and does not create a hazard to the user.

- A dirty respirator could cause dermatitis.
- A dirty or poorly disinfected respirator could cause an unnecessary inhalation hazard.
- A respirator wearer's health could be jeopardized due to an undetected medical condition (e.g., asthma, heart condition.)

What types of respirators do the voluntary use requirements apply to?

This requirement applies primarily to tight-fitting negative pressure APRs, but would also apply to powered APRs if an employee elected to voluntarily use this type of respirator.

Do I need to have a written respiratory protection program if only voluntary users wear respirators at my facility?

No, if the only respirators being worn voluntarily are filtering facepieces (dust masks).

Yes, if other respirators, such as elastomeric APRs or powered APRs, are being used voluntarily. In this case,

your written program needs to include only the elements that pertain to voluntary users, e.g., a section on medical evaluations, and one on inspection, care, and maintenance.

When employees choose to voluntarily use respirators in the workplace, you must provide the employee with a copy of the mandatory document found in *Appendix D* of the standard.

Who is responsible for any costs associated with voluntary use of a respirator?

You are not required to pay for filtering facepiece respirators used voluntarily by employees.

If the employer determines that any voluntary respirator use is permissible, the employer must provide the respirator users with the information contained in *Appendix D of the standard ("Information for Employees Using Respirators When Not Required Under the Standard.")*

If you permit the use of respirators other than filtering facepieces, you must pay for required medical evaluations for voluntary users and provide voluntary users with appropriate facilities and time to clean, disinfect, maintain, and store respirators.

(c)(3) Program administrator

You must designate a program administrator to run the program and evaluate its effectiveness.

An individual is qualified to be a program administrator if he or she has appropriate training or experience in accord with the program's level of complexity. This training or experience is appropriate if it enables the program administrator to fulfill the minimum requirements of recognizing, evaluating, and controlling the hazards in your workplace. For example, if your program requires air-supplying respirators for use in immediately dangerous to life or health (IDLH) environments, your program administrator must have training and experience pertaining to the use of this type of equipment. Similarly, if you do not use air-supplying respirators and do not have significant respiratory hazards at your workplace, someone with less experience or training might be able to effectively serve in this position.

Ultimately, the appropriate qualifications for your program administrator must be determined based on the particular respiratory hazards that exist, or that are reasonably anticipated, at your workplace.

How do I, or a designated employee, become a qualified program administrator?

If your workers are exposed only to nuisance dusts and relatively low-toxicity materials, and they use only a few types of relatively simple respirators, knowledge of this guide and materials supplied by the manufacturer may be sufficient for you, or a designated employee, to serve as the program administrator.

If more dangerous substances are present, if the potential for high exposures exists, or if more complex respirators are used, the program administrator must have more extensive experience and/or training. In these circumstances, you may need to seek out the expertise needed or obtain appropriate training.

Is there a list of approved training courses my program administrator can attend?

No, OSHA does not provide a training course specifically to train respiratory protection program administrators, nor does OSHA require program administrators to attend a specified course. OSHA only requires the program administrator to have an adequate level of training or experience to deal with the complexity of the respiratory protection program at the worksite.

You may want to check with trade associations or adult education programs run by universities or technical and vocational schools in your area. The OSHA Consultation Program can help you identify appropriate training courses, or, if you hire a consultant to help you with your respiratory protection program, he or she may be able to provide training.

How will OSHA determine that a person is experienced and/or trained to be a respiratory protection program administrator?

Usually, the OSHA compliance officer will review the written program and interview the respiratory protection program administrator. Questions asked during the interview are likely to focus on determining how familiar the program administrator is with the OSHA Respiratory Protection standard and the use and application of the respirators at the particular workplace. Significant deficiencies in the written program also could indicate a lack of training and understanding of the standard.

Only one person can fulfill the primary responsibilities of running the program, unless your company has more than one worksite. In that case, you may have a program administrator for each site. Ordinarily, however, you cannot divide the responsibilities among several employees. Requiring an administrator with sole responsibility helps ensure the integrity of the program by maintaining continuous oversight from one person. Nonetheless, the administrator may rely on other employees to help run parts of the respiratory protection program (e.g., fit testing, medical evaluations).

One of the program administrator's primary responsibilities is to evaluate the program. Although OSHA

CHECKLIST FOR RESPIRATORY PROTECTION PROGRAMS

√ Does your program contain written procedures for (check all that apply):

- ❑ Your specific workplace
- ❑ Selecting respirators
- ❑ Medical evaluations of employees required to wear respirators
- ❑ Fit testing
- ❑ Routine and emergency respirator use
- ❑ Schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and maintaining respirators
- ❑ Ensuring adequate air quality for supplied-air respirators
- ❑ Training in respiratory hazards
- ❑ Training in proper use and maintenance of respirators
- ❑ Program evaluation
- ❑ Ensuring that employes who voluntarily wear respirators (excluding filtering facepieces) comply with the medical evaluation and cleaning, storing and maintenance requirements of the standard
- ❑ A designated program administrator who is qualified to administer the program
- ❑ Updating the written program as necessary to account for changes in the workplace affecting respirator use
- ❑ Providing equipment, training and medical evaluations at no cost to employees

If you did not check all of the boxes above, your respiratory protection program **does not** meet OSHA standards.

recognizes the value of an objective assessment, the Agency did not want to burden small businesses with the cost of arranging for an outside party to conduct the evaluations, and the standard, therefore, allows program administrators to perform the program evaluations required under the standard.

(c)(4) Employer-provided respirators

You must provide respirators, training, and medical evaluations at no cost to employees who are required to wear a respirator for protection from respiratory hazards at your workplace. This requirement reflects the philosophy that employers are obligated to provide and pay for necessary personal protective equipment (such as respirators) used by employees on the job.

Section (d): Respirator selection

This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. The paragraph also specifies respirators for use in IDLH atmospheres, and limits the selection and use of air-purifying respirators.

(d)(1)(i) General guidelines for selection

You must base selections of respirators on the hazards to which your employees are exposed and must consider how workplace and user factors affect respirator performance and reliability.

What are workplace and user factors?

Workplace factors refer to the actual workplace facility and its geographic characteristics, among other factors. User factors refer to the distinguishing characteristics of the individual employee. Some examples include the following:

- The level of the contaminant in relation to the APF of available respirators
- The conditions of the workplace (e.g., size, configuration, temperature, humidity) of the workspace
  - Are employees equipped with atmosphere-supplying respirators able to fit into any tight space in your workplace?
  - Would the temperature and humidity affect the effectiveness of filters, cartridges, and other respirator parts, as well as the comfort of the wearer?
- Ease of employee communication
  - Are your employees wearing respirators able to communicate with one another and warn one another of hazards?
- Ease or difficulty of the work or rate of activity
  - Are your employees doing heavy lifting that may deplete the air supply of a self-contained breathing apparatus (SCBA)?
  - Would a fast work pace lead to discomfort, causing the employee to move the respirator and, thus, affect the protection afforded by the respirator?
- The type of workplace tasks and proximity to the source of contamination (e.g., cutting wood on a band saw would differ from hand polishing a wood veneer on furniture.)
  - Would hospital emergency medical staff be close to infectious clients?

- The location and movement of other personnel and equipment
  - Would the mobility of your employees or the presence of moving machinery entangle the airlines of atmosphere-supplying respirators?

(d)(1)(ii) Selected respirator must be certified by the National Institute for Occupational Safety and Health (NIOSH)

All respirators must be certified by NIOSH and used in compliance with the conditions of certification.

(d)(1)(iii) Employers need to identify and evaluate worksite hazards

- Identify the respiratory hazards to which your employees are exposed and evaluate these hazards.
- Determine the state and physical form of the respiratory hazard.
  - Are they solids, liquids, or gases?
  - Are they particulate, radioactive or chemical substances?
- Estimate or measure employee exposures to the hazards.
- Assume IDLH atmospheres if unable to estimate an employee's exposure.

Potential Respiratory Hazards:

Listed below are potential respiratory hazards:

Dusts and fibers are solid particles dispersed into the workplace atmosphere through mechanical processes such as crushing, grinding, drilling, abrading, blasting, shaking or physiological processes such as coughing, sneezing. Examples include: silica, metal dust in baghouses, and asbestos. Once an employee's hands and garments, boots, and respirators are contaminated with lead or asbestos, other employees can also be exposed just by handling, or shaking, the contaminated equipment.

Biological hazards include living organisms such as bacteria (e.g., Legionella pneumophila which causes Legionnaires' Disease), viruses (e.g., coronavirus which causes severe acute respiratory syndrome [SARS]), fungi, and other organisms, as well as dead organisms or parts of organisms. Examples of the latter include ground parts of plants (e.g., flour) and parts of animals (e.g., dead skin cells/dander).

Fumes are solid particles that are formed when a metal or other solid vaporizes and the molecules condense (or solidify) in cool air. Examples are metal fumes from smelting or welding. Fumes also may be formed from processes such as plastic injection or extrusion molding.

Mists are tiny droplets of liquid suspended in the air. Oil mists can be produced from lubricants used in metal-cutting operations, acid mists from electroplating, and paint-spray mist from spraying operations.

Gases are materials that exist as individual molecules in the air at room temperature. Examples are welding gases, such as acetylene and nitrogen, and carbon monoxide produced from internal combustion engines.

Vapors are the gaseous form of substances that are normally in the solid or liquid state at room temperature and pressure. They are formed by evaporation. Most solvents produce vapors. Examples include toluene and methylene chloride.

Suggestions for Measuring or Making "Reasonable" Estimates of Employee Exposures

- Personal monitoring is the most accurate way of obtaining employee exposure information. Sampling equipment and analytical methods are available for substances regulated by OSHA's Air Contaminants standard (29 CFR 1910.1000 and 29 CFR 1926.55). OSHA has specific monitoring requirements for its substance-specific standards (e.g., benzene or asbestos). See subpart Z of 29 CFR parts 1910 and 1926, for OSHA's substance-specific standards.
- If there is no specific monitoring requirement, you can also estimate exposures by monitoring fixed locations or by sampling for short time periods. If you do this, you should measure under worst-case conditions to be sure that you are providing adequate protection for your employees. For example, even though employees generally move about and do not spend most of their work shift near the source of emissions, if you select a respirator based on a reading obtained from a fixed sample collected close to the source of the emission, the respirator selected is more likely to provide adequate employee protection. Similarly, although process emissions under non-peak conditions will obviously be less than at peak conditions, a respirator selected on the basis of a reading obtained from a spot sample taken when the emissions are highest (when the process is operating at peak conditions) is more likely to provide sufficient protection.
- Data may be available from previous exposure measurements. For example, studies may have been conducted in your industry. Your trade association may have data, or manufacturers of products or materials used in your workplace may have conducted laboratory tests that provide employee exposure data. To generalize from data obtained from these sources or an industry-wide survey, however, you must show that the conditions

that existed in the survey, such as the processes, types of materials, control methods, work practices, and environmental conditions, are similar to those in your own workplace.

- You should be aware that exposures can be quite variable from day to day and from employee to employee. It is, therefore, important always to err on the side of over- rather than under-protection.
- You may wish to consult with health and safety professionals in evaluating exposures. However, consultation is not mandatory. The respiratory protection program administrator should have the necessary qualifications. You can often obtain assistance through the OSHA Consultation Program. A list of Consultation Programs is included under Attachment 2. An additional source of assistance might be your insurance carrier.
- You may be able to demonstrate, through information on processes and reasonable assumptions about potential maximum use concentrations (MUCs), that IDLH conditions would not occur. Under such a scenario, after a thorough review of relevant information, you may be able to place values on the unknown exposures. That is, you may be able to reduce, delineate, or eliminate the unknown exposures. After review of all available material, you need to make reasonable assumptions and develop conservative estimates. The material you used and the assumptions and findings you relied upon in place of a measurement of an employee's exposures should be in your written program. If new materials and sources of information are generated or conditions or processes or types of materials used in your processes change, or if new cases of airborne illness occur, you need to review and possibly update your written program.

If you do not know your employees' exposure levels

You must consider the worksite atmosphere Immediately Dangerous to Life or Health, (IDLH), and select respirators on that basis. IDLH means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere *(29 CFR 1910.134, paragraph d)*.

(d)(1)(iv) You must provide a sufficient number of respirators to correctly fit the user

A sufficient number of respirator models and sizes must be available to employees so that they can find the respirator that is acceptable to, and correctly fits, them.

(d)(2) Respirators for IDLH atmospheres

(d)(2)(i) Types of respirators

Atmospheres that are immediately dangerous to life or health (IDLH) require the highest level of respiratory protection and reliability. You must provide either of the following for use in IDLH environments:

- Full-facepiece pressure-demand SCBAs that are certified by NIOSH for a minimum service life of 30 minutes.
- Combination full-facepiece pressure-demand supplied-air respirators with auxiliary self-contained air supply.

(d)(2)(ii) Respirators for escape from IDLH atmospheres must be NIOSH-certified for escape from the atmosphere in which they will be used

For example, for formaldehyde exposures, escape respirators may be full-facepiece with chin style, front, or back-mounted industrial-size canister approved for protection against formaldehyde (29 CFR 1910.1048 at: *http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10075).*

(d)(2)(iii) You must consider all oxygen deficient atmospheres to be IDLH

Atmosphere-supplying respirators must be used in oxygen deficient atmospheres (where oxygen is less than 19.5%). Employers must provide employees with full-facepiece pressure demand SCBAs or combination full-facepiece pressure demand supplied-air respirators with auxiliary self-contained air supply. There is an exception that applies to well-controlled atmospheres, where the reason for the oxygen levels being reduced below 19.5% is known and the reduced oxygen level is stable and not changing. (You may use any atmosphere-supplying respirator if you can demonstrate that, under all reasonably foreseeable conditions, the oxygen concentration in the work area can be maintained within the ranges specified in *Table II of 29 CFR 1910.134.) (See also Table II.)*

Work operations being conducted in well-controlled atmospheres where oxygen levels are deficient (below 19.5 percent) are typically permit-required confined spaces. (*See OSHA's Permit-Required Confined Space standard, 29 CFR 1910.146 at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9797.)*

(d)(3) Respirators for non-IDLH atmospheres

(d)(3)(i) You must provide respirators that are adequate to protect employee health and ensure

compliance with all other OSHA requirements under routine and reasonably foreseeable emergency situations

The General Duty Clause of the OSH Act requires you to protect your employees from all hazardous substances, even those not regulated by OSHA. Consult the Safety Data Sheet (SDS) sent by your supplier if you have questions about the toxicity of a particular substance. For further assistance in ascertaining whether substances used in your workplace that are not regulated by OSHA are hazardous, you may contact OSHA. (*See list of OSHA Offices at page 119.*)

Other OSHA regulations that might apply include the Air Contaminants standard, 29 CFR 1910.1000, the substance-specific standards, appropriate safety regulations such as the Hazardous Waste Operations and Emergency Response standard, 29 CFR 1910.120, paragraph (g)(2), and many construction and maritime standards.

What is a Permissible Exposure Limit (PEL)?

Employee exposure means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection. OSHA permissible exposure limits (PELs) establish the maximum level of a specific airborne hazard that an employee can be exposed to, averaged over an 8-hour workday (8-hour time-weighted average, or TWA) or over a specified portion of a workday (e.g., a 15-minute short-term exposure limit, or STEL). Likewise, the action level (AL), which is one-half the PEL, is calculated in the same manner as the PEL, and is the level at or above which provisions of substance-specific standards can be triggered. (PELs are listed in 29 CFR 1910.1000, and 1926.55. *See also the substance-specific standards for general industry, maritime, longshoring, and construction.*)

(d)(3)(i)(A) You must select respirators according to Assigned Protection Factors (APF)

Selection of respirators must be made in accordance with the assigned protection factor (APF) of the respirator, as well as the workplace and exposure factors. (*See final APF standard; 71 FR 50122.*)

APF means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by *29 CFR 1910.134*.

Employers must use the APFs listed in Table I, at page 24, to select a respirator that meets or exceeds the required level of employee protection. When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers must ensure that the APF is appropriate to the mode of operation in which the respirator is being used.

A copy of the new APF table is provided below, at page 24, in section (d) of this guide. *Footnote 4 of Table I* relates to the testing of Powered Air-Purifying Respirators (PAPRs) and Supplied-air Respirators (SAR) with helmets or hoods to demonstrate that these respirators can perform at the higher APF of 1,000 instead of the overall APF of 25 for this class. As a result of OSHA's rulemaking, the 25/1000 APF is given to some hood/helmet PAPRs and supplied-air respirators (SARs).

(d)(3)(i)(B) You must select respirators after considering the Maximum Use Concentrations in your workplace under which respirators are used

Maximum use concentration (MUC) means the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the permissible exposure limit, short-term exposure limit, ceiling limit, peak limit, or any other exposure limit used for the hazardous substance. Basically, under the MUC, employers must: (1) select a respirator for employee use that maintains the employee's exposure to the hazardous substance, when measured outside the respirator, at or below the MUC; (2) not apply MUCs to conditions that are immediately dangerous to life or health (IDLH); instead, they must use respirators listed for IDLH conditions in *paragraph (d)(2)* of the Respiratory Protection standard; and, (3) set the maximum MUC at that lower limit when the calculated MUC exceeds the IDLH level for a hazardous substance, or the performance limits of the cartridge or canister.

How to use APFs and MUCs

APFs are used to select the appropriate class of respirators that will provide the necessary level of protection under routine and reasonably foreseeable emergency situations. The airborne hazardous exposure can be from a particulate or a gas or vapor. The APF for the class of respirators will remain the same. The APF value can only be applied to a class of respirators when the respirators are properly selected and used in compliance with the Respiratory Protection standard (29 CFR 1910.134). Also, for gases and vapors, additional cartridges and canisters may by needed. (*See paragraph (d)(3)(iii);* see change schedules of this guide.)

OSHA PELs (permissible exposure limits) establish the maximum level of a specific airborne hazard that an employee can be exposed to, averaged over an 8-hour workday (8-hour time-weighted average, or TWA) or over a specified portion of a workday (for example, a 15-minute short-term exposure limit, or STEL). (PELs are listed in 29 CFR 1910.1000, and 1926.55. Also see the substance-specific standards for general industry and construction.)

The MUC for respirators is calculated by multiplying the APF for the respirator by the PEL. The MUC is the upper exposure limit at which the class of respirator is expected to provide protection. Whenever the exposures approach the MUC, then the employer should consider selecting the next higher class of respirators for the employees.

MUCs for mixtures must satisfy the following equation:

E_m = (C_1 divided by L_1 + C_2 divided by L_2) +…..(C_n divided by L_n)

Where:

E_m is the equivalent exposure for the mixture
C is the concentration of a particulate contaminant
L is the exposure limit for that substance
The value of E_m shall not exceed unity (1).

There are exceptions to this equation, or situations in which it is inappropriate to use this equation. Examples of such situations are:

- Whenever an APF=10 times the PEL puts the employee into an IDLH atmosphere or puts them into a lower explosive limit (LEL) situation, then a negative pressure respirator must not be used.
- OSHA does not allow negative pressure respirators to be used for methylene chloride (except for emergency escape), so if employees are exposed above the PEL they are already in violation of the methylene chloride standard [(29 CFR 1910.1052(g)(2) rather than 1910.134(d)(3)(B)]. Using the MUC calculation for a half facepiece negative pressure respirator used for MeCl would be an example an inappropriate use of the MUC.
- For a mixture of toluene and xylene, a half facepiece respirator should be allowed to be used in a mixture situation as long as C1/L1 + C2/L2 was less than E times the APF (10), e.g., 300ppm Toluene /100ppm PEL + 650ppm Xylene/100ppm PEL = 9.5, so the respirator could be used "according to the MUC calculation." However, this concentration would be extremely irritating to the eyes, and a full facepiece would be more appropriate.

(d)(3)(ii) You must select respirators that are appropriate for the chemical state and physical form of the contaminant

You need different types of filters, cartridges, and canisters depending on whether dusts, fumes, mists, vapors, or gases are present in your workplace and depending on the kinds and concentrations of substances present. *(See paragraph (d)(1)(iii).)*

(d)(3)(iii) Respiratory protection for gases and vapors

For protection against gases and vapors, employers must provide:

A. an atmosphere-supplying respirator, or

B. an air-purifying respirator that:

1) has an NIOSH-certified end-of-service-life indicator (ESLI), or

2) if there is no ESLI, employers must calculate the service life of canisters and cartridges for employees who are wearing respirators.

You do not want to have situations where the canisters or cartridges become saturated and the gases or vapors break through, allowing the contaminants to get inside the respirator and into your workers' breathing zones.

What is an end-of-service-life indicator (ESLI)?

An ESLI is a mechanism for warning the user that a respirator is approaching the end of its ability to provide protection. The warning appears on the cartridge itself. For example, after a period of use, an indicator on a cartridge with sorbent material will signal that protection against organic vapors is approaching saturation or is no longer effective. (The ESLI for a carbon-monoxide canister involves a color change when the sorbent material is exhausted.)

The final standard requires the use of ESLIs where they are available and appropriate for the employer's workplace, whether or not warning properties exist for a contaminant. If there is no ESLI available, the employer is required to develop a cartridge/canister change schedule based on available information and data that describe the service life of the sorbent elements against the contaminant present in the employer's workplace and that will ensure that sorbent elements are replaced before they are exhausted. Reliance on odor thresholds and other warning properties is not permitted in the final rule as the sole basis for determining that an air-purifying respirator will afford adequate protection against exposure to gas and vapor contaminants.

To the extent that NIOSH-certified end of-service-life indicators are available, OSHA finds that there are

considerable benefits to their use. Thus far, however, NIOSH has only certified ESLIs for a few cartridges or canisters (for example, mercury vapor, carbon monoxide, ethylene oxide and hydrogen sulfide). Therefore, employers are more likely to have to establish change schedules to ensure that cartridges and canisters are changed before their end-of-service-life.

Why not just rely on the worker's ability to detect the odor of the substance when the gas or vapor breaks through?

You may not rely on the detection of odor as protection against respiratory hazards posed by gases and vapors because:

- Most toxic substances do not have appropriate sensory (odor or irritant) warning properties.
- Some chemicals have odors that are only detectable above their established exposure limits, meaning that the employees will smell the chemical only after they have already been exposed to unsafe levels of the contaminant.
- An individual's ability to perceive particular odors may differ quite markedly from the population average due to any of a variety of innate, chronic, or acute physiological conditions. For example, about 10 percent of people have a markedly impaired sense of smell.
- There is no good screening mechanism to identify persons with sensory-receptor problems. Continuing exposure to the odor usually results in diminution or even disappearance of the smell sensation. This phenomenon is known as olfactory fatigue. When this happens, the employee unknowingly gets used to the contaminant breaking through the cartridge/canister and loses the ability to detect its smell.

What must be considered when developing change schedules?

Employers must develop cartridge-change schedules based on available data or information that can be relied upon to ensure that cartridges are changed before the end of their useful service life.

You need to consider the following factors in developing change schedules:

- ❑ The contaminants the respirator is to protect against.
- ❑ The concentrations of contaminants in the work area.
- ❑ Frequency of use (e.g., is the respirator used continuously or intermittently throughout the shift);
- ❑ Temperature, humidity and air flow through the cartridge or canister.
- ❑ Employees' work rates.
- ❑ The presence of other potentially interfering substances.

You should assume worst-case conditions to avoid breakthrough earlier than anticipated.

You should document the information relied upon and the basis for the change schedules you use in your written respiratory protection program.

Where can I get help for developing change schedules?

You need to consult with your respirator supplier or manufacturer for guidance on developing change schedules specific to your work conditions. Some suppliers have prepared materials that may assist you with developing change schedules for your worksite. Other possible sources of help include your trade associations, which may be gathering published information, such as breakthrough test data (i.e., how long it takes a substance to break through the cartridge or canister and get into the facepiece). There is a model (the MultiVapor model) for estimating cartridge and canister breakthrough periods for gases and/or vapors. The software is available from NIOSH. (*See information from NIOSH on the MultiVapor model at Attachment 5 in this guide.*)

Furthermore, a specific rule of thumb also will help employers determine cartridge and canister schedules. These are as follows:

Rule of Thumb

Experimental work can allow for a generalization or "rule of thumb" that broadly covers service life of cartridges exposed to chemicals. One such Rule of Thumb for estimating vapor cartridge service life is found in chapter 36 of the American Industrial Hygiene Association publication "The Occupational Environment – Its Evaluation and Control."

It suggests that:

- If the chemical's boiling point is > 70° C and the concentration is less than 200 ppm you can expect a service life of 8 hours at a normal work rate.
- Service life is inversely proportional to work rate.
- Reducing concentration by a factor of 10 will increase service life by a factor of 5.

- Humidity above 85% will reduce service life by 50%.

These generalizations can be used in concert with other methods of predicting service life for specific contaminants.

Whenever a cartridge has become saturated or a contaminant has broken through the cartridge, the respirator must be taken out of service so that the cartridge can be replaced.

In general, The MultiVapor model (Attachment 5) and The Rule of Thumb can be used to calculate the service life of a respirator cartridge or canister, when the calculations are made using information about the canisters or cartridges themselves in combination with additional information about the workplace conditions. The information about the canisters or cartridges may be obtained from the respirator manufacturers. Calculations for either the MultiVapor model or the Rule of Thumb require information about the workplace, as well. The Rule of Thumb provides a rough estimate of the service life. Attachment 5 is a NIOSH table of cartridges and canisters by APFs that may provide assistance as well.

(d)(3)(iv) Respiratory protection for particulates

What are my options for protection against particulates?

You have three options:

- Atmosphere-supplying respirators.
- Air-purifying respirators (including filtering facepieces)
  - with filters certified by NIOSH under 30 CFR part 11 as high efficiency particulate air filters (HEPA), or
  - filters certified by NIOSH under 42 CFR part 84.
- Air-purifying respirators with any filter certified for particulates by NIOSH for protection against contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least two micrometers (µm).

Local OSHA offices can help to determine whether or not contaminants in your workplace consist primarily of particles of two micrometers or more.

What types of particulate filters are available for air-purifying respirators (APRs)?

Particulate-removing filters are used to protect employees from toxic dusts and fibers, such as lead and asbestos, fumes, mists, and radioactive and biological materials (such as grain dusts, bacteria, and viruses). Powered and non-powered APRs require different particulate filters. Appropriate protection against particulates for powered APRs is provided by HEPA filters.

There are nine filter types for use with non-powered APRs approved by NIOSH, and they are based on three levels of filter efficiency and three levels of resistance to degradation by oil. The three levels of filter efficiency are 95, 99, and 99.97 percent and are referred to as 95, 99 and 100 filters, respectively. The efficiency of a filter is based upon the percent of the most penetrating size particle (0.3 micrometers in diameter) that it can exclude (e.g., a 95 filter can exclude 95% of particles of this size).

The three levels of oil resistance are N (not oil resistant), R (oil resistant) and P (oilproof). The most common commercially available cartridges are the "N95" (not oil resistant and 95 percent efficient) and "P100" (oilproof and 99.97 percent efficient). N-series

Particulate Respirator Filter Type	Percentage (%) of 0.3 µm airborne particles filtered out	Not resistant to oil	Somewhat resistant to oil	Strongly resistant to oil (oilproof)
N95	95	X		
N99	99	X		
N100	99.97	X		
R95	95		X	
R99	99		X	
R100	99.97		X	
P95	95			X
P99	99			X
P100	99.97			X

The P100 is comparable to the HEPA filter that is used with PAPRs.

filters are not required to demonstrate resistance to the potentially "degrading" effects of oils and are, therefore, not intended for use in workplace atmospheres that contain oily aerosols. In this context, "degrading" means that exposure to an agent may cause an increase in filter penetration measured under laboratory test conditions. R and P series filters must demonstrate oil resistance when tested with dioctyl phthalate (DOP), which is described as a "highly degrading" oil aerosol. As a result, both R and P filters can be used in workplace atmospheres that contain oily aerosols, as well as those that do not.

The nine different types of particulate respirator filter types are listed in the table on page 22.

Do I need to use particulate filters with ESLI?

There are no ESLI for particulate-removing filters. Workers should be trained to change the filters when they experience difficulty breathing through the filter. This is usually an indication that the filter has become loaded with particulate.

Where can I go for help?

Sources of help include:

- *NIOSH Respirator Selection Logic.* U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health. Request DHHS (NIOSH) Publication No. 2005-100. NIOSH also has a help line. The telephone number is 1-800-35 NIOSH or http://www.cdc.gov/niosh/docs/2005-100/default.html
- American National Standard for Respiratory Protection (ANSI Z88.2). American National Standards Institute, 11 West 42nd Street, New York, New York, 10036. See: global.ihs.ANSI Z88.2
- Respirator manufacturers provide advice through product literature, sales staff, and telephone help lines. The Industrial Safety Equipment Association (ISEA) has contact information. ISEA can be reached at: 1901 N. Moore Street, Suite 808, Arlington, Virginia, 22209, or (703) 525-1695.
- Chemical manufacturers may provide information on the nature and properties of substances to which your employees may be exposed. You should be able to obtain information from the Safety Data Sheets (SDSs) provided by the supplier of the substance.
- You can contact the American Conference of Governmental Industrial Hygienists (ACGIH), 6500 Glenway Ave., Bldg. D-7, Cincinnati, Ohio, 45211-4438, for advice and information on exposure measurement and estimation and other related industrial hygiene subjects. ACGIH has published the ACGIH Ventilation Manual, which contains calculations applied to certain situations to estimate employee exposures.
- You can also contact the American Industrial Hygiene Association (AIHA), 2700 Prosperity Ave., Suite 250, Fairfax, Virginia, 22031, for advice and information on exposure measurement and estimation. Members of AIHA's Exposure Assessment Strategies Committee are knowledgeable in worker exposure measurement and estimation. (*See: http://www.aiha.org/Content.*)
- The National Library of Medicine provides free online help about chemical hazards. Through TOXNET, located at: http://toxnet.nlm.nih.gov, you can search a number of databases on toxicology, hazardous chemicals, hazardous biological atmospheres, and other related subjects for information on respiratory hazards.

CHECKLIST FOR RESPIRATOR SELECTION

√ Check that the following has been done at your facility:

- ❑ Respiratory hazards in your workplace have been identified and evaluated.
- ❑ Employee exposures that have not been, or cannot be, evaluated must be considered IDLH.
- ❑ Respirators are NIOSH-certified, and used under the conditions of certification.
- ❑ Respirators are selected based on the workplace hazards evaluated and workplace and user factors affecting respirator performance and reliability.
- ❑ Respirators are selected based on the APFs and calculated MUCs.
- ❑ A sufficient number of respirator sizes and models are provided for selection purposes.

For IDLH atmospheres:

- ❑ Full facepiece pressure demand SARs with auxiliary SCBA unit or full facepiece pressure demand SCBAs, with a minimum service life of 30 minutes, are provided.
- ❑ Respirators used for escape only are NIOSH-certified for the atmosphere in which they will be used.
- ❑ Oxygen deficient atmospheres must be *considered IDLH (d)(2)(B)(iii).*

For Non-IDLH atmospheres:

- ❑ Respirators selected are appropriate for the APFs and MUCs.
- ❑ Respirators selected are appropriate for the chemical nature and physical form of the contaminant.
- ❑ Air-purifying respirators used for protection against gases and vapors are equipped with ESLIs or a change schedule has been implemented.
- ❑ Air-purifying respirators used for protection against particulates are equipped with NIOSH-certified HEPA filters or other filters certified by NIOSH for particulates under 42 CFR part 84.

Table I: Assigned Protection Factors [5]

Type of Respirator [1, 2]	Quarter Mask	Half Mask	Full Facepiece	Helmet/Hood	Loose-Fitting Facepiece
1. Air-Purifying Respirator	5	10[3]	50	—	—
2. Powered Air-Purifying Respirator (PAPR)	—	50	1,000	25/1,000 [4]	25
3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode	—	10	50	—	—
• Continuous flow mode	—	50	1,000	25/1,000 [4]	25
• Pressure-demand or other positive pressure mode	—	50	1,000	—	—
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode	—	10	50	50	—
• Pressure-demand or other positive pressure mode (e.g., open/closed circuit)	—	—	10,000	10,000	—

Notes:

[1] Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

[2] The assigned protection factors in Table I are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

[3] This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

[4] The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

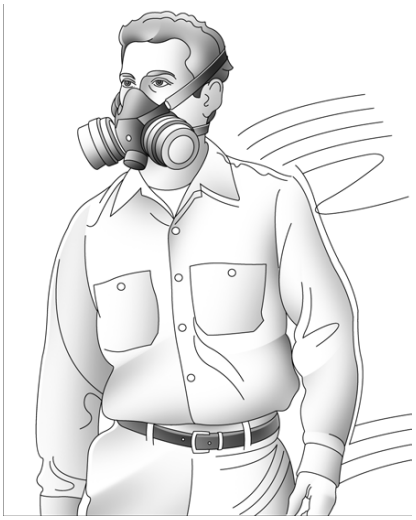
[5] These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134(d)(2)(ii).

Air-purifying respirators

Air-purifying respirators, which remove contaminants from the air.



Half mask Filtering Facepiece Dust mask
APF=10
Needs to be fit tested



Half mask Elastomeric Respirator
APF=10
Needs to be fit tested

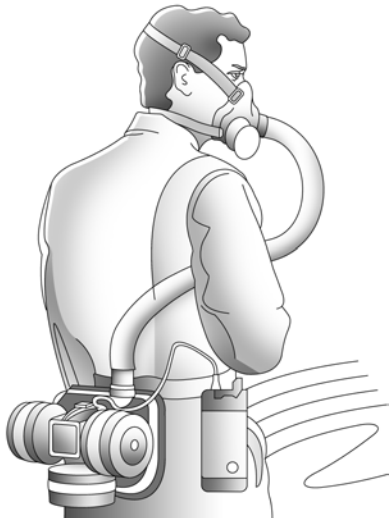


Full Facepiece Elastomeric Respirator
APF=50
Needs to be fit tested

Original Illustrations created by Attilis & Associates

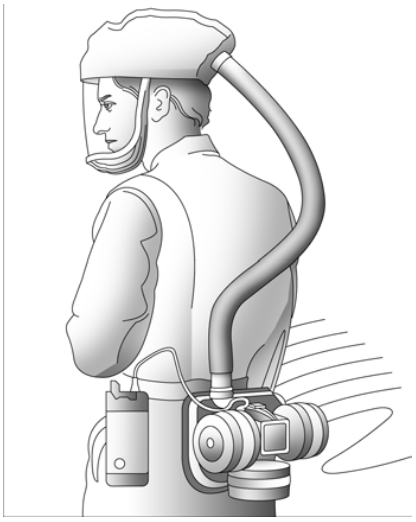


Tight-Fitting Full Facepiece Powered Air-Purifying Respirator (PAPR)
APF=1,000
Needs to be fit tested

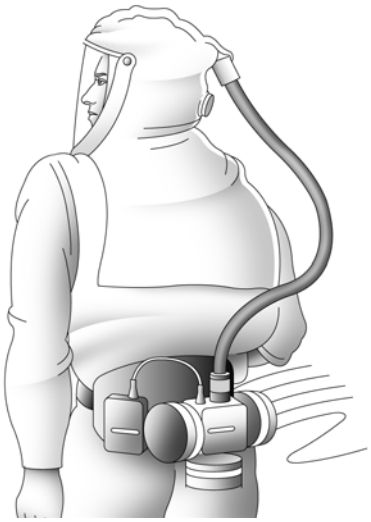


Tight-Fitting Half Facepiece Powered Air-Purifying Respirator (PAPR)
APF=50
Needs to be fit tested

Examples of Air-purifying respirators that can not be fit tested because they are loose-fitting



Loose-Fitting Powered Air-Purifying Respirator (PAPR)
APF=25



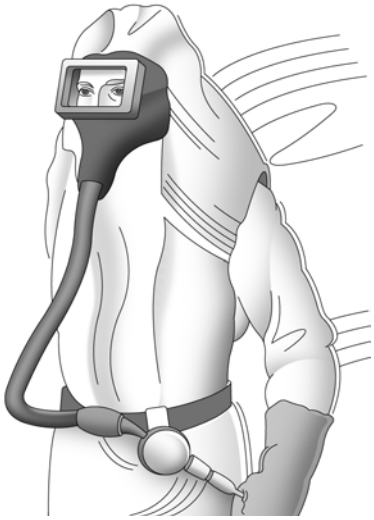
Hooded Powered Air-Purifying Respirator (PAPR)
APF=25 (1,000)*

Atmosphere-supplying respirators

Atmosphere-supplying respirators, which provide clean air from an uncontaminated source



Tight-fitting Self-Contained Breathing Apparatus (SCBA) pressure-demand mode
APF=10,000
Demand mode
APF=50
Needs to be fit tested



Tight-fitting Abrasive Blasting Respirator Continuous flow
APF=25/1,000*
SAR Full Facepiece
*Needs to be fit tested***



Tight-fitting Atmosphere-Supplying Respirator with an auxiliary escape bottle
APF=10,000 in escape mode only; otherwise APF=1,000
Full facepiece
Needs to be fit tested

* APF=25/1,000; Footnote 4 in the APF Table.
** One type of SAR Hood (not depicted) is a SAR with a loose hood; a loose-fitting SAR Hood looks much like this example, but without the tight-fitting facepiece, and does not need to be fit tested. For a loose-fitting facepiece SAR Hood the APF=25 unless the respirator qualifies for a higher APF under Footnote 4.

Table II: Oxygen Deficient Atmospheres

Altitude (ft)	Oxygen deficient atmospheres (% O_2) for which the employer may rely on any atmosphere-supplying respirator
Less than 3001	16.0-19.5
3001-4000	16.4-19.5
4001-5000	17.1-19.5
5001-6000	17.8-19.5
6001-7000	18.5-19.5
7001-8000[1]	19.3-19.5

[1] Above 8,000 feet the exception does not apply. Oxygen-enriched breathing air must be supplied above 14,000 feet.

Section (e): Medical evaluation

This section of the Respiratory Protection standard requires employers to implement medical evaluations to determine an employee's ability to use a respirator. This requirement is necessary because using a respirator may place a burden on an employee's health. This burden varies according to a number of factors, such as the weight and breathing resistance of the respirator and the workplace conditions under which the respirator is worn.

Examples of some medical conditions that may be associated with sudden incapacitation, or may interfere with safe use of a respirator or specific type of respirator, include:

- Cardiovascular and respiratory disease, such as high blood pressure, angina, asthma, chronic bronchitis, or emphysema.
- Cardiovascular damage caused by heart attack or stroke.
- Reduced lung function caused by factors such as smoking or prior exposure to respiratory hazards.
- Neurological disorders, such as epilepsy.
- Musculoskeletal disorders, such as lower back pain.
- Psychological conditions, such as claustrophobia and severe anxiety.

This list provides examples of only **some** medical conditions that **may** interfere with safe use of a respirator, or specific type of respirator. In addition, certain medications may interfere with safe use of a respirator.

(e)(1) Employer provided medical evaluations

The employer must provide an employee with a medical evaluation to determine his or her ability to use a respirator. If an employee refuses to be medically evaluated for the use of a respirator, he or she cannot be assigned to a job that requires a respirator.

When do I need to provide an employee with a medical evaluation?

The medical evaluation must be provided ***before*** the employee is fit tested and uses the respirator in your workplace for the first time.

Are medical evaluations required for all types of respirators?

Medical evaluations are required for both positive pressure and negative pressure respirators. When elastomeric or supplied-air respirators are worn voluntarily by employees (not required by you or OSHA), you must ensure that the employees are medically able to wear the respirators and that they are provided with the necessary information as required in the *standard*. (*See Attachment 2 at page 61.*) The procedures for making this medical determination must be part of your written respiratory protection program. When your employees voluntarily wear dust masks (filtering facepiece respirators), no medical examination is required.

Do I need to provide medical evaluations for seasonal and temporary employees?

If seasonal or temporary employees are required to wear a respirator, you must provide them with medical evaluations. The frequency or length of an employee's term of employment does not affect the requirement for medical evaluations.

(e)(2) Medical evaluation procedures

This portion of the standard specifies that the medical evaluation can be performed by using the mandatory portions of the medical questionnaire found in *Appendix C* of the Respiratory Protection standard. The mandatory portions of this Appendix in the final standard are under:

Appendix C to § 1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

Appendix C - Part A. Section 1. (Mandatory) - every employee who has been selected to use any type of respirator must answer all 12 questions.

Appendix C - Part A. Section 2. (Mandatory) - Questions 1 through 9 must be answered by every employee who has been selected to use any type of respirator. Questions 10 to 15 must also be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering questions 10 - 15 is optional.

All medical evaluations can be performed using the medical questionnaire of the standard, in *Appendix C*, or by a medical examination that obtains the same information as the medical questionnaire.

Question number 1 in *Part A. Section 1*, and question number 9 in *Part A. Section 2* collect personal historic data.

If an employee gives a positive answer to question number 9 in *Part A. Section 2*, the employer must allow the employee to contact the physician or other licensed healthcare professional (PLHCP).

There is a non-mandatory section of the medical questionnaire, *Part B of Appendix C* of the standard.

Identification of a Medical Professional

Employers must identify a physician or another licensed health care professional (PLHCP) to perform the medical evaluations.

Who can perform a medical evaluation?

Physicians are not the only health care professionals allowed to perform medical evaluations for respirator use. The Respiratory Protection standard allows any PLHCP to administer the medical questionnaire (described below) or to conduct the medical examination if doing so is within the scope of the PLHCP's license. You must check with PLHCPs in your local area to see if performing the medical evaluation is within the scope of their professional license. Or you may check with your state licensing board.

Can a nurse perform a medical evaluation?

Any health care professional, including a nurse, who qualifies as a PLHCP can perform a medical evaluation. If a nurse does not qualify as a PLHCP, he or she may still be able to perform a medical evaluation if he or she is doing so under the supervision of a physician, and the physician performs the final review of the assessment.

Can an employee request to see his or her own physician for a medical evaluation?

Yes, however, you are not required by the standard to comply with this request. If employees select their own physicians, you will need to maintain contact with each physician, and you will need to send each physician the supplemental information described in paragraph (e)(5) of the standard. You must allow the employee to be evaluated during the employee's normal working hours or at a time that is convenient to the employee, and you also are responsible for paying for this service (even if the employee has coverage under an insurance plan).

The Medical Questionnaire: The medical questionnaire is designed to identify general medical conditions that could place employees who use respirators at risk of serious medical consequences. If you choose to use the medical questionnaire to conduct the medical evaluation, you must use the questionnaire contained in *Appendix C to § 1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)* of the Respiratory Protection standard. A copy of the standard is in Attachment 3 of this guide.

You may choose to use medical examinations in place of the questionnaire, but you are not required to do so. Although the questionnaire does not have to be administered during the medical examination, the PLHCP must obtain the same information from the employee that is contained in the questionnaire.

(e)(3) Follow-up medical examinations

Employers must provide follow-up examinations for employees who give positive answers to any of the questions numbered *1 through 8 in Part A. Section 2, Appendix C to § 1910.134.* Employees who will be using SCBAs or full-face respirators will be asked questions 10 through 15 in this same section. Also, employers must provide a follow-up examination if the medical examination indicates that one is necessary for any other reason specified by the examining PLHCP.

As part of any medical examination, the PLHCP may include any tests, consultations, or diagnostic procedures that, in the opinion of the examining PLHCP, are necessary to make a final determination about an employee's ability to use a respirator. In some cases, all that might be needed is a phone call to the employee from the PLHCP to clarify an issue from the questionnaire.

If the PLHCP is not a physician, some medical issues may arise during follow-up examinations that may be outside the scope of the PLHCP's license. In such cases, a qualified physician or other licensed healthcare provider with appropriate licensure must be involved.

(e)(4) Administration of questionnaires and examinations

What procedures exist for administering the medical evaluation?

When you provide a medical evaluation program:

- You must protect the confidentiality of the employee who is being evaluated.
- The medical evaluation must be given during an employee's normal work hours or at a time and place convenient to the employee.
- The employee must understand the questions on the medical questionnaire.

Who pays for the medical evaluation?

You must pay for the medical evaluation and any related expenses, including travel costs, incurred by your employee during the evaluation.

How can I ensure that a employee's medical evaluation remains confidential?

You must provide your employees with instructions on how to deliver or send the completed questionnaire to the PLHCP who will review it. This can be done, for example, by supplying them with stamped, pre-addressed envelopes for mailing their completed questionnaires to the PLHCP.

If an employee does not speak English or cannot read, how can I make sure that he or she understands the questions on the medical questionnaire?

You can send the employee directly to a PLHCP who is able to help the employee fill out the questionnaire. For non-English speakers, you may want to consider supplying an interpreter to help the PLHCP interpret the questionnaire for your employee. The standard does not require you to hire a professional interpreter; instead, you may use an English-speaking family member or friend of the employee, or another employee who speaks both English and the employee's language, who can help the employee fill out the questionnaire.

Employee's Right to Contact the PLHCP

The standard requires you to inform employees that a PLHCP is available to discuss the medical questionnaire with them, and to allow employees to discuss the results of their questionnaire with the PLHCP. This discussion will enable employees and PLHCPs to clarify questions that were asked on the questionnaire, and for employees to explain answers that they provided.

How can I notify employees about how to contact the PLHCP?

You could post the PLHCP's name and telephone number in a location that is easily accessible to all employees (such as a lunchroom or break area). You could also include the information in a separate sheet with the medical questionnaire.

(e)(5) Supplemental information for the PLHCP

This portion of the Respiratory Protection standard requires you to provide the PLHCP with specific information to be used to make the determination about an employee's ability to use a respirator.

This information includes:

- The type and weight of the respirator to be worn by the worker.
- The duration and frequency of respirator use (including use for rescue and escape).
- The level of physical effort that the employee would be expending while wearing a respirator.
- Additional personal protective clothing and equipment that the employee would wear.
- The temperature and humidity extremes that may be encountered in the work environment where respirator use is required.
- In addition, you must provide the PLHCP with the following:
  - A copy of your written respiratory protection program.
  - A copy of the Respiratory Protection standard.

Why do I need to provide the PLHCP with a copy of the written respiratory protection program and the Respiratory Protection standard?

This requirement helps ensure that PLHCPs have a thorough understanding of their duties and responsibilities in the medical evaluation process. Your written respiratory protection program will provide the PLHCP with critical information about the working conditions that could increase the burden placed on the employee's health during respirator use.

Does the PLHCP need to visit the worksite to perform a medical evaluation?

No, the supplemental information required in this portion of the standard should be sufficient for the PLHCP to make a valid recommendation on the employee's ability to wear a respirator. OSHA, however, encourages PLHCPs to visit the worksite if they believe the information obtained there would be useful to them.

If I select a new PLHCP, do I need to have my employees reevaluated?

No, but you must make sure that the new PLHCP has the information required in this section. You must either provide the information directly to the new PLHCP, or you must make sure that the information is transferred from the former PLHCP to the new PLHCP.

How often do I need to provide the PLHCP with supplemental information?

You need to supply the information to the PLHCP only when the conditions of respirator use change.

(e)(6) Medical determination

This portion of the standard requires you to obtain a recommendation from the PLHCP about the employee's ability to use a respirator. The PLHCP's recommendation must be in writing, and it must provide only the following information:

- A determination of whether or not the employee is medically able to use a respirator.
- Any limitations on respirator use related to the medical condition of the employee or to the workplace conditions in which the respirator will be used.
- The need, if any, for follow-up medical evaluations.
- A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

Note that you are required to have the PLHCP provide a copy of the written recommendation to each employee.

Who is responsible for making the final decision about an employee's ability to wear a respirator?

You are responsible for making the final determination. The PLHCP's opinion is an important factor that you must consider in making this determination.

Is the information from the medical evaluation confidential, or can the PLHCP share this information with me?

The PLHCP must keep strictly confidential any information revealed during the medical evaluation; your access is limited to the information contained in the PLHCP's written recommendation.

Can I receive a copy of the employee's completed medical questionnaire?

No, the completed questionnaire is a medical record and must be kept confidential.

***Negative Pressure Respirators and Powered Air-Purifying Respirators (PAPR)*:** If the PLHCP determines that an employee is unable to wear a negative pressure respirator, perhaps because of a breathing problem such as asthma or bronchitis, but would be able to wear a powered air-purifying respirator (PAPR), you must provide the employee with a PAPR. If, however, the PLHCP determines in a subsequent medical evaluation that the employee can wear a negative pressure respirator, you no longer need to provide the employee with a PAPR. *(See 29 CFR 1910.1034(e)(6)(ii).)*

(e)(7) Additional medical evaluations

This portion of the standard requires you to provide an employee with additional medical evaluations whenever the following events occur:

- The employee reports symptoms related to his or her ability to use a respirator.
- The PLHCP, respiratory protection program administrator, or supervisor, determines that a medical reevaluation is necessary.
- Information from the respiratory protection program suggests a need for reevaluation.
- Workplace conditions (such as protective clothing, temperature, or level of work effort) have changed so that an increased physiological burden is placed on the employee.
- The results of the medical examination reveal that additional medical evaluations are necessary.

The results of the medical examination reveal that additional medical evaluations are necessary. Do I need to provide my employees with a medical reevaluation annually or according to some other fixed schedule?

No, however, you must provide medical reevaluations in accordance with the PLHCP's recommendation.

Do I need to provide an employee who is unable to use a respirator with an alternative job at no loss of pay and other benefits?

The Respiratory Protection standard does not require that workers receive such benefits; however, other OSHA substance-specific standards may contain such a requirement.

CHECKLIST FOR MEDICAL EVALUATION

√ Check that the following has been done at your facility:

- ❑ All employees have been evaluated to determine their ability to wear a respirator prior to being fit tested for or wearing a respirator for the first time in your workplace.
- ❑ A physician or other licensed healthcare professional (PLHCP) has been identified to perform the medical evaluations.
- ❑ The medical evaluations obtain the information requested in *Sections 1 and 2, Part A of Appendix C of the standard, 29 CFR 1910.134*. *(See Attachment 3 at page 67)*
- ❑ Employees are provided follow-up medical exams if they answer positively to any of *questions 1 through 8 in Section 2, Part A of Appendix C* of the standard, or if their medical examination reveals that a follow-up exam is needed.
- ❑ Medical evaluations are administered confidentially during normal work hours, and in a manner that is understandable to employees.
- ❑ Employees are provided the opportunity to discuss the medical evaluation results with the PLHCP.
- ❑ The following supplemental information is provided to the PLHCP before he or she makes a decision about respirator use:
  - Type and weight of the respirator.
  - Duration and frequency of respirator use.
  - Expected physical work effort.
  - Additional protective clothing to be worn.
  - Potential temperature and humidity extremes.
  - Written copies of the respiratory protection program and the Respiratory Protection standard are provided to the PLHCP.
- ❑ Written recommendations are obtained from the PLHCP regarding each employee's ability to wear a respirator, and that the PLHCP has given the worker a copy of these recommendations.
- ❑ Employees who are medically unable to wear a negative pressure respirator are provided with a powered air-purifying respirator (PAPR) if they are found by the PLHCP to be medically able to use a PAPR. *(29 CFR 1910.1034(e)(6)(ii).)*

Employees are given additional medical evaluations when:

- ❑ The employee reports symptoms related to his or her ability to use a respirator.
- ❑ The PLHCP, respiratory protection program administrator, or supervisor determines that a medical reevaluation is necessary.
- ❑ Information from the respiratory protection program suggests a need for reevaluation.
- ❑ Workplace conditions have changed in a way that could potentially place an increased physiological burden on the employee.

Section (f): Fit testing

This section of the Respiratory Protection standard requires you to conduct fit testing on all employees who are required to wear a respirator that includes a tight-fitting facepiece. Fit testing is a procedure used to determine how well a respirator "fits"—that is, whether the respirator forms a seal on the user's face. If a good facepiece-to-face seal is not achieved, the respirator will provide a lower level of protection than it was designed to provide. For example, without a good seal, the respirator can allow contaminants to leak into the user's breathing air. The APFs for the specific classes of respirators in the final Respiratory Protection standard (*Table I: Assigned Protection Factors*) only apply if the respirators are properly selected and used in compliance with the full respirator program, including initial fit testing when necessary. Fit testing must be performed before initial use and at least annually thereafter.

This section also describes:

- What types of respirators must be fit tested.
- How often fit testing must be conducted.
- What procedures must be used.
- How the results of fit testing should be used to guide respirator selection.

Examples of respirators that need to be fit tested (tight-fitting facepieces)

Air-purifying respirators remove contaminants from the air



Half mask Filtering Facepiece Dust mask
APF=10
Needs to be fit tested



Half mask Elastomeric Respirator
APF=10
Needs to be fit tested

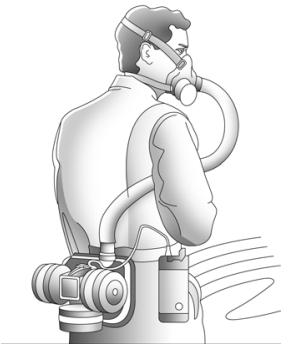
Examples of respirators that need to be fit tested (tight-fitting facepieces) *(continued)*



Full Facepiece Elastomeric Respirator
APF=50
Needs to be fit tested



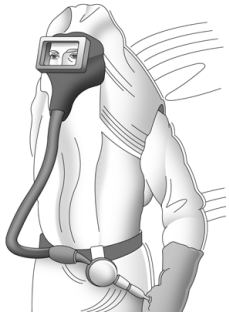
Tight-Fitting Full Facepiece Powered Air-Purifying Respirator (PAPR)
APF=1,000
Needs to be fit tested



Tight-Fitting Half Facepiece Powered Air-Purifying Respirator (PAPR)
APF=50
Needs to be fit tested



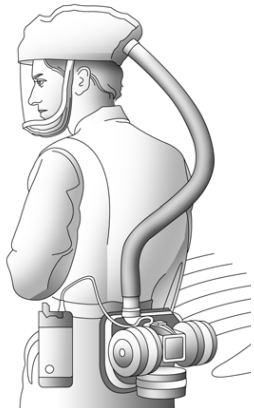
Atmosphere-supplied respirator Full Facepiece Elastomeric with an auxiliary escape bottle
APF=10,000 in escape mode only; otherwise APF=1,000
Needs to be fit tested



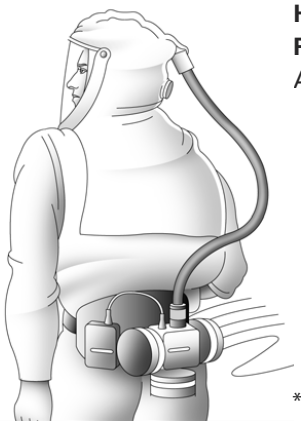
Abrasive Blasting Respirator; Atmosphere-supplying respirator Full Facepiece Elastomeric
APF=25/1,000*
Needs to be fit tested; Continuous flow

* Footnote 4 of the APF Table

Examples of air-purifying respirators that can not be fit tested because they are loose-fitting



Loose-Fitting Powered Air-Purifying Respirator (PAPR)
APF=25



Hooded Powered Air-Purifying Respirator (PAPR)
APF=25 1,000*

* Footnote 4 of the APF Table

What is a tight-fitting facepiece?

A tight-fitting facepiece is intended to form a complete seal with the respirator wearer's face. This seal must be sufficiently tight to prevent any contaminants in the work environment from leaking around the edges of the facepiece into the user's breathing air.

In contrast, a loose-fitting facepiece is specifically designed to form a partial seal with the user's face. Such a facepiece typically covers at least the head and includes a system through which clean air is distributed into the breathing zone. For example, hoods and helmets are loose-fitting facepieces. Such equipment does not rely on a tight facepiece-to-face seal to protect the employee, and is useful for employees with facial hair or other physical characteristics that make it difficult to wear a tight-fitting facepiece.

Examples of tight-fitting facepieces



Half mask Filtering Facepiece Dust mask
APF=10



Half mask Elastomeric Respirator
APF=10



Full Facepiece Elastomeric Respirator
APF=50

What are positive pressure and negative pressure respirators?

Positive pressure respirators maintain positive air pressure inside the facepiece throughout the user's breathing cycle. That is, the air pressure inside the facepiece remains greater than the air pressure outside the facepiece. Thus, any leakage around the facepiece seal should result in air escaping from inside the facepiece to the outside environment rather than worksite contaminants leaking into the facepiece and breathing air.

In contrast, a negative pressure respirator will have a lower air pressure inside the facepiece than outside during inhalation. If the facepiece-to-face seal leaks on these types of respirators, air contaminants will be drawn into the breathing air.

Examples of the two major types of respirators that require fit testing, negative pressure (air-purifying) and positive pressure (atmosphere-supplying)



Air-purifying respirator, which removes contaminants from the air
Half mask Filtering Facepiece; Dust mask
Needs to be fit tested
APF=10



Self-Contained Breathing Apparatus (SCBA)
Atmosphere-supplying, or Supplied-air respirator (SAR), which provides clean air from an uncontaminated source
Needs to be fit tested
APF=10,000

What is quantitative fit testing (QNFT)?

Quantitative fit testing is a method of measuring the amount of leakage into a respirator. It is a numeric assessment of how well a respirator fits a particular individual. To quantitatively fit test a respirator, sampling probes or other measuring devices must be placed to measure aerosol concentrations both outside and on the inside of the respirator facepiece.

The respirator wearer then performs the user seal checks followed by the selected QNFT. Basically, a user seal check is a quick and easy way for employees to verify that they have put on their respirators correctly and that the respirators are working properly. More detailed information on the user seal check is provided in Section (g): Use of Respirators, at page 41.

- For the generated aerosol QNFT, the respirator wearer stands inside a "test chamber" (booth or hood), where a nontoxic aerosol is introduced into the air. Measurements are then taken of the aerosol concentration both inside the test chamber and inside the respirator. An assessment of the quantitative fit is made based on the ratio of the aerosol concentration inside the test chamber to the concentration inside the facepiece.

- For the condensation nuclei counter QNFT, ambient air particles are used as the test aerosol with measurements made of their concentration outside and inside the facepiece, and an assessment is made of the quantitative fit of the facepiece.
- The controlled negative pressure QNFT method uses an instrument to exhaust air from inside the respirator facepiece to maintain a constant negative pressure. The measurement of the exhaust stream required to maintain a constant negative pressure yields a measure of leakage into the facepiece.
- Detailed protocols for quantitative fit testing are provided under Appendix A of the standard. *(See Attachment 3 at page 67.)*

What is qualitative fit testing (QLFT)?

Qualitative fit testing is a non-numeric pass/fail test that relies on the respirator wearer's response to a substance ("test agent") used in the test to determine respirator fit.

In qualitative fit testing, after performing user seal checks, the respirator wearer stands in an enclosure and a test agent is introduced. Such test agents are:

- Banana oil (Isoamyl acetate)
- Saccharin
- Bitrex
- Irritant smoke (no enclosure)

In qualitative fit testing, using irritant smoke as the test agent, there is no enclosure.

If the individual can detect the test agent, this indicates that the agent leaked into the facepiece and that the respirator has failed the test because a good facepiece-to-face seal has not been achieved. If the employee cannot successfully complete the qualitative test with a particular respirator, the employee must then be tested with another make, size, or model of respirator.

Detailed protocols for qualitative fit testing are in *Appendix A* of the standard. *(See Attachment 3 at page 67.)*

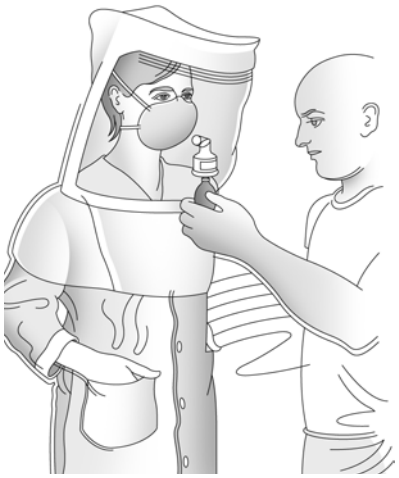
What is the fit factor?

The fit factor is a quantitative measure of how well a particular respirator fits (or provides protection to) an individual. It is the ratio of the concentration of a contaminant in the environment to the concentration inside the mask.

Fit factors are obtained from quantitative fit testing. For example, if an employee was in a test chamber that contained 300 ppm of aerosol and 3 ppm of the test agent was found inside the mask, the fit factor would be equal to 100.

Qualitative Fit Testing and User Seal Checking

Qualitative Fit Test



User seal check (paragraph (g))



A user seal check is not a fit test. The user seal check is one step an employee must take before any fit testing is performed and before the employee uses the respirator in the workplace.

(f)(1) Respirators that require fit testing

You must ensure that quantitative or qualitative fit testing is conducted for all employees required to wear either positive or negative pressure tight-fitting facepiece respirators. This includes both air-purifying and atmosphere-supplying respirators operating in either a positive or negative pressure mode, but does not include any loose-fitting facepieces.

Must I perform fit testing for workers who voluntarily wear tight-fitting facepiece respirators?

No. If an employee chooses to wear a tight-fitting facepiece respirator (including a negative pressure air-purifying respirator or a filtering facepiece (dust mask)) in a worksite environment where such equipment is not required, you are not required to conduct fit testing.

(f)(2) When fit testing must be conducted: general requirements

You must ensure that fit testing is conducted for all employees required to wear tight-fitting facepiece respirators as follows:

- Prior to initial use.
- Whenever an employee switches to a different tight-fitting facepiece respirator (for example, a different size, make or model).
- At least annually.

(f)(3) When fit testing must be conducted: changes in the respirator wearer's physical condition

You must ensure that an additional fit test is conducted if an employee experiences a change in physical condition that could affect the seal on a tight-fitting facepiece respirator. This requirement is triggered by a physical change:

- Reported by the respirator user.
- Observed by you, a physician or other licensed healthcare professional, the supervisor, or the program administrator.

Physical changes in the employee that might affect the facepiece-to-face seal could include, for example, an obvious change in body weight, facial scarring, extensive dental work, or cosmetic surgery.

(f)(4) When fit testing must be conducted: unacceptable fit as determined by an employee after fit testing

If, after fit testing, an employee reports that his or her respirator does not fit properly, you must allow the employee a reasonable opportunity to select a different tight-fitting facepiece respirator.

After another respirator is selected, you must conduct a new fit test on the employee's replacement equipment.

An employee might determine that the facepiece does not establish an effective facepiece-to-face seal, for example, upon detecting a worksite contaminant while wearing the respirator with new cartridges, or an employee might hear or feel air leaking around the facepiece-to-face seal. The employee's determination also can be based on factors unrelated to the particular worksite. For example, the employee might find that he or she can not wear the respirator for extended periods without experiencing irritation or pain.

(f)(5) Fit testing procedures: general fit testing procedures

You must ensure that all fit testing conducted for employees required to wear tight-fitting facepiece respirators follows the OSHA-approved protocols.

Detailed protocols for qualitative and quantitative fit testing are provided as part of the standard at *Appendix A*. Attachment 3 provides a copy of the standard. These protocols specify that you must have on hand during fit testing all types and sizes of respirators that are available for use at the worksite. This allows you to ensure that each employee is tested with the same type of respirator (make, model, style, and size) that he or she will wear at the worksite.

(f)(6) Limitation on use of qualitative fit testing

The table at the end of this chapter summarizes acceptable means of fit testing (QLFT and QNFT) for different types of respirators. For more information, consult OSHA's website at www.osha.gov.

Qualitative fit tests (QLFT) are those using Bitrex, Saccharin, Irritant smoke, or Isoamyl acetate as challenge agents.

QLFT may be used to fit test all positive pressure respirators (air-supplying and PAPRs). Your use of qualitative fit testing on negative pressure air-purifying respirators is limited to those that must achieve a fit factor of 100 or less. Dividing the fit factor of 100 by a standard safety factor of 10 indicates that the negative pressure air-purifying respirators that have successfully completed a qualitative fit test can be relied on to reduce an employee's exposure by a protection factor of 10. The safety factor of 10 is used because protection factors that employees achieve at work sites tend to be much lower than the fit factors achieved during fit testing.

In practice, this means that any negative pressure air-purifying respirator (APR) may be qualitatively fit tested if the APR is to be used in workplace atmospheres where the level of the hazardous contaminant is

10 times or less than the permissible exposure limit (PEL) and lower than the level that is immediately dangerous to life or health (IDLH). For example, if the PEL for a specific workplace contaminant is 5 ppm, you could use a qualitative fit test to fit test a negative pressure APR to be used in the workplace at exposure levels up to 50 ppm (ten times the PEL or less). Both half facepiece APRs and full facepiece APRs may be qualitatively fit tested if they are to be worn in work areas where the concentration of contaminant is no more than ten times the PEL. If a full facepiece APR is to be used in atmospheres with levels of contamination greater than ten (10) times the PEL, a quantitative fit test must be used. *(See section (f)(7).)*

The quantitative fit tests are:

- The Portacount
- CNP
- CNP REDON

(f)(7) Use of quantitative fit testing

If quantitative testing is used to fit test a tight-fitting facepiece respirator, respirator fit is not acceptable unless:

- For a half or quarter facepiece: The fit factor achieved in the test is greater than or equal to 100.
- For a full facepiece: The fit factor achieved in the test is greater than or equal to 500.

The following quantitative fit testing procedures (QNFT) have been demonstrated to be acceptable: Portacount, Controlled Negative Pressure (CNP), and Controlled Negative Pressure REDON (CNP REDON).

When using a QNFT, a non-hazardous test aerosol is generated and appropriate instrumentation measures the respirator fit.

(f)(8) Fit testing for atmosphere-supplying and powered air-purifying respirators

You must ensure that all fit testing conducted for employees issued tight-fitting atmosphere-supplying respirators and powered air-purifying respirators is conducted in the negative pressure mode, even if the respirator will be used with positive pressure. This is because it is difficult outside of a laboratory test situation to accurately perform fit testing on positive pressure respirators.

In what circumstances might an atmosphere-supplying or powered air-purifying respirator (PAPR) perform like a negative pressure respirator?

If the blower component of a PAPR loses power because it is turned off or the batteries run out, the respirator will become a negative pressure respirator.

Also, powered air-purifying respirators and self-contained breathing apparatus units can perform like negative pressure respirators when the user increases his or her inhalation rate during heavy work. The increased inhalation rate can result in negative pressure spikes inside the facepiece that are greater than the positive pressure of the air being supplied. This is called "overbreathing the respirator." Therefore, positive air flow alone cannot be counted on to prevent the leakage that can occur with a poorly fitting facepiece.

You can conduct qualitative or quantitative fit testing of tight-fitting atmosphere-supplying respirators and powered air-purifying respirators according to the following requirements.

Qualitative fit testing. To conduct qualitative fit testing on an atmosphere-supplying respirator, you must do one of the following:

- Temporarily convert the user's actual facepiece into a negative pressure respirator by installing the appropriate filters. If you are not sure how to do this, check with the respirator manufacturer or your supplier;
- Use an identical negative pressure facepiece (size, make, model); or
- You can conduct qualitative fit testing on a powered air-purifying respirator by simply turning off the blower.



Quantitative fit testing. To conduct quantitative fit testing on an atmosphere-supplying respirator, you must temporarily or permanently install a sampling probe or adaptor inside the facepiece.

In preparation for testing, you should contact the respirator manufacturer or supplier for information on

whether a sampling adapter can be temporarily installed in the facepiece.

Any modifications made to a respirator for testing purposes must be removed before use.

If temporary modifications cannot be made, you will need to permanently convert the facepiece to allow for testing. If you permanently convert the facepiece – for example, by drilling a hole in the respirator facepiece to insert the probe – you cannot repair the hole and put the respirator back in service. Once a hole is drilled in the facepiece, the respirator can only be used for fit testing purposes. It is no longer approved for workplace use.

What is the CNP REDON Fit Test?

The CNP REDON protocol requires the performance of three different test exercises followed by two redonnings of the respirator, while the CNP protocol approved previously by OSHA specifies eight test exercises, including one redonning of the respirator. In addition to amending the standard to include the CNP REDON protocol, this rulemaking made several editorial and non-substantive technical revisions to the Standard associated with the CNP REDON protocol and the previously approved CNP protocol.

This additional quantitative fit testing protocol, the controlled negative pressure (CNP) REDON fit testing protocol, is now included in *Appendix A of the final Respiratory Protection standard. (See Attachment 3 at page 67.)* The protocol affects, in addition to general industry, OSHA respiratory protection standards for shipyard employment and construction.

Are any new fit test methods being developed?

Yes, OSHA approved a new fit test, see Attachment 3 at page 67 of the guide.

The Respiratory Protection standard included a provision for the development of new, faster, less costly fit tests. *Part II of Appendix A of the Respiratory Protection standard,* at Attachment 3 of this guide, specifies, in part, the procedure individuals must follow to submit new fit testing protocols for the Agency's consideration. The criteria OSHA uses for determining whether to propose adding a fit testing protocol to the Respiratory Protection standard include: (1) A test report prepared by an independent government research laboratory (e.g., Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), the National Institute for Standards and Technology) stating that the laboratory tested the protocol and found it to be accurate and reliable; (2) an article published in a peer-reviewed industrial hygiene journal describing the protocol, and explaining how test data support the accuracy and reliability of the protocol. When a protocol meets one of these criteria, the Agency conducts a notice-and-comment rulemaking under *Section 6(b)(7) of the OSH Act of 1970 (29 U.S.C. 655)*. The purpose of this provision was to allow for the development of new technology for fit tests, allowing for faster and better fit test methods, as well as new fit test choices for employers. As OSHA noted in the proposal, the CNP REDON protocol met the second of these criteria (68 FR 33887; June 6, 2003).

Acceptable Fit Testing Methods

Respirator	QNFT	QLFT
Half Face, Negative Pressure, APR (<100 fit factor)	Yes	Yes
Full face, Negative Pressure, APR (<100 fit factor) used in atmospheres up to 10 times the PEL	Yes	Yes
Full face, Negative Pressure, APR (>100 fit factor)	Yes	No
PAPR	Yes	Yes
Supplied-Air Respirators (SAR), or SCBA used in Negative Pressure (Demand Mode) (>100 fit factor)	Yes	No
SCBA - Structural Fire Fighting, Positive Pressure	Yes	Yes
SCBA/SAR - IDLH, Positive Pressure	Yes	Yes
Mouthbit Respirators	Fit Testing Not Required	
Loose-fitting Respirators (e.g., hoods, helmets)	Fit Testing Not Required	

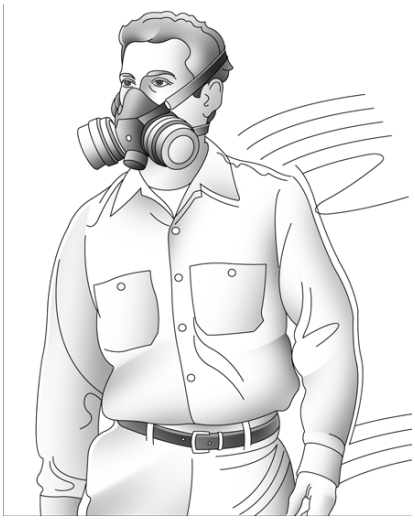
Examples of respirators that require fit testing (tight-fitting) are depicted on following pages. In cases in which elastomeric facepieces are used, remember that elastomeric facepieces are made from natural or synthetic rubber or silicone; EPDM is an acronym for a specific type of rubber, that is, Ethylene propylene diene M-class rubber.

Air-purifying respirators

Air-purifying respirators, which remove contaminants from the air.



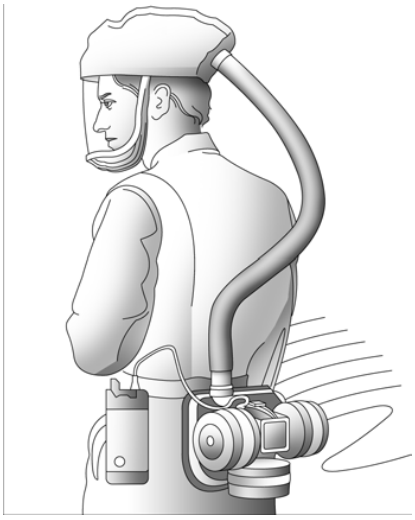
Half mask Filtering Facepiece Dust mask
APF=10
Needs to be fit tested



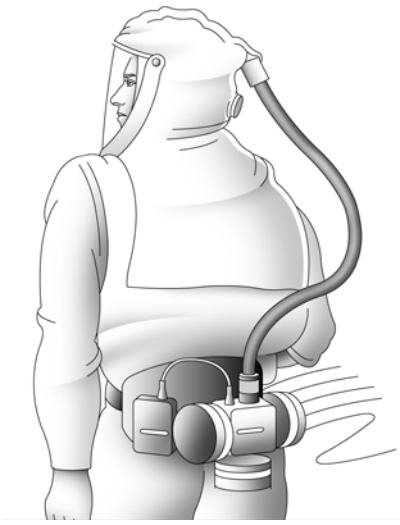
Half mask Elastomeric Respirator
APF=10
Needs to be fit tested



Full Facepiece Elastomeric Respirator
APF=50
Needs to be fit tested



Loose-Fitting Powered Air-Purifying Respirator (PAPR)
APF=25

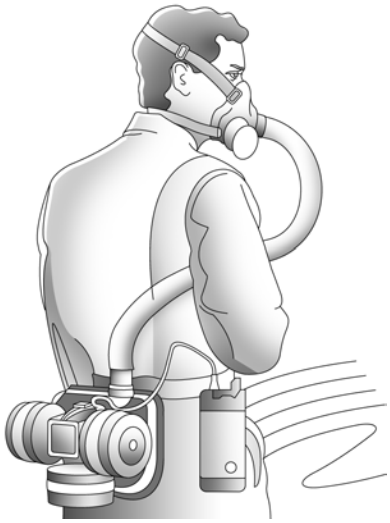


Hooded Powered Air-Purifying Respirator (PAPR)
APF=25 (1,000)*

* Footnote 4 of the APF Table.



Tight-Fitting Full Facepiece Powered Air-Purifying Respirator (PAPR)
APF= 1,000
Needs to be fit tested



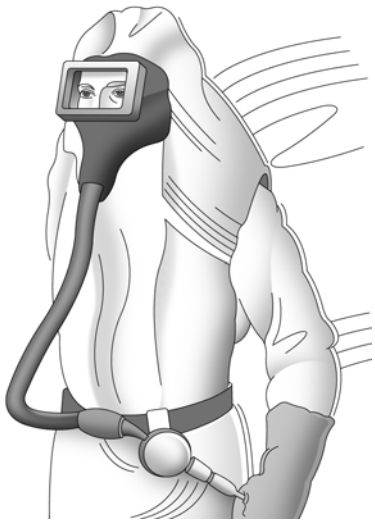
Tight-Fitting Half Facepiece Powered Air-Purifying Respirator (PAPR)
APF= 50
Needs to be fit tested

Atmosphere-supplying respirators

Atmosphere-supplying respirators, which provide clean air from an uncontaminated source.



Tight-fitting Self-Contained Breathing Apparatus (SCBA) pressure-demand mode
APF=10,000
demand mode
APF=50
Needs to be fit tested



Tight-fitting Abrasive Blasting Respirator Continuous flow
APF=25/1,000*
SAR Full Facepiece
*Needs to be fit tested**



Tight-fitting Atmosphere-Supplying Respirator with an auxiliary escape bottle
APF=10,000 in escape mode only; otherwise APF=1,000
Full facepiece
Needs to be fit tested

* Footnote 4 of the APF Table.

Filtering facepiece (N95) respirators, surgical (N95) respirators, and surgical masks



Filtering facepiece (N95) surgical mask

Surgical (N95) respirator

Surgical mask

Respirators are designed to reduce a worker's exposure to airborne contaminants. Respirators come in various sizes and must be individually selected to fit the wearer's face and to provide a tight seal. A proper seal between the user's face and the respirator forces the inhaled air through the respirator's filter material and not through gaps between the face and the respirator. Both the filtering facepiece (N95) respirators and the surgical (N95) respirators must be fit tested to ensure that a proper seal exists between the employee's face and the respirator. Both of the respirators provide protection from exposures to airborne influenza flu viruses. Whenever respirators are required by employees (e.g., N95 and Surgical N95 respirators), they must be NIOSH-certified and selected and used in compliance with OSHA's Respiratory Protection standard.

Surgical masks and surgical (N95) respirators are used as a physical barrier to protect the user from hazards, such as large droplets of: splashes or sprays of human and animal blood; any unfixed tissue, organs, tissue and organ cultures (including those from experimental animals); other secretions that are visibly contaminated with blood; and, all body fluids in situations where it is difficult or impossible to differentiate between body fluids. Surgical masks, by themselves, are not designed to seal tightly against the user's face and are not subject to fit testing. Surgical masks are not designed or certified to prevent the inhalation of small airborne particles that are not visible to the naked eye but may still be capable of causing infection.

CHECKLIST FOR FIT TESTING

√ Check all the fit tests listed below that are used at your facility:

- ❑ Employees who are using tight-fitting respirator facepieces have passed an appropriate fit test prior to being required to use a respirator.
- ❑ Fit testing is conducted with the same make, model, style and size that the employee will be expected to use at the worksite.
- ❑ Fit tests are conducted annually and when different respirator facepieces are to be used.
- ❑ Provisions are made to conduct additional fit tests in the event of physical changes in the employee that may affect respirator fit.
- ❑ Employees are given the opportunity to select a different respirator facepiece, and be retested if their respirator fit is unacceptable to them.
- ❑ Fit tests are administered using OSHA-accepted QNFT or QLFT protocols.
- ❑ QLFT is only used to fit test either PAPRs, SCBAs, or negative pressure APRs that must achieve a fit factor of 100 or less.
- ❑ QNFT is used in all situations where a negative pressure respirator is intended to protect workers from contaminant concentrations greater than 10 times the PEL.
- ❑ When QNFT is used to fit negative pressure respirators, a minimum fit factor of 100 is achieved for tight-fitting half facepieces and 500 for full facepieces.

For tight-fitting atmosphere-supplying respirators and powered air-purifying respirators:

- ❑ Fit tests are conducted in the negative pressure mode.
- ❑ QLFT is achieved by temporarily converting the facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure APR.
- ❑ QNFT is achieved by modifying the facepiece to allow for sampling inside the mask midway between the nose and mouth. If the facepiece is permanently converted during fit testing, the respirator is no longer approved for workplace use.

Section (g): Use of respirators

As part of your written program, you must establish and implement procedures for the proper use of respirators in both routine jobs and emergencies. Specific procedures are required to:

- Prevent leaks in the respirator facepiece seal.
- Prevent employees from removing respirators in hazardous environments.
- Ensure that respirators operate effectively throughout the work shift.
- Protect employees entering IDLH atmospheres and interior structural firefighting situations.

(g)(1) Preventing leaks in the facepiece seal

Facepiece seals and valves are important in tight-fitting respirators. Tight-fitting respirators should be able to provide a complete seal to the face. If there is a leak in the seal of a tight-fitting respirator or valve, then the respirator cannot effectively reduce the wearer's exposures to respiratory hazards. You must be sure that nothing interferes with the seal of the respirator to the employee's face or with the valves. You must also ensure that employees check the seal of a tight-fitting respirator by conducting a user seal check each time the employee dons the respirator.

Conditions that can interfere with the seal or valve are specified in the standard and include:

- Facial hair;
- Facial scars;
- Jewelry or headgear that projects under the facepiece seal;
- Missing dentures; and
- Corrective glasses or goggles or other protective equipment such as:
  - Face shields
  - Protective clothing
  - Helmets
  - Eyeglass insert or spectacle kits

Employees may use this equipment with tight-fitting respirators if you ensure that the equipment is worn in a way that:

- Does not interfere with the face-to-facepiece seal.
- Does not distort the employee's vision.
- Does not cause physical harm to the employee (e.g., if the eyeglass insert did not fit properly so that the tight fit of the respirator caused the insert to press against his or her forehead, eyes, or temples).

You must make sure that the employee's eyewear does not interfere with the respirator seal, or that the worker has to remove the eyewear altogether.

What if an employee has a condition that does not interfere with the face-to-facepiece seal?

As long as the condition does not interfere with the function of the respirator valves, then the employee can wear a tight-fitting respirator, provided that the employee has no other conditions that interfere with the face-to-facepiece seal or valve. For example, a mustache may not interfere with the facepiece seal but may interfere with the valve function.

Do these restrictions apply to all types of respirators?

The restrictions for facial hair and other conditions apply ONLY to tight-fitting respirators. Several respiratory protection alternatives, such as loose-fitting hoods or helmets, are available to accommodate employees with facial hair or with other conditions that might interfere with the seal of the facepiece to the face of the user.

Can employeess wear contact lenses?

Yes, contact lenses can be safely worn with respirators.

What is a user seal check?

You must be sure that employees perform user seal checks each time they put on a tight-fitting respirator. User seal checks are a quick and easy way for employees to verify that they have put on their respirators correctly and that the respirators are working properly.

To conduct a user seal check, the employee must follow either the procedures for a user seal check that are contained in *Appendix B-1 to § 1910.134: User Seal Check Procedures (Mandatory)*, or equally effective procedures that the respirator manufacturer recommends for conducting a user seal check. A copy of the standard is in Attachment 3 of this guide.

How are user seal checks conducted?

To conduct a user seal check, the employee performs a negative or positive pressure fit check.

For the negative pressure check, the employee:

- covers the respirator inlets (cartridges, canisters, or seals)
- gently inhales, and
- holds breath for 10 seconds.

The facepiece should collapse on the worker's face and remain collapsed.

For the positive pressure check, the worker:

- covers the respirator exhalation valve(s), and
- exhales.

The facepiece should hold the positive pressure for a few seconds. During this time, the employee should not hear or feel the air leaking out of the face-to-facepiece seal. *Appendix B-1 of the Respiratory Protection standard* provides detailed instructions on how to conduct the user seal check. Attachment 3 of this guide provides a copy of the standard.

The manufacturer's recommended procedures for checking the facepiece seal may be used if the employer demonstrates that the manufacturer's procedures are as effective as those described in *Appendix B-1 of the Respiratory Protection standard* (i.e., these procedures are effective in identifying respirators that fit poorly when put on or adjusted).

Can a user seal check be used as a substitute for a qualitative fit test?

No, a user seal check is ***not*** a substitute for a qualitative fit test. Fit testing is a more rigorous procedure that is used to determine whether the respirator fits the face of the employee. Section (f) of this Compliance Guide contains a complete discussion on respirator fit testing. *(See fit testing in Appendix A of the standard; See user seal check in Appendix B-1 of the standard.)* A copy of the standard is provided in Attachment 3 of this guide.

How can employers ensure that workers perform user seal checks?

A major purpose of the standard is to make sure that the fit and performance of the respirator is not compromised. You must take actions that will result in safe work practices. Examples of these actions include:

- Providing training to workers
- Routinely observing work practices
- Routinely monitoring site conditions
- Consulting workers

Example of a worker performing a user seal check on a half mask elastomeric air-purifying respirator



(g)(2) Continuing respirator effectiveness

You must be aware of conditions in work areas where employees are using respirators. You must also allow employees to leave the respirator use area to perform any activity that involves removing or adjusting a respirator facepiece, or if there is any indication that a respirator may not be fully effective. If there is any indication that they are not functioning properly, you must repair or discard and replace respirators before allowing employees to return to an area in which respirator use is required.

Workplace conditions include the following:

- The level of the contaminant in relation to the APF
- The size and configuration of the workspace
- Ease of employee communication
- Ease or difficulty of the work or rate of activity
- The type of workplace tasks and proximity to the source of contamination, e.g., cutting wood on a band saw would differ from hand polishing a wood veneer on furniture.
- Workplace conditions such as temperature and humidity or the location and movement of other personnel and equipment.

How can I conduct appropriate surveillance?

"Appropriate surveillance" means that you must routinely look for any changes that may affect the effectiveness of a respirator. You must look for changes in the work area, such as changes in work tasks or processes, that can result in changes in the hazard or the time period of exposure, or that put the employee in closer proximity to the hazard. Another change might be the addition of new machinery that would cause an employee to exert more energy and breathe harder.

By "appropriate surveillance" OSHA means that you must routinely observe employees as they work while wearing respirators. By observing respirator use under actual workplace conditions, you can determine:

- Whether other protective equipment is interfering with respirator use.
- Whether a change in working conditions may result in exposure to new contaminants or an increase in contaminant exposure.
- Whether employees are experiencing discomfort, such as skin irritation or breakthrough of contaminants through cartridges and canisters.

If any of these conditions exist, you must make adjustments – such as providing a more protective respirator or a different size or style of respirator, or altering work practices to reduce the stress on employees – to ensure that employees continue to receive adequate respiratory protection.

When must employees leave the exposure areas to maintain the integrity of their respirators?

To maintain their respirators, employees may, from time to time, need to leave the area where respirator use is required and go to a safe area free of respiratory hazards and contaminants.

Employees must leave the respirator use area:

- If the employee needs to wash his or her face or the respirator facepiece to prevent eye or skin irritation associated with respirator use.
- If the employee detects vapor or gas breakthrough (that is, the cartridge or canister is saturated with contaminant and needs to be changed).
- If the employee notices that the facepiece is leaking.
- If the employee observes a change in breathing resistance (that is, the filter is full of dust or other particles and needs to be changed).
- If the respirator or parts of the respirator, such as valves or straps, are not working properly and need to be replaced.

Employees need a "safe area" in the workplace where they can safely remove their respirators to wash or conduct the maintenance necessary to ensure the respirator's adequate operation. Through training and supervision, employees must know the conditions of respirator use that require them to leave the exposure areas and go to a safe area.

Where does the safe area need to be located?

The safe area must be located in a place that is free of respiratory hazards or contamination. As long as these conditions are met, the safe area can be in a location that minimizes interruptions to work flow.

How often do respirators need to be replaced or repaired?

There is no required replacement schedule for respirators in general. However, damaged respirators cannot properly protect workers. Respirators need to be replaced or repaired when one or more of their components is missing, damaged, or visibly deteriorated.

(g)(3) Procedures for Immediately Dangerous to Life or Health atmospheres and for interior structural firefighting

This section of the Respiratory Protection standard contains requirements for respirator use in IDLH environments. The standard defines IDLH as "an atmosphere that poses an immediate threat to life,

would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere." (See Section (d) of this guide or *paragraphs (g)(3)-(4)* of the standard.)

The provisions of *paragraph (g)(3)* of the Respiratory Protection standard are requirements for respirator use in all IDLH atmospheres. *Paragraph (g)(4)* contains additional requirements applicable only to the extra-hazardous environments encountered during "interior structural fire fighting." Information about "interior structural fire fighting" is explained further in section (g)(4) of the guide. OSHA considers interior structural firefighting environments to be IDLH environments. These two paragraphs, *((g)(3) and (g)(4))*, deal with requirements for standby personnel and the respirator users inside the IDLH atmosphere. The standard requires standby personnel when employees use respirators in IDLH environments. These two provisions ensure that adequate rescue capability exists in case of respirator failure or some other emergency inside the IDLH environment.

Who are standby personnel?

Standby personnel are firefighters who remain outside the IDLH atmosphere. They must be available, trained, and equipped to assist respirator users inside the IDLH atmosphere, and to provide effective emergency rescue, when needed.

You must be sure that standby personnel maintain visual, voice, or signal line communication with the employees in the IDLH environment. Standby personnel may use radios to communicate with workers inside the IDLH environment. You must be sure that standby personnel notify you or your designated representative before entering the IDLH atmosphere. Once notified, you must provide necessary assistance appropriate to the situation.

When do I need to have more than one standby person located outside the IDLH environment?

A single standby person is adequate if an IDLH environment is well characterized and controlled, and if one person can easily maintain communication with all employees in the IDLH environment. Two stand-by personnel are required for interior structural firefighting. An IDLH atmosphere is "well characterized" if it has been monitored and the results of the monitoring have been analyzed, or if it has been through a process-hazard analysis. (Chemical plants conduct comprehensive process-hazard analyses as required by OSHA's Process Safety Management standard [29 CFR 1910.119] to determine which process units pose IDLH hazards.)

Often, only one respirator user at a time is exposed to an IDLH atmosphere, and a single standby person can easily monitor that employee's status. Even in situations where more than one respirator user is inside an IDLH environment, a single standby person can often provide adequate communication and support. For example, one standby person can easily communicate with more than one employee working inside a small pump room or shed.

More than one standby person may be required for other situations. For example, to clean and paint the inside of a multi-level, multi-portal water tower, a process that often generates a deadly atmosphere as a result of cleaning solutions and paint-solvent vapors, employees often enter the tower through different portals to work on different levels. In such a situation, there will be a need for good communication at each entry portal, and more than one standby person would be needed to maintain adequate communication and accessibility (See also 29 CFR 1910.146, Confined Spaces).

When must standby personnel maintain communication with employees in the IDLH atmosphere?

Standby personnel must maintain communication with employees in the IDLH atmosphere at all times. Voice, visual, or hand signal line communication must be continuously maintained between the employee(s) in the IDLH environment and the standby person. Because IDLH conditions present the potential for serious injury or death, there is little margin for error in an IDLH environment. Equipment malfunction in an IDLH environment can swiftly disable employees, prevent them from leaving the environment, and lead to severe injury or death. For this reason, close communication between standby personnel and respirator users in the IDLH environment is critical.

When is radio communication acceptable?

Standby personnel must be in visual, voice, or signal-line communication with the employees inside the IDLH environment. However, standby personnel may communicate by two-way radio (intrinsically safe) with employees inside the IDLH environment, if use of visual, voice, or signal-line communication is not feasible. A standby employee should have a telephone or radio to summon additional help, and should not enter an IDLH environment for rescue until help arrives. The standby person also must be able to assist in providing or obtaining effective emergency assistance to employees inside the IDLH environment. In interior structural firefighting situations, firefighters inside the burning structure may communicate with one another by two-way radio, but they must also remain in visual or voice contact with each other.

Is voice communication the only acceptable method for employees in the IDLH environment and standby personnel to communicate with one another?

No, communication can be in the form of signal lines. It is advisable to have several means of communication systems available, in the event that one form of communication fails.

What is appropriate training and equipment for the standby personnel?

You must train the standby personnel to:

- Provide effective emergency rescue; and
- Notify you or your designated representative before the standby personnel enter the IDLH atmosphere to attempt an emergency rescue.

You must equip your standby personnel with the following:

- Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and
- Either appropriate retrieval equipment for removing the employees inside the IDLH atmosphere where retrieval equipment would contribute to the rescue of the employees inside the IDLH atmosphere and would not increase the overall risk resulting from entry; or
- Equivalent means for rescue where retrieval equipment could increase the overall risk resulting from entry.
- For employees involved in interior structural firefighting, standby personnel must be equipped with SCBAs.

Rescue personnel must be properly trained and protected before they enter the IDLH environment. The Hazardous Waste Operations and Emergency Response standard (29 CFR 1910.120) and the Permit-Required Confined Spaces standard (29 CFR 1910.146) provide guidance on the training and protective equipment that is required. Situations exist in which retrieval lines (harnesses, wristlets, anklets) may pose an entanglement problem, especially in areas in which air lines or electrical cords are present in the work areas in which the IDLH atmosphere occurs. Most of the time, however, rescue with retrieval equipment is effective, and much safer for the rescuers because the standby personnel do not have to enter the IDLH atmosphere.

If there is an emergency, can the standby provide immediate rescue assistance?

Your standby personnel must inform either you or your designated representative before attempting emergency rescue within an IDLH environment. Your designated representative may be a properly trained employee or response team, or local firefighting and emergency rescue personnel. In any case, proper arrangements and procedures must be in place before you can allow your employees to enter an IDLH environment. Once notified, you must provide necessary assistance appropriate to the situation.

This provision of the standard ensures that you know when an emergency has occurred so that you or your designated representative can send in immediate additional assistance to help in the rescue.

When should standby personnel enter the IDLH environment?

Under most circumstances, standby personnel should not enter the IDLH environment until you or your designated representative has responded to the notification acknowledging that an emergency exists, that rescue personnel are entering the IDLH environment, and that emergency response units are on their way to provide additional assistance. You must provide standby personnel (rescuers) with proper respiratory equipment, and you must train and prepare your standby personnel to facilitate rescue attempts.

This notification provision does not require that standby employees should wait indefinitely for you or your authorized designee to respond to notification before entering the IDLH atmosphere when your employees inside are in danger and standby personnel are appropriately trained and equipped to provide assistance. In the majority of cases, however, rescuers should not enter the IDLH environment until receiving some response from you (i.e., you or your designated representative should know that the rescuers are entering and emergency response units should be on their way to the incident).

How must I provide appropriate assistance in emergencies?

Once you or your designated representative has been notified, you or your representative must provide the necessary assistance appropriate for the situation. You must make sure that:

- Rescue operations are carried out appropriately
- Rescuers are provided with proper respiratory equipment
- Designated employees are adequately prepared to conduct rescue attempts

You may not always need to send standby personnel into the hazardous atmosphere. In some cases, the employee within the IDLH environment will be able to get out on his or her own, or retrieval equipment may

enable rescuers to retrieve the employee without entering the hazardous atmosphere. In these instances, you must be prepared to provide employees inside IDLH atmospheres and standby personnel employees with emergency medical treatment.

You should consult OSHA's rules on confined spaces (29 CFR 1910.146) and on hazardous waste operations and emergency response (29 CFR 1910.120) for other provisions that may apply to IDLH environments.

(g)(4) Procedures for interior structural firefighting

This portion of the standard applies to employees engaged in interior structural firefighting only. Federal OSHA does not cover public employees such as firefighters. However, public employees are covered by the State OSHA programs in the 27 states that operate their own state programs.

What is interior structural firefighting?

Interior structural firefighting is firefighting to control or extinguish a fire in an advanced stage of burning inside a building. Because the fire is producing large amounts of smoke, heat, and toxic products of combustion, exposure of firefighters is extremely hazardous and the environment is considered IDLH.

For interior structural firefighting, you must have two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times. You must also have two standby personnel located outside the IDLH atmosphere (two-in, two-out); all employees engaged in interior structural firefighting must use SCBAs.

Are all firefighters engaged in interior structural firefighting covered by the standard?

Yes, when OSHA's Respiratory Protection standard is applied to private-sector employees engaged in firefighting covered under Section 19 of the Occupational Safety and Health Act. These employees include those working in industrial fire brigades and private incorporated fire companies. Federal agencies must comply with the Respiratory Protection standard or an equally stringent standard, pursuant to Executive Order 12196 and 29 CFR 1960.17, covered under Section 6 of the Occupational Safety and Health Act (with a general exemption for military personnel and operations).

There are 27 states and territories that enforce occupational safety and health requirements. In these states and territories, enforcement of occupational safety and health requirements is by the State agency responsible for the OSHA-approved state plan. These states are required to extend their coverage to state and local government employees, including public sector firefighters, who are not otherwise covered by Federal OSHA. The states and territories operating OSHA-approved state plans are: Alaska, Arizona, California, Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Washington, and Wyoming. Connecticut, New Jersey, New York, and the Virgin Islands operate OSHA-approved state plans that apply to state and local government employees only.

Coverage of volunteer firefighters varies by State and depends on State law. State and local government employees in states that do not operate OSHA-approved state plans are not covered by these requirements, unless the requirements are voluntarily adopted for local applicability.

What additional requirements apply to interior structural firefighting?

In addition to the requirements for all IDLH atmospheres, if your employees are involved in interior structural firefighting, you must be certain that:

- At least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times and at least two employees are located outside the IDLH atmosphere, namely the "two in, two out" policy.
- All employees engaged in interior structural firefighting use SCBAs.
- Although two individuals must always be located outside the IDLH atmosphere, one may be assigned to an additional role, such as incident command, pump operations, or operator of the fire apparatus – so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident. Any assignment of additional duties to the second firefighter must be weighed against the potential for the additional duties to interfere with assistance or rescue activities.

Must firefighters wait until four employees are assembled before attempting to rescue victims inside the burning structure?

No, there is an explicit exemption in the Respiratory Protection standard that states that if life is in jeopardy the "two-in, two-out" requirement is waived. The incident commander and the firefighters at the scene must decide whether the risks posed by entering the interior structural fire before at least four firefighters have assembled is outweighed by the need to rescue a victim whose life may be at risk.

Section (h): Maintenance and care of respirators

You must provide respirator users with equipment that is clean, sanitary, and in good working order. To accomplish this you must have a system of respirator care and maintenance as a component of your respiratory protection program. Regular care and maintenance is important to ensure that the equipment functions as designed and protects the user from the threat of illness or death.

Your system of respirator care and maintenance must provide for:

- cleaning and disinfection procedures
- proper storage
- regular inspections
- repair methods

CHECKLIST FOR PROPER USE OF RESPIRATORS

√ Check your facility to be certain that:

- ❑ Employees using tight-fitting respirators have no conditions, such as facial hair, that would interfere with a face-to-facepiece seal or valve function.
- ❑ Employees wear corrective glasses, goggles, or other protective equipment in a manner that does not interfere with the face-to-facepiece seal or valve function.
- ❑ Employees perform user seal checks prior to each use of a tight-fitting respirator.
- ❑ There are procedures for conducting ongoing surveillance of the work area for conditions that affect respirator effectiveness, and that, when such conditions exist, you take steps to address those situations.
- ❑ Employees are permitted to leave their work area to conduct respirator maintenance, such as washing the facepiece, or to replace respirator parts.
- ❑ Employees do not return to their work area until their respirator has been repaired or replaced in the event of a breakthrough, a leak in the facepiece, or a change in breathing resistance.
- ❑ There are procedures for respirator use in IDLH atmospheres and during interior structural firefighting to ensure that: the appropriate number of standby personnel are deployed; standby personnel and workers in the IDLH environment maintain communication; standby personnel are properly trained, equipped, and prepared; you will be notified when standby personnel enter an IDLH atmosphere; and you will respond appropriately to this notification.
- ❑ Standby personnel are equipped with a pressure demand or other positive pressure SCBA, or a positive pressure supplied-air respirator with an escape SCBA, and appropriate retrieval equipment or other means for rescue.
- ❑ Procedures for interior structural firefighting require that: at least two employees enter the IDLH atmosphere and remain in contact with one another at all times; at least two standby personnel are used; and all firefighting employees use SCBAs.

(h)(1) Cleaning and disinfecting

Respirator equipment must be regularly cleaned and disinfected according to specified procedures (*See Appendix B-2* of the standard; a copy of the standard is provided at Attachment 3 of this guide) or according to manufacturer specifications that are of equivalent effectiveness.

Cleaning and disinfection procedures are divided into the following:

- Disassembly of components
- Cleaning and disinfecting
- Rinsing, drying and reassembly
- Testing

How often must respirators be cleaned and disinfected?

The frequency of cleaning and disinfecting or sanitizing respirators will depend in part on whether your employees share the equipment or are issued respirators for their exclusive use. Worksite conditions also dictate cleaning frequency; e.g., working in a dirty environment will require that the respirator facepiece, in particular, be cleaned more frequently. The frequency must be noted in your written respiratory protection plan.

At a minimum:

If a respirator is...

- issued for the exclusive use of an individual employee, the equipment must be cleaned and disinfected as often as necessary to be maintained in clean and sanitary condition.
- used by more than one employee, the equipment must be cleaned and disinfected before being used by different individuals.
- maintained for use in emergencies, testing, and training exercises, the equipment must be cleaned and disinfected *after* each use.

Who is responsible for cleaning and disinfecting respirators?

You may choose the program that best meets the needs of your workplace. For example, you may use a centralized operation where employees receive respirators that have been cleaned, disinfected and repaired by employees assigned to this task. You also may require that each respirator wearer be responsible for cleaning and maintaining his or her own equipment. In either case, you must provide the necessary equipment and supplies and, in addition, you must provide appropriate training and allow on-the-job time for the training and for the cleaning and maintenance of respirators.

(h)(2) Storage

What are the proper storage procedures for respirators?

You must store respirators in a manner that:

- Protects them from contamination, dust, sunlight, extreme temperatures, excessive moisture, damaging chemicals, or other destructive conditions.
- Prevents the facepiece or valves from becoming deformed.
- Follows all storage precautions issued by the respirator manufacturer.

In addition, if a respirator is for emergency use, it must be:

- Kept accessible to the work area, but not in an area that may itself become involved in an emergency and become contaminated or inaccessible.
- Stored in a compartment or cover (e.g., on a fire truck) that is clearly identified as containing emergency equipment.
- Stored according to the manufacturer's instructions.

(h)(3) Inspection

How often must respirators be inspected, and what procedures do I follow?

The frequency of and procedures for inspections depend on whether the respirator is designed for non-emergency, emergency, or escape-only use.

All respirator inspections must include:

- A check of respirator function, tightness of connections, and the condition of the various parts, including, but not limited to the facepiece, head straps, valves, connecting tubes, and cartridges, canisters, or filters. A visual inspection of the respirator may identify parts that may be missing, distorted, blocked, loose, deteriorated, or otherwise interfere with proper performance. *(See (g)(2) of the standard.)*
- A check of elastomeric (rubber) parts for pliability and deterioration.

In addition, inspect:

- **Non-emergency use equipment**. *Before* each use and *during* cleaning and disinfection.
- **Self-contained breathing apparatus (SCBA)**. *Monthly*, making sure the air and oxygen cylinders that are available for immediate use are maintained in a fully charged state (i.e., pressure is not below 90% of manufacturer's recommended level). You must also activate the regulator and low pressure warning devices to ensure that they function properly.
- **Emergency use respirators**. *At least monthly*, checking for proper functioning *before and after each use*. When inspecting these types of respirators you must:
  - Document the date of inspection, name or signature of inspector, inspection findings, any remedial action required, and serial number or other identification of the respirator.
  - Retain this information with the respirator, in the storage compartment or inspection report until the next certification. You may use tags or labels to document the inspections.
- **Emergency escape-only equipment**. *Before* being carried into the workplace for use.

The frequency must be noted in your written respiratory protection plan.

(h)(4) Repairs

What do I do if a respirator fails to pass inspection?

If a respirator does not pass inspection, you must remove the respirator from service and discard, repair, or adjust it. Tagging out-of-service respirators is a good means for ensuring that defective respirators are not inadvertently used.

When must I replace or repair respirators?

You must replace or repair respirators that are not working properly. Respirators should not be used if they are defective in any way. You must replace or repair a defective respirator whenever the employee detects vapor or gas breakthrough, changes in breathing resistance, or facepiece leakage, and before allowing the employee to return to the work area where respirator use is required.

Who performs the repair work?

Respirators may be repaired only by an appropriately trained person who must use NIOSH-certified parts

that are designed for the particular respirator being repaired.

Valves, regulators, and alarms must be adjusted and repaired only by the manufacturer or a technician trained by the manufacturer.

What are some examples of when a respirator should be removed from service?

- An alarm system is not functioning on an SCBA.
- A respirator strap, buckle, or connection is damaged or missing.
- The mask portion of a respirator is misshapen or degraded and can no longer form a good seal around the user's face.

CHECKLIST FOR RESPIRATOR MAINTENANCE AND CARE

√ Check to make sure that your facility has met the following requirements:

Cleaning and disinfecting:

❑ Respirators are provided that are clean, sanitary, and in good working order.

❑ Respirators are cleaned and disinfected using the procedures specified in *Appendix B-2 of the standard*.

Respirators are cleaned and disinfected:

❑ As often as necessary when issued for the exclusive use of one employee.

❑ Before being worn by different individuals.

❑ After each use for emergency use respirators.

❑ After each use for respirators used for fit testing and training.

Storage:

❑ Respirators are stored to protect them from damage from the elements, and from becoming deformed.

Emergency respirators are stored:

❑ To be accessible to the work area.

❑ In compartments marked as such.

❑ In accord with manufacturer's instructions.

Inspections:

❑ Routine-use respirators are inspected before each use and during cleaning.

❑ SCBAs and emergency respirators are inspected monthly and checked for proper functioning before and after each use.

❑ Emergency escape-only respirators are inspected before being carried into the workplace for use.

Inspections include:

❑ Check of respirator function.

❑ Tightness of connections.

❑ Condition of the facepiece, head straps, valves, cartridges, and other parts.

❑ Condition of elastomeric parts.

For SCBAs, inspections include:

❑ Check that cylinders are fully charged.

❑ Check that regulators function properly.

❑ Check that warning devices function properly.

For emergency use respirators, inspections include:

❑ Certification by documenting the inspection, and by tagging the information either to the respirator or its compartment, or storing it with inspection reports.

Repairs:

❑ Respirators that have failed inspection are taken out of service.

❑ Repairs are made only by trained personnel.

❑ Only NIOSH-certified parts are used.

❑ Reducing and admission valves, regulators and alarms are adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

Section (i): Breathing air quality and use

This section of the Respiratory Protection standard requires you to provide employees who are wearing atmosphere-supplying respirators with breathing air of high purity. Respirators that supply breathing air are generally used in highly hazardous work environments. It is critical that such respirator systems provide quality breathing air and that the equipment operates reliably.

More broadly, you are required to establish or continue a respiratory protection program that follows performance standards for the operation and maintenance of breathing air compressors, methods for ensuring breathing air quality, and requirements for the quality of purchased breathing air.

The requirements detailed in this section are critical for ensuring the integrity of high purity breathing air for use with respirators, whether the air is delivered in tanks by a supplier or produced on site using a compressor. Also, it is your responsibility to ensure that practices are in place for protecting the quality of breathing air while stored in containers and when being used by employees. These requirements are essential for protecting respirator-wearing employees from exposure to airborne contaminants.

As detailed below, when using atmosphere-supplying respirators you must:

- Provide breathing air that meets certain specifications.
- Develop procedures to ensure the proper use of compressed gas cylinders and air compressors.
- Implement certain precautions to avoid improper use of couplings on airline systems and confusion about breathing air containers.
- Implement certain precautions to prevent exposure to carbon monoxide when using air compressors.

How is breathing air delivered to the respirator user?

Air compressors capture air from the surrounding environment, filter it, remove oil (if necessary), compress it to increase its density, and deliver the air through a system of regulators that brings the air back down to a breathable pressure for the respirator user.

With SCBA units, the pressurized breathing air is transferred from the tank to the respirator user through regulators that decrease the pressure to a level that a human can breathe. Because there is a fixed amount of air in the tank, the user can only rely on it for a given period of time. That time varies based on the size of the tank, the amount of pressure in the tank, and the physical effort required by the respirator user. Use times range from 20 minutes for low pressure tanks (2,500 psi) to 45 minutes for high pressure tanks (4,500 psi) with moderate physical effort.

The air delivered by both types of systems is at slightly greater than atmospheric pressure, which assists in preventing contaminated air from seeping through gaps in the facepiece.

Breathing air that is supplied "on demand" rather than provided constantly to the user, as in a constant flow type device, is able to be used with a large, compressed air cylinder of breathable air or a bank of cylinders set up in cascading fashion. Cascading breathing air assemblies can be designed to provide breathing air from several assemblies. A pressure reducing regulator is supplied to deliver the correct pressure recommended by the respirator manufacturer. Air cascading simply means equalizing the pressure between the cylinder to be refilled and the next lowest supply cylinder. If this process does not get the desired pressure in the small cylinder, the supply cylinder is turned off and the next highest supply cylinder is opened and the pressure allowed to equalize between the two cylinders. A low pressure warning whistle, or bell, is supplied to notify the user that the cascade system has dropped below specified levels. Check valves are installed on each cylinder stem to prevent pressure equalization. These valves also allow the user to independently change cylinders without depressurizing the complete system.

(i)(1) Specifications for breathing air

You must ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen meet certain specifications as outlined below for breathing by employees wearing atmosphere-supplying respirators. Unless you produce your own breathing air from a compressor, you can rely on certificates of analysis from air suppliers to ensure that breathing air meets the required specifications.

Types of Breathing Air

Compressed air is the most common type of breathing-air system used in worksite applications because it is the most convenient and least expensive. Compressed air is provided either through compressed air cylinders or air compressors at relatively high pressures. Regulators are used to ensure that breathing air supplied to respirators is provided at pressures that are safe for employees to breathe.

Other types of breathing air systems include liquid air, compressed oxygen, and liquid oxygen. Liquid air is air that exists in a liquid state, which is achieved by compressing purified air and chilling it to a temperature below the boiling point of its principal components (i.e., nitrogen and oxygen). Compressed oxygen systems are used in limited applications because they present a significant fire hazard. Liquid oxygen is quite expensive and also presents a significant fire hazard. It is generally used only in very specialized applications.

(i)(1)(i) Compressed and liquid oxygen

Such forms of compressed oxygen must meet the U.S. Pharmacopeia requirements for medical or breathing oxygen.

(i)(1)(ii) Compressed breathing air

Any compressed breathing air must meet at least the requirements for Grade D breathing air described in “Compressed Gas Association Commodity

Specification for Air" (CGA G-7.1-1989). This specification requires that:

(A) Oxygen content in compressed breathing air must be 19.5 to 23.5 percent of the total volume of air.

(B) Condensed hydrocarbon content in compressed breathing air must be 5 milligrams (mg) per each cubic meter (m^3) of air or less.

(C) Carbon monoxide content in compressed breathing air must be 10 parts per million (ppm) or less.

(D) Carbon dioxide content in compressed breathing air must be 1,000 ppm or less.

(E) There must be a lack of any noticeable odor from the compressed breathing air.

(i)(2)&(3) Oxygen use

Explosion/fire hazard from compressor oil and grease. You must prohibit employees from using compressed oxygen in respirators that have previously been used with compressed air. The reason for this prohibition is that oil and grease can be introduced into respirator airlines used for compressed air, posing a danger of fire or explosion from the high pressure oxygen coming in contact with the oil or grease. Airline systems contain inline filters for capturing impurities so that the respirator user will not inhale the oil or grease.

Explosion/fire hazard from high concentration oxygen. You must ensure that employees use oxygen concentrations greater than 23.5 percent only with equipment designed specifically for oxygen service and distribution. Such equipment is specifically designed to minimize the risk of fire or explosion posed by the high concentration of oxygen.

(i)(4) Cylinder use

You must ensure that cylinders used with atmosphere-supplying respirators meet the following requirements:

- Cylinders of breathing air must be tested and maintained according to Department of Transportation (DOT) Shipping Container Specification Regulations (49 CFR Parts 173 and 178), which include provisions for the construction, testing, and maintenance of cylinders. These steps are necessary to prevent explosions that can result from a rupture in a breathing air cylinder under high pressure. (Additional guidance is available in 29 CFR 1910.101(b), which includes provisions for in-plant handling and storage of compressed gas cylinders.)
- Cylinders of purchased breathing air must be accompanied by a certificate from the supplier indicating that the contents of each cylinder have been tested and found to meet the criteria for Grade D breathing air. This certification will provide you with a reasonable assurance that the breathing air supplied to your employees is safe.
- Cylinder contents must have a moisture level that does not exceed a dew point of minus 50° Fahrenheit (F) (minus 45.6° Celsius [C]) at 1 atmosphere pressure. (Dew point refers to the temperature at which the air is saturated with moisture.) This requirement prevents respirator valves from freezing when excess moisture accumulates on the valves, which can cause blockages in the flow of breathing air. You should verify with the supplier that the breathing air meets this requirement.

(i)(5)-(7) Compressor use

You must ensure that compressors used with atmosphere-supplying respirators provide breathing air according to the following requirements:

(i)(5)(i) Location of compressor during use

The location of an air compressor during use is very important to maintain the purity of the supplied breathing air. For this reason, an air compressor in use must be located so that the air intake component is not drawing from areas that contain:

- Combustion exhaust from vehicles or the compressor itself.
- Plant process exhaust, which should be exhausted to the outside by the facility's ventilation system.
- Contaminated air from hazardous work areas.

(i)(5)(ii) Low moisture content of ambient air

The moisture content of compressed air must be kept to a minimum to prevent freezing of respirator valves at cold temperatures, which can cause blockages in the flow of breathing air. To ensure a low moisture content, the dew point at 1 atmosphere must be 10° F (5.56° C) below the ambient temperature (e.g., in plant).

Are there any systems for keeping moisture from getting into a compressor?

Water traps or desiccators can keep moisture out of a compressor. These systems remove the water from the air as it is run through the compressor, ensuring a certain level of dryness when it comes out. Such systems, like all other parts of a compressor, must be maintained in accord with the manufacturer's instructions to properly remove the moisture.

(i)(5)(iii) Inline air purification

Suitable air-purifying beds and filters must be used in the supply lines to ensure delivery of a continuous flow of Grade D breathing air to the respirator user. (A

sorbent bed is a filter designed to capture impurities in the air.) You must maintain, refurbish, or replace inline sorbent beds and filters as specified by the equipment manufacturer.

(i)(5)(iv) Tracking of bed and filter changes

You must ensure that a tag is maintained at/on the compressor with a note indicating when the sorbent beds and filters were last changed. The notation must include the signature of the person you have authorized to perform the bed and filter maintenance. Only a tag indicating the most recent filter and bed changes needs to be retained at/on the compressor.

Requirements Regarding Carbon Monoxide

You must take certain precautions in regard to carbon monoxide when using compressors with atmosphere-supplying respirators.

These precautions are required because:

- Exposure to carbon monoxide above certain levels can be fatal.
- Sources of this potentially lethal gas are fairly common in many worksites. (In fact, one source of carbon monoxide is the exhaust from the compressor itself.)
- You will not be able to detect the presence of carbon monoxide because it is an odorless gas.
- The types of precautions you will need to take depend on the type of compressor you use.

(i)(6) Compressors that are not oil lubricated

With this type of compressor, you must ensure that carbon monoxide in the breathing air is less than or equal to 10 ppm. This can be achieved by:

- Locating the compressor's air intake component in an area free of contaminants
- Conducting continuous or frequent monitoring of the breathing air supply
- Using inline carbon monoxide filters
- Using high-temperature alarms or shut-off devices

(i)(7) Compressors that are oil lubricated

With this type of compressor, carbon monoxide can be generated when oil enters the combustion chamber and is partially combusted. Therefore, you must ensure that the compressor operates with a carbon monoxide alarm or a high-temperature alarm. Carbon monoxide alarms provide better protection than high-temperature alarms because the high-temperature alarms only detect carbon monoxide generated in the combustion chamber, and not carbon monoxide resulting from a poorly located compressor intake. Furthermore, high temperature alarms are installed more for the purpose of protecting the compressor from damage than for guarding employees from exposure to carbon monoxide. Because of this, the alarm component of the system is often located with the alarm sensor where it may not be heard by the respirator users. Consequently, if the compressor has only a high-temperature alarm, you must ensure that air quality is frequently monitored to confirm that carbon monoxide levels stay below 10 ppm.

How often should I check on carbon monoxide levels?

Periodic monitoring for carbon monoxide is acceptable when using newer, well-maintained compressors. Continuous monitoring, however, is recommended for older compressors. In older equipment, oil may enter the air supply more readily due to piston ring or cylinder wear. Continuous monitoring also should be conducted for rented or second-hand compressors because the maintenance history is likely to be unknown or uncertain.

How do I check carbon monoxide levels?

Carbon monoxide levels can be tested with two general types of devices:

- Direct reading instruments that use electrochemical sensors
- Chemical detector tubes

Although the electrochemical devices tend to be more expensive, they are also more accurate (i.e., they have a 5 percent error rate). Also, such devices must be calibrated periodically (usually monthly) to achieve accurate readings. Calibration services provide traceable calibrations using a wide variety of multimeter devices.

Newer generations of electrochemical sensors use a meter with built-in advanced features that enhance reliability and repeatability. These may also have auto-zero features to eliminate manual calibration. The carbon monoxide meter shows carbon monoxide levels (0–1000 ppm) on a large, backlit liquid crystal display (LCD) and have hold functions to store and display the maximum carbon monoxide level.

Chemical detector tubes have an error rate of 10 to 15 percent. Carbon monoxide filters (i.e., filters that convert carbon monoxide to carbon dioxide) with color-change indicators may not be used as carbon monoxide monitors because the color change indicates the presence of moisture, not carbon monoxide.

Other devices, such as carbon monoxide probes and aspirator kits provide additional functions. Probes have

both light-emitting diodes (LED) that provide backlighting for indicators and beepers that trigger with increasing frequency as carbon monoxide levels rise. Optional aspirator kits let the user draw flue gas samples up to 370 degrees C (700 degrees F).

Must each of these methods be used for compressors that are not oil lubricated?

No, you must use whichever of the above methods are necessary to ensure that carbon monoxide does not contaminate the breathing air. In some cases, one method may be all that is needed. In other cases, you may be required to use more than one of these methods.

You must evaluate your own worksite conditions to determine which measures are needed to prevent carbon monoxide from contaminating breathing air.

(i)(8) Precautions regarding couplings

You must ensure that couplings used on airlines for atmosphere-supplying respirators are *incompatible* with outlets for nonbreathable worksite air or other gas systems. This precaution must be taken to avoid the chance of inadvertently connecting a respirator to a source other than the breathing air. Such a mistake could result in serious illness or death. Also, you must ensure that at no time is an asphyxiating substance introduced into a respirator's airlines. For example, an inert gas such as nitrogen must not be used to purge or clean breathing airlines.

(i)(9) Labeling of breathing gas containers

You must ensure that breathing air containers are labeled in keeping with the NIOSH respirator certification standard (42 CFR 84). The NIOSH standard incorporates ANSI's Method of Marking Portable Compressed Gas Containers to Identify Material Contained (Z48.1-1971). Proper labeling of containers will avoid the possibility of confusion when connecting the breathing air source to the respirator.

CHECKLIST FOR BREATHING AIR QUALITY AND USE

√ Check that at your facility:

General

- ❑ Compressed breathing air meets the requirements for Grade D breathing air.
- ❑ Compressed oxygen is not used in respirators that have previously used compressed air.
- ❑ Oxygen concentrations greater than 23.5 percent are used only in equipment designed for oxygen service or distribution.
- ❑ Breathing air couplings are incompatible with outlets for other gas systems.
- ❑ Breathing gas containers are marked in accord with the NIOSH certification standard.
- ❑ Carbon monoxide levels are monitored for both oil and gas compressors.

Breathing Air Cylinders

- ❑ Cylinders are tested and maintained according to DOT 49 CFR Parts 173 and 178.
- ❑ A certificate of analysis for breathing air has been obtained from the supplier.
- ❑ Moisture content in the cylinder does not exceed a dew point of -50°F at 1 atmosphere pressure.

Compressors

- ❑ Are constructed and situated to prevent contaminated air from getting into the system.
- ❑ Are set up to minimize the moisture content.
- ❑ Are equipped with in-line air-purifying sorbent beds and filters that are maintained or replaced following manufacturer's instructions.
- ❑ Are tagged with information on the most recent change date of the filter and an authorizing signature.
- ❑ Carbon monoxide does not exceed 10 ppm in the breathing air from compressors that are not oil-lubricated.
- ❑ High-temperature or carbon monoxide alarms are used on oil-lubricated compressors; monitor the air often enough to ensure that carbon monoxide does not exceed 10 ppm if only a high-temperature alarm is used.

Section (j): Identification of filters, cartridges and canisters

This section of the standard requires you to ensure that all filters, cartridges and canisters used are labeled and color coded with the NIOSH approval label. You must also ensure that the label is not removed and remains legible.

To fulfill these requirements, you should adopt appropriate procedures for ensuring that:

- Only NIOSH-certified filters, cartridges and canisters are used
- Labels are not removed, defaced, or obscured during respirator usage

Your written respiratory protection program must include these provisions.

What is included on the NIOSH label?

The label clearly states the class of contaminants for which the filter, cartridge, or canister may be used (e.g., permissible particulate respirator filter for dusts, fumes and mists, including asbestos-containing dusts and mists and radionuclides). The NIOSH certification number and any limitations or precautions are also included on the label.

What is the purpose of the label?

The NIOSH label serves several purposes. It ensures selection of the appropriate cartridge/canister for the contaminants found in the workplace. Also, it permits the employee using the respirator to check and confirm that the respirator has the appropriate filters before the respirator is used. Further, the color coding scheme allows fellow employees, supervisors and the respiratory protection program administrator to readily determine that the worker is using the appropriate filter.

Can I write the date of initial use on the label?

Yes, marking the initial use date on the label can be done if it does not obscure the information on the label.

Section (k): Training and information

This section of the Respiratory Protection standard requires you to train your employees on all the essential elements that help protect the employees while they use respirators. Some of these components answer the following questions, among others: why the respirator is needed; how must the respirator be maintained; and, what steps should the employee take when respirators fail to function or in emergency situations. Training on fit testing for negative pressure respirators and the need for user seal checks after donning respirators is important for the employee to determine how well a respirator fits. Employee training is a critical part of a successful respiratory protection program and is essential for correct respirator use. You must provide training to your employees who are required to wear respirators.

(k)(1) Content of training

You must ensure that each worker can demonstrate knowledge of at least the following:

- **Why the respirator is necessary and how improper fit, usage and maintenance can make the respirator ineffective.**
  - Training must include the identification of hazards, the extent of employee exposure to those hazards, and the potential health effects of exposure. The training that is required under the Hazard Communication standard (29 CFR 1910.1200) can satisfy this requirement for chemical hazards. Employees must understand that proper fit, usage, and maintenance of respirators is critical to ensure that they can perform their protective function.
- **The limitations and capabilities of the selected respirator.**
  - Training must address how the respirator operates. Included must be an explanation of how the respirator provides protection by filtering the air, absorbing the gas or vapor, or by supplying a clean source of air. Limitations on the use of the equipment, such as prohibitions against using an air-purifying respirator in an IDLH atmosphere, and why not, must also be explained.
  - Training must address the possibility of respirator malfunction and the development of emergency situations specific to the worksite. Employees must understand what procedures are to be followed in such circumstances, and which procedures require use of a different respirator.
- **How to properly select cartridges and canisters and know the assigned cartridge and canister change schedules for the devices selected.**
  - Training must address how to use the respirator effectively in terms of the use of cartridges and canisters, the exposures the cartridges are designed to address, and knowledge of the estimated service life of cartridges.
- **How to use the respirator effectively in emergency situations.**
  - Training must address how to use a respirator effectively in emergency situations, which are occurrences such as, but not limited to, respirator malfunctions or failures, rupture of containers, or failure of control equipment that may or does

result in an uncontrolled substantial release of an airborne contaminant. Respirators malfunction on occasion, work routines change, and emergency situations occur that require a different respirator. The training program must discuss these possibilities and the procedures the employer has established to deal with them. Such training is necessary when respirators are to be used in IDLH situations, including oxygen-deficient atmospheres, such as those that occur in firefighting, rescue operations and confined area entry.

- **How to inspect, put on and remove, use and check the seals of the respirator.**
  - You must train employees how to recognize problems that may decrease the effectiveness of the respirator and what steps to follow if a problem is detected, such as the person to whom problems should be reported and where replacement equipment can be obtained if needed. If specialized personnel conduct inspections, individual respirator wearers only need to be taught about the portions of the inspection process that are their responsibility. You must also cover how to properly put on and remove the respirator to ensure that respirator fit in the workplace is as close as possible to the fit obtained during fit testing. Employees must be trained to perform user seal checks. *(See Appendix B-1 of the standard.)*
- **The respirator maintenance and storage procedures.**
  - The extent of training required may vary according to workplace conditions. If employees are individually responsible for storing and maintaining respirators, detailed training may be necessary. If specialized personnel perform these functions, employees only need to be informed of the general maintenance and storage procedures.
- **How to recognize medical signs and symptoms that may limit or prevent effective use of the respirator.**
  - You must instruct employees to recognize medical signs and symptoms, such as shortness of breath or dizziness that may limit or prevent effective use of respirators.
- **The general requirements of the Respiratory Protection standard.**
  - You must ensure that employees are aware, in general, of your obligations under the standard. This discussion need not focus on the standard's provisions but could, for example, simply inform employees that employers are obligated to develop a written program, properly select respirators, evaluate respirator use, correct deficiencies in respirator use, conduct medical evaluations, provide for the maintenance, storage and cleaning of respirators, and retain and provide access to specific records.

Do I need to follow a particular format?

No. As long as the required topics are addressed, you can use whatever training method is effective. Prepared materials, such as audiovisual and slide presentations, formal classroom instruction, informal discussions during safety meetings, training programs developed or conducted by unions or respirator manufacturers, or a combination of these methods may be used.

In what sense are employees expected to be able to "demonstrate knowledge" of proper respirator use based on the training?

You must ensure that, before an employee is required to use a respirator in the workplace, he or she understands the information provided and can use the respirator properly. This can be done by reviewing the training with the employee either orally or in writing, and by reviewing the employee's hands-on use of respirators.

(k)(2) Comprehension of training

Training must be conducted in a manner that is understandable to your employees. This means that your program should be tailored to your employees' education level and language background.

(k)(3) Timing of training

You must provide the required training prior to having an employee use a respirator in the workplace.

(k)(4) Portability of training

If you can demonstrate that a new employee has received training within the last 12 months and can demonstrate the necessary knowledge, you are not required to repeat this training. In cases where training in some elements is lacking or inadequate, you are required to provide training in those elements. Previous training that has been transported with the employee (i.e., not repeated initially) must be provided no later than 12 months from the date of the previous training.

(k)(5) Retraining

You must retrain employees in the proper use of respirators annually. You must also retrain employees when:

- Changes in the workplace or the type of respirator make previous training obsolete.
- The knowledge and skill necessary to use the respirator properly has not been retained by the employee.
- Any other situation arises in which retraining

appears necessary to ensure safe respirator use.

(k)(6) Information for voluntary respirator users

For employees who choose to wear a respirator but are not required to do so, you are required to provide the advisory information in *Appendix D* of the standard. A copy of the standard is provided in Attachment 3 of this guide. This basic information on the proper use of respirators can be presented to the employee either verbally or in written form. Training is usually not required for employees who are not required to wear respirators, i.e., for employees who are wearing respirators voluntarily.

CHECKLIST FOR TRAINING AND INFORMATION

√ Check that your facility provides the following:

Demonstration of employees' knowledge of:

- ❑ Why the respirator is necessary and the consequences of improper fit, use, or maintenance.
- ❑ The limitations and capabilities of the respirator.
- ❑ How to effectively use the respirator in emergency situations, including respirator malfunction.
- ❑ How to inspect, put on, remove, use and check the seals of the respirator.
- ❑ Maintenance and storage procedures.
- ❑ The general requirements of the Respiratory Protection standard.
- ❑ How to recognize medical signs and symptoms that may limit or prevent effective use of the respirator.

√ Check that your facility satisfies the general requirements of the respirator standard by providing the following:

- ❑ Training that is understandable to employees.
- ❑ Training prior to employee use of a respirator.
- ❑ Retraining as specified below:
  - Annually.
  - Upon changes in workplace conditions that affect respirator use.
  - When knowledge and skills for respirator use are not retained by the employee.
  - Whenever retraining appears necessary to ensure safe respirator use.
- ❑ *Appendix D of the standard* to voluntary users.

Section (l): Program Evaluation

(l)(1) Conducting program evaluations

You must perform evaluations of the workplace as necessary to make sure that your written respiratory protection program is working effectively.

How often do I need to evaluate my written respiratory protection program?

You do not need to review your respiratory protection program according to any fixed schedule. The frequency with which you need to evaluate your respiratory protection program will depend on the complexity and/or variability of the program and factors such as:

- The type and extent of hazards in your workplace.
- The types of respirators used by your employees.
- The number of your employees who use respirators.
- The amount of experience your respirator-wearing employeess have in using respirators.

You must evaluate respirator use with sufficient frequency to ensure that all elements of the respiratory protection program are being effectively implemented.

(l)(2) Consulting with employees

You must regularly consult with employees required to wear respirators to assess their views on the effectiveness of the respiratory protection program and to identify any problems that they may be encountering with the use of respirators. You must correct any problems that are identified.

At a minimum, you must assess:

- Whether proper fit of respirators is being achieved, and whether respirator use is interfering with effective work performance.
- Whether appropriate respirators have been selected.
- Whether respirators are being properly used.
- Whether respirators are being properly maintained.

When I consult with my employees, what should I ask them?

You may want to ask your workers questions such as:

- Does your respirator interfere with your hearing or vision?
- Do you experience fatigue or have difficulty breathing during respirator use?
- Does your respirator restrict your movements or interfere with your job performance in any way?
- Is your respirator uncomfortable?

- Are you confident that you are using your respirator correctly?
- Are you confident that your respirator is performing adequately?

CHECKLIST FOR PROGRAM EVALUATION

√ Check that your facility:

❑ Conducts workplace evaluations as necessary to ensure that the written respiratory protection program is being effectively implemented.

❑ Regularly consults with employees required to wear respirators to assess their views on the respiratory protection program and to identify problems with respirator fit, selection, use and maintenance.

❑ Corrects any problems identified during assessments.

Section (m): Recordkeeping

You must retain certain records to:

- assist you in auditing the adequacy of your respiratory protection program
- facilitate employee involvement
- allow OSHA to inspect your records and make compliance determinations

(m)(1) Medical evaluation records

Records of medical evaluations required by *paragraph (e)* of the standard must be retained and made available to the employees in accord with OSHA's Access to Employee Exposure and Medical Records standard (29 CFR 1910.1020).

(m)(2) Respirator fit testing records

You are required to retain written records of the qualitative and quantitative fit tests administered to your employees. These records need to include:

- The name or identification of the worker tested.
- The type of fit test performed.
- The make, model and size of the respirator tested.
- The date of the fit test.
- Pass/fail results if a qualitative fit test (QLFT) is used, or the fit factor and strip chart recording or other record of the test results if a quantitative fit test (QNFT) is used.

How long do I need to retain fit test records?

Fit test records must be retained for respirator users until the next fit test is administered.

Do I need to retain records of fit tests for employees who are no longer using respirators?

No, fit test records do not need to be retained for these employees.

(m)(3) Written respiratory protection program

You must retain a written copy of your current respiratory protection program.

(m)(4) Access to records

Written materials required to be retained must be made available upon request to the affected employees, their designated representatives (29 CFR 1910.1020), and to OSHA. (See also 29 CFR 1910.1020 at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10027.)

Do I need to allow employees and OSHA to make copies of these materials?

Yes, you need to make these materials available for inspection and for copying.

Must employees be allowed access to the records of other employees?

No, each affected employe can have access to his or her records only.

CHECKLIST FOR RECORDKEEPING

√ Check that your facility does the following:

❑ Retains records of medical evaluations.

❑ Retains fit testing records.

❑ Retains a copy of the current respiratory protection program.

❑ Provides access to the above records by affected employees and OSHA.

Attachment 1: *APF Glossary and definitions*

The preamble to the final rule for Assigned Protection Factors (APF) includes a glossary (see 71 FR 50122; August 24, 2006) that provides an auxiliary list of terms used in the APF rulemaking and throughout the preamble to the APF final rule. In the glossary portion, there is both a list of acronyms used in the APF rule and a list of definitions, in addition to the definitions in the APF rulemaking for Assigned Protection Factor and Maximum Use Concentration (MUC). The glossary contains acronyms and terms from the final Respiratory Protection standard (29 CFR 1910.134) each of which is printed in brown italics and is highlighted with an asterisk (*). The purpose of this glossary in this Small Entity Compliance Guide, is to provide those same acronyms and terms from the final Respiratory Protection standard, and to provide the new definitions for APFs and MUCs from the APF rulemaking in one place for ease of review. A copy of the Respiratory Protection standard is provided in Attachment 3. *(See 71 FR 50122, August 24, 2006, for a copy of the APF standard.)*

This glossary specifies the terms represented by acronyms and provides definitions of other terms used frequently in the preamble to the final rule. This glossary does not change the legal requirements in this final rule, nor is it intended to impose new regulatory requirements on the regulated community.

Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute
APF	Assigned Protection Factor (see definition)
APR	Air-purifying respirator (see definition)
Ci	Concentration measured inside the respirator facepiece
Co	Concentration measured outside the respirator
DFM	Dust, fume, and mist filter
DOP	Dioctylphthalate (see definition)
EPF	Effective Protection Factor (see definition below under "Protection factor study")
HEPA	High efficiency particulate air filter (see definition)
IDLH	Immediately dangerous to life or health (see definition)
LANL	Los Alamos National Laboratory
LASL	Los Alamos Scientific Laboratory
LLNL	Lawrence Livermore National Laboratory
MSHA	Mine Safety and Health Administration
MUC	Maximum Use Concentration (see definition)
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NRC	Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration
OSH Act	The Occupational Safety and Health Act of 1970 (29 U.S.C. 655, 657, 665).
PAPR	Powered air-purifying respirator (see definition)
PEL	Permissible Exposure Limit (see definition)
PPF	Program Protection Factor (see definition below under "Protection factor study")
QLFT	Qualitative fit test (see definition)
QNFT	Quantitative fit test (see definition)
RDL	Respirator Decision Logic (see definition)
REL	Recommended Exposure Limit (see definition)
SAR	Supplied-air (or airline) respirator (see definition)
SCBA	Self-contained breathing apparatus (see definition)
SWPF	Simulated Workplace Protection Factor (see definition below under "Protection factor study")
TLV	Threshold Limit Value (see definition)
WPF	Workplace Protection Factor (see definition below under "Protection factor study")

Definitions

Terms preceded by an asterisk (*) refer to definitions that can be found in paragraph (b) ("Definitions") of OSHA's Respiratory Protection standard (29 CFR 1910.134).

***Air-purifying respirator:** A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

***Assigned protection factor (APF):** means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by this section.

***Atmosphere-supplying respirator:** A respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes SARs and SCBA units.

***Canister or cartridge:** A container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

Continuous flow respirator: An atmosphere-supplying respirator that provides a continuous flow of breathable air to the respirator facepiece.

***Demand respirator:** An atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

Dioctylphthalate (DOP): An aerosolized agent used for quantitative fit testing.

Elastomeric: A respirator facepiece made of a natural or synthetic elastic material such as natural rubber, silicone, or synthetic rubber.

***Emergency situation:** Any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

***Employee exposure:** Exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

***End-of-service-life indicator (ESLI):** A system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

***Escape-only respirator:** A respirator intended to be used only for emergency exit.

***Filter or air-purifying element:** A component used in respirators to remove solid or liquid aerosols from the inspired air.

***Filtering facepiece (or dust mask):** A negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

***Fit factor:** A quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

***Fit test:** The use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.

***Helmet:** A rigid respiratory inlet covering that also provides head protection against impact and penetration.

***High-efficiency particulate air filter (HEPA):** A filter that is at least 99.97% efficient in removing monodispersed particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

***Hood:** A respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

***Immediately dangerous to life or health (IDLH):** An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

***Interior structural firefighting:** The physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. (See 29 CFR 1910.155).

***Loose-fitting facepiece:** A respiratory inlet covering that is designed to form a partial seal with the face.

***Maximum use concentration (MUC):** The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

***Negative pressure respirator (tight-fitting):** A respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

***Oxygen deficient atmosphere:** An atmosphere with an oxygen content below 19.5% by volume.

Permissible Exposure Limit (PEL): An occupational exposure limit specified by OSHA.

***Physician or other licensed healthcare professional (PLHCP):** An individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the healthcare services required by paragraph (e) of this section.

***Positive pressure respirator:** A respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

***Powered air-purifying respirator (PAPR):** An air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

***Pressure demand respirator:** A positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

Protection factor study: A study that determines the protection provided by a respirator during use. This determination generally is accomplished by measuring the ratio of the concentration of an airborne contaminant (e.g., hazardous substance) outside the respirator (Co) to the concentration inside the respirator (Ci) (i.e., Co/Ci). Therefore, as the ratio between Co and Ci increases, the protection factor increases, indicating an increase in the level of protection provided to employees by the respirator. Four types of protection factor studies are:

Effective Protection Factor (EPF) study - a study, conducted in the workplace, that measures the protection provided by a properly selected, fit-tested, and functioning respirator when used intermittently for only some fraction of the total workplace exposure time (i.e., sampling is conducted during periods when respirators are worn and not worn). EPFs are not directly comparable to Workplace Protection Factor (WPF) values because the determinations include both the time spent in contaminated atmospheres with and without respiratory protection; therefore, EPFs usually underestimate the protection afforded by a respirator that is used continuously in the workplace.

Program Protection Factor (PPF) study - a study that estimates the protection provided by a respirator within a specific respirator program. Like the EPF, it is focused not only on the respirator's performance, but also the effectiveness of the complete respirator program. PPFs are affected by all factors of the program, including respirator selection and maintenance, user training and motivation, work activities and program administration.

Workplace Protection Factor (WPF) study - a study, conducted under actual conditions of use in the workplace, that measures the protection provided by a properly selected, fit-tested, and functioning respirator, when the respirator is worn correctly and used as part of a comprehensive respirator program that is in compliance with OSHA's Respiratory Protection standard at 29 CFR 1910.134. Measurements of Co and Ci are obtained only while the respirator is being worn during performance of normal work tasks (i.e., samples are not collected when the respirator is not being worn). As the degree of protection afforded by the respirator increases, the WPF increases.

Simulated Workplace Protection Factor (SWPF) study - a study, conducted in a controlled laboratory setting and in which Co and Ci sampling is performed while the respirator user performs a series of set exercises. The laboratory setting is used to control many of the variables found in workplace studies, while the exercises simulate the work activities of respirator users. This type of study is designed to determine the optimum performance of respirators by reducing the impact of sources of variability through maintenance of tightly controlled study conditions.

***Qualitative fit test (QLFT):** A pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

***Quantitative fit test (QNFT):** An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

Recommended Exposure Limit (REL): An occupational exposure level recommended by NIOSH.

Respirator Decision Logic (RDL): Respirator selection guidance developed by NIOSH that contains a set of respirator protection factors.

***Respiratory inlet covering:** That portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.

***Self-contained breathing apparatus (SCBA):** An atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

***Supplied-air respirator (or airline) respirator (SAR):** An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

Threshold Limit Value (TLV): An occupational exposure level recommended by ACGIH.

***Tight-fitting facepiece:** A respiratory inlet covering that forms a complete seal with the face.

***User seal check:** An action conducted by the respirator user to determine if the respirator is properly seated to the face.

Attachment 2:
Checklists

CHECKLIST FOR PERMISSIBLE PRACTICE

√ Check all that apply:

Hazard Determination

Is there a hazardous atmosphere in your workplace, which has (check all that apply):

❑ Insufficient oxygen

❑ Harmful levels of chemical, biological, or radiological contaminants

❑ Known and reasonably foreseeable emergencies related to...

❑ Unknown exposure levels or exposures to substances without an OSHA PEL

If you did not check any of the boxes above, the Respiratory Protection standard **does not** apply to your workplace.

If you checked any of the boxes above, the Respiratory Protection standard **may** apply to your workplace.

OSHA requires use of the following methods to control the hazardous atmosphere(s) in your workplace:

❑ Engineering controls, such as ventilation, isolation or enclosure of the work process, or substitution of non-hazardous materials for the materials that pose respiratory hazards; and

❑ Administrative controls, such as worker rotation, or scheduling major maintenance for weekends or times when few workers are present.

When engineering controls are not feasible, or while engineering controls are being installed or maintained, or whenever there is an emergency, appropriate respirators **must** be used.

Does your workplace have (check the box to indicate yes, and check all that apply):

❑ Sufficient engineering controls to prevent illness or diseases caused by breathing hazardous air in the workplace

❑ Sufficient administrative controls to prevent illness

If you did not check **both** of the boxes above, the Respiratory Protection standard **does apply** to your workplace, and you must develop a written respiratory protection program that is specific to your workplace.

CHECKLIST FOR RESPIRATORY PROTECTION PROGRAMS

√ Does your program contain written procedures for (check all that apply):

❑ Your specific workplace

❑ Selecting respirators

❑ Medical evaluations of employees required to wear respirators

❑ Fit testing

❑ Routine and emergency respirator use

❑ Schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and maintaining respirators

❑ Ensuring adequate air quality for supplied-air respirators

❑ Training in respiratory hazards

❑ Training in proper use and maintenance of respirators

❑ Program evaluation

❑ Ensuring that employees who voluntarily wear respirators (excluding filtering facepieces) comply with the medical evaluation and cleaning, storing and maintenance requirements of the standard

❑ A designated program administrator who is qualified to administer the program

❑ Updating the written program as necessary to account for changes in the workplace affecting respirator use

❑ Providing equipment, training and medical evaluations at no cost to employees

If you did not check all of the boxes above, your respiratory protection program **does not** meet OSHA standards.

CHECKLIST FOR RESPIRATOR SELECTION

√ Check that the following has been done at your facility:

- ❑ Respiratory hazards in your workplace have been identified and evaluated.
- ❑ Employee exposures that have not been, or cannot be, evaluated must be considered IDLH.
- ❑ Respirators are NIOSH-certified, and used under the conditions of certification.
- ❑ Respirators are selected based on the workplace hazards evaluated and workplace and user factors affecting respirator performance and reliability.
- ❑ Respirators are selected based on the APFs and calculated MUCs.
- ❑ A sufficient number of respirator sizes and models are provided for selection purposes.

For IDLH atmospheres:

- ❑ Full facepiece pressure demand SARs with auxiliary SCBA unit or full facepiece pressure demand SCBAs, with a minimum service life of 30 minutes, are provided.
- ❑ Respirators used for escape only are NIOSH-certified for the atmosphere in which they will be used.
- ❑ Oxygen deficient atmospheres must be considered IDLH (d)(2)(B)(iii).

For Non-IDLH atmospheres:

- ❑ Respirators selected are appropriate for the APFs and MUCs.
- ❑ Respirators selected are appropriate for the chemical nature and physical form of the contaminant.
- ❑ Air-purifying respirators used for protection against gases and vapors are equipped with ESLIs or a change schedule has been implemented.
- ❑ Air-purifying respirators used for protection against particulates are equipped with NIOSH-certified HEPA filters or other filters certified by NIOSH for particulates under 42 CFR part 84.

CHECKLIST FOR MEDICAL EVALUATION

√ Check that the following has been done at your facility:

- ❑ All employees have been evaluated to determine their ability to wear a respirator prior to being fit tested for or wearing a respirator for the first time in your workplace.
- ❑ A physician or other licensed healthcare professional (PLHCP) has been identified to perform the medical evaluations.
- ❑ The medical evaluations obtain the information requested in *Sections 1 and 2, Part A of Appendix C of the standard, 29 CFR 1910.134. (See Attachment 3)*
- ❑ Employees are provided follow-up medical exams if they answer positively to any of *questions 1 through 8 in Section 2, Part A of Appendix C* of the standard, or if their medical examination reveals that a follow-up exam is needed.
- ❑ Medical evaluations are administered confidentially during normal work hours, and in a manner that is understandable to employees.
- ❑ Employees are provided the opportunity to discuss the medical evaluation results with the PLHCP.
- ❑ The following supplemental information is provided to the PLHCP before he or she makes a decision about respirator use:
  - Type and weight of the respirator.
  - Duration and frequency of respirator use.
  - Expected physical work effort.
  - Additional protective clothing to be worn.
  - Potential temperature and humidity extremes.
  - Written copies of the respiratory protection program and the Respiratory Protection standard are provided to the PLHCP.
- ❑ Written recommendations are obtained from the PLHCP regarding each employee's ability to wear a respirator, and that the PLHCP has given the worker a copy of these recommendations.
- ❑ Employees who are medically unable to wear a negative pressure respirator are provided with a powered air-purifying respirator (PAPR) if they are found by the PLHCP to be medically able to use a PAPR. *(29 CFR 1910.1034(e)(6)(ii).)*

Employees are given additional medical evaluations when:

- ❑ The employee reports symptoms related to his or her ability to use a respirator.
- ❑ The PLHCP, respiratory protection program administrator, or supervisor determines that a medical reevaluation is necessary.
- ❑ Information from the respiratory protection program suggests a need for reevaluation.
- ❑ Workplace conditions have changed in a way that could potentially place an increased physiological burden on the employee.

CHECKLIST FOR FIT TESTING

√ Check all the fit tests listed below that are used at your facility:

- ❑ Employees who are using tight-fitting respirator facepieces have passed an appropriate fit test prior to being required to use a respirator.
- ❑ Fit testing is conducted with the same make, model, style and size that the employee will be expected to use at the worksite.
- ❑ Fit tests are conducted annually and when different respirator facepieces are to be used.
- ❑ Provisions are made to conduct additional fit tests in the event of physical changes in the employee that may affect respirator fit.
- ❑ Employees are given the opportunity to select a different respirator facepiece, and be retested if their respirator fit is unacceptable to them.
- ❑ Fit tests are administered using OSHA-accepted QNFT or QLFT protocols.
- ❑ QLFT is only used to fit test either PAPRs, SCBAs, or negative pressure APRs that must achieve a fit factor of 100 or less.
- ❑ QNFT is used in all situations where a negative pressure respirator is intended to protect workers from contaminant concentrations greater than 10 times the PEL.
- ❑ When QNFT is used to fit negative pressure respirators, a minimum fit factor of 100 is achieved for tight-fitting half facepieces and 500 for full facepieces.

For tight-fitting atmosphere-supplying respirators and powered air-purifying respirators:

- ❑ Fit tests are conducted in the negative pressure mode.
- ❑ QLFT is achieved by temporarily converting the facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure APR.
- ❑ QNFT is achieved by modifying the facepiece to allow for sampling inside the mask midway between the nose and mouth. If the facepiece is permanently converted during fit testing, the respirator is no longer approved for workplace use.

CHECKLIST FOR PROPER USE OF RESPIRATORS

√ Check your facility to be certain that:

- ❑ Employees using tight-fitting respirators have no conditions, such as facial hair, that would interfere with a face-to-facepiece seal or valve function.
- ❑ Employees wear corrective glasses, goggles, or other protective equipment in a manner that does not interfere with the face-to-facepiece seal or valve function.
- ❑ Employees perform user seal checks prior to each use of a tight-fitting respirator.
- ❑ There are procedures for conducting ongoing surveillance of the work area for conditions that affect respirator effectiveness, and that, when such conditions exist, you take steps to address those situations.
- ❑ Employees are permitted to leave their work area to conduct respirator maintenance, such as washing the facepiece, or to replace respirator parts.
- ❑ Employees do not return to their work area until their respirator has been repaired or replaced in the event of a breakthrough, a leak in the face-piece, or a change in breathing resistance.
- ❑ There are procedures for respirator use in IDLH atmospheres and during interior structural firefighting to ensure that: the appropriate number of standby personnel are deployed; standby personnel and workers in the IDLH environment maintain communication; standby personnel are properly trained, equipped, and prepared; you will be notified when standby personnel enter an IDLH atmosphere; and you will respond appropriately to this notification.
- ❑ Standby personnel are equipped with a pressure demand or other positive pressure SCBA, or a positive pressure supplied-air respirator with an escape SCBA, and appropriate retrieval equipment or other means for rescue.
- ❑ Procedures for interior structural firefighting require that: at least two employees enter the IDLH atmosphere and remain in contact with one another at all times; at least two standby personnel are used; and all firefighting employees use SCBAs.

CHECKLIST FOR RESPIRATOR MAINTENANCE AND CARE

√ Check to make sure that your facility has met the following requirements:

Cleaning and disinfecting:

- ❑ Respirators are provided that are clean, sanitary, and in good working order.
- ❑ Respirators are cleaned and disinfected using the procedures specified in *Appendix B-2 of the standard*.

Respirators are cleaned and disinfected:

- ❑ As often as necessary when issued for the exclusive use of one employee.
- ❑ Before being worn by different individuals.
- ❑ After each use for emergency use respirators.
- ❑ After each use for respirators used for fit testing and training.

Storage:

- ❑ Respirators are stored to protect them from damage from the elements, and from becoming deformed.

Emergency respirators are stored:

- ❑ To be accessible to the work area.
- ❑ In compartments marked as such.
- ❑ In accord with manufacturer's instructions.

Inspections:

- ❑ Routine-use respirators are inspected before each use and during cleaning.
- ❑ SCBAs and emergency respirators are inspected monthly and checked for proper functioning before and after each use.
- ❑ Emergency escape-only respirators are inspected before being carried into the workplace for use.

Inspections include:

- ❑ Check of respirator function.
- ❑ Tightness of connections.
- ❑ Condition of the facepiece, head straps, valves, cartridges, and other parts.
- ❑ Condition of elastomeric parts.

For SCBAs, inspections include:

- ❑ Check that cylinders are fully charged.
- ❑ Check that regulators function properly.
- ❑ Check that warning devices function properly.

For emergency use respirators, inspections include:

- ❑ Certification by documenting the inspection, and by tagging the information either to the respirator or its compartment, or storing it with inspection reports.

Repairs:

- ❑ Respirators that have failed inspection are taken out of service.
- ❑ Repairs are made only by trained personnel.
- ❑ Only NIOSH-certified parts are used.
- ❑ Reducing and admission valves, regulators and alarms are adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

CHECKLIST FOR BREATHING AIR QUALITY AND USE

√ Check that at your facility:

General

- ❑ Compressed breathing air meets the requirements for Grade D breathing air.
- ❑ Compressed oxygen is not used in respirators that have previously used compressed air.
- ❑ Oxygen concentrations greater than 23.5 percent are used only in equipment designed for oxygen service or distribution.
- ❑ Breathing air couplings are incompatible with outlets for other gas systems.
- ❑ Breathing gas containers are marked in accord with the NIOSH certification standard.
- ❑ Carbon monoxide levels are monitored for both oil and gas compressors.

Breathing Air Cylinders

- ❑ Cylinders are tested and maintained according to DOT 49 CFR Parts 173 and 178.
- ❑ A certificate of analysis for breathing air has been obtained from the supplier.
- ❑ Moisture content in the cylinder does not exceed a dew point of -50°F at 1 atmosphere pressure.

Compressors

- ❑ Are constructed and situated to prevent contaminated air from getting into the system.
- ❑ Are set up to minimize the moisture content.
- ❑ Are equipped with in-line air-purifying sorbent beds and filters that are maintained or replaced following manufacturer's instructions.
- ❑ Are tagged with information on the most recent change date of the filter and an authorizing signature.
- ❑ Carbon monoxide does not exceed 10 ppm in the breathing air from compressors that are not oil-lubricated.
- ❑ High-temperature or carbon monoxide alarms are used on oil-lubricated compressors; monitor the air often enough to ensure that carbon monoxide does not exceed 10 ppm if only a high-temperature alarm is used.

CHECKLIST FOR TRAINING AND INFORMATION

√ Check that your facility provides the following:

Demonstration of employees' knowledge of:

- ❑ Why the respirator is necessary and the consequences of improper fit, use, or maintenance.
- ❑ The limitations and capabilities of the respirator.
- ❑ How to effectively use the respirator in emergency situations, including respirator malfunction.
- ❑ How to inspect, put on, remove, use and check the seals of the respirator.
- ❑ Maintenance and storage procedures.
- ❑ The general requirements of the Respiratory Protection standard.
- ❑ How to recognize medical signs and symptoms that may limit or prevent effective use of the respirator.

√ Check that your facility satisfies the general requirements of the respirator standard by providing the following:

- ❑ Training that is understandable to employees.
- ❑ Training prior to employee use of a respirator.
- ❑ Retraining as specified below:
  - Annually.
  - Upon changes in workplace conditions that affect respirator use.
  - When knowledge and skills for respirator use are not retained by the employee.
  - Whenever retraining appears necessary to ensure safe respirator use.
- ❑ *Appendix D of the standard* to voluntary users.

CHECKLIST FOR PROGRAM EVALUATION

√ Check that your facility:

- ❑ Conducts workplace evaluations as necessary to ensure that the written respiratory protection program is being effectively implemented.
- ❑ Regularly consults with employees required to wear respirators to assess their views on the respiratory protection program and to identify problems with respirator fit, selection, use and maintenance.
- ❑ Corrects any problems identified during assessments.

CHECKLIST FOR RECORDKEEPING

√ Check that your facility does the following:

- ❑ Retains records of medical evaluations.
- ❑ Retains fit testing records.
- ❑ Retains a copy of the current respiratory protection program.
- ❑ Provides access to the above records by affected employees and OSHA.

Attachment 3
Respiratory Protection Standard

This section applies to General Industry (part 1910), Shipyards (part 1915), Marine Terminals (part 1917), Longshoring (part 1918), and Construction (part 1926).

1910.134(a)
Permissible practice.

1910.134(a)(1)
In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to this section.

1910.134(a)(2)
Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program which shall include the requirements outlined in paragraph (c) of this section.

1910.134(b)
Definitions.
The following definitions are important terms used in the respiratory protection standard in this section.

Air-purifying respirator means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

Assigned protection factor (APF) means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by this section.

Atmosphere-supplying respirator means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

Canister or cartridge means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

Demand respirator means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

Emergency situation means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

Employee exposure means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

End-of-service-life indicator (ESLI) means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

Escape-only respirator means a respirator intended to be used only for emergency exit.

Filter or air purifying element means a component used in respirators to remove solid or liquid aerosols from the inspired air.

Filtering facepiece (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Fit factor means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit test means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)

Helmet means a rigid respiratory inlet covering that also provides head protection against impact and penetration.

High efficiency particulate air (HEPA) filter means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

Hood means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

Immediately dangerous to life or health (IDLH) means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Interior structural firefighting means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. (See 29 CFR 1910.155)

Loose-fitting facepiece means a respiratory inlet covering that is designed to form a partial seal with the face.

Maximum use concentration (MUC) means the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

Negative pressure respirator (tight fitting) means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

Oxygen deficient atmosphere means an atmosphere with an oxygen content below 19.5% by volume.

Physician or other licensed healthcare professional (PLHCP) means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the healthcare services required by paragraph (e) of this section.

Positive pressure respirator means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

Powered air-purifying respirator (PAPR) means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

Pressure demand respirator means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

Qualitative fit test (QLFT) means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

Quantitative fit test (QNFT) means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

Respiratory inlet covering means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.

Self-contained breathing apparatus (SCBA) means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Service life means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.

Supplied-air respirator (SAR) or airline respirator means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

This section means this Respiratory Protection standard.

Tight-fitting facepiece means a respiratory inlet covering that forms a complete seal with the face.

User seal check means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

1910.134(c)

Respiratory protection program.

This paragraph requires the employer to develop and implement a written respiratory protection program with required worksite-specific procedures and elements for required respirator use. The program must be administered by a suitably trained program administrator. In addition, certain program elements may be required for voluntary use to prevent potential hazards associated with the use of the respirator.

> Note: The *Small Entity Compliance Guide* contains criteria for the selection of a program administrator and a sample program that meets the requirements of this paragraph.

1910.134(c)(1)

In any workplace where respirators are necessary to protect the health of the employee or whenever respirators are required by the employer, the employer shall establish and implement a written respiratory protection program with worksite-specific procedures. The program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use. The employer shall include in the program the following provisions of this section, as applicable:

1910.134(c)(1)(i)

Procedures for selecting respirators for use in the workplace;

1910.134(c)(1)(ii)

Medical evaluations of employees required to use respirators;

1910.134(c)(1)(iii)

Fit testing procedures for tight-fitting respirators;

1910.134(c)(1)(iv)

Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;

1910.134(c)(1)(v)

Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;

1910.134(c)(1)(vi)

Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;

1910.134(c)(1)(vii)

Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;

1910.134(c)(1)(viii)

Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and

1910.134(c)(1)(ix)

Procedures for regularly evaluating the effectiveness of the program.

1910.134(c)(2)

Where respirator use is not required:

1910.134(c)(2)(i)

An employer may provide respirators at the request of employees or permit employees to use their own respirators, if the employer determines that such respirator use will not in itself create a hazard. If the employer determines that any voluntary respirator use is permissible, the employer shall provide the respirator users with the information contained in Appendix D to this section ("Information for Employees Using Respirators When Not Required Under the Standard"); and

1910.134(c)(2)(ii)

In addition, the employer must establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is medically able to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user. Exception: Employers are not required to include in a written respiratory protection program those employees whose only use of respirators involves the voluntary use of filtering facepieces (dust masks).

1910.134(c)(3)

The employer shall designate a program administrator who is qualified by appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.

1910.134(c)(4)

The employer shall provide respirators, training, and medical evaluations at no cost to the employee.

1910.134(d)

Selection of respirators.

This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. The paragraph also specifies appropriately protective respirators for use in IDLH atmospheres, and limits the selection and use of air-purifying respirators.

1910.134(d)(1

General requirements.

1910.134(d)(1)(i)

The employer shall select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability.

1910.134(d)(1)(ii)

The employer shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification.

1910.134(d)(1)(iii)

The employer shall identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

1910.134(d)(1)(iv)

The employer shall select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

1910.134(d)(2)

Respirators for IDLH atmospheres.

1910.134(d)(2)(i)

The employer shall provide the following respirators for employee use in IDLH atmospheres:

1910.134(d)(2)(i)(A)

A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or

1910.134(d)(2)(i)(B)

A combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.

1910.134(d)(2)(ii)

Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

1910.134(d)(2)(iii)

All oxygen-deficient atmospheres shall be considered IDLH. Exception: If the employer demonstrates that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table II of this section (i.e., for the altitudes set out in the table), then any atmosphere-supplying respirator may be used.

1910.134(d)(3)

Respirators for atmospheres that are not IDLH.

1910.134(d)(3)(i)

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

1910.134(d)(3)(i)(A)

Assigned Protection Factors (APFs) Employers must use the assigned protection factors listed in Table I to select a respirator that meets or exceeds the required level of employee protection. When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers must ensure that the assigned protection factor is appropriate to the mode of operation in which the respirator is being used.

Table I: Assigned Protection Factors[5]					
Type of Respirator[1, 2]	Quarter mask	Half mask	Full facepiece	Helmet/Hood	Loose-fitting facepiece
1. Air-Purifying Respirator	5	10[3]	50	—	—
2. Powered Air-Purifying Respirator (PAPR)	—	50	1,000	25/1,000[4]	25
3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode	—	10	50	—	—
• Continuous flow mode	—	50	1,000	25/1,000[4]	25
• Pressure-demand or other positive-pressure mode	—	50	1,000	—	—
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode	—	10	50	50	—
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)	—	—	10,000	10,000	—

Notes:

[1] Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

[2] The assigned protection factors in Table I are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

[3] This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

[4] The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

[5] These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134(d)(2)(ii).

1910.134(d)(3)(i)(B)

Maximum Use Concentration (MUC)

1910.134(d)(3)(i)(B)(1)

The employer must select a respirator for employee use that maintains the employee's exposure to the hazardous substance, when measured outside the respirator, at or below the MUC.

1910.134(d)(3)(i)(B)(2)

Employers must not apply MUCs to conditions that are immediately dangerous to life or health (IDLH); instead, they must use respirators listed for IDLH conditions in paragraph (d)(2) of this standard.

1910.134(d)(3)(i)(B)(3)

When the calculated MUC exceeds the IDLH level for a hazardous substance, or the performance limits of the cartridge or canister, then employers must set the maximum MUC at that lower limit.

1910.134(d)(3)(ii)

The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

1910.134(d)(3)(iii)

For protection against gases and vapors, the employer shall provide:

1910.134(d)(3)(iii)(A)

An atmosphere-supplying respirator, or

1910.134(d)(3)(iii)(B)

An air-purifying respirator, provided that:

1910.134(d)(3)(iii)(B)(1)

The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or

1910.134(d)(3)(iii)(B)(2)

If there is no ESLI appropriate for conditions in the employer's workplace, the employer implements a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. The employer shall describe in the respirator program the information and data relied upon and the basis for the canister and

cartridge change schedule and the basis for reliance on the data.

1910.134(d)(3)(iv)
For protection against particulates, the employer shall provide:

1910.134(d)(3)(iv)(A)
An atmosphere-supplying respirator; or

1910.134(d)(3)(iv)(B)
An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84; or

1910.134(d)(3)(iv)(C)
For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.

Table II: Oxygen Deficient Atmospheres

Altitude (ft.)	Oxygen deficient atmospheres (% O_2) for which the employer may rely on atmosphere-supplying respirators
Less than 3,001	16.0-19.5
3,001-4,000	16.4-19.5
4,001-5,000	17.1-19.5
5,001-6,000	17.8-19.5
6,001-7,000	18.5-19.5
7,001-8,000[1]	19.3-19.5

[1] Above 8,000 feet the exception does not apply. Oxygen-enriched breathing air must be supplied above 14,000 feet.

1910.134(e)
Medical evaluation.
Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. Accordingly, this paragraph specifies the minimum requirements for medical evaluation that employers must implement to determine the employee's ability to use a respirator.

1910.134(e)(1)
General. The employer shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace. The employer may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.

1910.134(e)(2)
Medical evaluation procedures.

1910.134(e)(2)(i)
The employer shall identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

1910.134(e)(2)(ii)
The medical evaluation shall obtain the information requested by the questionnaire in Sections 1 and 2, Part A of Appendix C of this section.

1910.134(e)(3)
Follow-up medical examination.

1910.134(e)(3)(i)
The employer shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2, Part A of Appendix C or whose initial medical examination demonstrates the need for a follow-up medical examination.

1910.134(e)(3)(ii)
The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

1910.134(e)(4)
Administration of the medical questionnaire and examinations.

1910.134(e)(4)(i)
The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content.

1910.134(e)(4)(ii)
The employer shall provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.

1910.134(e)(5)
Supplemental information for the PLHCP.

1910.134(e)(5)(i)
The following information must be provided to the PLHCP before the PLHCP makes a recommendation concerning an employee's ability to use a respirator:

1910.134(e)(5)(i)(A)
(A) The type and weight of the respirator to be used by the employee;

1910.134(e)(5)(i)(B)
The duration and frequency of respirator use (including use for rescue and escape);

1910.134(e)(5)(i)(C)
The expected physical work effort;

1910.134(e)(5)(i)(D)
Additional protective clothing and equipment to be worn; and

1910.134(e)(5)(i)(E)
Temperature and humidity extremes that may be encountered.

1910.134(e)(5)(ii)
Any supplemental information provided previously to the PLHCP regarding an employee need not be provided for a subsequent medical evaluation if the information and the PLHCP remain the same.

1910.134(e)(5)(iii)
The employer shall provide the PLHCP with a copy of the written respiratory protection program and a copy of this section.

Note to Paragraph (e)(5)(iii): When the employer replaces a PLHCP, the employer must ensure that the new PLHCP obtains this information, either by providing the documents directly to the PLHCP or having the documents transferred from the former PLHCP to the new PLHCP. However, OSHA does not expect employers to have employees medically reevaluated solely because a new PLHCP has been selected.

1910.134(e)(6)
Medical determination. In determining the employee's ability to use a respirator, the employer shall:

1910.134(e)(6)(i)
Obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. The recommendation shall provide only the following information:

1910.134(e)(6)(i)(A)
Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator;

1910.134(e)(6)(i)(B)
The need, if any, for follow-up medical evaluations; and

1910.134(e)(6)(i)(C)
A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

1910.134(e)(6)(ii)
If the respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the employee's health at increased risk if the respirator is used, the employer shall provide a PAPR if the PLHCP's medical evaluation finds that the employee can use such a respirator; if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the employer is no longer required to provide a PAPR.

1910.134(e)(7)
Additional medical evaluations. At a minimum, the employer shall provide additional medical evaluations that comply with the requirements of this section if:

1910.134(e)(7)(i)
An employee reports medical signs or symptoms that are related to ability to use a respirator;

1910.134(e)(7)(ii)
A PLHCP, supervisor, or the respirator program administrator informs the employer that an employee needs to be reevaluated;

1910.134(e)(7)(iii)
Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation; or

1910.134(e)(7)(iv)
A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

1910.134(f)

Fit testing.

This paragraph requires that, before an employee may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. This paragraph specifies the kinds of fit tests allowed, the procedures for conducting them, and how the results of the fit tests must be used.

1910.134(f)(1)

The employer shall ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as stated in this paragraph.

1910.134(f)(2)

The employer shall ensure that an employee using a tight-fitting facepiece respirator is fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually thereafter.

1910.134(f)(3)

The employer shall conduct an additional fit test whenever the employee reports, or the employer, PLHCP, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

1910.134(f)(4)

If after passing a QLFT or QNFT, the employee subsequently notifies the employer, program administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator facepiece and to be retested.

1910.134(f)(5)

The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. The OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A of this section.

1910.134(f)(6)

QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.

1910.134(f)(7)

If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.

1910.134(f)(8)

Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

1910.134(f)(8)(i)

Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.

1910.134(f)(8)(ii)

Quantitative fit testing of these respirators shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.

1910.134(f)(8)(iii)

Any modifications to the respirator facepiece for fit testing shall be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.

1910.134(g)

Use of respirators.

This paragraph requires employers to establish and implement procedures for the proper use of respirators. These requirements include prohibiting conditions that may result in facepiece seal leakage, preventing employees from removing respirators in hazardous environments, taking actions to ensure continued effective respirator operation throughout the work shift, and establishing procedures for the use of respirators in IDLH atmospheres or in interior structural firefighting situations.

1910.134(g)(1)

Facepiece seal protection.

1910.134(g)(1)(i)

The employer shall not permit respirators with tight-fitting facepieces to be worn by employees who have:

1910.134(g)(1)(i)(A)
Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or

1910.134(g)(1)(i)(B)
Any condition that interferes with the face-to-facepiece seal or valve function.

1910.134(g)(1)(ii)
If an employee wears corrective glasses or goggles or other personal protective equipment, the employer shall ensure that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

1910.134(g)(1)(iii)
For all tight-fitting respirators, the employer shall ensure that employees perform a user seal check each time they put on the respirator using the procedures in Appendix B-1 or procedures recommended by the respirator manufacturer that the employer demonstrates are as effective as those in Appendix B-1 of this section.

1910.134(g)(2)
Continuing respirator effectiveness.
1910.134(g)(2)(i)
Appropriate surveillance shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the employer shall reevaluate the continued effectiveness of the respirator.

1910.134(g)(2)(ii)
The employer shall ensure that employees leave the respirator use area:

1910.134(g)(2)(ii)(A)
To wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use; or

1910.134(g)(2)(ii)(B)
If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece; or

1910.134(g)(2)(ii)(C)
To replace the respirator or the filter, cartridge, or canister elements.

1910.134(g)(2)(iii)
If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece, the employer must replace or repair the respirator before allowing the employee to return to the work area.

1910.134(g)(3)
Procedures for IDLH atmospheres. For all IDLH atmospheres, the employer shall ensure that:

1910.134(g)(3)(i)
One employee or, when needed, more than one employee is located outside the IDLH atmosphere;

1910.134(g)(3)(ii)
Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere;

1910.134(g)(3)(iii)
The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue;

1910.134(g)(3)(iv)
The employer or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue;

1910.134(g)(3)(v)
The employer or designee authorized to do so by the employer, once notified, provides necessary assistance appropriate to the situation;

1910.134(g)(3)(vi)
Employee(s) located outside the IDLH atmospheres are equipped with:

1910.134(g)(3)(vi)(A)
Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either

1910.134(g)(3)(vi)(B)
Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or

1910.134(g)(3)(vi)(C)
Equivalent means for rescue where retrieval equipment is not required under paragraph (g)(3)(vi)(B).

1910.134(g)(4)
Procedures for interior structural firefighting. In addition to the requirements set forth under paragraph (g)(3), in interior structural fires, the employer shall ensure that:

1910.134(g)(4)(i)
At least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times;

1910.134(g)(4)(ii)
At least two employees are located outside the IDLH atmosphere; and

1910.134(g)(4)(iii)
All employees engaged in interior structural firefighting use SCBAs.

Note 1 to paragraph (g): One of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident.

Note 2 to paragraph (g): Nothing in this section is meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.

1910.134(h)
Maintenance and care of respirators.
This paragraph requires the employer to provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees.

1910.134(h)(1)
Cleaning and disinfecting. The employer shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. The employer shall ensure that respirators are cleaned and disinfected using the procedures in Appendix B-2 of this section, or procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness. The respirators shall be cleaned and disinfected at the following intervals:

1910.134(h)(1)(i)
Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;

1910.134(h)(1)(ii)
Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals;

1910.134(h)(1)(iii)
Respirators maintained for emergency use shall be cleaned and disinfected after each use; and

1910.134(h)(1)(iv)
Respirators used in fit testing and training shall be cleaned and disinfected after each use.

1910.134(h)(2)
Storage. The employer shall ensure that respirators are stored as follows:

1910.134(h)(2)(i)
All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the facepiece and exhalation valve.

1910.134(h)(2)(ii)
In addition to the requirements of paragraph (h)(2)(i) of this section, emergency respirators shall be:

1910.134(h)(2)(ii)(A)
Kept accessible to the work area;

1910.134(h)(2)(ii)(B)
Stored in compartments or in covers that are clearly marked as containing emergency respirators; and

1910.134(h)(2)(ii)(C)
Stored in accordance with any applicable manufacturer instructions.

1910.134(h)(3)
Inspection.

1910.134(h)(3)(i)
The employer shall ensure that respirators are inspected as follows:

1910.134(h)(3)(i)(A)
All respirators used in routine situations shall be inspected before each use and during cleaning;

1910.134(h)(3)(i)(B)
All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use; and

1910.134(h)(3)(i)(C)
Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

1910.134(h)(3)(ii)
The employer shall ensure that respirator inspections include the following:

1910.134(h)(3)(ii)(A)
A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters; and

1910.134(h)(3)(ii)(B)
A check of elastomeric parts for pliability and signs of deterioration.

1910.134(h)(3)(iii)
In addition to the requirements of paragraphs (h)(3)(i) and (ii) of this section, self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The employer shall determine that the regulator and warning devices function properly.

1910.134(h)(3)(iv)
For respirators maintained for emergency use, the employer shall:

1910.134(h)(3)(iv)(A)
Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator; and

1910.134(h)(3)(iv)(B)
Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

1910.134(h)(4)
Repairs. The employer shall ensure that respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the following procedures:

1910.134(h)(4)(i)
Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator;

1910.134(h)(4)(ii)
Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and

1910.134(h)(4)(iii)
Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

1910.134(i)
Breathing air quality and use.
This paragraph requires the employer to provide employees using atmosphere-supplying respirators (supplied-air and SCBA) with breathing gases of high purity.

1910.134(i)(1)
The employer shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

1910.134(i)(1)(i)
Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and

1910.134(i)(1)(ii)
Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:

1910.134(i)(1)(ii)(A)
Oxygen content (v/v) of 19.5-23.5%;

1910.134(i)(1)(ii)(B)
Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;

1910.134(i)(1)(ii)(C)
Carbon monoxide (CO) content of 10 ppm or less;

1910.134(i)(1)(ii)(D)
Carbon dioxide content of 1,000 ppm or less; and

1910.134(i)(1)(ii)(E)
Lack of noticeable odor.

1910.134(i)(2)
The employer shall ensure that compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.

1910.134(i)(3)
The employer shall ensure that oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.

1910.134(i)(4)
The employer shall ensure that cylinders used to supply breathing air to respirators meet the following requirements:

1910.134(i)(4)(i)
Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178);

1910.134(i)(4)(ii)
Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air; and

1910.134(i)(4)(iii)
The moisture content in the cylinder does not exceed a dew point of -50 deg.F (-45.6 deg.C) at 1 atmosphere pressure.

1910.134(i)(5)
The employer shall ensure that compressors used to supply breathing air to respirators are constructed and situated so as to:

1910.134(i)(5)(i)
Prevent entry of contaminated air into the air-supply system;

1910.134(i)(5)(ii)
Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (5.56 deg.C) below the ambient temperature;

1910.134(i)(5)(iii)
Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions.

1910.134(i)(5)(iv)
Have a tag containing the most recent change date and the signature of the person authorized by the employer to perform the change. The tag shall be maintained at the compressor.

1910.134(i)(6)
For compressors that are not oil-lubricated, the employer shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.

1910.134(i)(7)
For oil-lubricated compressors, the employer shall use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm.

1910.134(i)(8)
The employer shall ensure that breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.

1910.134(i)(9)
The employer shall use breathing gas containers marked in accordance with the NIOSH respirator certification standard, 42 CFR part 84.

1910.134(j)
Identification of filters, cartridges, and canisters.
The employer shall ensure that all filters, cartridges and canisters used in the workplace are labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible.

1910.134(k)
Training and information.
This paragraph requires the employer to provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary. This paragraph also requires the employer to provide the basic information on respirators in Appendix D of this section to employees who wear respirators when not required by this section or by the employer to do so.

1910.134(k)(1)
The employer shall ensure that each employee can demonstrate knowledge of at least the following:

1910.134(k)(1)(i)
Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;

1910.134(k)(1)(ii)
What the limitations and capabilities of the respirator are;

1910.134(k)(1)(iii)
How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;

1910.134(k)(1)(iv)
How to inspect, put on and remove, use, and check the seals of the respirator;

1910.134(k)(1)(v)
What the procedures are for maintenance and storage of the respirator;

1910.134(k)(1)(vi)
How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and

1910.134(k)(1)(vii)
The general requirements of this section.

1910.134(k)(2)
The training shall be conducted in a manner that is understandable to the employee.

1910.134(k)(3)
The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.

1910.134(k)(4)
An employer who is able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified in paragraph (k)(1)(i) through (vii) is not required to repeat such training provided that, as required by paragraph (k)(1), the employee can demonstrate knowledge of those element(s). Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.

1910.134(k)(5)
Retraining shall be administered annually, and when the following situations occur:

1910.134(k)(5)(i)
Changes in the workplace or the type of respirator render previous training obsolete;

1910.134(k)(5)(ii)
Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; or

1910.134(k)(5)(iii)
Any other situation arises in which retraining appears necessary to ensure safe respirator use.

1910.134(k)(6)
The basic advisory information on respirators, as presented in Appendix D of this section, shall be provided by the employer in any written or oral format, to employees who wear respirators when such use is not required by this section or by the employer.

1910.134(l)
Program evaluation.
This section requires the employer to conduct evaluations of the workplace to ensure that the written respiratory protection program is being properly implemented, and to consult employees to ensure that they are using the respirators properly.

1910.134(l)(1)
The employer shall conduct evaluations of the workplace as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.

1910.134(l)(2)
The employer shall regularly consult employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

1910.134(l)(2)(i)
Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);

1910.134(l)(2)(ii)
Appropriate respirator selection for the hazards to which the employee is exposed;

1910.134(l)(2)(iii)
Proper respirator use under the workplace conditions the employee encounters; and

1910.134(l)(2)(iv)
Proper respirator maintenance.

1910.134(m)
Recordkeeping.
This section requires the employer to establish and retain written information regarding medical evaluations, fit testing, and the respirator program. This in-

formation will facilitate employee involvement in the respirator program, assist the employer in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

1910.134(m)(1)
Medical evaluation. Records of medical evaluations required by this section must be retained and made available in accordance with 29 CFR 1910.1020.

1910.134(m)(2)
Fit testing.

1910.134(m)(2)(i)
The employer shall establish a record of the qualitative and quantitative fit tests administered to an employee including:

1910.134(m)(2)(i)(A)
The name or identification of the employee tested;

1910.134(m)(2)(i)(B)
Type of fit test performed;

1910.134(m)(2)(i)(C)
Specific make, model, style, and size of respirator tested;

1910.134(m)(2)(i)(D)
Date of test; and

1910.134(m)(2)(i)(E)
The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.

1910.134(m)(2)(ii)
Fit test records shall be retained for respirator users until the next fit test is administered.

1910.134(m)(3)
A written copy of the current respirator program shall be retained by the employer.

1910.134(m)(4)
Written materials required to be retained under this paragraph shall be made available upon request to affected employees and to the Assistant Secretary or designee for examination and copying.

1910.134(n)
Effective date.
Paragraphs (d)(3)(i)(A) and (d)(3)(i)(B) of this section become effective November 22, 2006.

1910.134(o)
Appendices.

1910.134(o)(1)
Compliance with Appendix A, Appendix B-1, Appendix B-2, and Appendix C of this section is mandatory.

1910.134(o)(2)
Appendix D of this section is non-mandatory and is not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998; 71 FR 16672, April 3, 2006; 71 FR 50187, August 24, 2006]

Appendix A to §1910.134: Fit Testing Procedures (Mandatory)

Part I. OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures -- General Requirements

The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.

3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

4. The test subject shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.

5. The more acceptable facepieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

6. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:
   (a) Position of the mask on the nose
   (b) Room for eye protection
   (c) Room to talk
   (d) Position of mask on face and cheeks

7. The following criteria shall be used to help determine the adequacy of the respirator fit:
   (a) Chin properly placed;
   (b) Adequate strap tension, not overly tightened;
   (c) Fit across nose bridge;
   (d) Respirator of proper size to span distance from nose to chin;
   (e) Tendency of respirator to slip;
   (f) Self-observation in mirror to evaluate fit and respirator position.

8. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in Appendix B-1 of this section or those recommended by the respirator manufacturer which provide equivalent protection to the procedures in Appendix B-1. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.

11. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

12. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

14. Test Exercises.

(a) Employers must perform the following test exercises for all fit testing methods prescribed in this appendix, except for the CNP quantitative fit testing protocol and the CNP REDON quantitative fit testing protocol. For these two protocols, employers must ensure that the test subjects (i.e., employees) perform the exercise procedure specified in Part I.C.4(b) of this appendix for the CNP quantitative fit testing protocol, or the exercise procedure described in Part I.C.5(b) of this appendix for the CNP REDON quantitative fit-testing protocol. For the remaining fit testing methods, employers must ensure that employees perform the test exercises in the appropriate test environment in the following manner:

(1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.

(2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.

(3) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

(4) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

(5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(6) Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)

(7) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

(8) Normal breathing. Same as exercise (1).

(b) Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

B. Qualitative Fit Test (QLFT) Protocols

1. General

(a) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.

(b) The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

2. Isoamyl Acetate Protocol

Note: This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator must be equipped with an organic vapor filter.

(a) Odor Threshold Screening

Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

(1) Three 1 liter glass jars with metal lids are required.

(2) Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions.

(3) The isoamyl acetate (IAA) (also known a3 isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1 liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.

(4) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.

(5) The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.

(6) A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.

(7) The odor test and test blank jar lids shall be labeled (e.g., 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.

(8) The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(9) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(10) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

(11) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(b) Isoamyl Acetate Fit Test

(1) The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.

(2) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors.

(3) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(4) A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.

(5) Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.

(6) Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.

(7) If at any time during the test, the subject detects the banana-like odor of IAA, the test is failed. The subject shall quickly exit from the

test chamber and leave the test area to avoid olfactory fatigue.

(8) If the test is failed, the subject shall return to the selection room and remove the respirator. The test subject shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

(9) If the subject passes the test, the efficiency of the test procedure shall be demonstrated by having the subject break the respirator face seal and take a breath before exiting the chamber.

(10) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.

3. Saccharin Solution Aerosol Protocol

The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

(1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.

(2) The test enclosure shall have a 3/4-inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a sweet taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(5) The threshold check solution is prepared by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see (b)(5) below) in 100 ml of distilled water.

(6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

(7) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the test subject reports tasting the sweet taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

(10) The test conductor will take note of the number of squeezes required to solicit a taste response.

(11) If the saccharin is not tasted after 30 squeezes (step 10), the test subject is unable to taste saccharin and may not perform the saccharin fit test.

Note to paragraph 3. (a): If the test subject eats or drinks something sweet before the screening test, he/she may be unable to taste the weak saccharin solution.

(12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

(14) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(b) Saccharin solution aerosol fit test procedure.

(1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure described in 3. (a) above.

(3) The test subject shall don the enclosure while wearing the respirator selected in section I. A. of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).

(4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(5) The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 ml of warm water.

(6) As before, the test subject shall breathe through the slightly open mouth with tongue extended, and report if he/she tastes the sweet taste of saccharin.

(7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test. A minimum of 10 squeezes is required.

(8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(9) Every 30 seconds the aerosol concentration shall be replenished using one half the original number of squeezes used initially (e.g., 5, 10 or 15).

(10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected. If the test subject does not report tasting the saccharin, the test is passed.

(11) If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

(12) Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.

4. BitrexTM (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol

The BitrexTM (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Taste Threshold Screening.

The Bitrex taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of Bitrex.

(1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure shall be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar

to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.

(2) The test enclosure shall have a 3/4 inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his or her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a bitter taste

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the Threshold Check Solution into the enclosure. This Nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(5) The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex to 100 ml of 5% salt (NaCl) solution in distilled water.

(6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.

(7) An initial ten squeezes are repeated rapidly and then the test subject is asked whether the Bitrex can be tasted. If the test subject reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

(10) The test conductor will take note of the number of squeezes required to solicit a taste response.

(11) If the Bitrex is not tasted after 30 squeezes (step 10), the test subject is unable to taste Bitrex and may not perform the Bitrex fit test.

(12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

(14) The nebulizer shall be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four hours.

(b) Bitrex Solution Aerosol Fit Test Procedure.

(1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure as that described in 4. (a) above.

(3) The test subject shall don the enclosure while wearing the respirator selected according to section I. A. of this appendix. The respirator shall be properly adjusted and equipped with any type particulate filter(s).

(4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(5) The fit test solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5% salt (NaCl) solution in warm water.

(6) As before, the test subject shall breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex.

(7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of the fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the num-

ber of squeezes required to elicit a taste response as noted during the screening test.

(8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(9) Every 30 seconds the aerosol concentration shall be replenished using one half the number of squeezes used initially (e.g., 5, 10 or 15).

(10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of Bitrex is detected. If the test subject does not report tasting the Bitrex, the test is passed.

(11) If the taste of Bitrex is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

5. Irritant Smoke (Stannic Chloride) Protocol

This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

(a) General Requirements and Precautions

(1) The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).

(2) Only stannic chloride smoke tubes shall be used for this protocol.

(3) No form of test enclosure or hood for the test subject shall be used.

(4) The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.

(5) The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

(b) Sensitivity Screening Check

The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.

(1) The test operator shall break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.

(2) The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.

(3) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

(c) Irritant Smoke Fit Test Procedure

(1) The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).

(2) The test subject shall be instructed to keep his/her eyes closed.

(3) The test operator shall direct the stream of irritant smoke from the smoke tube toward the faceseal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.

(4) If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.

(5) The exercises identified in section I.A. 14. of this appendix shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.

(6) If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.

(7) Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.

(8) If a response is produced during this second sensitivity check, then the fit test is passed.

C. Quantitative Fit Test (QNFT) Protocols

The following quantitative fit testing procedures have been demonstrated to be acceptable: Quantitative fit testing using a non-hazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and employing instrumentation to quantify the fit of the respirator; Quantitative fit testing using ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit; Quantitative fit testing using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a facepiece to quantify the respirator fit.

1. General

(a) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.

(b) The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Generated Aerosol Quantitative Fit Testing Protocol

(a) Apparatus.

(1) Instrumentation. Aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols shall be used for quantitative fit testing.

(2) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the test agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

(3) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.

(4) The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.

(5) The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the test subject is not exposed in excess of an established exposure limit for the test agent at any time during the testing process, based upon the length of the exposure and the exposure limit duration.

(6) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be designed and used so that the air sample is drawn from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 1/4 inch.

(7) The test setup shall permit the person administering the test to observe the test subject inside the chamber during the test.

(8) The equipment generating the test atmosphere shall maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.

(9) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.

(10) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.

(11) The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate filter) before release.

(12) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.

(13) The limitations of instrument detection shall be taken into account when determining the fit factor.

(14) Test respirators shall be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.

(b) Procedural Requirements.

(1) When performing the initial user seal check using a positive or negative pressure check, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.

(2) The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.

(3) A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the test subject has entered the test environment.

(4) Immediately after the subject enters the test chamber, the test agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full facepiece respirator.

(5) A stable test agent concentration shall be obtained prior to the actual start of testing.

(6) Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.

(7) The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The test subject shall be refitted and retested.

(8) Calculation of fit factors.

(i) The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.

(ii) The average test chamber concentration shall be calculated as the arithmetic average of the concentration measured before and after each test (i.e., 7 exercises) or the arithmetic average of the concentration measured before and after each exercise or the true average measured continuously during the respirator sample.

(iii) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

(A) Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent

penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

(B) Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

(C) Integration by calculation of the area under the individual peak for each exercise except the grimace exercise. This includes computerized integration.

(D) The calculation of the overall fit factor using individual exercise fit factors involves first converting the exercise fit factors to penetration values, determining the average, and then converting that result back to a fit factor. This procedure is described in the following equation:

$$\text{Overall Fit Factor} = \frac{\text{Number of exercises}}{1/ff_1 + 1/ff_2 + 1/ff_3 + 1/ff_4 + 1/ff_5 + 1/ff_6 + 1/ff_7 + 1/ff_8}$$

Where ff_1, ff_2, ff_3, etc. are the fit factors for exercises 1, 2, 3, etc.

(9) The test subject shall not be permitted to wear a half mask or quarter facepiece respirator unless a minimum fit factor of 100 is obtained, or a full facepiece respirator unless a minimum fit factor of 500 is obtained.

(10) Filters used for quantitative fit testing shall be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.

3. Ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol.

The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (Portacount ™) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling device, installed on the respirator, that allows the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Portacount Fit Test Requirements.

(1) Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (e.g., NIOSH 42 CFR 84 series 100, series 99, or series 95 particulate filter) per manufacturer's instruction.

(2) Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.

(3) Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.

(4) Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.

(5) Follow the manufacturer's instructions for operating the Portacount and proceed with the test.

(6) The test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(7) After the test exercises, the test subject shall be questioned by the test conductor regarding

the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

(b) Portacount Test Instrument.

(1) The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.

(2) Since the pass or fail criterion of the Portacount is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.

(3) A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

4. Controlled negative pressure (CNP) quantitative fit testing protocol.

The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator. The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators. The CNP instrument manufacturer Occupational Health Dynamics of Birmingham, Alabama also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in an employee's own respirator. To perform the test, the test subject closes his or her mouth and holds his/her breath, after which an air pump removes air from the respirator facepiece at a pre-selected constant pressure. The facepiece fit is expressed as the leak rate through the facepiece, expressed as milliliters per minute. The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full facepiece respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) CNP Fit Test Requirements.

(1) The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.

(2) The CNP system defaults selected for test pressure shall be set at -- 15 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall be 53.8 liters per minute for performing fit tests.

(**Note:** CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.)

(3) The individual who conducts the CNP fit testing shall be thoroughly trained to perform the test.

(4) The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.

(5) The employer must train the test subject to hold his or her breath for at least 10 seconds.

(6) The test subject must don the test respirator without any assistance from the test administrator who is conducting the CNP fit test. The respirator must not be adjusted once the fit-test exercises begin. Any adjustment voids the test, and the test subject must repeat the fit test.

(7) The QNFT protocol shall be followed according to section I. C. 1. of this appendix with an exception for the CNP test exercises.

(b) CNP Test Exercises.

(1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject needs to hold head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during test measurement.

(3) Turning head side to side. Standing in place, the subject shall slowly turn his or her head from side to side between the extreme positions on each side for 1 minute. The head shall be held at each extreme momentarily so the subject can inhale at each side. After the turning head side to side exercise, the subject needs to hold head full left and hold his or her breath for 10 seconds during test measurement. Next, the subject needs to hold head full right and hold his or her breath for 10 seconds during test measurement.

(4) Moving head up and down. Standing in place, the subject shall slowly move his or her head up and down for 1 minute. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject shall hold his or her head full up and hold his or her breath for 10 seconds during test measurement. Next, the subject shall hold his or her head full down and hold his or her breath for 10 seconds during test measurement.

(5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1 minute. After the talking exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(6) Grimace. The test subject shall grimace by smiling or frowning for 15 seconds.

(7) Bending Over. The test subject shall bend at the waist as if he or she were to touch his or her toes for 1 minute. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(8) Normal Breathing. The test subject shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement. After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of a respirator shall be tried.

(c) CNP Test Instrument.

(1) The test instrument must have an effective audio-warning device, or a visual-warning device in the form of a screen tracing, that indicates when the test subject fails to hold his or her breath during the test. The test must be terminated and restarted from the beginning when the test subject fails to hold his or her breath during the test. The test subject then may be refitted and retested.

(2) A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style and size of respirator used; and date tested.

5. Controlled negative pressure (CNP) REDON quantitative fit testing protocol.

(a) When administering this protocol to test subjects, employers must comply with the requirements specified in paragraphs (a) and (c) of Part I.C.4 of this appendix ("Controlled negative pressure (CNP) quantitative fit testing protocol"), as well as use the test exercises described below in paragraph (b) of this protocol instead of the test exercises specified in paragraph (b) of Part I.C.4 of this appendix.

(b) Employers must ensure that each test subject being fit tested using this protocol follows the exercise and measurement procedures, including the order of administration, described below in Table A-1 of this appendix.

Table A-1. CNP REDON Quantitative Fit Testing Protocol		
Exercises(1)	Exercise procedure	Measurement procedure
Facing Forward	Stand and breathe normally, without talking, for 30 seconds.	Face forward, while holding breath for 10 seconds.
Bending Over	Bend at the waist, as if going to touch his or her toes, for 30 seconds.	Face parallel to the floor, while holding breath for 10 seconds
Head Shaking	For about three seconds, shake head back and forth vigorously several times while shouting.	Face forward, while holding breath for 10 seconds.
REDON 1	Remove the respirator mask, loosen all facepiece straps, and then redon the respirator mask.	Face forward, while holding breath for 10 seconds.
REDON 2	Remove the respirator mask, loosen all facepiece straps, and then redon the respirator mask again.	Face forward, while holding breath for 10 seconds.

[1] Exercises are listed in the order in which they are to be administered.

(c) After completing the test exercises, the test administrator must question each test subject regarding the comfort of the respirator. When a test subject states that the respirator is unacceptable, the employer must ensure that the test administrator repeats the protocol using another respirator model.

(d) Employers must determine the overall fit factor for each test subject by calculating the harmonic mean of the fit testing exercises as follows:

$$\text{Overall Fit Factor} = \frac{N}{[1/FF_1 + 1/FF_2 + \ldots 1/FF_N]}$$

Where:
N = The number of exercises;
FF_1 = The fit factor for the first exercise;
FF_2 = The fit factor for the second exercise; and
FF_N = The fit factor for the nth exercise.

Part II. New Fit Test Protocols

A. Any person may submit to OSHA an application for approval of a new fit test protocol. If the application meets the following criteria, OSHA will initiate a rulemaking proceeding under section 6(b)(7) of the OSH Act to determine whether to list the new protocol as an approved protocol in this Appendix A.

B. The application must include a detailed description of the proposed new fit test protocol. This application must be supported by either:

1. A test report prepared by an independent government research laboratory (e.g., Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the National Institute for Standards and Technology) stating that the laboratory has tested the protocol and had found it to be accurate and reliable; or

2. An article that has been published in a peer-reviewed industrial hygiene journal describing the protocol and explaining how test data support the protocol's accuracy and reliability.

C. If OSHA determines that additional information is required before the Agency commences a rulemaking proceeding under this section, OSHA will so notify the applicant and afford the applicant the opportunity to submit the supplemental information. Initiation of a rulemaking proceeding will be deferred until OSHA has received and evaluated the supplemental information.

Appendix B-1 to §1910.134: User Seal Check Procedures (Mandatory)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

I. Facepiece Positive and/or Negative Pressure Checks

A. Positive pressure check. Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

B. Negative pressure check. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

II. Manufacturer's Recommended User Seal Check Procedures

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

Appendix B-2 to §1910.134: Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in Appendix B- 2. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

I. Procedures for Cleaning Respirators

A. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

B. Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

C. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.

D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,

2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F); or,

3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

E. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

F. Components should be hand-dried with a clean lint-free cloth or air-dried.

G. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

H. Test the respirator to ensure that all components work properly.

Appendix C to §1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee:

Can you read (circle one): Yes/No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A. Section 1. (Mandatory)

The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date:_____

2. Your name:_____

3. Your age (to nearest year):_____

4. Sex (circle one): Male/Female

5. Your height: _____ ft. _____ in.

6. Your weight: _____ lbs.

7. Your job title:_____

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____

9. The best time to phone you at this number: _____

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No

11. Check the type of respirator you will use (you can check more than one category):

a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).

b. _____ Other type (for example, half- or full-face-piece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one): Yes/No

If "yes," what type(s):_____
_____
_____

Part A. Section 2. (Mandatory)

Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you **currently** smoke tobacco, or have you smoked tobacco in the last month: Yes/No

2. Have you **ever had** any of the following conditions?

Seizures (fits): Yes/No
Diabetes (sugar disease): Yes/No
Allergic reactions that interfere with your breathing: Yes/No
Claustrophobia (fear of closed-in places): Yes/No
Trouble smelling odors: Yes/No

3. Have you **ever had** any of the following pulmonary or lung problems?

Asbestosis: Yes/No
Asthma: Yes/No
Chronic bronchitis: Yes/No
Emphysema: Yes/No
Pneumonia: Yes/No
Tuberculosis: Yes/No
Silicosis: Yes/No
Pneumothorax (collapsed lung): Yes/No
Lung cancer: Yes/No
Broken ribs: Yes/No
Any chest injuries or surgeries: Yes/No
Any other lung problem that you've been told about: Yes/No

4. Do you **currently** have any of the following symptoms of pulmonary or lung illness?

Shortness of breath: Yes/No

Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No

Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No

Have to stop for breath when walking at your own pace on level ground: Yes/No

Shortness of breath when washing or dressing yourself: Yes/No

Shortness of breath that interferes with your job: Yes/No

Coughing that produces phlegm (thick sputum): Yes/No

Coughing that wakes you early in the morning: Yes/No

Coughing that occurs mostly when you are lying down: Yes/No

Coughing up blood in the last month: Yes/No

Wheezing: Yes/No

Wheezing that interferes with your job: Yes/No

Chest pain when you breathe deeply: Yes/No

Any other symptoms that you think may be related to lung problems: Yes/No

5. Have you **ever had** any of the following cardiovascular or heart problems?

Heart attack: Yes/No

Stroke: Yes/No

Angina: Yes/No

Heart failure: Yes/No

Swelling in your legs or feet (not caused by walking): Yes/No

Heart arrhythmia (heart beating irregularly): Yes/No

High blood pressure: Yes/No

Any other heart problem that you've been told about: Yes/No

6. Have you **ever had** any of the following cardiovascular or heart symptoms?

Frequent pain or tightness in your chest: Yes/No

Pain or tightness in your chest during physical activity: Yes/No

Pain or tightness in your chest that interferes with your job: Yes/No

In the past two years, have you noticed your heart skipping or missing a beat: Yes/No

Heartburn or indigestion that is not related to eating: Yes/ No

Any other symptoms that you think may be related to heart or circulation problems: Yes/No

7. Do you **currently** take medication for any of the following problems?

Breathing or lung problems: Yes/No

Heart trouble: Yes/No

Blood pressure: Yes/No

Seizures (fits): Yes/No

8. If you've used a respirator, have you **ever had** any of the following problems? (If you've never used a respirator, check the following space and go to question 9:)

Eye irritation: Yes/No

Skin allergies or rashes: Yes/No

Anxiety: Yes/No

General weakness or fatigue: Yes/No

Any other problem that interferes with your use of a respirator: Yes/No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you **ever lost** vision in either eye (temporarily or permanently): Yes/No

11. Do you **currently** have any of the following vision problems?

Wear contact lenses: Yes/No

Wear glasses: Yes/No

Color blind: Yes/No

Any other eye or vision problem: Yes/No

12. Have you **ever had** an injury to your ears, including a broken ear drum: Yes/No

13. Do you **currently** have any of the following hearing problems?

Difficulty hearing: Yes/No

Wear a hearing aid: Yes/No

Any other hearing or ear problem: Yes/No

14. Have you **ever had** a back injury: Yes/No

15. Do you **currently** have any of the following musculoskeletal problems?

Weakness in any of your arms, hands, legs, or feet: Yes/No

Back pain: Yes/No

Difficulty fully moving your arms and legs: Yes/No

Pain or stiffness when you lean forward or backward at the waist: Yes/No

Difficulty fully moving your head up or down: Yes/No

Difficulty fully moving your head side to side: Yes/No

Difficulty bending at your knees: Yes/No

Difficulty squatting to the ground: Yes/No

Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No

Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

Part B

Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes/No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes/No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes/No

If "yes," name the chemicals if you know them:_____

_____

_____

_____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

Asbestos: Yes/No

Silica (e.g., in sandblasting): Yes/No

Tungsten/cobalt (e.g., grinding or welding this material): Yes/No

Beryllium: Yes/No

Aluminum: Yes/No

Coal (for example, mining): Yes/No

Iron: Yes/No

Tin: Yes/No

Dusty environments: Yes/No

Any other hazardous exposures: Yes/No

If "yes," describe these exposures:_____

_____

_____

_____

4. List any second jobs or side businesses you have:_____

_____

5. List your previous occupations:_____

_____

_____

6. List your current and previous hobbies:_____

_____

_____

7. Have you been in the military services? Yes/No

If "yes," were you exposed to biological or chemical agents (either in training or combat): Yes/No

8. Have you ever worked on a HAZMAT team? Yes/No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes/No

If "yes," name the medications if you know them:_____

10. Will you be using any of the following items with your respirator(s)?

HEPA Filters: Yes/No

Canisters (for example, gas masks): Yes/No

Cartridges: Yes/No

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:

Escape only (no rescue): Yes/No

Emergency rescue only: Yes/No

Less than 5 hours **per week**: Yes/No

Less than 2 hours **per day**: Yes/No

2 to 4 hours per day: Yes/No

Over 4 hours per day: Yes/No

12. During the period you are using the respirator(s), is your work effort:

Light (less than 200 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift:_____hrs._____mins.

Examples of a light work effort are **sitting** while

writing, typing, drafting, or performing light assembly work; or **standing** while operating a drill press (1-3 lbs.) or controlling machines.

Moderate (200 to 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift:_____hrs._____mins.

Examples of moderate work effort are **sitting** while nailing or filing; **driving** a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; **walking** on a level surface about 2 mph or down a 5-degree grade about 3 mph; or **pushing** a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

Heavy (above 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift:_____hrs._____mins.

Examples of heavy work are **lifting** a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; **shoveling**; **standing** while bricklaying or chipping castings; **walking** up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes/No

If "yes," describe this protective clothing and/or equipment:_____
_____

14. Will you be working under hot conditions (temperature exceeding 77 deg. F): Yes/No

15. Will you be working under humid conditions: Yes/No

16. Describe the work you'll be doing while you're using your respirator(s)_____
_____
_____

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):_____
_____
_____
_____

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic sustance:_____
_____
Estimated maximum exposure level per shift:_____
Duration of exposure per shift:_____
Name of the second toxic substance:_____
Estimated maximum exposure level per shift:_____
Duration of exposure per shift:_____
Name of the third toxic substance:_____
Estimated maximum exposure level per shift:_____
Duration of exposure per shift:_____
The name of any other toxic substances that you'll be exposed to while using your respirator:
_____
_____
_____
_____
_____
_____

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security):
_____
_____
_____
_____

Appendix D to §1910.134: Information for Employees Using Respirators When Not Required Under the Standard (Mandatory)

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.

2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.

3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.

4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

[63 FR 1152, Jan. 8, 1998; 63 FR 20098, 20099, April 23, 1998; assembled at 69 FR 46993, Aug. 4, 2004, 71 FR 16672, April 3, 2006; 71 FR 50187, August 24, 2006]

Attachment 4: *Sample Program*

Small Entity Compliance Guide: Sample Respiratory Protection Program (fill in blanks with your company's/facility's information).

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1. Purpose

_____ has determined that employees in the Prep, Coating, Assembly, and Maintenance departments are exposed to respiratory hazards during routine operations. These hazards include wood dust, particulates, and vapors, and in some cases represent Immediately Dangerous to Life or Health (IDLH) conditions. The purpose of this program is to ensure that all _____ employees are protected from exposure to these respiratory hazards.

Engineering controls, such as ventilation and substitution of less toxic materials, are the first line of defense at _____; however, engineering controls have not always been feasible for some of our operations, or have not always completely controlled the identified hazards. In these situations, respirators and other protective equipment must be used. Respirators are also needed to protect employees' health during emergencies. The work processes requiring respirator use at _____ are outlined in Table 1 in the Scope and Application section of this program.

In addition, some employees have expressed a desire to wear respirators during certain operations that do not require respiratory protection. As a general policy _____ will review each of these requests on a case-by-case basis. If the use of respiratory protection in a specific case will not jeopardize the health or safety of the employee(s), _____ _____ will provide respirators for voluntary use. As outlined in the Scope and Application section of this program, voluntary respirator use is subject to certain requirements of this program.

2. Scope and Application

This program applies to all employees who are required to wear respirators during normal work operations, and during some non-routine or emergency operations such as a spill of a hazardous substance. This includes workers in the Prep, Coating (Spray Booth), Assembly, and Maintenance departments. All employees working in these areas and engaged in certain processes or tasks (as outlined in the table below) must be enrolled in the company's respiratory protection program.

In addition, any employee who voluntarily wears a respirator when a respirator is not required (i.e., in certain maintenance and coating operations) is subject to the medical evaluation, cleaning, maintenance, and storage elements of this program, and must be provided with certain information specified in this section of the program.

Table 1: Voluntary and Required Respirator Use at _____

Type of Respirator	*Employee Work Area*	*Conditions of Use*
Filtering facepiece (dust mask)	Warehouse workers	Voluntary
Filtering facepiece	Maintenance workers when cleaning spray booth walls or changing spray booth filter	Voluntary
PAPR with P100 filter	Preparation and Assembly	Mandatory
SAR, pressure demand, with auxiliary SCBA	Maintenance - dip coat tank cleaning	Mandatory
Continuous flow SAR with hood	Spray booth operations (prep and cleaning)	Mandatory
Half facepiece APR, with organic vapor cartridge	Dip Coat Tenders, Spray Maintenance workers and loading coating agents into supply system	Voluntary
Escape SCBA	Dip Coat, Coatings Storage Area, Spray Booth Cleaning Area until ventilation is installed	Mandatory

3. Responsibilities

Program Administrator: the Program Administrator is responsible for administering the respiratory protection program. Duties of the program administrator include:

- Identifying work areas, processes or tasks that require workers to wear respirators, and evaluating hazards.
- Ensuring adequate air quantity, quality, and flow of breathing air for atmosphere-supplying respirators. *(See (c)(1) of the standard.)*
- Selection of respiratory protection options.
- Monitoring respirator use to ensure that respirators are used in accord with their certifications.
- Arranging for and/or conducting training.
- Ensuring proper storage, cleaning, inspections, and maintenance of respiratory protection equipment.
- Conducting qualitative fit testing with Bitrex.
- Administering the medical surveillance program.
- Maintaining records required by the program.
- Evaluating the program.
- Updating written program, as needed.
- The Program Administrator for_____ is _____.

Supervisors: supervisors are responsible for ensuring that the respiratory protection program is implemented in their particular areas. In addition to being knowledgeable about the program requirements for their own protection, supervisors must also ensure that the program is understood and followed by the workers under their charge. *Note: Workers participating in the respiratory protection program do so at no cost to themselves.*

Duties of the supervisor include:

- Ensuring that employees under their supervision (including new hires) have received appropriate training, fit testing, and annual medical evaluation.
- Ensuring the availability of appropriate respirators and accessories.
- Being aware of tasks requiring the use of respiratory protection.
- Enforcing the proper use of respiratory protection when necessary.
- Ensuring that respirators are properly cleaned, maintained, inspected, and stored according to the respiratory protection plan.
- Ensuring that respirators fit well and do not cause discomfort.

- Continually monitoring work areas and operations to identify respiratory hazards.
- Coordinating with the Program Administrator on how to address respiratory hazards or other concerns regarding the program.
- Ensuring adequate air quantity, quality, and flow of breathing air for atmosphere-supplying respirators. *(See (c)(1) of the standard.)*

Employees: each employee has the responsibility:

- To wear his or her respirator when and where required and in the manner in which they were trained.
- Care for and maintain their respirators as instructed, and store them in a clean, sanitary location.
- Inform their supervisor if the respirator no longer fits well, and request a new one that fits properly.
- Inform their supervisor or the Program Administrator of any respiratory hazards that they feel are not adequately addressed in the workplace and of any other concerns that they have regarding the program.
- Inform their supervisor of need for a medical reevaluation.

4. Program Elements

Selection Procedures – The Program Administrator:

- Will select respirators to be used on site, based on the hazards to which workers are exposed and in accord with all applicable OSHA standards.
- Will conduct a hazard evaluation for each operation, process, or work area where airborne contaminants may be present in routine operations or during an emergency.
- Monitoring can be contracted out.
- The hazard evaluation will include:
  - Identification and development of a list of hazardous substances used in the workplace, by department or work process.
  - Review of work processes to determine where potential exposures to these hazardous substances may occur. This review is to be conducted by surveying the workplace, reviewing process records, and talking with employees and supervisors.
  - Exposure monitoring to quantify potential hazardous exposures.
  - If worker exposures have not been, or cannot be, evaluated they must be considered IDLH.
  - Respirators are selected based on the workplace hazards evaluated, and workplace and user factors affecting respirator performance and reliability.
- Respirators are selected based on the Assigned Protection Factors (APFs) and calculated Maximum Use Concentrations (MUCs).
- A sufficient number of respirator sizes and models must be provided to the employee during fit testing to identify the acceptable respirator that correctly fits the users.
- For IDLH atmospheres:
  - Full facepiece pressure demand SARs with auxiliary SCBA unit or full facepiece pressure demand SCBAs, with a minimum service life of 30 minutes, must be provided.
  - Respirators used for escape only are NIOSH-certified for the atmosphere in which they will be used.
  - Oxygen deficient atmospheres are considered IDLH.
- For Non-IDLH atmospheres, respirators are:
  - Selected as appropriate for the APFs and MUCs.
  - Selected as appropriate for the chemical nature and physical form of the contaminant.
  - Equipped with end-of-service-life indicators (ESLIs) if the respirators (APRs) are used for protection against gases and vapors. If there is no ESLI, then a change schedule must be implemented.
  - Equipped with NIOSH-certified HEPA filters (or other filters certified by NIOSH for particulates under 42 CFR part 84) if the respirators (APRs) are to be used for protection against particulates.
- When monitoring is contracted out, an example of the type of statement needed in the respirator program is: _____ currently has a contract with _____ to provide monitoring when needed.

  Note: Table 2 at the end of this program contains the sampling data on which this section was based. The results of the current hazard evaluation are the following:

  - Prep-sanding: Ventilation controls on some sanders are in place, but employees continue to be exposed to respirable wood dust at 2.5 - 7.0 mg/m^3 (8-hour time-weighted average, or TWA). Half facepiece APRs with P100 filters and goggles are required for employees sanding wood pieces. PAPRs will be available for employees who are unable to wear an APR.

- Prep-cleaning: Average methylene chloride exposures measured at 70 ppm based on 8-hour TWA exposure results for workers cleaning/stripping furniture pieces. Ventilation controls are planned but will not be implemented until designs are completed and a contract has been let for installation of the controls. In the meantime, workers must wear supplied-air hoods with continuous air flow, as required by the Methylene Chloride standard at 29 CFR 1910.1052.
- Coating-spray booth: _____ has decided to take a conservative approach and require all employees to wear supplied-air respirators when working inside the spray booth. Based on exposure data in published reports on the same type of spray booth operations, the **Program Administrator** has determined that a SAR in the continuous flow mode will provide sufficient protection. Spray booth employees may opt to wear half facepiece APRs with organic vapor cartridges when cleaning spray guns.
- Coating-dip coat and drying: Exposures are kept within PELs by ventilation, and employees generally enter the dip coat area for short time periods (up to one hour). Vapors could leak into the dip coat and drying areas if the ventilation system is not running at peak efficiency. Odors in this area are often unpleasant even at the levels maintained by the ventilation system. While _____ notes that respiratory protection is not required in this area, the company recognizes employee concern about breathing vapors and about having to work in an unpleasant environment. Accordingly, employees may voluntarily choose to wear a half facepiece APR with organic vapor cartridges when working in this area.
- Assembly: Ventilation controls on sanders are in place, but employees continue to be exposed to respirable wood dust at 2.5 - 6.0 mg/m^3 (8-hour TWA); half facepiece APRs with P100 filters and goggles are required for employees sanding wood pieces in the assembly department. PAPRs will be available for employees who are unable to wear an APR. The planned substitution for aqueous-based glues will eliminate exposures to formaldehyde, methylene chloride, and epoxy resins. Until then, appropriate respiratory protection is required according to the Formaldehyde and Methylene Chloride standards, and the cartridge, filter, and canister requirements of the Respiratory Protection standard at *paragraph (d)(3)(ii)*.
- Maintenance: Because of potential IDLH conditions, employees cleaning dip coat tanks must wear a pressure demand SAR during the performance of this task. Employees may voluntarily wear half facepiece APRs with P100 cartridges when cleaning spray booth walls or changing booth filters, and half facepiece APRs with organic vapor cartridges when loading coating agents into supply systems. Although exposure monitoring has shown that exposures are kept within PELs during these procedures, _____ will provide respirators to workers who are concerned about potential exposures.

Table 2: Hazard Assessment (Sample Program) - Date of Assessment

Department	*Contaminants*	*Exposure Level (8-hr TWA)*	*PEL*	*Controls*
Spray Booth Cleaning Area	Possible emergency spills of hazardous substances			Alarms; escape respirators located in Locker #1 in Spray Booth
Dip Coat/ Drying Area	Potentially malfunctioning ventilation system; leak in supply			Alarms; escape respirators located in Storage Area #3 in the Dip Coat/Drying Area
Coatings Storage Area	Leaks/spills			Alarms; escape respirators located in locker #4 in the Coating Storage Area
Dip Coat Tank Cleaner	Possible IDLH		IDLH	Pressure demand SAR; confined space entry procedures as specified in the Confined Space Program for this workplace
Preparation Coat/Assembly Area/Maintenance	Respirable wood dust, other particulates, vapors; can be IDLH		Can be IDLH	Pressure demand SAR
Preparation Sanding	Respirable wood dust	2.5 - 7.0 mg/m^3	15 mg/m^3	Half facepiece APRs with P100 filters and goggles
Preparation cleaning/clean and strip	Methylene Chloride	70 ppm	25 ppm PEL 12.5 ppm AL 125 ppm STEL	Awaiting the installation of ventilation; until then, SAR hood with continuous flow
Coat/Spray Booth				At Program Administrator's discretion: SAR Hood with continuous flow
Coat Spray/Cleaning Spray Gun				When cleaning spray guns **only**, employees may opt for APRs with organic vapor cartridges
Coating/Dip Tank/Drying				Ventilation; employees work in this area for short periods of time only (an hour); due to the presence of smells and vapors, employees may voluntarily choose to wear half mask APRs with organic vapor filters
Assembly	Respirable wood dust	2.5 - 6.0 mg/m^3 IDLH	15 mg/m^3	Although ventilation has been provided, employees still experience respirable dust; half facepiece APRs with P100 filters and goggles; PAPRs can be made available to workers who cannot wear half mask APRs; substitution of aqueous-based glues will eliminate exposures to formaldehyde, methylene chloride, and epoxy resins
Maintenance: cleaning dip coat tanks				Pressure demand SAR while performing this task

Updating the Hazard Assessment – The Program Administrator:

- Must revise and update the hazard assessment as needed (i.e., any time work process changes may potentially affect exposure). If an employee feels that respiratory protection is needed during a particular activity, he/she is to contact his or her supervisor or the **Program Administrator**. The Program Administrator then:
- Will evaluate the potential hazard, arranging for outside assistance as necessary.
- Will then communicate the results of that assessment back to the employees. If it is determined that respiratory protection is necessary, all other elements of this program will be in effect for those tasks, and this program will be updated accordingly.
- Will ensure that all respirators are certified by the National Institute for Occupational Safety and Health (NIOSH) and are used in accord with the terms of that certification.
- Will also ensure that all filters, cartridges, and canisters must be labeled with the appropriate NIOSH certification label. The label must not be removed or defaced while it is in use.
- Regarding **Voluntary Respirator Use**, the following statement is needed: _____ will provide respirators at no charge to employees for voluntary use for the following work processes/areas:

  Employees may wear half facepiece APRs with organic vapor cartridges while working in the dip coat area.

  Warehouse workers may wear filtering facepieces.

  Spray Booth Operators may wear half facepiece APRs with organic vapor cartridges while cleaning spray guns.

  Maintenance personnel may wear half facepiece APRs with P100 cartridges while cleaning spray booth walls, and organic vapor cartridges while loading spray guns.

The Program Administrator will also:

- Provide all employees who voluntarily choose to wear either of the above respirators with a copy of *Appendix D* of the standard specified by the *Respiratory Protection standard (29 CFR 1910.134). (Appendix D* details the requirements for voluntary use of respirators by workers.) Workers choosing to wear a half facepiece APR must comply with the procedures for medical evaluation, respirator use, and cleaning, maintenance and storage.
- Authorize voluntary use of respiratory protective equipment as requested by all other workers on a case-by-case basis, depending on specific workplace conditions and the results of the medical evaluations. Voluntary use does not require compliance with these specific provisions of the standard.

Medical Evaluation: Employees who are either required to wear respirators, or who choose to wear an APR voluntarily, must pass a medical exam before being permitted to wear a respirator on the job. Employees are not permitted to wear respirators until a PLHCP has determined that they are medically able to do so. Any employee refusing the medical evaluation will not be allowed to work in an area requiring respirator use. A PLHCP _____, where all company medical services are provided, will provide the medical evaluations.

Medical evaluation procedures are as follows:

- The medical evaluation will be conducted using the questionnaire provided in *Appendix C* of the Respiratory Protection standard.
- The **Program Administrator** will provide a copy of this questionnaire to all employees requiring medical evaluations.
- To the extent feasible, the company will assist employees who are unable to read the questionnaire (by providing help in reading the questionnaire). When this is not possible, the employee will be sent directly to the physician for medical evaluation.
- All affected employees will be given a copy of the medical questionnaire to fill out, along with a stamped and addressed envelope for mailing the questionnaire to the company physician.

Employees will:

- Be permitted to fill out the questionnaire on company time.
- Be granted follow-up medical exams as required by the Respiratory Protection standard, and/or as deemed necessary by _____ the PLHCP.
- Be granted the opportunity to speak with the physician about their medical evaluation, if they so request.

The Program Administrator has provided _____ _____ the physician with:

- A copy of this program, and a copy of the Respiratory Protection standard.
- The list of hazardous substances by work area, and for each employee requiring evaluation, his or her work area or job.
- The employee's title, proposed respirator type and weight, length of time required to wear the respirator, expected physical work load (light, moderate, or heavy), potential temperature and humidity extremes, and any additional protective clothing required.

Any employee required for medical reasons to wear a positive pressure air purifying respirator will be provided with a powered air purifying respirator.

After an employee has received clearance and begun to wear his or her respirator, additional medical evaluations will be provided if:

- The employee reports signs and/or symptoms related to their ability to use a respirator, such as shortness of breath, dizziness, chest pains, or wheezing.
- The PLHCP _____or supervisor informs the **Program Administrator** that the employee needs to be reevaluated, additional medical evaluation will be provided.
- Information from this program, including observations made during fit testing and program evaluation, indicates a need for reevaluation.
- An example of the PLHCP's or the supervisor's observations that additional medical evaluation is needed could be that there has been a change in workplace conditions that may result in an increased physiological burden on the employee.

A list of _____ employees currently included in medical surveillance is provided in Table 3 of this program. All examinations and questionnaires are to remain confidential between the employee and the physician.

Fit Testing:

- Fit testing is required for employees wearing half facepiece APRs for exposure to wood dust in Prep and Assembly, and maintenance workers who wear a tight-fitting SAR for dip tank cleaning.
- Employees voluntarily wearing half facepiece APRs may also be fit tested upon request.
- Employees who are required to wear half facepiece APRs will be fit tested:
  - Prior to being allowed to wear any respirator with a tight fitting facepiece.
  - Annually.
  - When there are changes in the employee's physical condition that could affect respiratory fit (e.g., obvious change in body weight, facial scarring, etc.).
- Employees will be fit tested with the make, model, and size of respirator that they will actually wear.
- Employees will be provided with several models and sizes of respirators so that they may find an optimal fit.
- Fit testing of PAPRs is to be conducted in the negative pressure mode. The **Program Administrator** will conduct fit tests following the OSHA approved Bitrex Solution Aerosol QLFT Protocol in *Appendix A of the Respiratory Protection standard*. The **Program Administrator** has determined that QNFT is not required for the respirators used under current conditions at _____. If conditions affecting respirator use change, the **Program Administrator** will evaluate on a case-by-case basis whether QNFT is required.

Respirator Use - Responsibilities for **Employees** are that they:

- Will use their respirators under conditions specified by this program, and in accord with the training they receive on the use of each particular model. In addition, the respirator must not be used in a manner for which it is not certified by NIOSH or by its manufacturer.
- Must conduct user seal checks each time that they wear their respirator.
- Must use either the positive or negative pressure check (depending on which test works best for them) specified in *Appendix B-1 of the Respiratory Protection standard*.
- Must leave the work area to go to the locker room to maintain their respirator for the following reasons:
  - to clean their respirator if the respirator is impeding their ability to work;
  - to change filters or cartridges, or replace parts; or
  - to inspect the respirator if it stops functioning as intended.
- Should notify their supervisor before leaving the area.
- Not wear tight-fitting respirators if they have any condition, such as facial scars, facial hair, or missing dentures, that prevents them from achieving a good seal.

- Not wear headphones, jewelry, or other articles that may interfere with the facepiece-to-face seal.

Emergency Procedures:

- The following work areas have been identified as having foreseeable emergencies:
  - Spray Booth Cleaning Area - spill of hazardous waste
  - Dip Coat Area - malfunction of ventilation system, leak in supply system
  - Coatings Storage Area - spill or leak of hazardous substances
- When the alarm sounds, employees in the affected department must immediately don their emergency escape respirator, shut down their process equipment, and exit the work area.
- All other employees must immediately evacuate the building. _____'s Emergency Action Plan describes these procedures (including proper evacuation routes and rally points) in greater detail.
- Emergency escape respirators are located in:
  - Locker #1 in the Spray Booth Area
  - Storage cabinet #3 in the Dip Coat/Drying Area
  - Locker #4 in the Coatings Storage Area
- Respiratory protection in these instances is for escape purposes only. _____ employees are not trained as emergency responders, and are not authorized to act in such a manner.

Respirator Malfunction

1. **APR Respirator Malfunction:**

- For any malfunction of an APR (e.g., breakthrough, facepiece leakage, or improperly working valve), the respirator wearer must inform his or her supervisor that the respirator no longer functions, and go to the designated safe area to maintain the respirator. The supervisor must ensure that the employee receives the needed parts to repair the respirator, or is provided with a new respirator.

2. **Atmosphere-Supplying Respirator Malfunction:**

- All workers wearing atmosphere-supplying respirators will work with a buddy.
- Buddies should assist workers who experience an SAR malfunction as follows:
  - If a worker in the spray booth experiences a malfunction of an SAR, he or she should signal to the buddy that he or she has had a respirator malfunction. The buddy shall don an emergency escape respirator and aid the worker in immediately exiting the spray booth.
  - Workers cleaning wood pieces or assembled furniture in the Prep department will work with a buddy. If one of the workers experiences a respirator malfunction, he/she shall signal this to their buddy. The buddy must immediately stop what he or she is doing to escort the worker to the Prep staging area where the worker can safely remove the SAR.

IDLH Procedures

- The **Program Administrator** has identified the following area as presenting the potential for IDLH conditions:
- **Dip Coat Tank Cleaning:**
  - Maintenance workers will be periodically required to enter the dip tank to perform scheduled or unscheduled maintenance.
  - In such cases, workers will follow the permit-required confined space entry procedures specified in the _____ Confined Space Program.
  - As specified above, the **Program Administrator** has determined that workers entering this area must wear a pressure demand SAR.
  - In addition, an appropriately trained and equipped standby person must remain outside the dip tank and maintain constant voice and visual communication with the worker.
  - In the event of an emergency requiring the standby person to enter the IDLH environment, the standby person must immediately notify the **Program Administrator** and will proceed with rescue operations in accord with rescue procedures outlined in the _____ Confined Space Program.

Air Quality

- For supplied-air respirators, only Grade D breathing air is to be used in the cylinders.
- The **Program Administrator** will coordinate deliveries of compressed air with the company's vendor, Compressed Air Inc., and require Compressed Air Inc. to certify that the air in the cylinders meets the specifications of Grade D breathing air.
- The **Program Administrator** will maintain a minimum air supply of one fully charged replacement

cylinder for each SAR unit. In addition, cylinders may be recharged as necessary from the breathing air cascade system located near the respirator storage area.

- The air for this system is provided by _____'s supplier, and deliveries of new air are coordinated by the **Program Administrator**.

Cleaning, Maintenance and Change Schedules and Storage

Cleaning

- Respirators are to be regularly cleaned and disinfected at the designated respirator cleaning station located in the employee locker room.
- Respirators issued for the exclusive use of a employee are to be cleaned as often as necessary, but at least once a day for workers in the Prep and Assembly departments.
- Atmosphere-supplying and emergency use respirators are to be cleaned and disinfected after each use.

- The following procedure is to be used when cleaning and disinfecting respirators:
  - Disassemble respirator, removing any filters, canisters, or cartridges.
  - Wash the facepiece and associated parts in a mild detergent with warm water. Do not use organic solvents.
  - Rinse completely in clean warm water.
  - Wipe the respirator with disinfectant wipes (70% Isopropyl Alcohol) to kill germs.
  - Air dry in a clean area.
  - Reassemble the respirator and replace any defective parts.
  - Place in a clean, dry plastic bag or other airtight container.
- Note: The **Program Administrator** will ensure an adequate supply of appropriate cleaning and disinfection material at the cleaning station. If supplies are low, employees should contact their supervisor, who will inform the **Program Administrator**.

Maintenance

- Respirators are to be properly maintained at all times to ensure that they function properly and adequately protect the employee.
- Maintenance involves a thorough visual inspection for cleanliness and defects.
- Worn or deteriorated parts will be replaced prior to use.
- No components will be replaced or repairs made beyond those recommended by the manufacturer.
- Repairs to regulators or alarms of atmosphere-supplying respirators will be conducted by the manufacturer.
- The following checklist will be used when inspecting respirators:
  - Facepiece:
    - cracks, tears, or holes
    - facemask distortion
    - cracked or loose lenses/faceshield
  - Valves:
    - Residue or dirt
    - Cracks or tears in valve material
  - Headstraps:
    - breaks or tears
    - broken buckles
  - Filters/Cartridges:
    - approval designation
    - gaskets
    - cracks or dents in housing
    - proper cartridge for hazard
  - Air Supply Systems:
    - breathing air quality/grade
    - condition of supply hoses
    - hose connections
    - settings on regulators and valves
- Employees are permitted to leave their work area and go to a designated area that is free of respiratory hazards when they need to wash their face and respirator facepiece to prevent any eye or skin irritation, or to replace the filter, cartridge or canister, or when they detect vapor or gas breakthrough or leakage in the facepiece or detect any other damage to the respirator or its components.

Change Schedules

- Employees wearing APRs or PAPRs with P100 filters for protection against wood dust and other particulates need to change the cartridges on their respirators when they first begin to experience difficulty breathing (i.e., resistance) while wearing their masks.

- Based on discussions with our respirator distributor about _____'s workplace exposure conditions, employees voluntarily wearing APRs with organic vapor cartridges must change the cartridges on their respirators at the end of each work week to ensure the continued effectiveness of the respirators.

Storage

- Respirators must be stored in a clean, dry area, and in accord with the manufacturer's recommendations.
- Each employee will clean and inspect their own air-purifying respirator in accord with the provisions of this program, and will store their respirator in a plastic bag in their own locker.
- Each employee will have his/her name on the bag, and that bag will only be used to store that employee's respirator.
- Atmosphere-supplying respirators will be stored in the storage cabinet outside of the **Program Administrator's** office.
- The **Program Administrator** will store _____ _____'s supply of respirators and respirator components in their original manufacturer's packaging in the equipment storage room.

Defective Respirators

- Respirators that are defective or have defective parts must be taken out of service immediately.
- If, during an inspection, an employee discovers a defect in a respirator, he/she is to bring the defect to the attention of his or her supervisor.
- Supervisors will give all defective respirators to the **Program Administrator**.
- The **Program Administrator** will decide whether to:
  - Temporarily take the respirator out of service until it can be repaired.
  - Perform a simple fix on the spot such as replacing a headstrap.
  - Dispose of the respirator due to an irreparable problem or defect.
- When a respirator is taken out of service, the respirator will be tagged out of service, and the employee will be given a replacement of the same make, model and size.
- If the employee is not given a replacement of the same make, model and size, then the employee must be fit tested.
- All tagged out-of-service respirators will be kept in the storage cabinet inside the **Program Administrator's** office.

Training

- The **Program Administrator** will provide training to respirator users and their supervisors on the contents of the _____ Respiratory Protection Program and their responsibilities under it, and on the OSHA Respiratory Protection standard.
- Workers will be trained prior to using a respirator in the workplace.
- The training must be comprehensive, understandable and recur annually, and more often if necessary.
- As with any employee, supervisors must be trained prior to using a respirator in the workplace; they also should be trained prior to supervising workers who must wear respirators if the supervisors themselves do not use a respirator.
- Supervisors will provide the basic information on respirators in Appendix D of the Respiratory Protection standard to employees who wear respirators when not required by the employer to do so.
- Supervisors will ensure that each employee can demonstrate knowledge of at least the following:

  Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;

  What the limitations and capabilities of the respirator are;

  How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;

  How to inspect, put on and remove, use, and check the seals of the respirator;

  What the procedures are for maintenance and storage of the respirator;

  How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and

  The general requirements of the Respiratory Protection standard.
- Supervisors will ensure that employees will be retrained annually or as needed (e.g., if they change departments and need to use a different respirator).

  An employer who is able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified in

paragraph (k)(1)(i) through (vii) is not required to repeat such training provided that, as required by *paragraph (k)(1)*, the employee can demonstrate knowledge of those element(s).

Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.

Retraining shall be administered annually, and when the following situations occur:

Changes in the workplace or the type of respirator render previous training obsolete;

Inadequacies in the employee's knowledge or use of the respirator indicate that the worker has not retained the requisite understanding or skill; or

Any other situation arises in which retraining appears necessary to ensure safe respirator use.

The basic advisory information on respirators, as presented in Appendix D of the Respiratory Protection standard, shall be provided by the employer in any written or oral format to employees who wear respirators when such use is not required by this section or by the employer.

5. Program Evaluation

- The **Program Administrator** will conduct periodic evaluations of the workplace to ensure that the provisions of this program are being implemented.
- The evaluations will include regular consultations with employees who use respirators and their supervisors, site inspections, air monitoring and a review of records.
- List factors to be evaluated *(see (l)(2).)*
- Problems identified will be noted in an inspection log and corrected by the **Program Administrator**.
- These findings will be reported to _____ management, and the report will list plans to correct deficiencies in the respirator program and target dates for implementing those corrections.

6. Documentation and Recordkeeping

- A written copy of this program and the OSHA standard is kept in the **Program Administrator's** office and is available to all employees who wish to review it.
- Also maintained in the **Program Administrator's** office are copies of training materials.
- Copies of fit test records *(see (m)(2) of the standard)*. These records will be updated as new fit tests are conducted.
- These records will be updated as new employees are trained and as existing employees receive refresher training.
- The **Program Administrator** will also maintain copies of the records for all employees covered under the respirator program (except medical records).
- The completed medical questionnaire and the PLHCP's documented findings are confidential and will remain at _____. The company will only retain the physician's written recommendation regarding each employee's ability to wear a respirator.

Table 3: A list of _____ employees currently included in the medical surveillance program. Date of Listing.

Name of first employee _____	Date_____
Second name _____	Date_____
Next name_____	Date_____
Next name_____	Date_____
Next name_____	Date_____
Next name_____	Date_____
Next name_____	Date_____
Next name_____	Date_____
Next name_____	Date_____
Last name_____	Date_____

Attachment 5:
NIOSH MultiVapor Information

The National Institute for Occupational Safety and Health (NIOSH) announced new computer software that enables administrators of workplace respiratory protection programs to consider the effects of relative humidity on the service life of NIOSH-approved organic vapor (OV) chemical cartridges. This software assists program administrators, in workplaces where air-purifying respirators are used, in reducing on-the-job respiratory exposures to potentially harmful organic vapors from a single volatile source, such as an individual paint, thinner, or solvent.

The ambient relative humidity in the environment in which an air-purifying respirator is used or stored is one of the factors that, over time, can cause the sorbent in a cartridge to lose its ability to collect organic vapors from the air breathed in through the cartridge. Collecting the vapors removes them from the air that the respirator user breathes into his or her body. Advances in computational capabilities of personal computers, and verification of the mathematical model through recent research, made possible the addition of this critical factor to the software program that was not included in previous government versions.

The new software program also incorporates factors that were used in previous computer software available from the government. Those factors include, for example, the type of air contaminant against which the chemical cartridge will protect the user, the concentration of the contaminant, the parameters of the cartridge and the rate at which the user is working.

By using the software, a respirator program administrator can determine when the cartridge is likely to reach the end of its service life or effectiveness; this is the point at which "breakthrough" is likely to occur as the sorbent no longer is able to collect organic vapors at the needed capacity. With that information, the administrator will know when to schedule a replacement of the cartridge.

"Especially in situations when the use of air-purifying respirators may be necessary for hours, knowing when to change the organic vapor cartridge is critical for keeping the user safe and healthy," said NIOSH Director John Howard, M.D. "By adding in a key factor that was not included in previous government software, program administrators can feel more confident in the schedules they set for changing cartridges."

The new computer software reflects the concept of government leadership through collaboration with diverse technical organizations. The software resulted from research conducted by Los Alamos National Laboratory (LANL), in conjunction with a partnership by NIOSH, LANL, the Occupational Safety and Health Administration (OSHA), the International Safety Equipment Association (ISEA), the American Chemistry Council (ACC), the Synthetic Organic Chemical Manufacturers Association (SOCMA), the National Paint and Coatings Association (NPCA), and the American Petroleum Institute (API), organized and led by ORC Worldwide. The consortium provided funding for the initial research and then joined with NIOSH, which provided funding necessary to complete the work.

The NIOSH website for calculating end of service indicators for organics, called "MultiVapor,"can be accessed at: *http://www.cdc.gov/niosh/npptl/multivapor/multivapor.html.*

Attachment 6:
NIOSH Tables of Cartridges and Canisters by APFs (Modified to OSHA APFs)

Table 1: Particulate Respirators

Assigned protection[1] factor	*Type of Respirator*
5	Quarter mask respirator
10	Any air-purifying elastomeric half mask respirator equipped with appropriate type of particulate filter.[2] Appropriate filtering facepiece respirator.[2,3] Any air-purifying full facepiece respirator equipped with appropriate type of particulate filter.[2] Any negative pressure (demand) supplied-air respirator equipped with a half mask.
25	Any powered air-purifying respirator equipped with a loose-fitting hood or helmet and a high efficiency (HEPA) filter. Any continuous flow supplied-air respirator equipped with a hood or helmet.
50	Any air-purifying full facepiece respirator equipped with N-100, R-100, or P-100 filter(s).[4] Any powered air-purifying respirator equipped with a tight-fitting facepiece (half or full facepiece) and a high-efficiency filter. Any negative pressure (demand) supplied-air respirator equipped with a full facepiece. Any continuous flow supplied-air respirator equipped with a tight-fitting facepiece (half or full facepiece). Any negative pressure (pressure demand) self-contained respirator equipped with a half or full facepiece.
1,000	Any pressure-demand, or other positive pressure mode, supplied-air respirator equipped with a full facepiece Any powered air-purifying respirator with helmet or hood for which the employer has provided evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater.
10,000	Any pressure-demand, or other positive pressure mode self-contained respirator equipped with a full facepiece. Any pressure-demand self contained breathing apparatus respirator equipped with a full facepiece helmet or hood.

[1] The protection offered by a given respirator is contingent upon (1) the respirator user adhering to complete program requirements (such as the ones required by OSHA in 29 CFR 1910.134), (2) the use of NIOSH-certified respirators in their approved configuration, and (3) individual fit testing to rule out those respirators that cannot achieve a good fit on individual workers.

[2] "Appropriate" means that the filter medium will provide protection against the particulate in question. See step 4.0 for information on the presence or absence of oil particulates.

[3] An APF of 10 can only be achieved if the respirator is qualitatively or quantitatively fit tested on individual workers.

[4] N, P, and R series: Since 1995, NIOSH has been approving three series of particle-filtering respirators, designated N, R and P. Within each series, three levels of efficiency in removing the laboratory test aerosols are certified: 95%, 99% and 99.97%. N-series filters are not required to demonstrate resistance to the potentially "degrading" effects of oils, and are, therefore, not intended for use in workplace atmospheres that contain oily aerosols. In this context, "degrading" means that exposure to an agent may cause an increase in filter penetration measured under laboratory test conditions. R and P series filters must demonstrate oil resistance when tested with dioctyl phthalate (DOP), which is described as a "highly degrading" oil aerosol. As a result both R and P filters can be used in workplace atmospheres that contain oily aerosols, as well as those that do not. In other cases, NIOSH-certified electret filters are necessary since the filtering efficiency of respiratory protection may be degraded by electrical charges. Electret filters consist of electrically charged fibers, such as polymer fibers, and they are widely used in particulate respirators. The charges enhance their filtration efficiency, particularly for submicrometer aerosols, without a corresponding increase in pressure drop across the filter. Electret filters can be N, P, R filters across all of the filtering efficiencies of 95% through 99.97%.

Table 2: Gas/Vapor Respirators

Assigned protection[1] factor	*Type of Respirator*
10	Any air-purifying half mask respirator equipped with appropriate gas/vapor cartridges.[2] Any negative pressure (demand) supplied-air respirator equipped with a half mask.
25	Any powered air-purifying respirator with a loose-fitting hood or helmet equipped with appropriate gas/vapor cartridges.[2] Any continuous flow supplied-air respirator equipped with a hood or helmet.
50	Any air-purifying full facepiece respirator equipped with appropriate gas/vapor cartridges[2] or gas mask (canister respirator).[2] Any powered air-purifying respirator equipped with a tight-fitting facepiece (half facepiece) and appropriate gas/vapor cartridges or canisters.[2] Any negative pressure (demand) supplied-air respirator equipped with a full facepiece. Any continuous flow supplied-air respirator equipped with a tight-fitting facepiece (half facepiece). Any negative pressure (pressure demand) self-contained respirator equipped with a half facepiece.
1,000	Any pressure-demand supplied-air respirator equipped with a half or full facepiece.
10,000	Any pressure-demand self-contained respirator equipped with a full facepiece. Any pressure-demand supplied-air respirator equipped with a full facepiece in combination with an auxiliary pressure-demand self-contained breathing apparatus.

[1] The protection offered by a given respirator is contingent upon (1) the respirator user adhering to complete program requirements (such as the ones required by OSHA in 29 CFR 1910.134), (2) the use of NIOSH-certified respirators in their approved configuration, and (3) individual fit testing to rule out those respirators that cannot achieve a good fit on individual workers.

[2] Select a cartridge/canister certified to be used for the specific class of chemicals or the specific gas/vapor found in your workplace.

Table 3: Combination Gas/Vapor and Particulate Respirators

Assigned protection[1] factor	*Type of Respirator*
10	Any air-purifying half mask respirator equipped with appropriate gas/vapor cartridges[2] in combination with appropriate type of particulate filter.[3] Any full facepiece respirator with appropriate gas/vapor cartridges[2] in combination with appropriate type of particulate filter.[3] Any negative pressure (demand) supplied-air respirator equipped with a half mask.
25	Any powered air-purifying respirator with a loose-fitting hood or helmet that is equipped with an appropriate gas/vapor cartridge[2] in combination with a high-efficiency particulate filter. Any continuous flow supplied-air respirator equipped with a hood or helmet.
50	Any air-purifying full facepiece respirator equipped with appropriate gas/vapor cartridges[2] in combination with an N-100, R-100 or P-100 filter or an appropriate canister[2] incorporating an N-100, P-100 or R-100 filter. Any powered air-purifying respirator with a tight-fitting facepiece (half or full facepiece) equipped with appropriate gas/vapor cartridges[2] in combination with a high-efficiency filter or an appropriate canister[2] incorporating a high-efficiency filter. Any negative pressure (demand) supplied-air respirator equipped with a full facepiece. Any continuous flow supplied-air respirator equipped with a tight-fitting facepiece (half or full facepiece). Any negative pressure (demand) self-contained respirator equipped with a full facepiece.
1,000	Any pressure-demand supplied-air respirator equipped with a half or full mask.
10,000	Any pressure-demand self-contained respirator equipped with a full facepiece. Any pressure-demand supplied-air respirator equipped with a full facepiece in combination with an auxiliary pressure-demand self-contained breathing apparatus.

[1] The protection offered by a given respirator is contingent upon (1) the respirator user adhering to complete program requirements (such as the ones required by OSHA in 29 CFR 1910.134), (2) the use of NIOSH-certified respirators in their approved configuration, and (3) individual fit testing to rule out those respirators that cannot achieve a good fit on individual workers.

[2] Select a cartridge/canister certified to be used for the specific class of chemicals or the specific gas/vapor found in your workplace.

[3] "Appropriate" means that the filter medium will provide protection against the particulate in question.

NIOSH publication 2005-100, Respirator Selection.

Workers' Rights

Under OSHA law, workers are entitled to working conditions that do not pose a risk of serious harm. To help assure a safe and healthful workplace, the law provides workers with the right to:

- File a confidential complaint with OSHA to have their workplace inspected.
- Receive information and training about hazards, methods to prevent harm, and the OSHA standards that apply to their workplace. The training must be done in a language and vocabulary workers can understand.
- Receive copies of records of work-related injuries and illnesses that occur in their workplace.
- Receive copies of the results from tests and monitoring done to find and measure hazards in their workplace.
- Receive copies of their workplace medical records.
- Participate in an OSHA inspection and speak in private with the inspector.
- File a complaint with OSHA if they have been retaliated against by their employer as the result of requesting an inspection or using any of their other rights under the OSH Act.
- File a complaint if punished or retaliated against for acting as a "whistleblower" under the 21 additional federal laws for which OSHA has jurisdiction.

For more information, visit OSHA's Workers' Rights page at www.osha.gov/workers.html.

OSHA Assistance, Services and Programs

OSHA offers free compliance assistance to employers and workers. Several OSHA programs and services can help employers identify and correct job hazards, as well as improve their injury and illness prevention program.

Establishing an Injury and Illness Prevention Program

The key to a safe and healthful work environment is a comprehensive injury and illness prevention program.

Injury and illness prevention programs are systems that can substantially reduce the number and severity of workplace injuries and illnesses, while reducing costs to employers. Thousands of employers across the United States already manage safety using illness and injury prevention programs, and OSHA believes that all employers can and should do the same. Thirty-four states have requirements or voluntary guidelines for workplace injury and illness prevention programs. Most successful injury and illness prevention programs are based on a common set of key elements. These include management leadership, worker participation, hazard identification, hazard prevention and control, education and training, and program evaluation and improvement. Visit OSHA's illness and injury prevention program web page at www.osha.gov/dsg/topics/safetyhealth for more information.

Compliance Assistance Specialists

OSHA has compliance assistance specialists throughout the nation located in most OSHA offices. Compliance assistance specialists can provide information to employers and workers about OSHA standards, short educational programs on specific hazards or OSHA rights and responsibilities, and information on additional compliance assistance resources. For more details, visit www.osha.gov/dcsp/compliance_assistance/cas.html or call 1-800-321-OSHA [6742] to contact your local OSHA office.

Free On-site Safety and Health Consultation Services for Small Business

OSHA's On-site Consultation Program offers free and confidential advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. Each year, responding to requests from small employers looking to create or improve their safety and health management programs, OSHA's On-site Consultation Program conducts over 29,000 visits to small business worksites covering over 1.5 million workers across the nation.

On-site consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing safety and health management programs.

For more information, to find the local On-site Consultation office in your state, or to request a brochure on Consultation Services, visit www.osha.gov/consultation, or call 1-800-321-OSHA [6742].

Under the consultation program, certain exemplary employers may request participation in OSHA's **Safety and Health Achievement Recognition Program** (SHARP). Eligibility for participation includes, but is not limited to, receiving a full-service, comprehensive consultation visit, correcting all identified hazards and developing an effective safety and health management program. Worksites that receive SHARP recognition are exempt from programmed inspections during the period that the SHARP certification is valid.

Cooperative Programs

OSHA offers cooperative programs under which businesses, labor groups and other organizations can work cooperatively with OSHA. To find out more about any of the following programs, visit www.osha.gov/dcsp/compliance_assistance/index_programs.html.

Strategic Partnerships and Alliances

The OSHA Strategic Partnerships (OSP) provides the opportunity for OSHA to partner with employers, workers, professional or trade associations, labor organizations, and/or other interested stakeholders. OSHA Strategic Partnerships are formalized through unique agreements designed to encourage, assist, and recognize partner efforts to eliminate serious hazards and achieve model workplace safety and health practices. Through the Alliance Program, OSHA works with groups committed to worker safety and health to prevent workplace fatalities, injuries and illnesses by developing compliance assistance tools and resources to share with workers and employers, and educate workers and employers about their rights and responsibilities.

Voluntary Protection Programs (VPP)

The VPP recognize employers and workers in private industry and federal agencies who have implemented effective safety and health management programs and maintain injury and illness rates below the national average for their respective industries. In VPP, management, labor, and OSHA work cooperatively and proactively to prevent fatalities, injuries, and illnesses through a system focused on: hazard prevention and control, worksite analysis, training, and management commitment and worker involvement.

Occupational Safety and Health Training

The OSHA Training Institute in Arlington Heights, Illinois, provides basic and advanced training and education in safety and health for federal and state compliance officers, state consultants, other federal agency personnel and private sector employers, workers, and their representatives. In addition, 27 OSHA Training Institute Education Centers at 42 locations throughout the United States deliver courses on OSHA standards and occupational safety and health issues to thousands of students a year.

For more information on training, contact the OSHA Directorate of Training and Education, 2020 Arlington Heights Road, Arlington Heights, IL 60005; call 1-847-297-4810; or visit www.osha.gov.

OSHA Educational Materials

OSHA has many types of educational materials in English, Spanish, Vietnamese and other languages available in print or online. These include:

- Brochures/booklets that cover a wide variety of job hazards and other topics;
- Fact Sheets, which contain basic background information on safety and health hazards;
- Guidance documents that provide detailed examinations of specific safety and health issues;
- Online Safety and Health Topics pages;
- Posters;
- Small, laminated QuickCards™ that provide brief safety and health information; and
- *QuickTakes*, OSHA's free, twice-monthly online newsletter with the latest news about OSHA initiatives and products to assist employers and workers in finding and preventing workplace hazards. To sign up for *QuickTakes* visit OSHA's web site at www.osha.gov and click on *QuickTakes* at the top of the page.

To view materials available online or for a listing of free publications, visit OSHA's web site at www.osha.gov. You can also call 1-800-321-OSHA [6742] to order publications.

OSHA's web site also has a variety of eTools. These include utilities such as expert advisors, electronic compliance assistance, videos and other information for employers and workers. To learn more about OSHA's safety and health tools online, visit www.osha.gov.

NIOSH Health Hazard Evaluation Program

Getting Help with Health Hazards

The National Institute for Occupational Safety and Health (NIOSH) is a federal agency that conducts scientific and medical research on workers' safety and health. At no cost to employers or workers, NIOSH can help identify health hazards and recommend ways to reduce or eliminate those hazards in the workplace through its Health Hazard Evaluation (HHE) Program.

Workers, union representatives and employers can request a NIOSH HHE. An HHE is often requested when there is a higher than expected rate of a disease or injury in a group of workers. These situations may be the result of an unknown cause, a new hazard, or a mixture of sources. To request a NIOSH Health Hazard Evaluation go to www.cdc.gov/niosh/hhe/request.html. To find out more about the Health Hazard Evaluation Program:

- Call (513) 841-4382, or to talk to a staff member in Spanish, call (513) 841-4439; or
- Send an email to HHERequestHelp@cdc.gov.

OSHA Regional Offices

Region I
Boston Regional Office
(CT*, ME, MA, NH, RI, VT*)
JFK Federal Building, Room E340
Boston, MA 02203
(617) 565-9860 (617) 565-9827 Fax

Region II
New York Regional Office
(NJ*, NY*, PR*, VI*)
201 Varick Street, Room 670
New York, NY 10014
(212) 337-2378 (212) 337-2371 Fax

Region III
Philadelphia Regional Office
(DE, DC, MD*, PA, VA*, WV)
The Curtis Center
170 S. Independence Mall West
Suite 740 West
Philadelphia, PA 19106-3309
(215) 861-4900 (215) 861-4904 Fax

Region IV
Atlanta Regional Office
(AL, FL, GA, KY*, MS, NC*, SC*, TN*)
61 Forsyth Street, SW, Room 6T50
Atlanta, GA 30303
(678) 237-0400 (678) 237-0447 Fax

Region V
Chicago Regional Office
(IL*, IN*, MI*, MN*, OH, WI)
230 South Dearborn Street
Room 3244
Chicago, IL 60604
(312) 353-2220 (312) 353-7774 Fax

Region VI
Dallas Regional Office
(AR, LA, NM*, OK, TX)
525 Griffin Street, Room 602
Dallas, TX 75202
(972) 850-4145 (972) 850-4149 Fax
(972) 850-4150 FSO Fax

Region VII
Kansas City Regional Office
(IA*, KS, MO, NE)
Two Pershing Square Building
2300 Main Street, Suite 1010
Kansas City, MO 64108-2416
(816) 283-8745 (816) 283-0547 Fax

Region VIII
Denver Regional Office
(CO, MT, ND, SD, UT*, WY*)
Cesar Chavez Memorial Building
1244 Speer Boulevard, Suite 551
Denver, CO 80204
(720) 264-6550 (720) 264-6585 Fax

Region IX
San Francisco Regional Office
(AZ*, CA*, HI*, NV*, and American Samoa,
Guam and the Northern Mariana Islands)
90 7th Street, Suite 18100
San Francisco, CA 94103
(415) 625-2547 (415) 625-2534 Fax

Region X
Seattle Regional Office
(AK*, ID, OR*, WA*)
1111 Third Avenue, Suite 715
Seattle, WA 98101-3212
(206) 553-5930 (206) 553-6499 Fax

*These states and territories operate their own OSHA-approved job safety and health plans and cover state and local government employees as well as private sector employees. The Connecticut, Illinois, New Jersey, New York and Virgin Islands programs cover public employees only. (Private sector workers in these states are covered by Federal OSHA). States with approved programs must have standards that are identical to, or at least as effective as, the Federal OSHA standards.

Note: To get contact information for OSHA area offices, OSHA-approved state plans and OSHA consultation projects, please visit us online at www.osha.gov or call us at 1-800-321-OSHA (6742).

Notes

How to Contact OSHA

For questions or to get information or advice, to report an emergency, report a fatality or catastrophe, order publications, sign up for OSHA's e-newsletter *QuickTakes*, or to file a confidential complaint, contact your nearest OSHA office, visit www.osha.gov or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

For assistance, contact us.
We are OSHA. We can help.

OSHA®
www.osha.gov

U.S. Department of Labor

For more information



www.osha.gov (800) 321-OSHA (6742)

APPENDIX 5

Heat/Cold Safety Protocols

Cold Stress Guidelines

	Symptoms	What to do
Mild Hypothermia	• Body Temp 98-90°F • Shivering • Lack of coordination, stumbling, fumbling hands • Slurred speech • Memory loss • Pale, cold skin	• Move to warm area • Stay active • Remove wet clothes and replace with dry clothes of blankets • Cover the head • Drink warm (not hot) sugary drink
Moderate Hypothermia	• Body temp 90-86°F • Shivering stops • Unable to walk or stand • Confused irrational	• All of the above, plus: • Call 911 • Cover all extremities completely • Place very warm objects, such as hot packs on the victim's head, neck, chest and groin
Severe Hypothermia	• Body temp 86-78°F • Severe muscle stiffness • Very sleepy or unconscious • Ice cold skin • Death	• Call 911 • Treat victim very gently • Do not attempt to re-warm
Frostbite	• Cold, tingling, stinging or aching feeling in the frostbitten area, followed by numbness • Skin color turns red, then purple, then white or very pale skin • Cold to the touch • Blisters in severe cases	• Call 911 • Do not rub the area • Wrap in soft cloth • If help is delayed, immerse in warm, not hot, water
Trench Foot	• Tingling, itching or burning sensation • Blisters	• Soak feet in warm water, then wrap with dry cloth bandages • Drink a warm sugary drink

HEAT STRESS GUIDELINES			
Form	**Signs & Symptoms**	**Care**	**Prevention[3]**
Heat Rash	Tiny red vesicles in affected skin area. If the area is extensive, sweating can be impaired.	Apply mild lotions and cleanse the affected area.	Cool resting and sleeping areas to permit skin to dry between heat exposures
Heat Cramps	Spasm, muscular pain (cramps) in stomach area and extremities (arms and legs).	Provide replacement fluids with minerals (salt) such as Gatorade.	Adequate salt intake with meals[1] ACCLIMATIZATION[2]
Heat Exhaustion	Profuse sweating, cool (clammy) moist skin, dizziness, confusion, pale skin color, faint, rapid willow breathing, headache, weakness, muscle cramps.	Remove from heat, sit or lie down, rest, replace lost water with electrolyte replacement fluids (water, Gatorade) take frequent sips of liquids in amounts greater than required to satisfy thirst.	ACCLIMATIZATION[2] Adequate salt intake with meals 1 only during early part of heat season. Ample water intake, frequently during the day
Heat Stroke	HOT Dry Skin. Sweating has stopped. Mental confusion, dizziness, nausea, severe headache, collapse, delirium, coma.	HEAT STROKE IS A MEDICAL EMERGENCY - Remove from heat. - COOL THE BODY AS RAPIDLY AS POSSIBLE by immersing in cold (or cool) water, or splash with water and fan. Call for Emergency Assistance. Observe for signs of shock.	ACCLIMATIZATION[2] Initially moderate workload in heat (8 to 14 days). Monitor worker's activities.

Footnotes:

1) American diets are normally high in salt, sufficient to aid acclimatization. However, during the early part of the heat season, (May, June), one extra shake of salt during one to two meals per day may help, so long as this is permitted by your physician. Check with your personal physician.

2) ACCLIMATIZATION - The process of adapting to heat is indicated by worker's ability to perform hot jobs less fluid loss, lower concentrations of salt loss in sweat, and a reduced core (body) temperature and heart rate.

3) Method to Achieve Acclimatization - Moderate work or exercise in hot temperatures during early part of heat season. Adequate salt (mineral) and water intake. Gradually increasing work time in hot temperatures. Avoid alcohol. Normally takes 8 to 14 days to achieve acclimatization. Lost rapidly, if removed from strenuous work (or exercise) in hot temperature for more than approximately 5 days.

APPENDIX 6

NIOSH Guides and Safety Data Sheets for Site Contaminants
Respiratory Protection Policy

Methyl chloroform

SYNONYMS & TRADE NAMES

Chlorothene, 1,1,1-Trichloroethane, 1,1,1-Trichloroethane (stabilized)

CAS NO.

71-55-6

RTECS NO.

KJ2975000

DOT ID & GUIDE

2831 160

FORMULA

CH_3CCl_3

CONVERSION

1 ppm = 5.46 mg/m^3

IDLH

700 ppm
See: 71556

EXPOSURE LIMITS

NIOSH REL
C 350 ppm (1900 mg/m^3) [15-minute] See Appendix C (Chloroethanes)
OSHA PEL
TWA 350 ppm (1900 mg/m^3) See Appendix G

MEASUREMENT METHODS

NIOSH 1003
See: NMAM or OSHA Methods

PHYSICAL DESCRIPTION

Colorless liquid with a mild, chloroform-like odor.

MOLECULAR WEIGHT

133.4

BOILING POINT

165°F

FREEZING POINT

-23°F

SOLUBILITY

0.4%

VAPOR PRESSURE

100 mmHg

IONIZATION POTENTIAL

11.00 eV

SPECIFIC GRAVITY

1.34

FLASH POINT

?

UPPER EXPLOSIVE LIMIT

12.5%

LOWER EXPLOSIVE LIMIT

7.5%

Combustible Liquid, but burns with difficulty.

INCOMPATIBILITIES & REACTIVITIES

Strong caustics; strong oxidizers; chemically-active metals such as zinc, aluminum, magnesium powders, sodium & potassium; water [Note: Reacts slowly with water to form hydrochloric acid.]

EXPOSURE ROUTES

inhalation, ingestion, skin and/or eye contact

SYMPTOMS

irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage

TARGET ORGANS

Eyes, skin, central nervous system, cardiovascular system, liver

PERSONAL PROTECTION/SANITATION

(See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated

Remove: When wet or contaminated
Change: No recommendation

FIRST AID

(See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

RESPIRATOR RECOMMENDATIONS

NIOSH/OSHA

Up to 700 ppm:
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

SEE ALSO

INTRODUCTION ICSC CARD: 0079 MEDICAL TESTS: 0141

Page last reviewed: October 30, 2019

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 3 Reviewed on 03/25/2019

1 Identification

· **Product identifier**

· **Trade name: 1,1,1-Trichloroethane**

· **Part number:** RHH-014, RHH-014-2G
· **CAS Number:**
71-55-6
· **EC number:**
200-756-3
· **Index number:**
602-013-00-2
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

*
2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.


GHS07

Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS07 GHS08

· **Signal word** Warning

· **Hazard-determining components of labeling:**
1,1,1-trichloroethane
· **Hazard statements**
Causes skin irritation.
Causes serious eye irritation.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 3 Reviewed on 03/25/2019

Trade name: 1,1,1-Trichloroethane

(Contd. of page 1)

Suspected of causing cancer.

· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wash thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin: Wash with plenty of water.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Specific treatment (see on this label).
Take off contaminated clothing and wash it before reuse.
If skin irritation occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
71-55-6 1,1,1-trichloroethane
· **Identification number(s)**
· **EC number:** 200-756-3
· **Index number:** 602-013-00-2

*
4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

*
5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

*
6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Not required.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
230 ppm
· **PAC-2:**
600 ppm
· **PAC-3:**
4,200 ppm

*
7 Handling and storage

· **Handling:**
· **Precautions for safe handling** Open and handle receptacle with care.
· **Information about protection against explosions and fires:** Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

(Contd. on page 4)

(Contd. of page 3)

*

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
71-55-6 1,1,1-trichloroethane	
PEL	Long-term value: 1900 mg/m³, 350 ppm
REL	Ceiling limit value: 1900* mg/m³, 350* ppm *15-min; See Pocket Guide App. C
TLV	Short-term value: 2460 mg/m³, 450 ppm Long-term value: 1910 mg/m³, 350 ppm BEI

· **Ingredients with biological limit values:**	
71-55-6 1,1,1-trichloroethane	
BEI	40 ppm Medium: end-exhaled air Time: prior to last shift of workweek Parameter: Methyl chloroform 10 mg/L Medium: urine Time: end of workweek Parameter: Trichloroacetic acid (nonspecific, semi-quantitative) 30 mg/L Medium: urine Time: end of shift at end of workweek Parameter: Total trichloroethanol (nonspecific, semi-quantitative) 1 mg/L Medium: blood Time: end of shift at end of workweek Parameter: Total trichloroethanol (nonspecific)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.

(Contd. on page 5)

(Contd. of page 4)

· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.
· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**



Tightly sealed goggles

*

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Like chlorine
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-35 °C (-31 °F)
Boiling point/Boiling range:	72-75 °C (161.6-167 °F)
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	537 °C (998.6 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	8 Vol %
Upper:	15.5 Vol %
· **Vapor pressure at 20 °C (68 °F):**	133.3 hPa (100 mm Hg)
· **Density at 20 °C (68 °F):**	1.3 g/cm³ (10.8485 lbs/gal)
· **Relative density**	Not determined.

(Contd. on page 6)

(Contd. of page 5)

· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	0.13 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	0.00 %
	0.0 g/l / 0.00 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

*

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
71-55-6 1,1,1-trichloroethane		
Oral	LD50	10,300 mg/kg (rat)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
3

· **NTP (National Toxicology Program)**
Substance is not listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (Assessment by list): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

*
14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN2831
· **UN proper shipping name**	
· **DOT**	1,1,1-Trichloroethane
· **IMDG, IATA**	1,1,1-TRICHLOROETHANE
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	
· **Class**	6.1 Toxic substances
· **Label**	6.1
· **Packing group**	
· **DOT, IMDG, IATA**	III
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Toxic substances

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acc. to OSHA HCS

(Contd. of page 7)

· **Danger code (Kemler):**	60
· **EMS Number:**	6.1-02
· **Segregation groups**	Liquid halogenated hydrocarbons
· **Stowage Category**	A
· **Stowage Code**	SW2 Clear of living quarters.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 60 L On cargo aircraft only: 220 L
· **Hazardous substance:**	1000 lbs, 454 kg
· **IMDG**	
· **Limited quantities (LQ)**	5L
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· **UN "Model Regulation":**	UN 2831 1,1,1-TRICHLOROETHANE, 6.1, III

*
15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
II

(Contd. on page 9)

(Contd. of page 8)

· **TLV (Threshold Limit Value established by ACGIH)**

A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 2
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Carc. 2: Carcinogenicity – Category 2
· *** Data compared to the previous version altered.**

Tetrachloroethylene

SYNONYMS & TRADE NAMES

Perchlorethylene, Perchloroethylene, Perk, Tetrachlorethylene

CAS NO.

127-18-4

RTECS NO.

KX3850000

DOT ID & GUIDE

1897 160

FORMULA

$Cl_2C=CCl_2$

CONVERSION

1 ppm = 6.78 mg/m^3

IDLH

Ca [150 ppm]
See: 127184

EXPOSURE LIMITS

NIOSH REL
Ca Minimize workplace exposure concentrations. See Appendix A
OSHA PEL
TWA 100 ppm
C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm
See Appendix G

MEASUREMENT METHODS

NIOSH 1003;
OSHA 1001
See: NMAM or OSHA Methods

PHYSICAL DESCRIPTION

Colorless liquid with a mild, chloroform-like odor.

MOLECULAR WEIGHT

165.8

BOILING POINT

250°F

FREEZING POINT

-2°F

SOLUBILITY

0.02%

VAPOR PRESSURE

14 mmHg

IONIZATION POTENTIAL

9.32 eV

SPECIFIC GRAVITY

1.62

FLASH POINT

NA

UPPER EXPLOSIVE LIMIT

NA

LOWER EXPLOSIVE LIMIT

NA

Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.

INCOMPATIBILITIES & REACTIVITIES

Strong oxidizers; chemically-active metals such as lithium, beryllium & barium; caustic soda; sodium hydroxide; potash

EXPOSURE ROUTES

inhalation, skin absorption, ingestion, skin and/or eye contact

SYMPTOMS

irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]

TARGET ORGANS

Eyes, skin, respiratory system, liver, kidneys, central nervous system

CANCER SITE

[in animals: liver tumors]

PERSONAL PROTECTION/SANITATION

(See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

FIRST AID

(See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

RESPIRATOR RECOMMENDATIONS

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

SEE ALSO

INTRODUCTION ICSC CARD: 0076 MEDICAL TESTS: 0179

Page last reviewed: October 30, 2019

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 4 Reviewed on 03/25/2019

*
1 Identification

· **Product identifier**

· **Trade name: Tetrachloroethene**

· **Part number:** RHH-023
· **CAS Number:**
127-18-4
· **EC number:**
204-825-9
· **Index number:**
602-028-00-4
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

*
2 Hazard(s) identification

· **Classification of the substance or mixture**



GHS08 Health hazard

Carc. 1B H350 May cause cancer.



GHS07

Skin Irrit. 2 H315 Causes skin irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**





GHS07 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
tetrachloroethylene
· **Hazard statements**
Causes skin irritation.
May cause an allergic skin reaction.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Tetrachloroethene

(Contd. of page 1)

May cause cancer.

· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin: Wash with plenty of water.
IF exposed or concerned: Get medical advice/attention.
Specific treatment (see on this label).
Take off contaminated clothing and wash it before reuse.
If skin irritation or rash occurs: Get medical advice/attention.
Wash contaminated clothing before reuse.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 1
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = *1
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
127-18-4 tetrachloroethylene
· **Identification number(s)**
· **EC number:** 204-825-9
· **Index number:** 602-028-00-4

*
4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:**
Supply fresh air and to be sure call for a doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

*
6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Not required.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
35 ppm
· **PAC-2:**
230 ppm
· **PAC-3:**
1,200 ppm

*
7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:** Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
127-18-4 tetrachloroethylene	
PEL	Long-term value: 100 ppm Ceiling limit value: 200; 300* ppm *5-min peak in any 3 hrs
REL	Minimize workplace exp. concs.;Pocket Guide App. A
TLV	Short-term value: 685 mg/m³, 100 ppm Long-term value: 170 mg/m³, 25 ppm BEI

· **Ingredients with biological limit values:**	
127-18-4 tetrachloroethylene	
BEI	3 ppm Medium: end-exhaled air Time: prior to shift Parameter: Tetrachloroethylene 0.5 mg/L Medium: blood Time: prior to shift Parameter: Tetrachloroethylene

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the skin.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

(Contd. on page 5)

(Contd. of page 4)

· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**



Tightly sealed goggles

*

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Like chlorine
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-23.5 °C (-10.3 °F)
Boiling point/Boiling range:	121.1 °C (250 °F)
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not applicable.
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure at 20 °C (68 °F):**	13 hPa (9.8 mm Hg)
· **Density at 20 °C (68 °F):**	1.6 g/cm³ (13.352 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	0.4 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **Viscosity:**

Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	0.00 % 0.0 g/l / 0.00 lb/gal

· **Other information** No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

*
11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	2,629 mg/kg (rat)
Inhalative	LC50/4 h	4,000 mg/L (rat)

127-18-4 tetrachloroethylene		
Oral	LD50	2,629 mg/kg (rat)
Inhalative	LC50/4 h	4,000 mg/L (rat)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** No irritating effect.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
2A

· **NTP (National Toxicology Program)**
R

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (Assessment by list): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

*
14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1897
· **UN proper shipping name**	
· **DOT**	Tetrachloroethylene
· **IMDG**	TETRACHLOROETHYLENE, MARINE POLLUTANT
· **IATA**	TETRACHLOROETHYLENE
· **Transport hazard class(es)**	
· **DOT, IATA**	
· **Class**	6.1 Toxic substances

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Tetrachloroethene

(Contd. of page 7)

· **Label**	6.1
· **IMDG**	
	
· **Class**	6.1 Toxic substances
· **Label**	6.1
· **Packing group**	
· **DOT, IMDG, IATA**	III
· **Environmental hazards:**	
· **Marine pollutant:**	Symbol (fish and tree)
· **Special precautions for user**	Warning: Toxic substances
· **Danger code (Kemler):**	60
· **EMS Number:**	6.1-02
· **Segregation groups**	Liquid halogenated hydrocarbons
· **Stowage Category**	A
· **Stowage Code**	SW2 Clear of living quarters.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 60 L On cargo aircraft only: 220 L
· **Hazardous substance:**	100 lbs, 45.4 kg
· **IMDG**	
· **Limited quantities (LQ)**	5L
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· **UN "Model Regulation":**	UN 1897 TETRACHLOROETHYLENE, 6.1, III

*
15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**

Substance is listed.

· **TSCA (Toxic Substances Control Act):**

Substance is listed.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 8)

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
L

· **TLV (Threshold Limit Value established by ACGIH)**
A3

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is listed.

· **National regulations:**

· **Information about limitation of use:**
Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 3
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit

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Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 4 Reviewed on 03/25/2019

Trade name: Tetrachloroethene

(Contd. of page 9)

BEI: Biological Exposure Limit
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Skin Sens. 1: Skin sensitisation – Category 1
Carc. 1B: Carcinogenicity – Category 1B

· *** Data compared to the previous version altered.**

The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research NIOSH

Trichloroethylene

SYNONYMS & TRADE NAMES

Ethylene trichloride, TCE, Trichloroethene, Trilene

CAS NO.

79-01-6

RTECS NO.

KX4550000

DOT ID & GUIDE

1710 160

FORMULA

$ClCH{=}CCl_2$

CONVERSION

1 ppm = 5.37 mg/m^3

IDLH

Ca [1000 ppm]
See: 79016

EXPOSURE LIMITS

NIOSH REL
Ca See Appendix A See Appendix C
OSHA PEL
TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours) See Appendix G

MEASUREMENT METHODS

NIOSH 1022 , 3800;
OSHA 1001
See: NMAM or OSHA Methods

PHYSICAL DESCRIPTION

Colorless liquid (unless dyed blue) with a chloroform-like odor.

MOLECULAR WEIGHT

131.4

BOILING POINT

189°F

FREEZING POINT

-99°F

SOLUBILITY

0.1%

VAPOR PRESSURE

58 mmHg

IONIZATION POTENTIAL

9.45 eV

SPECIFIC GRAVITY

1.46

FLASH POINT

?

UPPER EXPLOSIVE LIMIT

(77°F): 10.5%

LOWER EXPLOSIVE LIMIT

(77°F): 8%

Combustible Liquid, but burns with difficulty.

INCOMPATIBILITIES & REACTIVITIES

Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)

EXPOSURE ROUTES

inhalation, skin absorption, ingestion, skin and/or eye contact

SYMPTOMS

irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]

TARGET ORGANS

Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system

CANCER SITE

[in animals: liver & kidney cancer]

PERSONAL PROTECTION/SANITATION

(See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

FIRST AID

(See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

RESPIRATOR RECOMMENDATIONS

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

SEE ALSO

INTRODUCTION ICSC CARD: 0081 MEDICAL TESTS: 0236

Page last reviewed: October 30, 2019

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 2 Reviewed on 03/25/2019

*

1 Identification

· **Product identifier**

· **Trade name: Trichloroethene**

· **Part number:** RHH-022
· **CAS Number:**
79-01-6
· **EC number:**
201-167-4
· **Index number:**
602-027-00-9
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**



GHS08 Health hazard

Muta. 2	H341	Suspected of causing genetic defects.
Carc. 1B	H350	May cause cancer.



GHS07

Skin Irrit. 2	H315	Causes skin irritation.
Eye Irrit. 2A	H319	Causes serious eye irritation.
STOT SE 3	H336	May cause drowsiness or dizziness.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS07



GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
trichloroethylene

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 1)

· **Hazard statements**
Causes skin irritation.
Causes serious eye irritation.
Suspected of causing genetic defects.
May cause cancer.
May cause drowsiness or dizziness.
· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin: Wash with plenty of water.
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.
IF exposed or concerned: Get medical advice/attention.
Call a poison center/doctor if you feel unwell.
Specific treatment (see on this label).
Take off contaminated clothing and wash it before reuse.
If skin irritation occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = *2
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
79-01-6 trichloroethylene
· **Identification number(s)**
· **EC number:** 201-167-4

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **Index number:** 602-027-00-9

4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Not required.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
130 ppm
· **PAC-2:**
450 ppm
· **PAC-3:**
3,800 ppm

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:** Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
79-01-6 trichloroethylene	
PEL	Long-term value: 100 ppm Ceiling limit value: 200; 300* ppm *5-min peak in any 2 hrs
REL	See Pocket Guide Apps. A and C
TLV	Short-term value: 135 mg/m³, 25 ppm Long-term value: 54 mg/m³, 10 ppm BEI

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Ingredients with biological limit values:**

79-01-6 trichloroethylene

BEI	15 mg/L Medium: urine Time: end of shift at end of workweek Parameter: Trichloroacetic acid (nonspecific) 0.5 mg/L Medium: blood Time: end of shift at end of workweek Parameter: Trichloroethanol without hydrolysis (nonspecific) - Medium: blood Time: end of shift at end of workweek Parameter: Trichloroethylene (semi-quantitative) - Medium: end-exhaled air Time: end of shift at end of workweek Parameter: Trichloroethylene (semi-quantitative)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.
· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours

(Contd. on page 6)

(Contd. of page 5)

· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Like chlorine
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-86.4 °C (-123.5 °F)
Boiling point/Boiling range:	87 °C (188.6 °F)
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	410 °C (770 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	7.9 Vol %
Upper:	90 Vol %
· **Vapor pressure at 20 °C (68 °F):**	60 hPa (45 mm Hg)
· **Density at 20 °C (68 °F):**	1.46 g/cm³ (12.1837 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	1 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 % 1,460.0 g/l / 12.18 lb/gal

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Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **Other information** No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	2,402 mg/kg (mouse)

79-01-6 trichloroethylene		
Oral	LD50	2,402 mg/kg (mouse)
		4,290 mg/kg (rat)
Dermal	LD50	8,450 mg/kg (mouse)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
1

· **NTP (National Toxicology Program)**
K

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.

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Safety Data Sheet
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· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (Assessment by list): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1710
· **UN proper shipping name**	
· **DOT**	Trichloroethylene
· **IMDG, IATA**	TRICHLOROETHYLENE
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	



· **Class**	6.1 Toxic substances
· **Label**	6.1
· **Packing group**	
· **DOT, IMDG, IATA**	III
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Toxic substances
· **Danger code (Kemler):**	60
· **EMS Number:**	6.1-02
· **Segregation groups**	Liquid halogenated hydrocarbons
· **Stowage Category**	A
· **Stowage Code**	SW2 Clear of living quarters.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

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acc. to OSHA HCS

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· **Transport/Additional information:**

· **DOT**

· **Quantity limitations**	On passenger aircraft/rail: 60 L On cargo aircraft only: 220 L
· **Hazardous substance:**	100 lbs, 45.4 kg

· **IMDG**

· **Limited quantities (LQ)**	5L
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· **UN "Model Regulation":**	UN 1710 TRICHLOROETHYLENE, 6.1, III

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is listed.

· **Chemicals known to cause developmental toxicity:**
Substance is listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
CaH

· **TLV (Threshold Limit Value established by ACGIH)**
A2

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is listed.

· **National regulations:**
· **Additional classification according to Decree on Hazardous Materials:**
Carcinogenic hazardous material group I (extremely dangerous).

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Carcinogenic hazardous material group II (very dangerous).
Carcinogenic hazardous material group III (dangerous).

· **Information about limitation of use:**
Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation.
No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Muta. 2: Germ cell mutagenicity – Category 2
Carc. 1B: Carcinogenicity – Category 1B
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
· *** Data compared to the previous version altered.**

The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research

Vinyl chloride

SYNONYMS & TRADE NAMES

Chloroethene, Chloroethylene, Ethylene monochloride, Monochloroethene, Monochloroethylene, VC, VCM, Vinyl chloride monomer (VCM)

CAS NO.

75-01-4

RTECS NO.

KU9625000

DOT ID & GUIDE

1086 116P(inhibited)

FORMULA

CH_2=CHCl

CONVERSION

1 ppm = 2.56 mg/m^3

IDLH

Ca [N.D.]
See: IDLH INDEX

EXPOSURE LIMITS

NIOSH REL
Ca See Appendix A
OSHA PEL
[1910.1017] TWA 1 ppm C 5 ppm [15-minute]

MEASUREMENT METHODS

NIOSH 1007;
OSHA 4 , 75
See: NMAM or OSHA Methods

PHYSICAL DESCRIPTION

Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations. [Note: Shipped as a liquefied compressed gas.]

MOLECULAR WEIGHT

62.5

BOILING POINT

7°F

FREEZING POINT

-256°F

SOLUBILITY

(77°F): 0.1%

VAPOR PRESSURE

3.3 atm

IONIZATION POTENTIAL

9.99 eV

FLASH POINT

NA (Gas)

UPPER EXPLOSIVE LIMIT

33.0%

LOWER EXPLOSIVE LIMIT

3.6%

RELATIVE GAS DENSITY

2.21

Flammable Gas

INCOMPATIBILITIES & REACTIVITIES

Copper, oxidizers, aluminum, peroxides, iron, steel [Note: Polymerizes in air, sunlight, or heat unless stabilized by inhibitors such as phenol. Attacks iron & steel in presence of moisture.]

EXPOSURE ROUTES

inhalation, skin and/or eye contact (liquid)

SYMPTOMS

lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]

TARGET ORGANS

Liver, central nervous system, blood, respiratory system, lymphatic system

CANCER SITE

[liver cancer]

PERSONAL PROTECTION/SANITATION

(See protection codes)
Skin: Frostbite
Eyes: Frostbite
Wash skin: No recommendation
Remove: When wet (flammable)
Change: No recommendation
Provide: Frostbite wash

FIRST AID

(See procedures)
Eye: Frostbite
Skin: Frostbite
Breathing: Respiratory support

RESPIRATOR RECOMMENDATIONS

(See Appendix E)

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

SEE ALSO

INTRODUCTION ICSC CARD: 0082 MEDICAL TESTS: 0241

Page last reviewed: October 30, 2019

The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research NIOSH

1,1-Dichloroethane

SYNONYMS & TRADE NAMES

Asymmetrical dichloroethane, Ethylidene chloride, 1,1-Ethylidene dichloride

CAS NO.

75-34-3

RTECS NO.

KI0175000

DOT ID & GUIDE

2362 130

FORMULA

$CHCl_2CH_3$

CONVERSION

1 ppm = 4.05 mg/m^3

IDLH

3000 ppm
See: 75343

EXPOSURE LIMITS

NIOSH REL
TWA 100 ppm (400 mg/m^3) See Appendix C (Chloroethanes)
OSHA PEL
TWA 100 ppm (400 mg/m^3)

MEASUREMENT METHODS

NIOSH 1003;
OSHA 7
See: NMAM or OSHA Methods

PHYSICAL DESCRIPTION

Colorless, oily liquid with a chloroform-like odor.

MOLECULAR WEIGHT

99.0

BOILING POINT

135°F

FREEZING POINT

-143°F

SOLUBILITY

0.6%

VAPOR PRESSURE

182 mmHg

IONIZATION POTENTIAL

11.06 eV

SPECIFIC GRAVITY

1.18

FLASH POINT

2°F

UPPER EXPLOSIVE LIMIT

11.4%

LOWER EXPLOSIVE LIMIT

5.4%

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

INCOMPATIBILITIES & REACTIVITIES

Strong oxidizers, strong caustics

EXPOSURE ROUTES

inhalation, ingestion, skin and/or eye contact

SYMPTOMS

irritation skin; central nervous system depression; liver, kidney, lung damage

TARGET ORGANS

Skin, liver, kidneys, lungs, central nervous system

PERSONAL PROTECTION/SANITATION

(See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation

FIRST AID

(See procedures)
Eye: Irrigate immediately
Skin: Soap flush promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

RESPIRATOR RECOMMENDATIONS

NIOSH/OSHA

Up to 1000 ppm:
(APF = 10) Any supplied-air respirator

Up to 2500 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode

Up to 3000 ppm:
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

SEE ALSO

INTRODUCTION ICSC CARD: 0249

Page last reviewed: October 30, 2019

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 2 Reviewed on 03/25/2019

*

1 Identification

· **Product identifier**

· **Trade name: 1,1-Dichloroethane**

· **Part number:** RHH-012
· **CAS Number:**
75-34-3
· **EC number:**
200-863-5
· **Index number:**
602-011-00-1
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.


GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS02 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**
1,1-dichloroethane
· **Hazard statements**
Highly flammable liquid and vapor.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Trade name: 1,1-Dichloroethane

(Contd. of page 1)

Harmful if swallowed.
Causes serious eye irritation.
May cause respiratory irritation.

· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Call a poison center/doctor if you feel unwell.
Rinse mouth.
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.
If eye irritation persists: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
75-34-3 1,1-dichloroethane
· **Identification number(s)**
· **EC number:** 200-863-5

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

Trade name: 1,1-Dichloroethane

(Contd. of page 2)

· **Index number:** 602-011-00-1

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** Immediately call a doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
300 ppm

· **PAC-2:**
670 ppm

(Contd. on page 4)

(Contd. of page 3)

· PAC-3:
4,000 ppm

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

*

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· Components with limit values that require monitoring at the workplace:	
75-34-3 1,1-dichloroethane	
PEL	Long-term value: 400 mg/m³, 100 ppm
REL	Long-term value: 400 mg/m³, 100 ppm See Pocket Guide App. C
TLV	Long-term value: 405 mg/m³, 100 ppm

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.

(Contd. on page 5)

(Contd. of page 4)

· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.
· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Not determined.
· **Odor:**	Characteristic
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	96.6 °C (205.9 °F)
Boiling point/Boiling range:	57 °C (134.6 °F)
· **Flash point:**	-10 °C (14 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	175 °C (347 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	5.6 Vol %
Upper:	16 Vol %
· **Vapor pressure at 20 °C (68 °F):**	240 hPa (180 mm Hg)
· **Density at 20 °C (68 °F):**	1.17 g/cm³ (9.76365 lbs/gal)

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	5.06 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
VOC content:	0.00 % 0.0 g/l / 0.00 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	725 mg/kg (rat)

75-34-3 1,1-dichloroethane		
Oral	LD50	725 mg/kg (rat)
Inhalative	LC50/4 h	13,000 mg/L (rat)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
Substance is not listed.

· **NTP (National Toxicology Program)**
Substance is not listed.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **OSHA-Ca (Occupational Safety & Health Administration)**

Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (Assessment by list): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN2362
· **UN proper shipping name**	
· **DOT**	1,1-Dichloroethane
· **IMDG, IATA**	1,1-DICHLOROETHANE
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	



· **Class**	3 Flammable liquids
· **Label**	3

(Contd. on page 8)

(Contd. of page 7)

· **Packing group**	
· **DOT, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	33
· **EMS Number:**	3-03
· **Segregation groups**	Liquid halogenated hydrocarbons
· **Stowage Category**	B
· **Stowage Code**	SW2 Clear of living quarters.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **Hazardous substance:**	1000 lbs, 454 kg
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 2362 1,1-DICHLOROETHANE, 3, II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

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· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
C

· **TLV (Threshold Limit Value established by ACGIH)**
A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Acute Tox. 4: Acute toxicity – Category 4
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
· *** Data compared to the previous version altered.**

1,2-Dichloroethylene

SYNONYMS & TRADE NAMES

Acetylene dichloride, cis-Acetylene dichloride, trans-Acetylene dichloride, sym-Dichloroethylene

CAS NO.

540-59-0

RTECS NO.

KV9360000

DOT ID & GUIDE

1150 130P

FORMULA

ClCH=CHCl

CONVERSION

1 ppm = 3.97 mg/m^3

IDLH

1000 ppm
See: 540590

EXPOSURE LIMITS

NIOSH REL
TWA 200 ppm (790 mg/m^3)
OSHA PEL
TWA 200 ppm (790 mg/m^3)

MEASUREMENT METHODS

NIOSH 1003;
OSHA 7
See: NMAM or OSHA Methods

PHYSICAL DESCRIPTION

Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor.

MOLECULAR WEIGHT

97.0

BOILING POINT

118-140°F

FREEZING POINT

-57 to -115°F

SOLUBILITY

0.4%

VAPOR PRESSURE

180-265 mmHg

IONIZATION POTENTIAL

9.65 eV

SPECIFIC GRAVITY

(77°F): 1.27

FLASH POINT

36-39°F

UPPER EXPLOSIVE LIMIT

12.8%

LOWER EXPLOSIVE LIMIT

5.6%

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

INCOMPATIBILITIES & REACTIVITIES

Strong oxidizers, strong alkalis, potassium hydroxide, copper [Note: Usually contains inhibitors to prevent polymerization.]

EXPOSURE ROUTES

inhalation, ingestion, skin and/or eye contact

SYMPTOMS

irritation eyes, respiratory system; central nervous system depression

TARGET ORGANS

Eyes, respiratory system, central nervous system

PERSONAL PROTECTION/SANITATION

(See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated

Remove: When wet (flammable)
Change: No recommendation

FIRST AID

(See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

RESPIRATOR RECOMMENDATIONS

NIOSH/OSHA

Up to 1000 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode[£]
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)[£]
(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

SEE ALSO

INTRODUCTION ICSC CARD: 0436

Page last reviewed: October 30, 2019

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 2 Reviewed on 03/25/2019

*
1 Identification

· **Product identifier**

· **Trade name: cis-1,2-Dichloroethene**

· **Part number:** RHH-057
· **CAS Number:**
156-59-2
· **EC number:**
205-859-7
· **Index number:**
602-026-00-3
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

*
2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.


GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Acute Tox. 4 H332 Harmful if inhaled.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS02 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**
cis-dichloroethylene
· **Hazard statements**
Highly flammable liquid and vapor.
Harmful if swallowed or if inhaled.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Trade name: cis-1,2-Dichloroethene

(Contd. of page 1)

· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Call a poison center/doctor if you feel unwell.
Rinse mouth.
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.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep cool.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
156-59-2 cis-dichloroethylene
· **Identification number(s)**
· **EC number:** 205-859-7
· **Index number:** 602-026-00-3

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

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4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** Immediately call a doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
140 ppm

· **PAC-2:**
500 ppm

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **PAC-3:**
850 ppm

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

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8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
156-59-2 cis-dichloroethylene	
PEL	Long-term value: 790 mg/m³, 200 ppm
REL	Long-term value: 790 mg/m³, 200 ppm
TLV	Long-term value: 793 mg/m³, 200 ppm

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Not determined.
· **Odor:**	Characteristic
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-80.5 °C (-112.9 °F)
Boiling point/Boiling range:	60 °C (140 °F)
· **Flash point:**	6 °C (42.8 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	460 °C (860 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	6.2 Vol %
Upper:	16 Vol %
· **Vapor pressure at 20 °C (68 °F):**	215 hPa (161.3 mm Hg)
· **Density at 20 °C (68 °F):**	1.28 g/cm³ (10.6816 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

Trade name: cis-1,2-Dichloroethene

(Contd. of page 5)

· **Solubility in / Miscibility with Water:**	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 % 1,280.0 g/l / 10.68 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)

Oral	LD50	770 mg/kg (rat)
Inhalative	LC50/4 h	11 mg/L

156-59-2 cis-dichloroethylene

Oral	LD50	770 mg/kg (rat)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

Substance is not listed.

· **NTP (National Toxicology Program)**

Substance is not listed.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **OSHA-Ca (Occupational Safety & Health Administration)**

Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1150
· **UN proper shipping name**	
· **DOT**	1,2-Dichloroethylene
· **IMDG, IATA**	1,2-DICHLOROETHYLENE
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	



· **Class**	3 Flammable liquids
· **Label**	3

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 7)

· **Packing group**	
· **DOT, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	33
· **EMS Number:**	3-07
· **Segregation groups**	Liquid halogenated hydrocarbons
· **Stowage Category**	B
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **Hazardous substance:**	1000 lbs, 454 kg
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1150 1,2-DICHLOROETHYLENE, 3, II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is not listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **TSCA new (21st Century Act): (Substances not listed)**

156-59-2	cis-dichloroethylene

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

Trade name: cis-1,2-Dichloroethene

(Contd. of page 8)

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
II

· **TLV (Threshold Limit Value established by ACGIH)**
Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation.
No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Acute Tox. 4: Acute toxicity – Category 4
· *** Data compared to the previous version altered.**

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 2 Reviewed on 03/25/2019

*
1 Identification

· **Product identifier**

· **Trade name: trans-1,2-Dichloroethene**

· **Part number:** RHH-021
· **CAS Number:**
156-60-5
· **EC number:**
205-860-2
· **Index number:**
602-026-00-3
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

*
2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.


GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Acute Tox. 4 H332 Harmful if inhaled.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS02 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**
trans-dichloroethylene
· **Hazard statements**
Highly flammable liquid and vapor.
Harmful if swallowed or if inhaled.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Trade name: trans-1,2-Dichloroethene

(Contd. of page 1)

· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Call a poison center/doctor if you feel unwell.
Rinse mouth.
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.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep cool.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
156-60-5 trans-dichloroethylene
· **Identification number(s)**
· **EC number:** 205-860-2
· **Index number:** 602-026-00-3

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

*
4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** Immediately call a doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
280 ppm

· **PAC-2:**
1,000 ppm

(Contd. on page 4)

(Contd. of page 3)

· **PAC-3:**
1,700 ppm

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

*

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
156-60-5 trans-dichloroethylene	
PEL	Long-term value: 790 mg/m³, 200 ppm
REL	Long-term value: 790 mg/m³, 200 ppm
TLV	Long-term value: 793 mg/m³, 200 ppm

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 2 Reviewed on 03/25/2019

Trade name: trans-1,2-Dichloroethene

(Contd. of page 4)

· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Not determined.
· **Odor:**	Characteristic
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-57 °C (-70.6 °F)
Boiling point/Boiling range:	48 °C (118.4 °F)
· **Flash point:**	6 °C (42.8 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	440 °C (824 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	9.7 Vol %
Upper:	12.8 Vol %
· **Vapor pressure at 20 °C (68 °F):**	350 hPa (262.5 mm Hg)
· **Density at 20 °C (68 °F):**	1.257 g/cm³ (10.48967 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.

(Contd. on page 6)

(Contd. of page 5)

· **Solubility in / Miscibility with Water:**	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 % 1,257.0 g/l / 10.49 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)

Oral	LD50	1,235 mg/kg (rat)
Inhalative	LC50/4 h	11 mg/L

156-60-5 trans-dichloroethylene

Oral	LD50	1,235 mg/kg (rat)
Dermal	LD50	>5,000 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

Substance is not listed.

· **NTP (National Toxicology Program)**

Substance is not listed.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **OSHA-Ca (Occupational Safety & Health Administration)**

Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1150
· **UN proper shipping name**	
· **DOT**	1,2-Dichloroethylene
· **IMDG, IATA**	1,2-DICHLOROETHYLENE
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	



· **Class**	3 Flammable liquids
· **Label**	3

(Contd. on page 8)

(Contd. of page 7)

· **Packing group**	
· **DOT, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	33
· **EMS Number:**	3-07
· **Segregation groups**	Liquid halogenated hydrocarbons
· **Stowage Category**	B
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1150 1,2-DICHLOROETHYLENE, 3, II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is not listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

Trade name: trans-1,2-Dichloroethene

(Contd. of page 8)

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
II

· **TLV (Threshold Limit Value established by ACGIH)**
Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Acute Tox. 4: Acute toxicity – Category 4
· *** Data compared to the previous version altered.**

APPENDIX 7

Air Monitoring Log Sheets

Daily Air Monitoring Activity Log

Project Name: _____ ***Page:*** _____ ***of*** _____

Site Location: _____ ***Date:*** ___/_____/_____

Project #: _____ ***Field Air Crew:*** _____

_____

Site Activity Log

Time	Activity

Note: This form is to document field activities on an hourly basis or as activities change.

Completed By: _____ **Date:** _____

DAILY PERIMETER AIR MONITORING DATA FORM

Project Name: _____ ***of*** _____

Site Location: _____ ***Date:*** ___/___/___

Project Number: _____ ***Personnel.:*** /

Site Activities:

☐ Excavating / Loading	☐ Decontamination	☐ Compacting
☐ Backfilling	☐ Installing/pulling slide rail	☐ Drilling
☐ Water Treatment	☐	☐ No Work
☐	☐	☐

Time											
Hour:Minute	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----	----:----

	Monitoring Location	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**
PARTICULATES (mg/m^3)												

	Monitoring Location	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**
VOCs (ppm)												

	Monitoring Location	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**	**Reading**
__ __ __ __ __ _ (units)												

Notes / Comments:

See CHASP for Action Levels

HOURLY PERIMETER AIR MONITORING DATA FORM

Project Name: _____ ***Page:*** ***of***

Site Location: _____ ***Personnel:*** _____ ***Date:*** ___/___/___

_____ ***Personnel:*** _____ ***Time:*** _____

Site Activities:

1)

Sample Location	Dust (mg/m³)	PID (ppm)	( )	( )	( )

Notes:

Atmospheric Conditions

*Wind Speed*_____ *Temp*_____ *Relative Humidity*_____ *Barometric Pressure* _____

Cloud Cover (S,PC,H,D): _____

*Predominant Wind Direction (from):*_____

Upwind Location: _____

Downwind Location: _____

Cloud Cover: S = Sunny (Clear); PC = Partly Cloudy; H = Hazy; D = Dusty

Precipitation (Check Box)					
None	Rain	Drizzle	Fog	Sleet	Snow

Notes/Comments:

Action Level(s) See CHASP for relevant action levels

WORK ZONE AIR MONITORING DATA FORM

Project Name: _____ ***Page:*** ***of***

Site Location: _____ ***Personnel:*** _____ ***Date:*** ___/___/___

_____ ***Personnel:*** _____ ***Time:*** _____

Site Activities:

Location	Dust (mg/m3)	VOC (ppm)	O2 (%)	H2S (ppm)	CO (ppm)	LEL (%)

Atmospheric Conditions

*Wind Speed*_____ *Temp*_____ *Relative Humidity*_____ *Barometric Pressure* _____

Cloud Cover (S,PC,H,D): _____

*Predominant Wind Direction (from):*_____

Upwind Location: _____

Downwind Location: _____

Cloud Cover: S = Sunny (Clear); PC = Partly Cloudy; H = Hazy; D = Dusty

Precipitation (Check Box)					
None	Rain	Drizzle	Fog	Sleet	Snow

Notes/Comments:

Daily Air Monitoring Weather Conditions Log

Project Name: _____ ***Page:*** _____ ***of*** _____

Site Location: _____ ***Date:*** ____/____/____

Project #: _____ ***Field Air Crew:*** _____

Weather Conditions

Cloud Cover: S = Sunny (Clear); PC = Partly Cloudy; H = Hazy

Time	Temp. (ºF)	Barometric Pressure (in. Hg)	Precipitation (check one)						Humidity (%)	Wind		Cloud Cover
			None	Rain	Drizzle	Fog	Sleet	Snow		Speed	Dir.*	

Note: * Wind Direction is the direction from which the wind is coming **from**.

Completed By: _____ **Date:** _____

APPENDIX 8

Emergency Telephone Numbers

11.2 Emergency Telephone Numbers

General Emergencies	**911**
New York City Police	**911**
New York City Police (non-emergency)	**1-212 767-8400**
Midtown North Precinct	
NYSDEC Spills Division	**1-800-457-7362**
NYSDEC Hazardous Waste Division	**1-718-482-4994**
	1-718-482-4098
NYCDEP	**311 or**
	1-212-639-9675
NYC Department of Health	**311 or**
	1-212-639-9675
NYC Fire Department	**911 or 311**
New York Fire Department (non-emergency)	**1-718-999-2222**
National Response Center	**1-800-424-8802**
Poison Control	**1-212-340-4494**
Hospital - Mount Sinai West	**1-212-636-3375**

APPENDIX 9

Field Accident Report Form

FIELD ACCIDENT REPORT

This report is to be filled out by the designated Site Safety Officer after EVERY accident.

PROJECT NAME _____ PROJECT. NO._____

Date of Accident _____ Time _____ Report By _____

Type of Accident (Check One):

( ) Vehicular ( ) Personal ( ) Property

Name of Injured _____ DOB or Age _____

How Long Employed _____

Names of Witnesses _____

_____

Description of Accident _____

_____

_____

Action Taken _____

_____

_____

Did the Injured Lose Any Time? _____ How Much (Days/Hrs.)? _____

Was Safety Equipment in Use at the Time of the Accident (Hard Hat, Safety Glasses, Gloves, Safety Shoes, etc.)? _____

_____

(If not, it is the EMPLOYEE'S sole responsibility to process his/her claim through his/her Health and Welfare Fund.)

INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

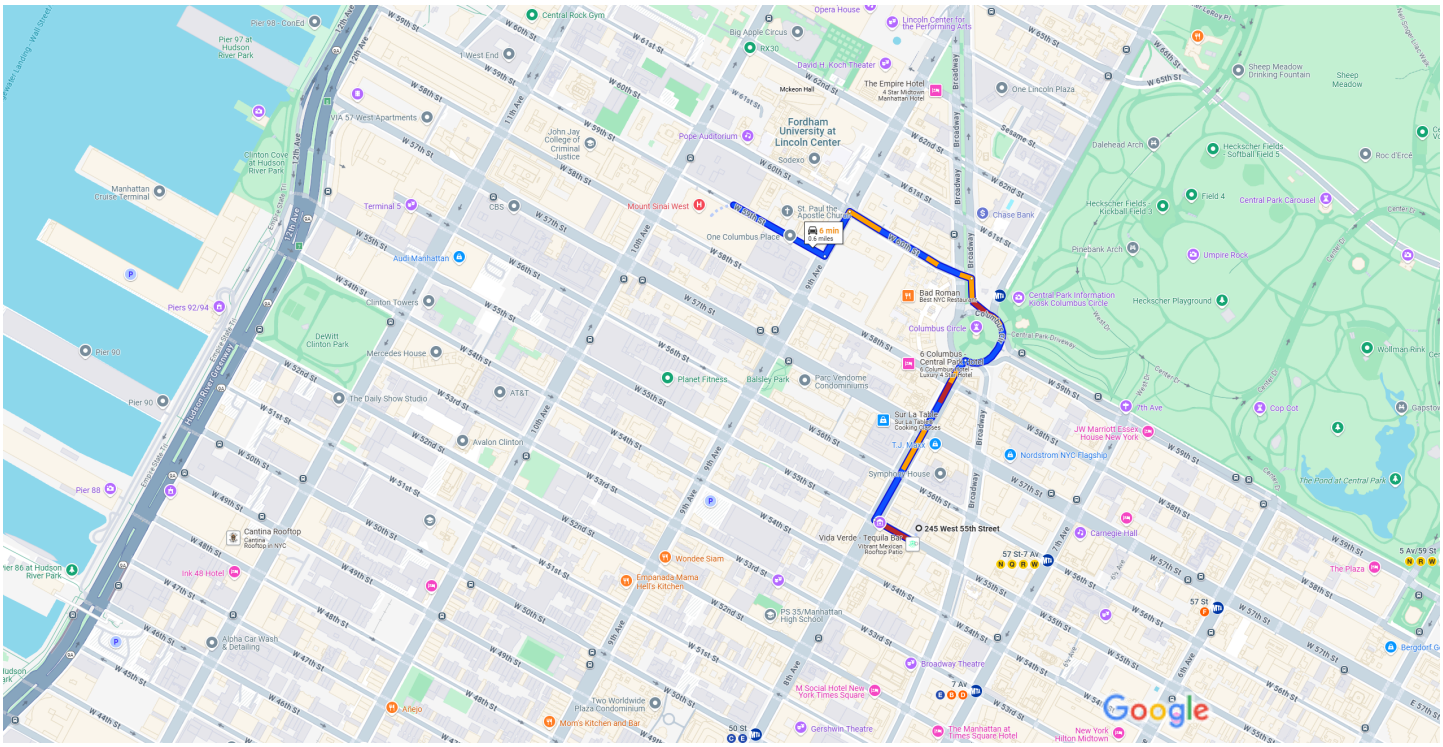
APPENDIX 10

Directions to Nearest Hospital

Google Maps

245 W 55th St, New York, NY 10019 to Mount Sinai West Emergency Room, 1000 10th Ave, New York, NY 10019

Drive 0.6 mile, 6 min



Map data ©2025 Google 200 ft

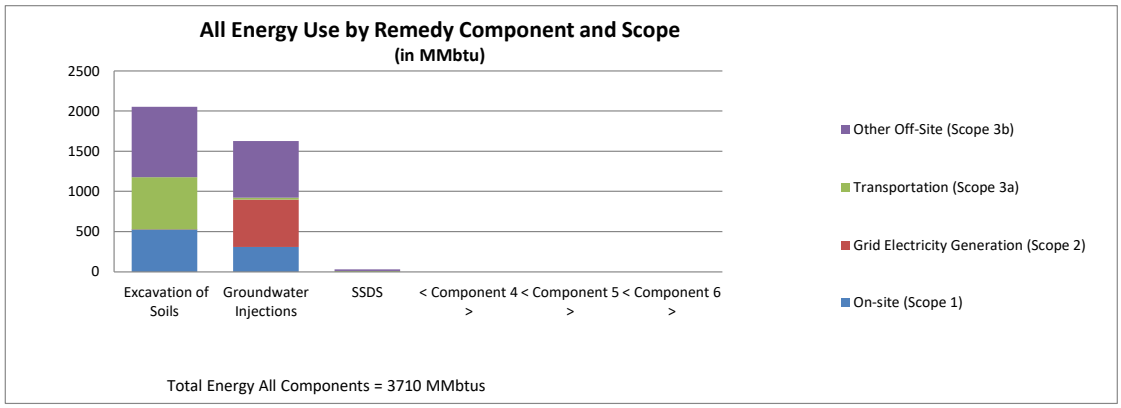
245 W 55th St
New York, NY 10019

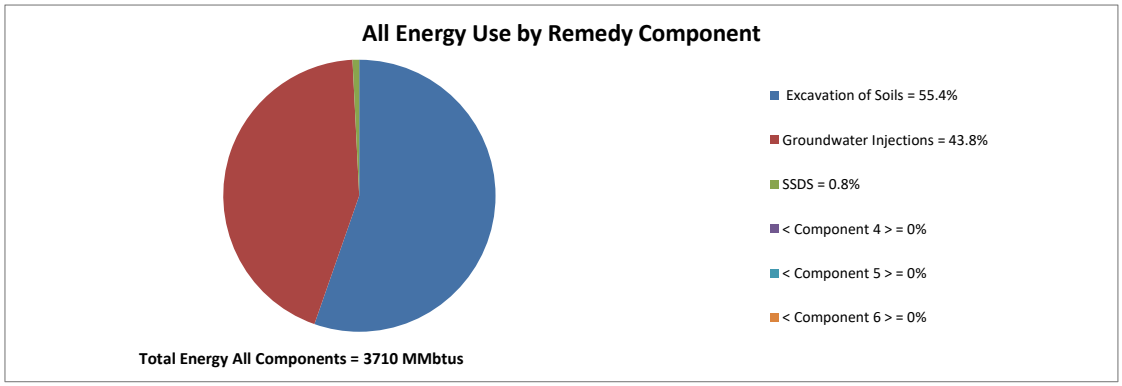
1. Head northwest on W 55th St toward 8th Ave
   249 ft
2. Turn right at the 1st cross street onto 8th Ave
   0.2 mi
3. At the traffic circle, take the 4th exit onto Broadway
   0.1 mi
4. Turn left onto W 60th St
   0.1 mi
5. Turn left onto Columbus Ave
   269 ft
6. Turn right after Starbucks (on the right)
   Destination will be on the left
   0.1 mi

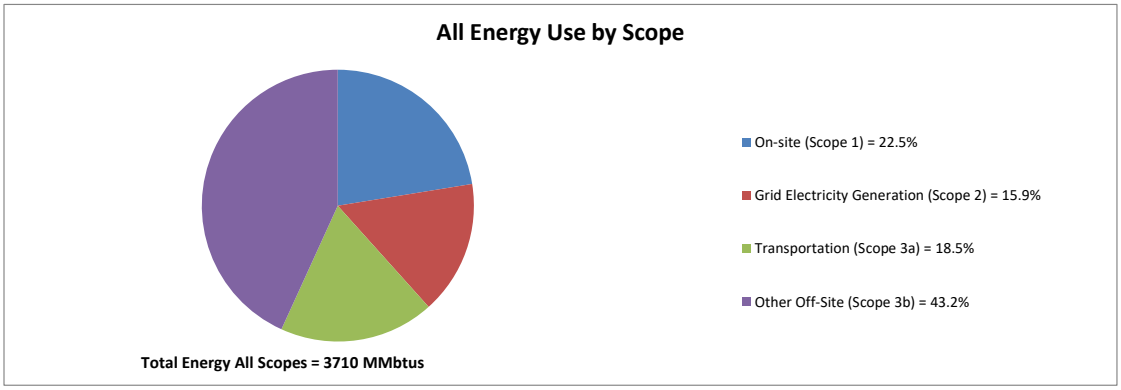
Mount Sinai West Emergency Room
1000 10th Ave, New York, NY 10019

ATTACHMENT F

Spreadsheets for Environmental Footprint Analysis (SEFA)


All Energy Use by Remedy Component and Scope
(in MMbtu)
2500
2000
1500
1000
500
0
Excavation of Soils
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
Total Energy All Components = 3710 MMbtus


All Energy Use by Remedy Component
Excavation of Soils = 55.4%
Groundwater Injections = 43.8%
SSDS = 0.8%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
Total Energy All Components = 3710 MMbtus


All Energy Use by Scope
On-site (Scope 1) = 22.5%
Grid Electricity Generation (Scope 2) = 15.9%
Transportation (Scope 3a) = 18.5%
Other Off-Site (Scope 3b) = 43.2%
Total Energy All Scopes = 3710 MMbtus

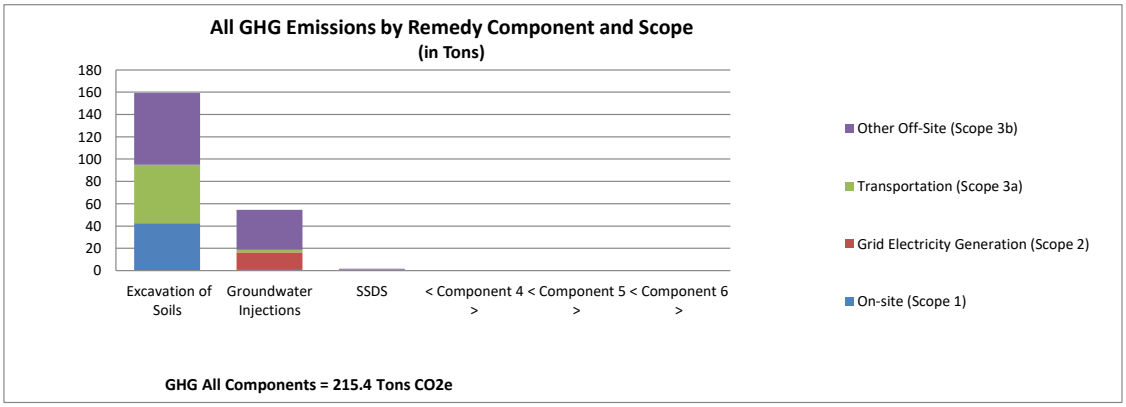
Total Energy
MMbtus

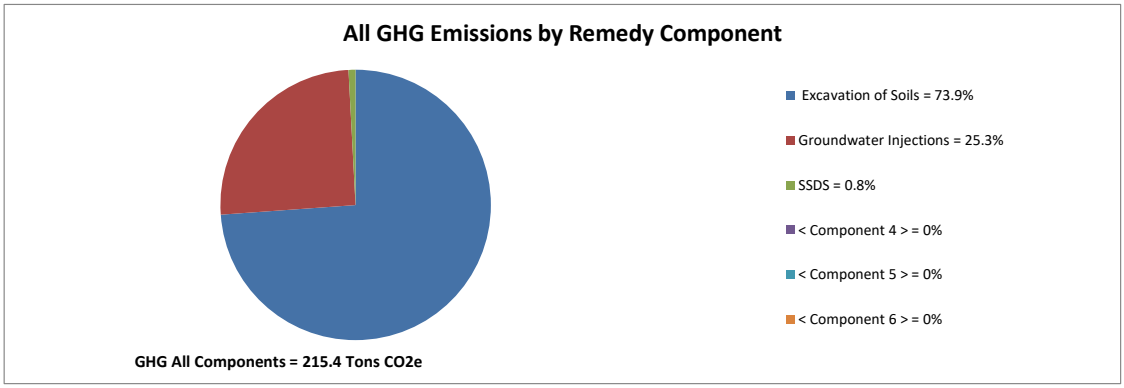
	Excavation of Soils	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	525.8	307.4	0.0	0.0	0.0	0.0	833.3
Grid Electricity Generation (Scope 2)	0.8	588.6	0.0	0.0	0.0	0.0	589.4
Transportation (Scope 3a)	648.5	26.7	9.7	0.0	0.0	0.0	684.9
Other Off-Site (Scope 3b)	879.3	702.9	20.3	0.0	0.0	0.0	1,602.4
Total	2,054.4	1,625.5	30.0	0.0	0.0	0.0	3,710.0

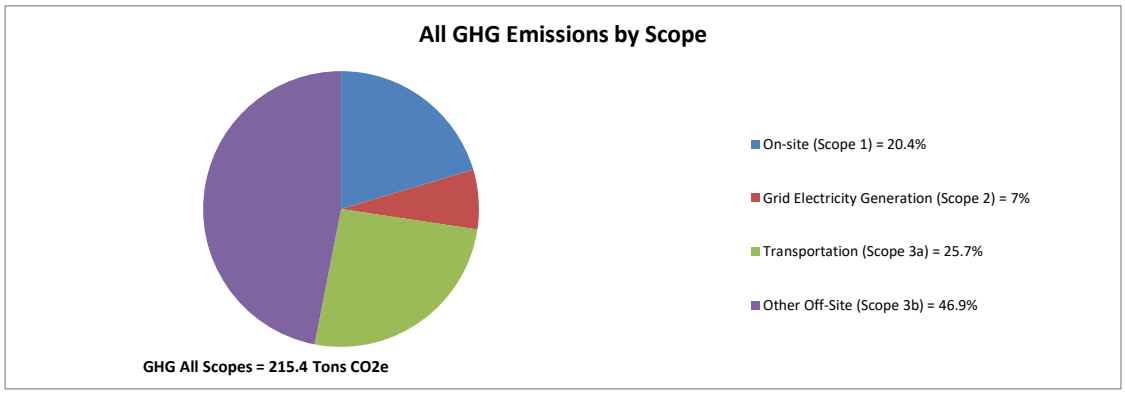
Excavation of Soils = 55.4%
Groundwater Injections = 43.8%
SSDS = 0.8%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 22.5%
Grid Electricity Generation (Scope 2) = 15.9%
Transportation (Scope 3a) = 18.5%
Other Off-Site (Scope 3b) = 43.2%

Total Energy All Components = 3710 MMbtus
Total Energy All Scopes = 3710 MMbtus


All GHG Emissions by Remedy Component and Scope
(in Tons)
180
160
140
120
100
80
60
40
20
0
Excavation of Soils
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
GHG All Components = 215.4 Tons CO2e


All GHG Emissions by Remedy Component
Excavation of Soils = 73.9%
Groundwater Injections = 25.3%
SSDS = 0.8%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
GHG All Components = 215.4 Tons CO2e


All GHG Emissions by Scope
On-site (Scope 1) = 20.4%
Grid Electricity Generation (Scope 2) = 7%
Transportation (Scope 3a) = 25.7%
Other Off-Site (Scope 3b) = 46.9%
GHG All Scopes = 215.4 Tons CO2e

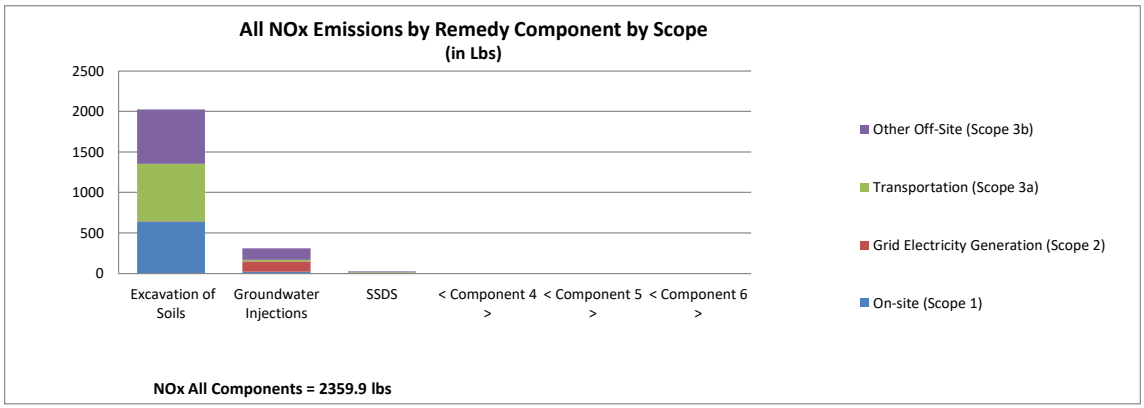
GHG
Tons CO2e

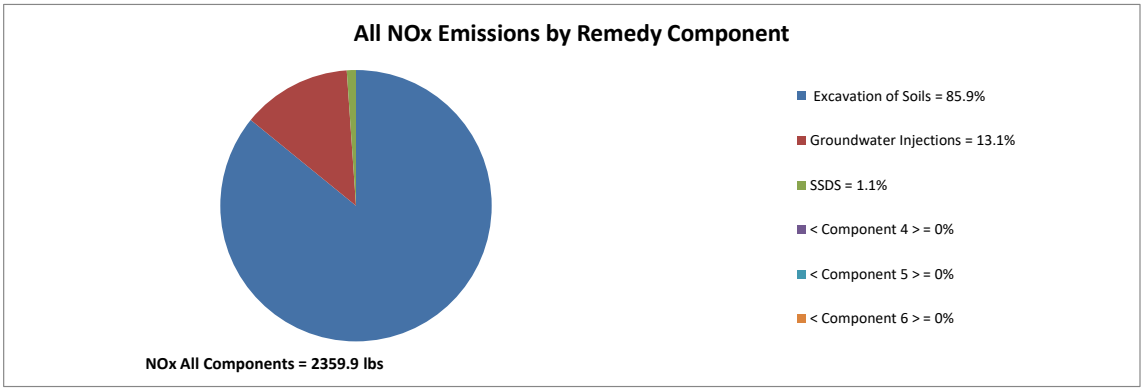
	Excavation of Soils	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	42.5	1.4	0.0	0.0	0.0	0.0	43.9
Grid Electricity Generation (Scope 2)	0.1	15.0	0.0	0.0	0.0	0.0	15.0
Transportation (Scope 3a)	52.4	2.2	0.8	0.0	0.0	0.0	55.4
Other Off-Site (Scope 3b)	64.1	35.9	1.0	0.0	0.0	0.0	101.1
Total	159.1	54.5	1.8	0.0	0.0	0.0	215.4

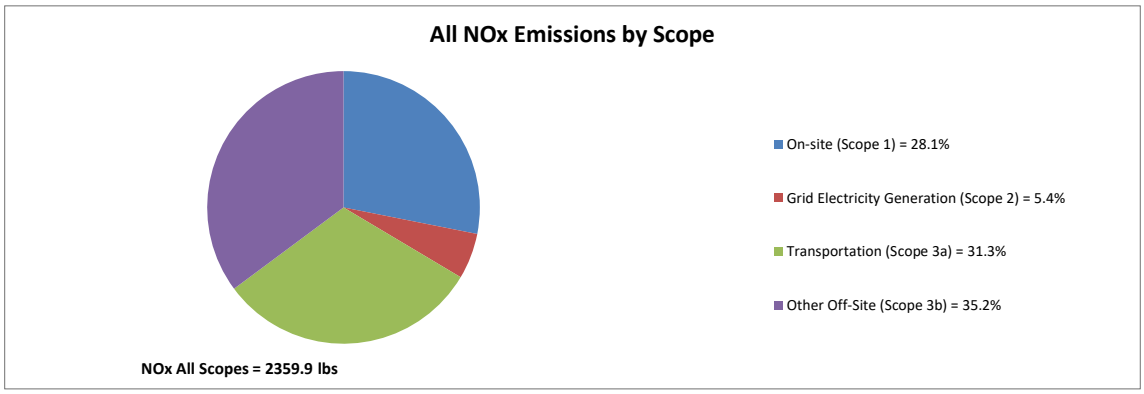
Excavation of Soils = 73.9%
Groundwater Injections = 25.3%
SSDS = 0.8%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 20.4%
Grid Electricity Generation (Scope 2) = 7%
Transportation (Scope 3a) = 25.7%
Other Off-Site (Scope 3b) = 46.9%

GHG All Components = 215.4 Tons CO2e
GHG All Scopes = 215.4 Tons CO2e


All NOx Emissions by Remedy Component by Scope
(in Lbs)
2500
2000
1500
1000
500
0
Excavation of Soils
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
NOx All Components = 2359.9 lbs


All NOx Emissions by Remedy Component
Excavation of Soils = 85.9%
Groundwater Injections = 13.1%
SSDS = 1.1%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
NOx All Components = 2359.9 lbs


All NOx Emissions by Scope
On-site (Scope 1) = 28.1%
Grid Electricity Generation (Scope 2) = 5.4%
Transportation (Scope 3a) = 31.3%
Other Off-Site (Scope 3b) = 35.2%
NOx All Scopes = 2359.9 lbs

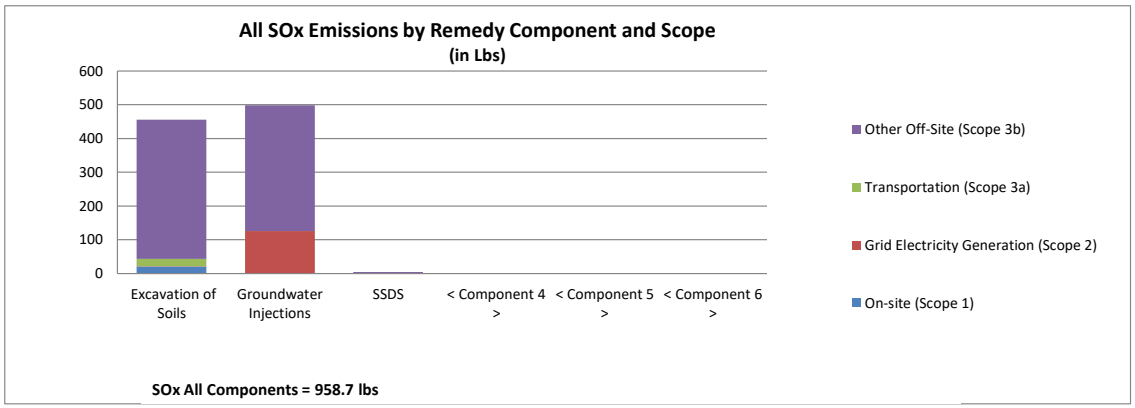
NOx
lbs

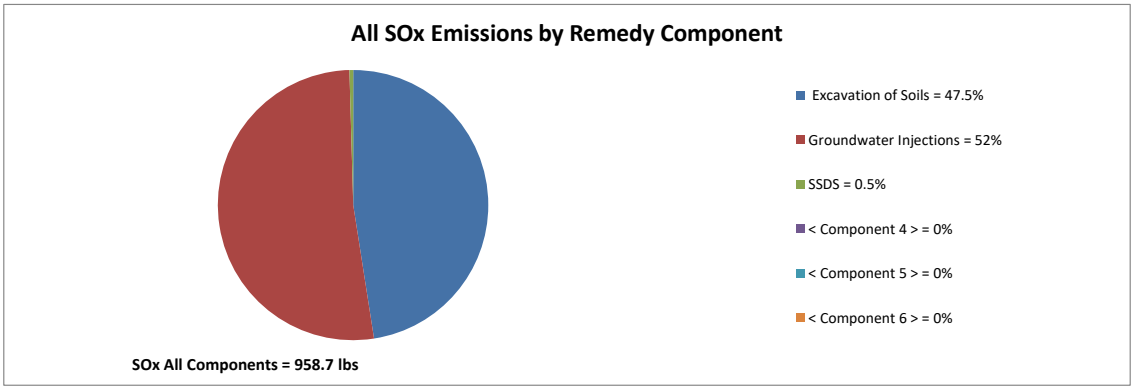
	Excavation of Soils	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	642.6	21.4	0.0	0.0	0.0	0.0	664.0
Grid Electricity Generation (Scope 2)	0.3	127.8	0.0	0.0	0.0	0.0	128.0
Transportation (Scope 3a)	708.4	17.4	11.9	0.0	0.0	0.0	737.7
Other Off-Site (Scope 3b)	675.0	141.4	13.7	0.0	0.0	0.0	830.2
Total	2,026.2	308.0	25.6	0.0	0.0	0.0	2,359.9

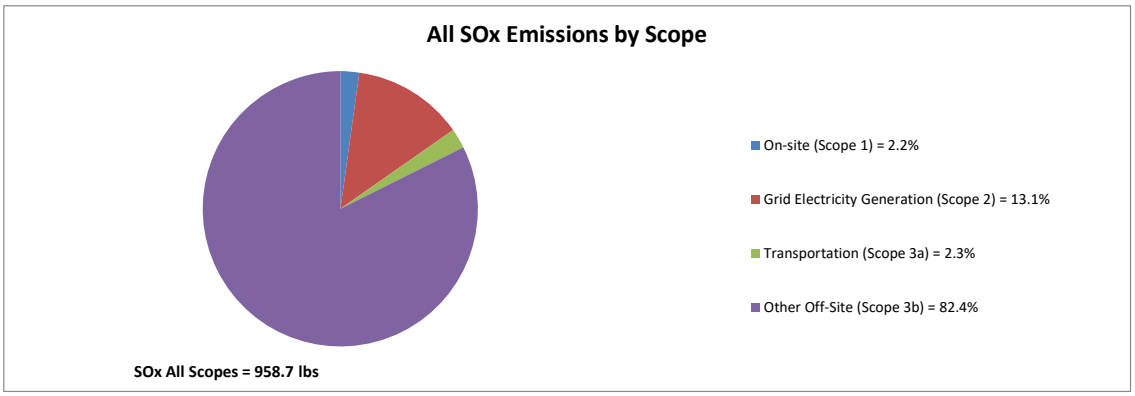
Excavation of Soils = 85.9%
Groundwater Injections = 13.1%
SSDS = 1.1%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

NOx All Components = 2359.9 lbs
NOx All Scopes = 2359.9 lbs

On-site (Scope 1) = 28.1%
Grid Electricity Generation (Scope 2) = 5.4%
Transportation (Scope 3a) = 31.3%
Other Off-Site (Scope 3b) = 35.2%


All SOx Emissions by Remedy Component and Scope
(in Lbs)
600
500
400
300
200
100
0
Excavation of Soils
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
SOx All Components = 958.7 lbs


All SOx Emissions by Remedy Component
Excavation of Soils = 47.5%
Groundwater Injections = 52%
SSDS = 0.5%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
SOx All Components = 958.7 lbs

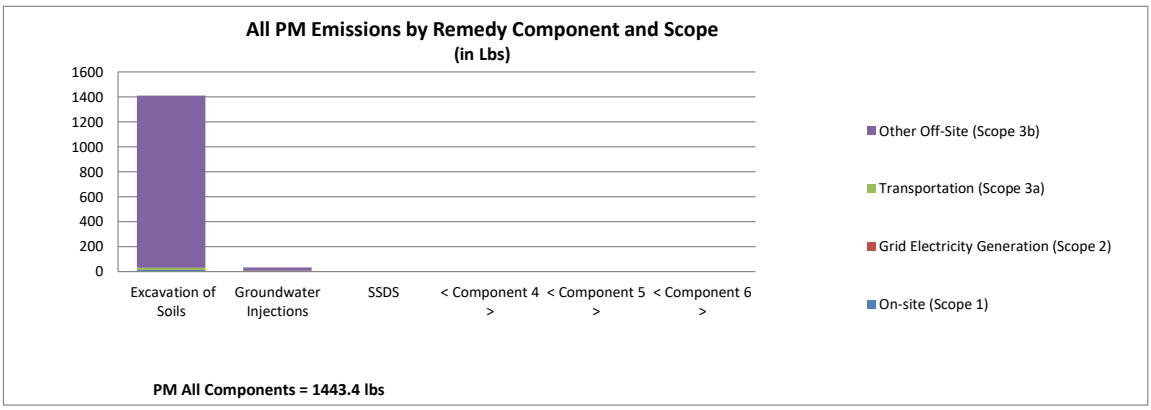

All SOx Emissions by Scope
On-site (Scope 1) = 2.2%
Grid Electricity Generation (Scope 2) = 13.1%
Transportation (Scope 3a) = 2.3%
Other Off-Site (Scope 3b) = 82.4%
SOx All Scopes = 958.7 lbs

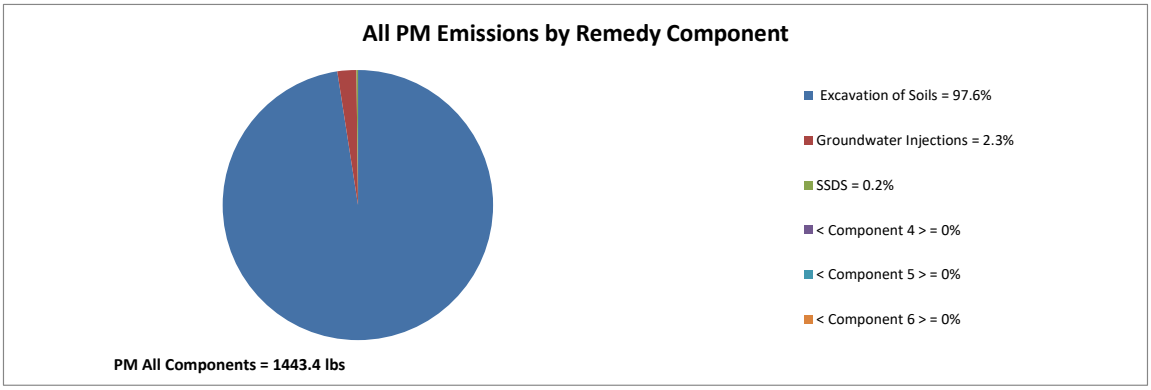
SOx lbs	Excavation of Soils	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	20.4	0.7	0.0	0.0	0.0	0.0	21.1
Grid Electricity Generation (Scope 2)	0.6	124.8	0.0	0.0	0.0	0.0	125.4
Transportation (Scope 3a)	21.7	0.4	0.4	0.0	0.0	0.0	22.5
Other Off-Site (Scope 3b)	413.0	372.7	4.0	0.0	0.0	0.0	789.7
Total	455.7	498.6	4.4	0.0	0.0	0.0	958.7

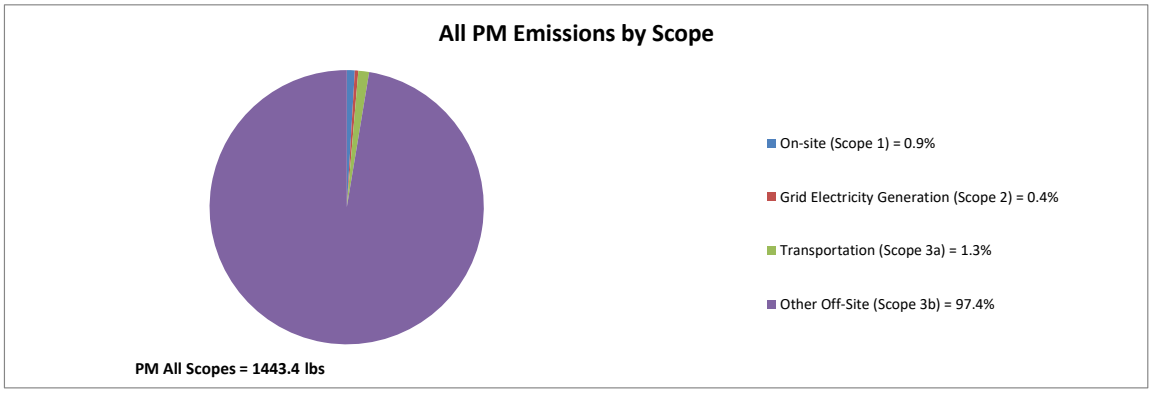
Excavation of Soils = 47.5%
Groundwater Injections = 52%
SSDS = 0.5%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

SOx All Components = 958.7 lbs
SOx All Scopes = 958.7 lbs

On-site (Scope 1) = 2.2%
Grid Electricity Generation (Scope 2) = 13.1%
Transportation (Scope 3a) = 2.3%
Other Off-Site (Scope 3b) = 82.4%


All PM Emissions by Remedy Component and Scope
(in Lbs)
1600
1400
1200
1000
800
600
400
200
0
Excavation of Soils
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
PM All Components = 1443.4 lbs


All PM Emissions by Remedy Component
Excavation of Soils = 97.6%
Groundwater Injections = 2.3%
SSDS = 0.2%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
PM All Components = 1443.4 lbs


All PM Emissions by Scope
On-site (Scope 1) = 0.9%
Grid Electricity Generation (Scope 2) = 0.4%
Transportation (Scope 3a) = 1.3%
Other Off-Site (Scope 3b) = 97.4%
PM All Scopes = 1443.4 lbs

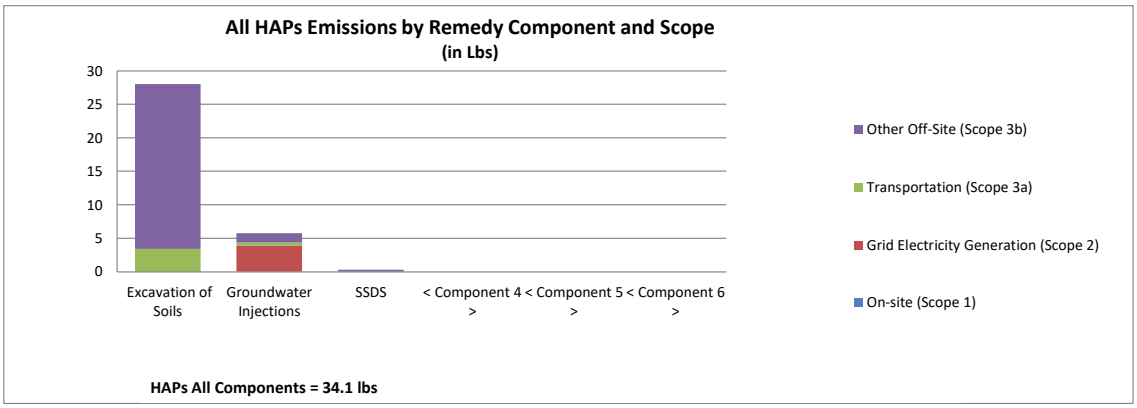
PM lbs

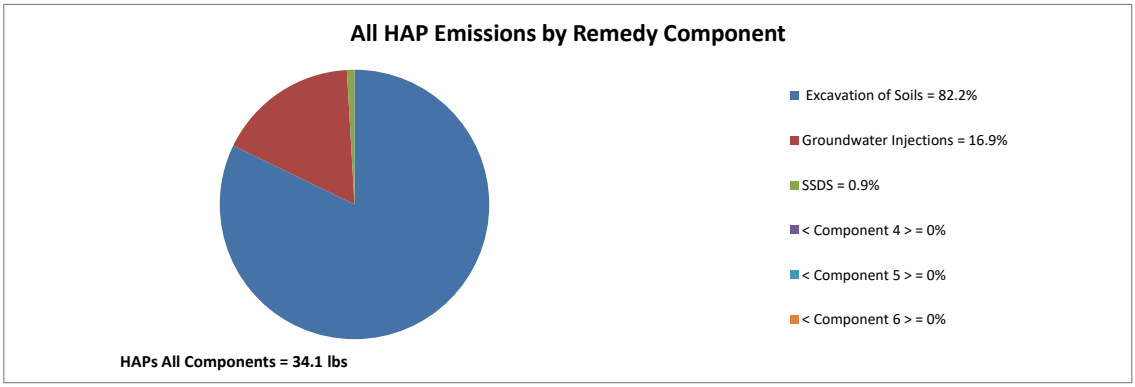
	Excavation of Soils	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	12.9	0.4	0.0	0.0	0.0	0.0	13.3
Grid Electricity Generation (Scope 2)	0.0	6.4	0.0	0.0	0.0	0.0	6.4
Transportation (Scope 3a)	17.1	1.0	0.2	0.0	0.0	0.0	18.3
Other Off-Site (Scope 3b)	1,378.3	25.0	2.1	0.0	0.0	0.0	1,405.3
Total	1,408.3	32.8	2.3	0.0	0.0	0.0	1,443.4

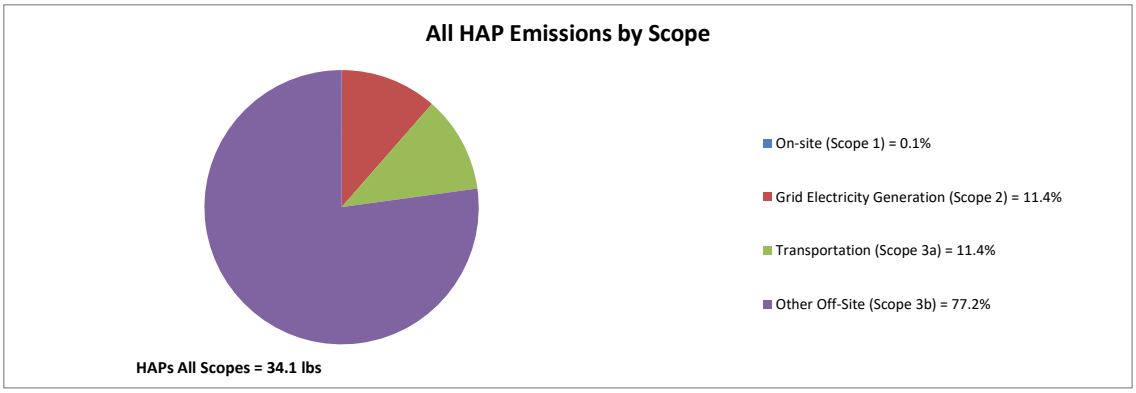
Excavation of Soils = 97.6%
Groundwater Injections = 2.3%
SSDS = 0.2%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0.9%
Grid Electricity Generation (Scope 2) = 0.4%
Transportation (Scope 3a) = 1.3%
Other Off-Site (Scope 3b) = 97.4%

PM All Components = 1443.4 lbs
PM All Scopes = 1443.4 lbs


All HAPs Emissions by Remedy Component and Scope
(in Lbs)
30
25
20
15
10
5
0
Excavation of Soils
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
HAPs All Components = 34.1 lbs


All HAP Emissions by Remedy Component
Excavation of Soils = 82.2%
Groundwater Injections = 16.9%
SSDS = 0.9%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
HAPs All Components = 34.1 lbs


All HAP Emissions by Scope
On-site (Scope 1) = 0.1%
Grid Electricity Generation (Scope 2) = 11.4%
Transportation (Scope 3a) = 11.4%
Other Off-Site (Scope 3b) = 77.2%
HAPs All Scopes = 34.1 lbs

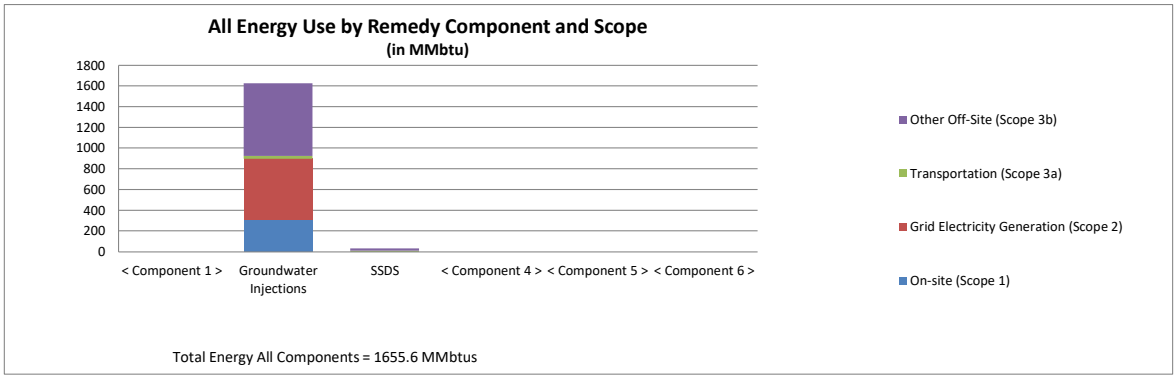
HAPs
lbs

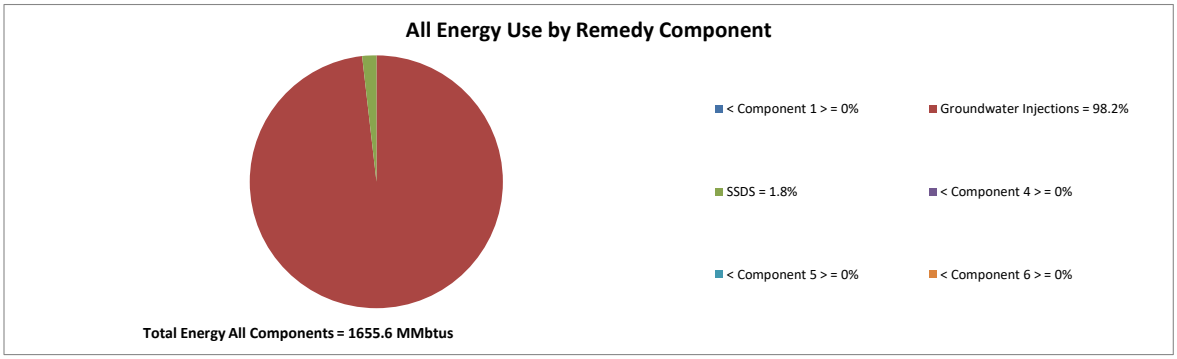
	Excavation of Soils	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grid Electricity Generation (Scope 2)	0.0	3.9	0.0	0.0	0.0	0.0	3.9
Transportation (Scope 3a)	3.4	0.5	0.0	0.0	0.0	0.0	3.9
Other Off-Site (Scope 3b)	24.6	1.4	0.3	0.0	0.0	0.0	26.3
Total	28.0	5.8	0.3	0.0	0.0	0.0	34.1

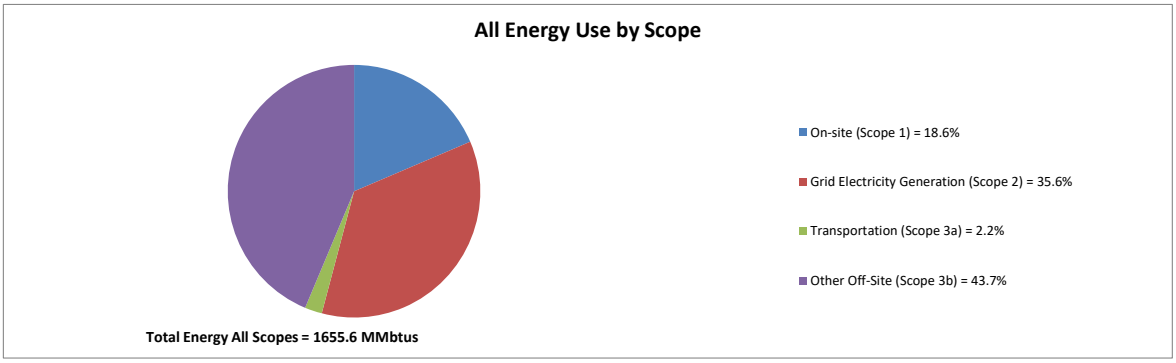
Excavation of Soils = 82.2%
Groundwater Injections = 16.9%
SSDS = 0.9%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

HAPs All Components = 34.1 lbs
HAPs All Scopes = 34.1 lbs

On-site (Scope 1) = 0.1%
Grid Electricity Generation (Scope 2) = 11.4%
Transportation (Scope 3a) = 11.4%
Other Off-Site (Scope 3b) = 77.2%


All Energy Use by Remedy Component and Scope
(in MMbtu)
1800
1600
1400
1200
1000
800
600
400
200
0
< Component 1 >
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
Total Energy All Components = 1655.6 MMbtus


All Energy Use by Remedy Component
< Component 1 > = 0%
Groundwater Injections = 98.2%
SSDS = 1.8%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
Total Energy All Components = 1655.6 MMbtus

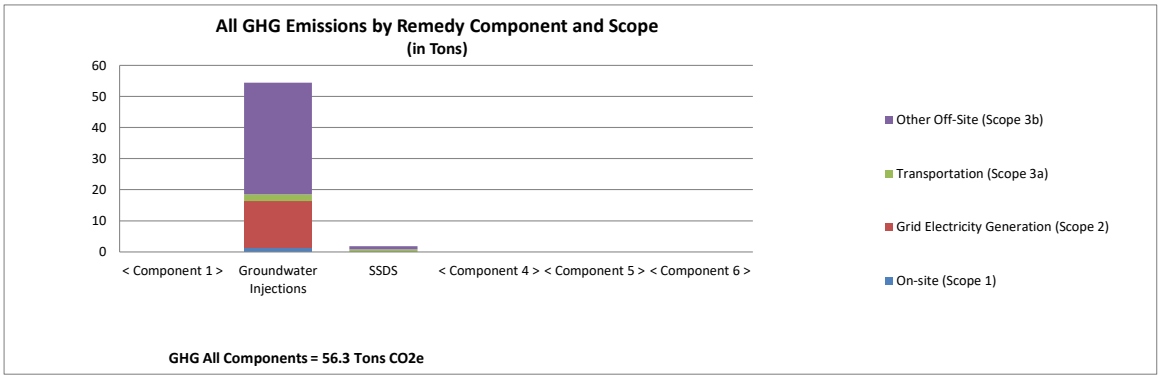

All Energy Use by Scope
On-site (Scope 1) = 18.6%
Grid Electricity Generation (Scope 2) = 35.6%
Transportation (Scope 3a) = 2.2%
Other Off-Site (Scope 3b) = 43.7%
Total Energy All Scopes = 1655.6 MMbtus

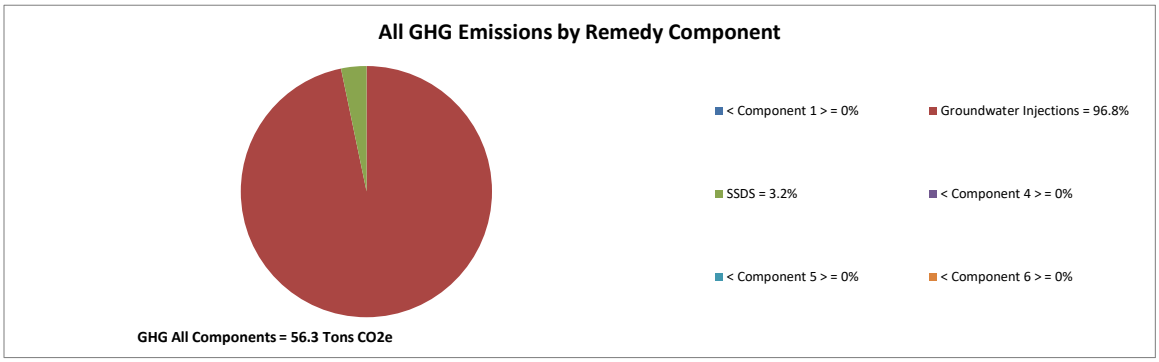
Total Energy MMbtus	< Component 1 >	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	0.0	307.4	0.0	0.0	0.0	0.0	307.4
Grid Electricity Generation (Scope 2)	0.0	588.6	0.0	0.0	0.0	0.0	588.6
Transportation (Scope 3a)	0.0	26.7	9.7	0.0	0.0	0.0	36.4
Other Off-Site (Scope 3b)	0.0	702.9	20.3	0.0	0.0	0.0	723.2
Total	0.0	1,625.5	30.0	0.0	0.0	0.0	1,655.6

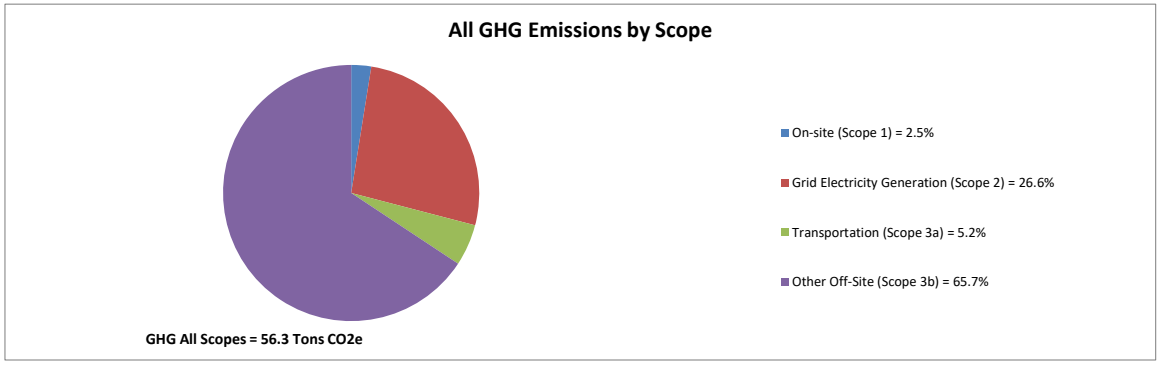
< Component 1 > = 0%
Groundwater Injections = 98.2%
SSDS = 1.8%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 18.6%
Grid Electricity Generation (Scope 2) = 35.6%
Transportation (Scope 3a) = 2.2%
Other Off-Site (Scope 3b) = 43.7%

Total Energy All Components = 1655.6 MMbtus
Total Energy All Scopes = 1655.6 MMbtus


All GHG Emissions by Remedy Component and Scope
(in Tons)
60
50
40
30
20
10
0
< Component 1 >
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
GHG All Components = 56.3 Tons CO2e


All GHG Emissions by Remedy Component
< Component 1 > = 0%
Groundwater Injections = 96.8%
SSDS = 3.2%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
GHG All Components = 56.3 Tons CO2e

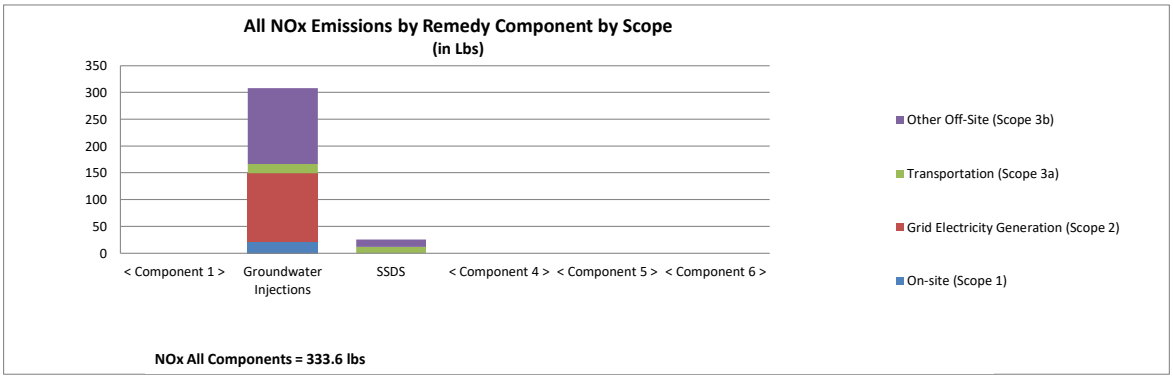

All GHG Emissions by Scope
On-site (Scope 1) = 2.5%
Grid Electricity Generation (Scope 2) = 26.6%
Transportation (Scope 3a) = 5.2%
Other Off-Site (Scope 3b) = 65.7%
GHG All Scopes = 56.3 Tons CO2e

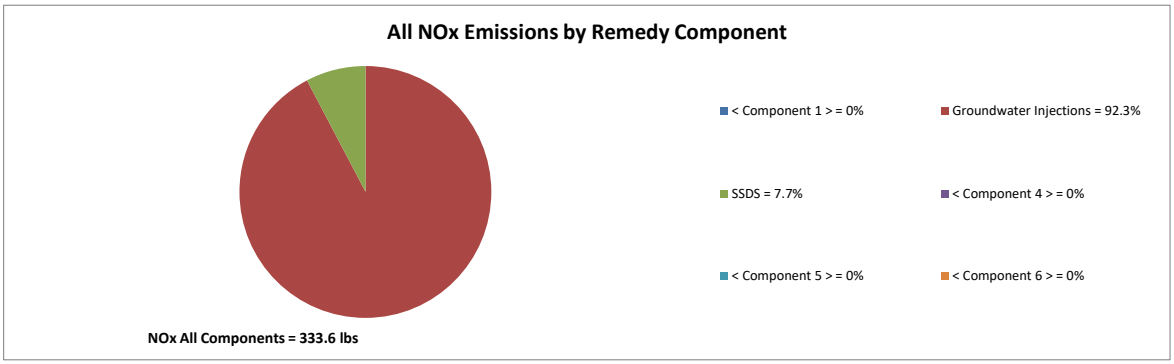
GHG Tons CO2e	< Component 1 >	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	0.0	1.4	0.0	0.0	0.0	0.0	1.4
Grid Electricity Generation (Scope 2)	0.0	15.0	0.0	0.0	0.0	0.0	15.0
Transportation (Scope 3a)	0.0	2.2	0.8	0.0	0.0	0.0	2.9
Other Off-Site (Scope 3b)	0.0	35.9	1.0	0.0	0.0	0.0	37.0
Total	0.0	54.5	1.8	0.0	0.0	0.0	56.3

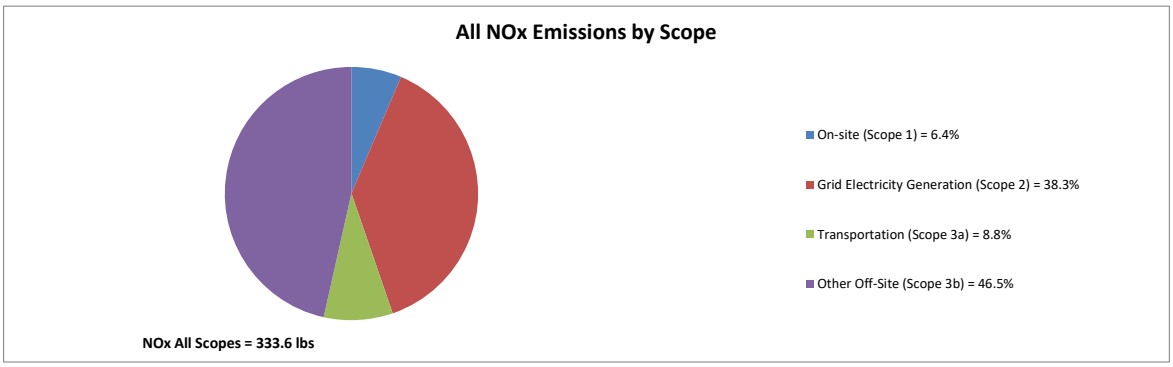
< Component 1 > = 0%
Groundwater Injections = 96.8%
SSDS = 3.2%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 2.5%
Grid Electricity Generation (Scope 2) = 26.6%
Transportation (Scope 3a) = 5.2%
Other Off-Site (Scope 3b) = 65.7%

GHG All Components = 56.3 Tons CO2e
GHG All Scopes = 56.3 Tons CO2e


All NOx Emissions by Remedy Component by Scope
(in Lbs)
350
300
250
200
150
100
50
0
< Component 1 >
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
NOx All Components = 333.6 lbs


All NOx Emissions by Remedy Component
< Component 1 > = 0%
Groundwater Injections = 92.3%
SSDS = 7.7%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
NOx All Components = 333.6 lbs

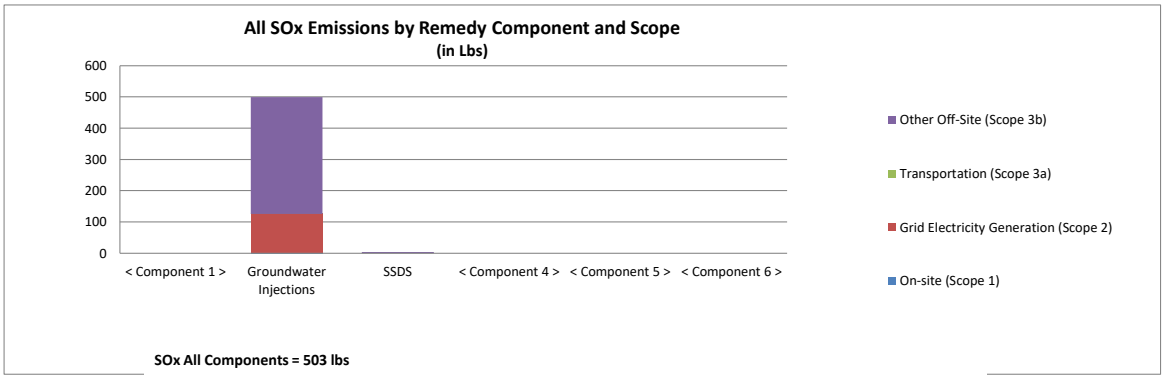

All NOx Emissions by Scope
On-site (Scope 1) = 6.4%
Grid Electricity Generation (Scope 2) = 38.3%
Transportation (Scope 3a) = 8.8%
Other Off-Site (Scope 3b) = 46.5%
NOx All Scopes = 333.6 lbs

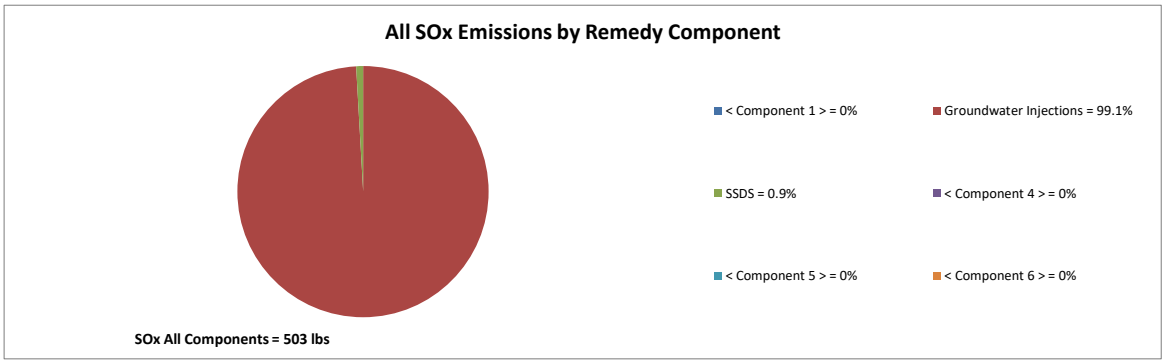
NOx lbs	< Component 1 >	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	0.0	21.4	0.0	0.0	0.0	0.0	21.4
Grid Electricity Generation (Scope 2)	0.0	127.8	0.0	0.0	0.0	0.0	127.8
Transportation (Scope 3a)	0.0	17.4	11.9	0.0	0.0	0.0	29.3
Other Off-Site (Scope 3b)	0.0	141.4	13.7	0.0	0.0	0.0	155.1
Total	0.0	308.0	25.6	0.0	0.0	0.0	333.6

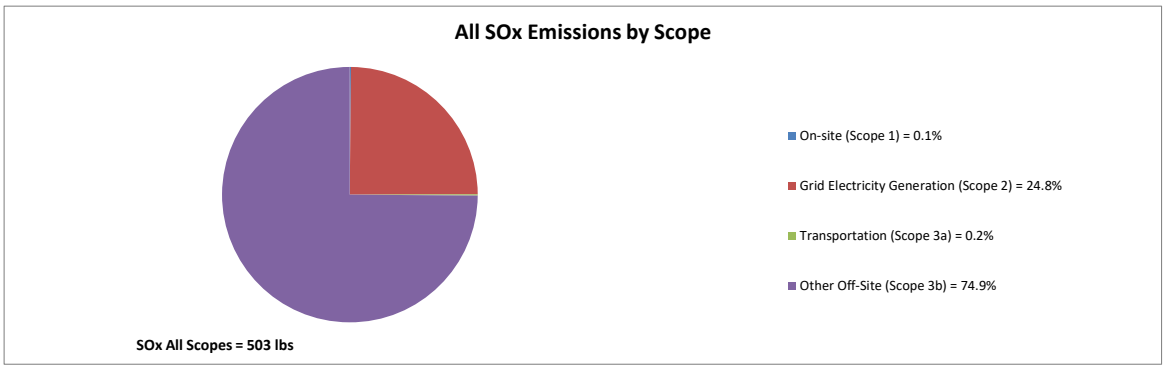
< Component 1 > = 0%
Groundwater Injections = 92.3%
SSDS = 7.7%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

NOx All Components = 333.6 lbs
NOx All Scopes = 333.6 lbs

On-site (Scope 1) = 6.4%
Grid Electricity Generation (Scope 2) = 38.3%
Transportation (Scope 3a) = 8.8%
Other Off-Site (Scope 3b) = 46.5%


All SOx Emissions by Remedy Component and Scope
(in Lbs)
600
500
400
300
200
100
0
< Component 1 >
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
SOx All Components = 503 lbs


All SOx Emissions by Remedy Component
< Component 1 > = 0%
Groundwater Injections = 99.1%
SSDS = 0.9%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
SOx All Components = 503 lbs

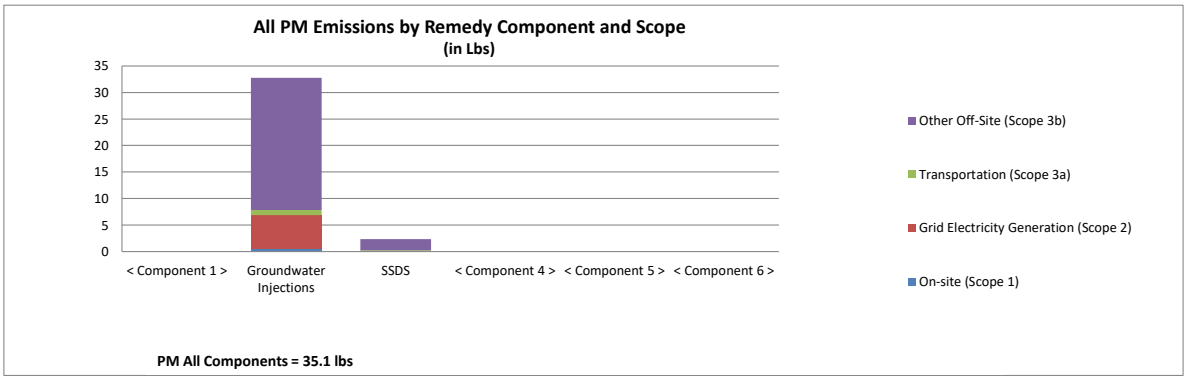

All SOx Emissions by Scope
On-site (Scope 1) = 0.1%
Grid Electricity Generation (Scope 2) = 24.8%
Transportation (Scope 3a) = 0.2%
Other Off-Site (Scope 3b) = 74.9%
SOx All Scopes = 503 lbs

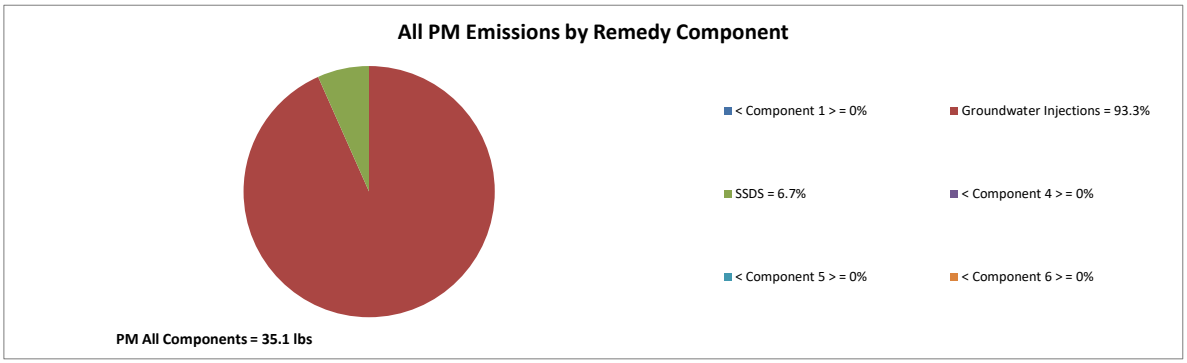
SOx lbs	< Component 1 >	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	0.0	0.7	0.0	0.0	0.0	0.0	0.7
Grid Electricity Generation (Scope 2)	0.0	124.8	0.0	0.0	0.0	0.0	124.8
Transportation (Scope 3a)	0.0	0.4	0.4	0.0	0.0	0.0	0.8
Other Off-Site (Scope 3b)	0.0	372.7	4.0	0.0	0.0	0.0	376.7
Total	0.0	498.6	4.4	0.0	0.0	0.0	503.0

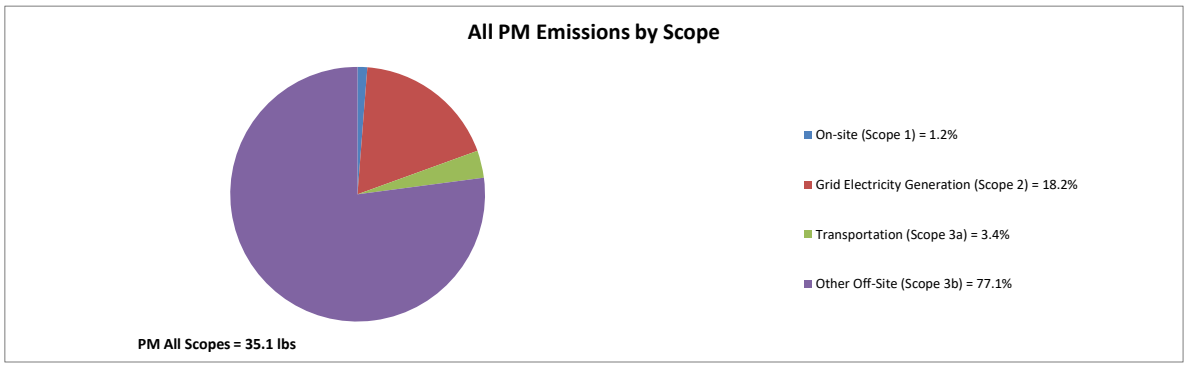
< Component 1 > = 0%
Groundwater Injections = 99.1%
SSDS = 0.9%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

SOx All Components = 503 lbs
SOx All Scopes = 503 lbs

On-site (Scope 1) = 0.1%
Grid Electricity Generation (Scope 2) = 24.8%
Transportation (Scope 3a) = 0.2%
Other Off-Site (Scope 3b) = 74.9%


All PM Emissions by Remedy Component and Scope
(in Lbs)
35
30
25
20
15
10
5
0
< Component 1 >
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
PM All Components = 35.1 lbs


All PM Emissions by Remedy Component
< Component 1 > = 0%
Groundwater Injections = 93.3%
SSDS = 6.7%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
PM All Components = 35.1 lbs

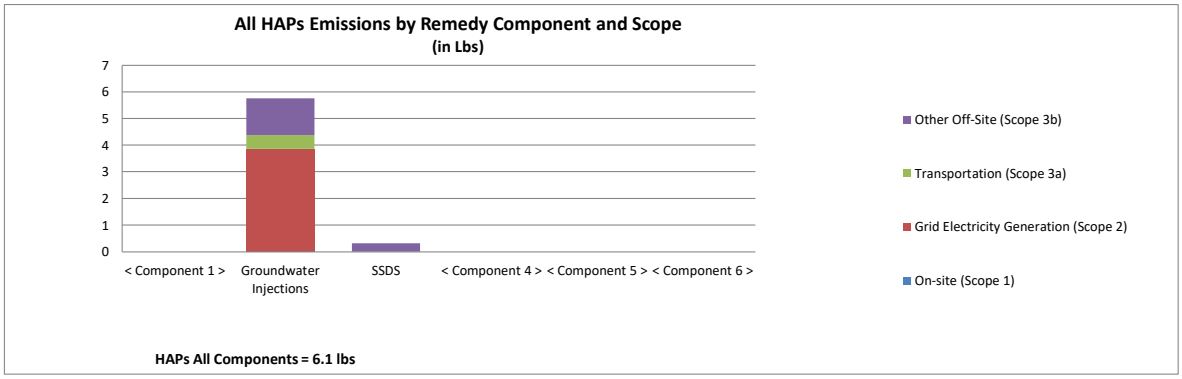

All PM Emissions by Scope
On-site (Scope 1) = 1.2%
Grid Electricity Generation (Scope 2) = 18.2%
Transportation (Scope 3a) = 3.4%
Other Off-Site (Scope 3b) = 77.1%
PM All Scopes = 35.1 lbs

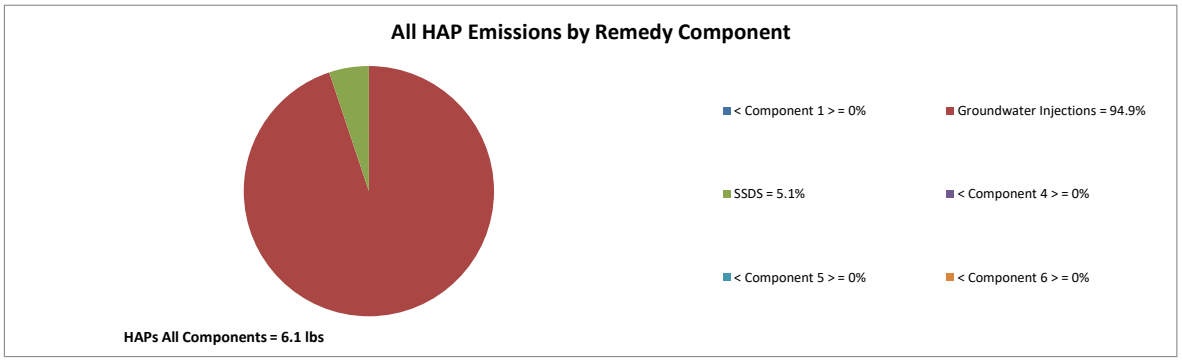
PM lbs	< Component 1 >	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	0.0	0.4	0.0	0.0	0.0	0.0	0.4
Grid Electricity Generation (Scope 2)	0.0	6.4	0.0	0.0	0.0	0.0	6.4
Transportation (Scope 3a)	0.0	1.0	0.2	0.0	0.0	0.0	1.2
Other Off-Site (Scope 3b)	0.0	25.0	2.1	0.0	0.0	0.0	27.1
Total	0.0	32.8	2.3	0.0	0.0	0.0	35.1

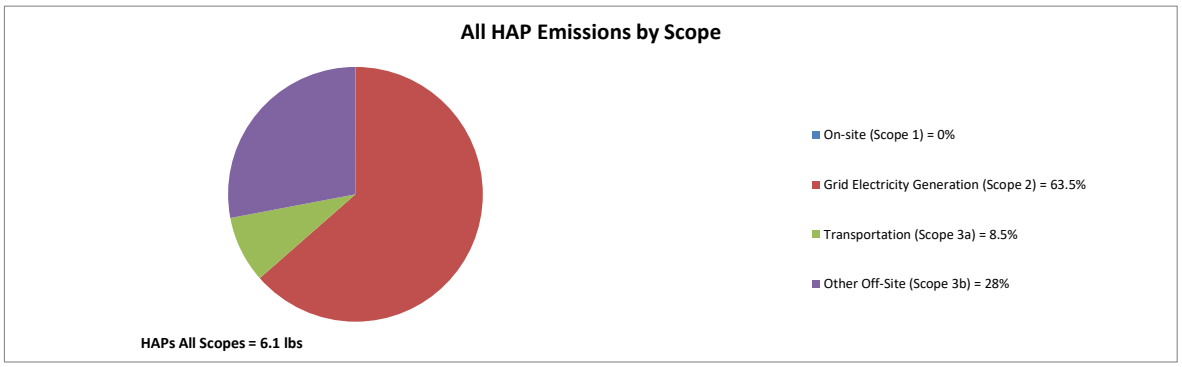
< Component 1 > = 0%
Groundwater Injections = 93.3%
SSDS = 6.7%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

PM All Components = 35.1 lbs
PM All Scopes = 35.1 lbs

On-site (Scope 1) = 1.2%
Grid Electricity Generation (Scope 2) = 18.2%
Transportation (Scope 3a) = 3.4%
Other Off-Site (Scope 3b) = 77.1%


All HAPs Emissions by Remedy Component and Scope
(in Lbs)
7
6
5
4
3
2
1
0
< Component 1 >
Groundwater Injections
SSDS
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
HAPs All Components = 6.1 lbs


All HAP Emissions by Remedy Component
< Component 1 > = 0%
Groundwater Injections = 94.9%
SSDS = 5.1%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
HAPs All Components = 6.1 lbs


All HAP Emissions by Scope
On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 63.5%
Transportation (Scope 3a) = 8.5%
Other Off-Site (Scope 3b) = 28%
HAPs All Scopes = 6.1 lbs

HAPs lbs	< Component 1 >	Groundwater Injections	SSDS	< Component 4 >	< Component 5 >	< Component 6 >	Total
On-site (Scope 1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grid Electricity Generation (Scope 2)	0.0	3.9	0.0	0.0	0.0	0.0	3.9
Transportation (Scope 3a)	0.0	0.5	0.0	0.0	0.0	0.0	0.5
Other Off-Site (Scope 3b)	0.0	1.4	0.3	0.0	0.0	0.0	1.7
Total	0.0	5.8	0.3	0.0	0.0	0.0	6.1

< Component 1 > = 0%
Groundwater Injections = 94.9%
SSDS = 5.1%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

HAPs All Components = 6.1 lbs
HAPs All Scopes = 6.1 lbs

On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 63.5%
Transportation (Scope 3a) = 8.5%
Other Off-Site (Scope 3b) = 28%

ATTACHMENT G

Field Sampling and Analysis Plan / Quality Assurance Project Plan

FIELD SAMPLING AND ANALYSIS PLAN
&
QUALITY ASSURANCE PROJECT PLAN

FOR

245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK
EL PROJECT NUMBER 23-0001

REVISED APRIL 2026

Environmental LOGIC www.env-logic.com

15 Princess Road, Suite K | Lawrenceville, NJ 08648

FIELD SAMPLING AND ANALYSIS PLAN & QUALITY ASSURANCE PROJECT PLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK

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FIELD SAMPLING AND ANLAYSIS PLAN & QUALITY ASSURANCE PROJECT PLAN
FOR
245 WEST 55TH ST LLC
245 WEST 55TH STREET
BLOCK 1027, LOT 7
NEW YORK, NEW YORK

1.0 INTRODUCTION

Environmental Logic, LLC (EL) has prepared this Field Sampling and Analysis Plan (SAP) & Quality Assurance Project Plan (QAPP), on behalf of 245 West 55th ST LLC, for sampling outlined in the Remedial Action Work Plan (RAWP) proposed for 245 West 55th Street (Block 1027, Lot 7), located in New York, New York (herein referred to as the "Site"). This SAP/QAPP outlines the procedures to be implemented following RA activities as well as identifies the data quality assurance/quality control (QA/QC) activities associated with sampling and analysis of environmental samples at the Site. The procedures in this SAP/QAPP are designed to be followed by personnel participating in the field investigation and in the laboratory analyses of environmental samples.

Redevelopment of the Site building is ongoing and consists of the rehabilitation of the existing vacant building into residential housing, including the removal of the existing top floor and the construction of six (6) additional floors. The rehabilitation of the existing building, including the construction of the 6 additional floors, is expected to be completed in approximately four (4) years.

This SAP & QAPP has been prepared in accordance with the New York State Department of Environmental Conservation (NYSDEC) *DER-10, Technical Guidance for Site Investigation and Remediation. May 3, 2010, 6 NYCRR Part 375 – Environmental Remediation Programs, and New York State Department of Health (NYSDOH) Soil Vapor Intrusion Guidance and Updates,* as well as other applicable guidance documents

2.0 PROJECT BACKGROUND

2.1 Site Description

The Site is located in a C6-4/C6-6 Commercial District in Manhattan, approximately 1,000 feet southwest of Central Park. The property is a rectangle-shaped parcel comprised of 0.14 acres and identified on tax maps of Manhattan NY as Block 1027, Lot 7. The Site is currently owned by 245 WEST 55TH ST LLC. The Site is bordered to the north, east, and west by mixed-use commercial/residential properties, and is bordered to the south by West 55th Street and additional mixed-use commercial/residential properties.

The Site location, as shown on the USGS Topographic Map, is provided on Figure 1. A Site map is included as Figure 2.

The Site was formerly owned and utilized by DuArt Media Services/DuArt Film Labs (DuArt) for cinematographic film cleaning and film processing from approximately 1922 through 2011. Film production including voiceover work, audio recording, and film editing continued to take place at the Site until 2021. Cinematographic film cleaning operations reportedly utilized cleaning and degreasing compounds including the chlorinated volatile organic compounds (cVOCs) tetrachloroethene (PCE) and 1,1,1-trichloroethane (1,1,1-TCA) to remove dirt, grease, and minor scratches from film negatives prior to print. Previous investigations and the results of the Remedial Investigations (RI) are presented in the RAWP.

2.2 Project Scope and Goals

The RAWP presents the recommended remedial actions for the Site, which includes chemical injections for groundwater, cover system for soils, and installation of a sub-slab depressurization system (SSDS). Post verification groundwater sampling is proposed as part of the RAWP to evaluate the effectiveness of the chemical injections. Also, sampling of indoor air is proposed following the installation of the SSDS to confirm its efficacy.

Proposed injection locations and permanent monitoring well locations are shown on Figure 8 of the Remedial Action Workplan (RAW). A sampling summary table for the proposed remedial samples is provided as Table 1.

The RA field tasks are discussed in more detail in the SAP (Section 4.0) and generally consist of the following activities:

- End-point soil samples for soil excavation associated with new building foundation elements;
- Installation of temporary or permanent injection wells for Enhanced In-Situ Dechlorination (EISD);

- Post verification quarterly groundwater sampling from monitoring wells; and
- Post verification indoor air samples, following SSDS installation.

2.3 Regulatory Criteria

Soil sample results will be compared to the New York State Department of Environmental Conservation (NYSDEC) 6 NYCRR Part 375 Unrestricted Use and Restricted Residential Use Soil Cleanup Objectives (SCOs).

Groundwater sample results will be compared to the ground water quality standards established by 6 NYCRR Part 703.5 NYSDEC Technical and/or Technical Operational Guidance Series (TOGS) 1.1.1, the Ambient Water Quality Standards (AWQS).

3.0 PROJECT ORGANIZATION AND RESPONSIBILITY

The consultant, EL, will be responsible for project management, sample collection and data reporting. Responsibilities for key project team members are summarized below.

3.1 Regulatory Agency and Key Project Personnel

3.1.1 NYSDEC Project Manager

Mr. Erick Bower is the NYSDEC Project Manager for the Site. As such, he will be responsible for reviewing submissions and overseeing project activities on behalf of NYSDEC.

Erick Bower, Project Manager NYSDEC
Division of Environmental Remediation 625 Broadway
Albany, NY 12233
518-402-9824
Erick.bower@dec.ny.gov

3.1.2 NYSDOH Project Manager

Mr. Chris Budd is the NYSDOH Project Manager for the Site. As such, he will be responsible for reviewing submissions and overseeing project activities on behalf of NYSDOH.

Chris Budd
Project Manager
NYSDOH
Empire State Plaza Corning Tower Room 1787 Albany, NY 12237
518-402-7860
beei@health.ny.gov

3.1.3 Owner Representative

Mr. Lou Madigan, of Madigan Development, LLC, represents the Site owner and is managing the redevelopment efforts at the Site. As such, he will be responsible for reviewing submissions and overseeing project activities.

Lou Madigan
MADIGAN DEVELOPMENT LLC
250 West 55th Street 17th Floor
New York, NY 10019
T: 917.880.7182
lmadigan@madigandevelopment.com

3.1.4 Remedial Engineer

The Remedial Engineer (RE) for this project will be Matthew M. Carroll, P.E.:

Remedial Engineer:
Matthew M. Carroll, PE
Tenen Environmental, LLC
(646) 606-2332
mcarroll@tenen-env.com

The RE is a registered professional engineer (PE) licensed by the State of New York. The RE will have primary direct responsibility for implementation of the remedial program for the 245 West 55th Street Site (NYSDEC Site No. C231157). The RE will certify in the Final Engineering Report (FER) that the remedial actions were performed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the RAWP.

The PE will review all pre-remedial plans submitted by contractors for compliance with this RAWP and will certify compliance in the FER.

3.2 Consultant Key Personnel

The table below lists EL personnel and summarizes their primary responsibilities. Resumes of key personnel are included as Attachment A.

Position	EL Personnel	Areas of Responsibilities
Program Manager	Gary Weissberger Environmental Logic 15 Princess Road, Suite K Lawrenceville, NJ 08648 Phone (609) 910-0451 gweissberger@env-logic.com	• Overall program oversight • Communication with NYSDEC and NYDOH • Project management • Project schedule • Client contact regarding project related issues • Personnel and resource management • Review of project submittals • Budgeting • Technical development and implementation of RAWP and related documents
Project Manager &	Bill Major Environmental Logic	• Client contact regarding project related issues

Position	EL Personnel	Areas of Responsibilities
Field Team Leader	15 Princess Road, Suite K Lawrenceville, NJ 08648 Phone (609) 910-0720 bmajor@env-logic.com	• Coordination of contractors • Personnel and resource management • Preparation and review of project submittals • Implementation of RAWP and Field Sampling

3.3 Groundwater Remedy Design and Implementation:

ISOTEC, of Lawrenceville, NJ, will conduct groundwater remediation with oversight by EL and the Remedial Engineer. The proposed remedial action to address groundwater impacts includes enhanced in-situ Dechlorination (EISD) which applies a combination of both biotic (biodegradation by bacteria) and abiotic (chemical reactions without bacteria) processes to effectively degrade chlorinated volatile organic compounds (CVOCs) compounds in groundwater.

ISOTEC Remediation Technologies
11 Princess Road, Suite A
Lawrenceville, NJ 08648
609-275-8500

3.4 Quality Assurance Officer

The QA Officer (QAO) for this project will be Ms. Jerri Rossi, who will manage and be responsible for QA/QC review of data generated during the sample collection activities. A resume is included in Attachment A. Data processing and validation will be overseen and reviewed by the QAO. If QA problems or deficiencies requiring special action are identified, the QAO, Project Manager, and Program Manager will determine the appropriate corrective action. The QAO will then be responsible for follow-up and oversight of corrective action implementation, to the satisfaction of Madigan Development and NYSDEC.

The QAO will perform data validation activities or designate additional data validators to work under their direction. Data validators will be responsible for review of laboratory data for compliance with the project specific DQOs and for such parameters as precision, accuracy, representativeness, comparability, sensitivity, and completeness. Data validators will notify the QAO of any major QA deficiencies.

3.5 Subcontractors

3.5.1 Drilling Subcontractor

The following drillers may be used for groundwater remediation:

Coastal Environmental Solutions, Inc.
1150 Lincoln Ave, Unit 4, Holbrook, NY 11741
(631) 256-6974
www.Coastalenvsolutions.com

AARCO Environmental Services
50 Gear Ave
Lindenhurst, NY 11757
(631) 586-5900
www.aarcoenvironmental.com/

3.5.2 Sub-Slab Depressurization System (SSDS) Contractor

Clean Vapor, LLC
148 State Route 94, PO Box 688
Blairstown, NJ 07825
(908) 362-5616
www.cleanvapor.com

3.5.3 Laboratory Subcontractor

PACE/Alpha Analytical (Alpha), of Westborough, Massachusetts, will perform analysis of the samples collected during the RA. Alpha is a NYSDOH Certified Laboratory (NY Certification #11148 and #11627). The laboratory project manager for PACE/Alpha is:

Nadine Yakes, Supervisor - Project Management
PACE LABs
Westborough, MA
O: 201-812-9037
Nadine.Yakes@pacelabs.com

The laboratory will provide results that meet NYSDEC format as discussed in Section 7.3. The laboratory will also provide results that meet NYSDECs regulatory criteria presented in Section 2.3.

4.0 FIELD SAMPLING AND ANALYSIS PLAN

This Field Sampling and Analysis Plan (SAP) outlines the procedures to be followed during implementation of field investigation activities to support the Remedial Action (RA).

The following field activities will be completed as part of the RA:

- Injection well installation (either temporary well points or permanent injection wells);
- Groundwater sampling;
- Indoor/Ambient Air sampling
- Decontamination of sampling equipment; and
- Management of Investigative-Derived Waste (IDW)

Potential Site and environmental hazards associated with these activities are identified in the Site-specific HASP (**RAWP, Attachment D**). Proposed injection well locations and current monitoring well locations are shown on Figure 8 of the RAW. A Proposed Sample Summary Table is included as Table 1. An Analytical Methods/Quality Assurance Summary Table is included as Table 2. Table 3, provided by the NY State Certified Laboratory Subcontractor (PACE/Alpha Analytical) listed in Section 3.4.2., summarizes the minimum reporting limits achievable by the laboratory methodologies.

4.1 Temporary Injection Wells - Direct Push Technology Injection Approach

Temporary injection points, advanced using a direct push technology (DPT) rig, is the preferred approach for EISD implementation. The DPT approach establishes a systematic injection grid within the remediation area, allowing for more uniform amendment distribution and the inclusion of ZVI in the treatment formulation. A bottom-up injection approach will be used, such that at each injection point the DPT rig will advance 1.5-inch diameter threaded steel rods to the maximum depth at the location (anticipated to be bedrock refusal). An ISOTEC designed injection screen will be lowered to the bottom of the rod string. While the injection screen is held in place, the rod string will be retracted to expose the screen to impacted soils in the target treatment interval. The EISD amendments will then be injected through the temporary injection screen and into the subsurface. Following completion of the injections into bottom interval, the direct-push rods will be raised to the next screened interval, and injections will continue. This process will continue until the top of the treatment interval has been reached.

The ISOTEC screens are designed such that the injected reagent material enters the direct push rod and contacts within the ISOTEC screen to create a “pressurized jet flow” that allows the reagent to discharge under low pressure throughout the vertical depth interval by maintaining a continuous flow that fills the entire screen interval. Due to the small diameter (1 cm), a very small volume of water

fills the screen (<0.1 gallon) allowing uniform discharge. To focus injection delivery to the target intervals, and to minimize preferential flow across the target interval ISOTEC will use three-foot, four-foot or five-foot length screens.

The temporary direct push technology (DPT) injection points will be abandoned the same day injection activities have been completed.

4.2 Permanent Injection Wells

An alternative to deliver EISD solutions is through installed PVC injection wells. For an injection interval of up to 20 feet, 2-inch injection well screens may be installed at each injection location. Individual injection well screens would range from 8 to 15 feet long, with well screen length determined for each location based on overburden thickness, geology, and contaminant observations from soil borings. If injection wells are used for EISD implementation, smaller size ZVI would be recommended (4 micron).

4.3 Groundwater Sampling Procedures

Groundwater samples will be collected following the *EPA LOW STRESS (Low Flow) PURGING AND SAMPLING PROCEDURE FOR THE COLLECTION OF GROUNDWATER SAMPLES FROM MONITORING WELLS (Rev. 4, 2017).* This method of purging and sampling was selected to minimize the volume of purge water and to minimize sample turbidity as described below.

Groundwater sampling and analysis for PFAS will be performed in accordance with the latest guidelines listed in the NYSDEC "Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs" dated April 2023.

- Equipment will be decontaminated prior to use at each location;
- Prior to commencing daily sampling activities, the groundwater quality monitoring probes/meters including pH, conductivity, oxidation-reduction potential (ORP), dissolved oxygen, and turbidity will be calibrated in accordance with the manufacturer's instructions.

  At a minimum, two-point calibrations will be conducted for pH, conductivity, and turbidity. The dissolved oxygen probe will be checked against a zero-dissolved oxygen solution. Calibration results will be recorded on a Calibration Forms (see Attachment B).
- The intake of the pump will be positioned in the center of the screened interval and the upper end of the tubing will be connected to the flow through cell. Flow rate will be measured during purging with a calibrated container and shall not exceed 0.5 liters/min (500 ml/min).
- During purging, pH, specific conductivity, temperature, ORP, dissolved oxygen, and turbidity will be monitored and recorded at 5-minute intervals. Water quality parameter information along with water level readings to monitor drawdown will be recorded on the Groundwater Purge Sheet (see Attachment C).

- Purging is considered complete when water quality indicator parameters (WQIPs) have stabilized to within the following ranges for 3 consecutive readings which are recorded every 5 minutes:
    - pH - +/- 0.1 standard units
    - Specific conductivity - +/- 3%
    - Temperature - +/- 3%
    - Dissolved oxygen (do) - +/- 10% for values greater than 0.5 mg/l
      If three consecutive do values are less than 0.5 mg/l they will be considered as stabilized
    - turbidity - +/- 10% (for values > 1 ntu)
    - Oxidation reduction potential (orp) - +/- 10 millivolts
    - Depth to water - drawdown < -0.3 ft.

- Prior to collecting the sample, the flow-through cell will be disconnected from the tubing. Groundwater will be allowed to flow from the tubing into the sample container carefully so as to limit aeration of the sample. If preservative is present in a container, the container will not be overfilled.
- The sample bottles will be kept in the sample cooler with their caps on until they are ready to receive samples. The type of analysis for which a sample is collected determines the type of container, preservative, holding time, and filtering requirement as specified in the QAPP.
- Fill the containers that will undergo analysis for VOCs first. The VOC containers should be filled with zero headspace, and then securely capped.
- Samples for laboratory analysis will be submitted to an approved NYSDOH ELAP-certified laboratory under chain-of-custody procedures. An example chain-of-custody is included in Attachment D. The sample containers will be labeled, placed in a laboratory-supplied cooler, with protective packaging (*i.e.*, bubble wrap) and packed on ice (to maintain a temperature of <6˚ C). The cooler will be shipped no later than 48 hours after sample collection. Analyses will be conducted using USEPA methodologies. Samples will be managed in accordance with QAPP.
- Purge water will be managed in accordance with Section 4.5; and
- Equipment will be decontaminated prior to use at each location in accordance with Section 4.5.

4.4 Indoor Air Sampling

Following SSDS installation and implementation as proposed in the RAWP, indoor air samples will be collected as part of the RA, to evaluate post SSDS indoor air conditions. Samples will be collected in accordance with the NYSDOH's Guidance for Evaluating Soil Vapor Intrusion in the State of New York (VIG).

The scope of the VI Investigation will include the collection of indoor air samples in accordance with NYSDEC and NYSDOH guidelines. Seven (7) indoor air samples (IA-1 through IA-7) will be

collected. Sample locations are shown on Figure 13 of the RAW. One background ambient air sample will also be collected. Per the NYSDOH VIG, indoor air samples are typically collected during the heating season because soil vapor intrusion is more likely to occur when a building's heating system is in operation and doors and windows are closed. In New York State, heating systems are generally expected to be operating routinely from November 15th to March 31st. However, these dates are not absolute and NYSDOH guidance notes that the timeframe for sampling may vary.

Prior to sampling activities, field personnel will conduct a Site reconnaissance to complete the NYSDOH Structure Sampling Questionnaire and Building Inventory (**see Attachment E**) and document the following:

- Inspect the SSDS and identify and document any preferential pathways (cracks, perforations, sumps, drains, etc.) in the basement walls and building slab;
- Evaluate/assess for the presence of slab perforations, if any;
- Evaluate the operating conditions of the heating/ventilation/air conditioning system; and
- Identify the type and location of chemical products that could influence indoor air results.

Indoor air samples will be collected from a breathing height of approximately 3 to 5 feet above the basement slab. The ambient sample will be collected from outside the building. The samples will be collected using laboratory supplied 6-Liter Summa canisters and pressure gauge flow regulator assembly preset to collect a 24-hour time-composite sample. consistent with the proposed residential use of the Site building. Refer to **Attachment F** for Summa Canister operation instructions. All samples will be sealed, labeled, and placed in a secure container for delivery to a NYSDOH ELAP-certified analytical laboratory.

Confirmatory indoor air samples will be collected and analyzed for the full TO-15 VOCs. EPA Method TO-15 Selected Ion Monitoring (SIM) will be used for the following seven compounds in indoor and ambient air samples: 1,1,1-TCA, 1,1-dichloroethene, carbon tetrachloride, cis-1,2-dischloroethene, PCE, TCE, and vinyl chloride. Reporting limits are shown on Table 3.

An independent sub-consultant will validate sample results and prepare a Data Usability Summary Report (DUSR).

4.5 Field Decontamination and Management of Investigative Derived Waste

4.5.1 Decontamination Area

A temporary decontamination area with polyethylene sheeting will be constructed on-Site for use during any required decontamination of the drilling equipment associated with installation of the injection wells Decontamination fluids will be collected in 55-gallon drums.

4.5.2 Drilling Equipment Decontamination

The following procedures will be used to decontaminate equipment used during the RA activities.

- Drilling equipment such as augers, bits, rods, tools, and split-spoon samplers be decontaminated with high-pressure water, hot water as necessary before beginning work, following the completion of injection wells, and prior to exiting the Site;
- Tools, drill rods, and augers will be placed on polyethylene plastic sheets following decontamination. Direct contact with the ground will be avoided;
- Augers, rods, and tools will be decontaminated between each drilling location and at the completion of the work prior to leaving the Site.

4.5.3 Sampling Equipment Decontamination

In between each sampling location, non-dedicated sampling equipment will be washed with potable water and soapy water (*e.g.*, Alconox). Decontamination may take place at the sampling location as long as all liquids are contained in pails, buckets, etc. The sampling equipment will then be rinsed with potable water. Equipment can be placed on polyethylene sheets, if necessary.

4.5.4 Management of Investigative Derived Waste

Investigative Derived Waste (IDW) produced during this project include materials such as: soil, groundwater, decontamination water, personal protective equipment (PPE), and dedicated sampling equipment that may be potentially contaminated. Contained in determinations will be obtained, as needed, for disposal of IDW as non-hazardous. IDW will be handled and disposed of in accordance with applicable state and federal regulations. The following paragraphs describe procedures to be followed for handling each waste material.

<u>Decontamination Fluids</u>

Decontamination fluids associated with drilling activities will be containerized in 55-gallon drums and temporarily staged at the Site at a location convenient for transportation from the Site. At the conclusion of field activities, these materials will be appropriately characterized per disposal facility requirements, and, after receiving the necessary approvals, will be transported off-Site for treatment and/or disposal at a permitted facility.

<u>Drilling Cuttings</u>

Drill cuttings generated during installation of injection wells drilling activities will be contained in 55-gallon drums and temporarily staged at the Site at a location convenient for transportation from the Site. The final disposition of the cuttings will be identified after the various analytical results from the investigation are available. Depending on the results of the investigation, waste characterization samples will be collected pursuant to disposal facility requirements and will be transported off-Site for disposal at a permitted facility.

<u>Development and Purge Water</u>

Development and purge water will be containerized in 55-gallon drums (labeled with the date and contents, including well ID) will be temporarily staged at the Site at a location convenient for transportation from the Site. The final disposition of the water will be evaluated after the various analytical results from the investigation are available. Depending on the results of the investigation, and waste characterization samples, it is assumed that water will be transported off-Site for disposal at a permitted facility or appropriate permitting obtained for the discharge of the water to the municipal sanitary sewer system with appropriate pre-approval and permit.

4.5.5 Dedicated Sampling Equipment, Personal Protective Equipment (PPE), and General Refuse

Dedicated sampling equipment (*e.g.*, disposable polyethylene or Teflon lined bailers and tubing), used PPE, and general refuse associated with the execution of field activities will be containerized in plastic trash bags and disposed of as general refuse in appropriate waste receptacles.

5.0 FIELD INSTRUMENTS CALIBRATION AND PREVENTATIVE MAINTENANCE PROCEDURES FOR INSTRUMENTATION

Field analytical equipment will be calibrated prior to each daily sampling, or more frequently if required. The calibration procedures will conform to manufacturer's standard instructions. Calibration will be conducted in accordance with manufacturer's instructions such that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. Instrument calibrations will be documented in the project field book.

The following field instruments are anticipated to be used during the RA activities:

- MiniRae 3000 Photoionization Detector with 11.7 eV lamp
- YSI 6920 Water Quality Meter with Flow Cell
- Particulate meter

Prior to the initiation of the field investigation, a preventative maintenance and calibration program will be implemented to ensure proper operation of the field instruments. The field personnel will be familiar with the maintenance, calibration, and operation of field equipment and will perform the prescribed field operating procedures outlined in the Operations Manuals accompanying each instrument.

Field instruments used during sampling will be checked for calibration consistent with manufacturer-recommended procedure. When the manufacturer has not specified a calibration interval for an instrument, EL will establish one. Field equipment will be supplied and maintained by EL or an equipment leasing firm.

Records of instrument calibration will be maintained by the Field Team Leader and field staff. All changes to instrumentation will be noted in the field logbook.

6.0 LABORATORY ANALYSES

6.1 Environmental Samples

Groundwater samples will be analyzed for VOCs via EPA Method 8260D.

Indoor air samples will be analyzed for VOCs via EPA Method TO15.

Table 1 presents a summary of the RA samples proposed to be collected. Table 2 presents the analytical methods, sample collection containers, volumes, preservation, holding times, and

associate quality control frequency. Table 3 lists the laboratory reporting limits for proposed analytical methods listed above.

6.2 Field Duplicates, Field Blanks, Trip Blanks and MS/MSDs

To evaluate data quality, QA/QC samples will be collected during the groundwater sampling activities. Table 2 lists the environmental samples and corresponding QC samples to be collected by analysis and includes the following.

- Field Duplicate Samples - Collection of field duplicate samples provides for the evaluation of the laboratory's precision performance by comparing analytical results of two samples from the same location. They are also collected to evaluate field sample collection precision procedures. Samples are collected from one location and sent to the laboratory blind (with two different sample identifications).

  One field duplicate will be collected for every 20 samples for soil and groundwater samples.

- Field blanks will be analyzed to assess contamination introduced during field sampling procedures and sample shipment. Field blank collection begins with two sets of identical bottles; one set filled with target analyte-free water provided by the laboratory, and one empty set of bottles identical to those provided for aqueous sample collection. Field blanks are collected by pouring water supplied by the laboratory over a clean sampling instrument and collecting it in a bottle containing the appropriate preservative. The field blank samples will be subject to the same analyses as the environmental samples during the specific sampling event.

  Field blanks will be collected for every 20 samples for soil and groundwater samples.

- Trip blanks will be prepared and submitted for VOC analysis with field samples and will contain analyte-free water or preservative, as appropriate. A trip blank will be prepared by the laboratory, using the same preservation technique as that used to prepare the sample containers, from the same source as the method blank water, and sent to the Site in the cooler with the other sample containers.

  Trip blanks are collected at a rate of one (1) per sample shipment (not to exceed two consecutive field days) for VOCs. Trip blanks consist of laboratory supplied water. The blanks will remain sealed and accompany sample jars to and from the field.

- Matrix Spike / Matrix Spike Duplicate (MS/MSD) data are generated to determine long-term precision and accuracy of the analytical method with respect to sample matrices. MS/MSDs samples are duplicate samples that are collected in the field and have spiking solutions added at the laboratory during sample preparation.

  One set of MS/MSD samples will be collected for every 20 samples. If less than 20 samples are collected, one MS/MSD set will be collected. Whenever possible, MS/MSD samples will be prepared and analyzed within the same batch as the environmental samples. MS/MSD samples will be spiked at the laboratory with the complete list of target analytes.



6.3 IDW CHARACTERIZATION

Samples of the IDW generated during the investigation will be collected as needed and characterized for disposal based on the requirements of the designated disposal facility. Contained in determinations will be obtained, as needed, for disposal of IDW as non-hazardous.

7.0 DATA QUALITY OBJECTIVES

This section establishes the QA objectives for measurements that are critical to the project. The QA objectives are developed for relevant data quality indicators. These indicators include the method detection limit (MDL), reporting limit (RL), precision, accuracy, completeness, representativeness, and comparability. The data quality objectives (DQOs) are based on project requirements and ensure: (1) that the data generated during the project are of known quality and (2) that the quality is acceptable to achieve the project's technical objectives.

Quantitation Limits are laboratory-specific and reflect those values achievable by the laboratory performing the analyses. However, to ensure that the analytical methodologies are capable of achieving the DQOs, measurement performance criteria have been set for the analytical measurements in terms of accuracy, precision, and completeness. The analytical methods to be used at this site will provide a level of data quality and can be used to evaluate potential impacts to soil, groundwater, and air compared to New York State Standards, Criteria and Guidance values, and for purposes of risk assessment.

The overall QA objective is to develop and implement procedures for field sampling, chain of-custody, laboratory analysis, and reporting which will provide results that are scientifically valid, and the levels of which are sufficient to meet DQOs. Specific procedures for sampling, chain of custody, laboratory instruments calibration, laboratory analysis, reporting of data, internal quality control, and corrective action are described in other sections of the QAPP.

The data quality indicators are discussed in subsections 7.1 through 7.6.

7.1 Required Quantification Limit

The required quantification limit is the quantitative analytical level for individual analytes needed to make decisions relative to the objectives of the project. Quantitative limits may be expressed as the MDL or some quantitative level defined in terms relative to the program. It should be noted that there is some ambiguity in the definitions and use of terms that define quantification limits. The MDL presented herein is a well-defined and accepted entity, although attainable only under ideal laboratory conditions.

Method Detection Limit: The MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. MDL is determined from analysis of a sample in a given matrix type containing the analyte.

Practical Quantitation Limit: The practical quantitation limit (PQL) [also referred to as the reporting limit (RL) is the concentration in the sample that corresponds to the lowest concentration standard of the laboratory calibration curve.



Selective Ion Monitoring (SIM): TO-15 for indoor air analyses will be run in both full scan and Selective Ion Monitoring (SIM) mode to meet the required MDLs and PQLs for indoor air samples. SIM will be used for the following five compounds in indoor and ambient air samples: trichloroethene; cis-1,2-dichloroethene; 1,1-dichloroethene; carbon tetrachloride and vinyl chloride, which require a minimum laboratory reporting limit of 0.20 micrograms per cubic meter (mcg/m3) or less

7.2 Accuracy

Accuracy measures the bias in a measurement system. Sampling accuracy may be assessed by evaluating the results of field blanks and field duplicates. Analytical accuracy may be assessed through the use of matrix spikes.

Accuracy will be defined as percent recovery for the compounds of interest from the matrix spike. Matrix spikes to assess accuracy will be analyzed at a rate of 1 per 20 samples, in most cases. A sample batch will consist of a maximum of 20 environmental samples analyzed.

A matrix spike is an environmental sample to which known concentrations of analytes have been added. The matrix spike is taken through the entire analytical procedure and the recovery is calculated. Results are expressed in percent recovery. The matrix spike is used to evaluate the effect of the sample matrix on laboratory results.

7.3 Precision

Precision is a measure of variability between individual sample measurements under prescribed conditions. The specific criteria of precision are defined within the individual analytical test methods. The measure of precision will be expressed as relative percent different (RPD).

A matrix duplicate is an environmental sample that is divided into two aliquots, which are processed identically and separately, and the results are compared to determine the effect of the matrix on the precision of the analysis. Matrix duplicates and matrix spike duplicates, collectively, are to be analyzed at a rate of 1 per 20 environmental samples, in most cases.

7.4 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. “Normal conditions” are defined as the conditions expected if the sampling plan was implemented as planned. The objective for completeness is to determine if there is a sufficient amount of valid data to achieve a predetermined statistical level of confidence. Critical samples must be identified and plans must be formulated to secure requisite valid data for these samples.

Field completeness is a measure of the amount of 1) valid measurements obtained from all the measurements taken in the project and 2) valid samples collected. The field completeness objective is greater than 90 percent.

Laboratory completeness is a measure of the amount of valid measurements obtained from all valid samples submitted to the laboratory. The laboratory completeness objective is greater than 95 percent.

7.5 Representativeness

Representativeness expresses the extent to which the collected samples are reasonable representative to the environmental conditions. Representativeness of the analytical data is a function of the procedures used in processing the samples.

7.6 Comparability

Comparability expresses the confidence with which one data set can be compared to another. Comparability can be related to precision and accuracy as these quantities are measures of data reliability.

Samples from the same media will be considered comparable if the procedures for collecting the samples are complied with, the same or equivalent analytical techniques are employed and comply with the same or equivalent QA/QC procedures, and if the units of measurement are the same.

All data will be subjected to strict QA/QC procedures and reported in a consistent manner to allow for comparison across data sets.

8.0 CHAIN OF CUSTODY AND SAMPLING HANDLING PROCEDURES

Chain-of-custody procedures will be instituted and followed throughout the post remedial action sampling. These procedures include field custody, laboratory custody, and evidence files. Samples are physical evidence and will be handled according to strict chain-of-custody protocols. The QAO must be prepared to produce documentation that traces the samples from the field to the laboratory and through analysis.

8.1 SAMPLE CONTAINERS, HANDLING, AND FIELD STORAGE

The NYSDOH certified laboratory will supply appropriate sample containers containing any required preservatives for groundwater samples in coolers (as presented in Table 2). Immediately after collection, samples will be transferred to properly labeled sample containers, and for preservation and shipment to the laboratory. Table 2 lists the proper sample container, sample volumes, preservation, and holding times.

The following procedures will then be followed:

- All sample containers will be marked before sample collection. After collection, the container will be sealed, and a sample label will be attached to the container.

- Groundwater samples will be placed in a cooler packed with ice and/or ice packs to maintain a temperature of 4°C. Samples will be recorded on the Chain-of-Custody form. A copy of a Chain-of-Custody form is included as Attachment D.

- Transportation of the coolers to the laboratory will occur as soon as possible. Laboratory service will provide delivery of coolers and supplies. Chain- of-Custody will be signed accordingly.

- Laboratory personnel will be responsible for the care and custody of the sample once it is transferred to them.

8.2 Field Documentation

The field sampler is personally responsible for the care and custody of the sample until transferred. A field logbook will be used to note information regarding collection of samples and any observations. All entries will be signed and dated. Field logbooks will be waterproof and bound. The logbook will be dedicated to the project and pages will not be removed. Corrections will be made by drawing a single line through the incorrect data and initialing and dating the correction that was made to the side of the error. An initialed diagonal line will be used to indicate the end of an entry or the end of the day's activities. The following information will be recorded in the field

logbook by the field sampling team:

- Name and title of author, date, and time of site entry;
- Project number, client name, and Site name;
- Name and title of field crew members;
- Sample media;
- Sample collection method, including equipment utilized;
- Description of sample locations;
- Date and start and end time of sample collection;
- Sample and QA/QC identification numbers; and
- Field observations

8.3 Field Custody Procedures

Chain-of-Custody forms are to be initiated by the sampling crew in the field. A Chain-of-Custody form will accompany the sample from the field for sample containment and preservation, through its return to the laboratory. The Chain-of-Custody form will trace the path of each individual sample by means of a unique identification number. The Chain-of-Custody form is included in Attachment D.

Chain-of-custody records will be kept starting at the time that sample containers are placed in the coolers for transportation to the laboratory. One completed chain-of-custody record must be kept with each sample cooler at all times.

For groundwater samples, the chain-of- custody form will contain the following information:

- Project identification and number;
- Sample description/location;
- Date and time of sample collection;
- Type and matrix of sample;
- Number of sample containers;
- Analysis requested/comments;
- Sampler signature/date/time;
- Date and signature of the field representative; and
- Date and signature of the laboratory representative.

For indoor air samples, the chain-of-custody form will contain the following information:

- Project identification and number;
- Sample description/location;
- Date and time of sample collection;
- Initial and Final Vacuum of the air canisters;
- Flow controller number;
- Sample Matrix;
- Canister size/ID;
- Analysis requested/comments;

- Sampler signature/date/time;
- Date and signature of the field representative; and
- Date and signature of the laboratory representative.

Field and laboratory personnel relinquishing and receiving the sample containers will sign the Chain-of Custody form as having relinquished and received the sample containers. Different columns of the Chain-of-Custody form will be used to record specific considerations associated with sample acquisition such as sample collection time, sample designation, sample depth, sample type, analysis, preservatives and special handling instructions. The laboratory will maintain on file copies of the completed form. The completed, original form will be submitted as part of the final analysis report.

8.4 Sample Transportation

The laboratory will provide a laboratory courier for sample pick up at the Site or other designated location. Prior to shipment of sample coolers (for groundwater samples) or summa cannister totes (for indoor air samples), the field sampling team will contact the laboratory to notify the laboratory of the shipment. Samples will remain in the custody of the sampler until transfer of custody is completed. Transfer consists of:

- Delivery of samples to the client or Laboratory Sample Custodian; and/or

- Signature of the Laboratory Sample Custodian on the chain-of-custody form as receiving the samples and signature of sampler as relinquishing the samples. The field sampling team will hand deliver coolers or arrange for laboratory courier pick up at the Site or other designated location.

The chain-of-custody document will be completed by the field sampler and provided for each sample cooler or box. When transferring the possession of samples, individuals relinquishing and receiving will sign, date, and note the time on the chain-of-custody. Custody of samples must be continuous between parties and time gaps must not be present. Each shipment of samples to the laboratory must have its own chain-of-custody record with the contents of the shipment, method of shipment, name of courier, and other pertinent information written on the record. The original record accompanies the shipment and the copies are kept with the field logbook and distributed to the Consultant Project Manager. The laboratory will be notified daily of each sample shipment.

9.0 LABORATORY SAMPLE STORAGE, HANDLING, AND DATA DELIVERABLES

9.1 Laboratory Sample Receipt

Laboratory custody procedures continue when the samples are received by the laboratory. When the samples arrive at the laboratory, the Laboratory Sample Custodian will note the cooler temperature on the chain-of-custody form, where applicable. If the cooler temperature is greater than 12°C, the Consultant Project Manager will be notified.

The Laboratory Sample Custodian's duties and responsibilities upon sample receipt will be to:

- Document receipt of samples by signing the record with the date and time of sample receipt;
- Note the cooler temperature on the chain-of-custody form;
- Inspect sample for container integrity;
- Sign the appropriate forms or documents, verify, and record the agreement or disagreement of information on sample documents and, if there are discrepancies, record the problem and notify the Consultant Project Manager;
- Assign a number for each sample upon receipt. That sample number will be placed on the sample label which will remain attached to the sample container;
- Log sample information into the laboratory sample tracking system; and
- Label sample with a unique, sequential laboratory sample number.

If samples have not been properly identified during sample collection, the Laboratory Project Manager will contact the Consultant Project Manager prior to the start of sample analysis.

The laboratory will immediately contact the Consultant Project Manager if issues pertaining to sample condition or documentation are detected (*e.g.*, broken security seal; broken, open, or otherwise compromised sample containers; chain-of-custody information in disagreement with sample labels).

9.2 Laboratory Sample Storage

The analysts will initial and date the internal Custody Record when removing samples from storage. The sample custodian is responsible for filing all Custody Records forms in the project file.
Laboratory personnel will be responsible for the care and custody of the sample once it is transferred to them. Once the analysis is complete, the unused portion of the sample will be returned to the sample custodian.

Samples and sample extracts will be maintained in secure storage until disposal.

All Custody Records and associated paperwork will be maintained in a separate file for the project.

9.3 Laboratory Data Deliverable Formats

Laboratory deliverables will consist of a data package that is in general accordance with NYSDEC Analytical Service Protocol, Category B data deliverable requirements. All data generated as part of post RA activities will be submitted to NYSDEC in the appropriate Electronic Data Deliverable (EDD) format.

10.0 QUALITY CONTROL REQUIREMENTS AND MEASUREMENT PERFORMANCE CRITERIA

The overall effectiveness of a QA/QC program depends on operating in the field and laboratory according to a program that systematically ensures the precision and accuracy of analyses by detecting errors and preventing their recurrence or measuring the degree of error inherent in the methods applied. Field QA/QC includes the collection of QA/QC samples as described above in Section 4.6.

10.1 Laboratory QA/QC

The selected laboratory, Alpha Analytical/Pace (Alpha) will perform analysis of the samples collected during the RI. Alpha is a NYSDOH Certified Laboratory (NY Certification #11148) and will conduct routine QC checks, frequency of analysis, control limits, and laboratory corrective actions for the analytical method to be used in this project. A brief description of laboratory QA/QC analyses is presented below.

GC/MS Tuning

Tuning and performance criteria are established to verify mass resolution, identification, and to some degree, instrument sensitivity. These criteria are not sample specific; conformance is determined using standard materials. Therefore, these criteria should be met in all circumstances.

Calibration

Compliance requirements for satisfactory instrument calibration are established to verify that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of analysis, and continuing calibration and performance checks document satisfactory maintenance and adjustment of the instrument on a day-to-day basis.

Blanks

Several types of blanks will be analyzed by the laboratory. Corrective action procedures will be implemented for blank analyses if target compounds are detected at concentrations greater than the applicable criteria. The criteria for evaluation of blanks apply to any blank associated with a group of samples collected, prepared and/or analyzed at the same time, where applicable. If problems with a blank exist, data associated with the project must be carefully evaluated to determine whether or not there is an inherent variability in the data for the project, or if the problem is an isolated occurrence not affecting other data.

For soil and groundwater samples, a method blank is an analyte-free blank that undergoes the preparation procedures applied to a sample. These samples are analyzed to examine whether sample preparation and analysis techniques result in sample contamination. The laboratory will

prepare and analyze a method blank with each group of samples that are extracted, digested, or analyzed at the same time.

Field Duplicates, Field Blanks, Trip Blanks, and Matrix Spike/Matrix Spike Duplicates will be collected as part of the SAP, as described in Section 4.0

Internal Standards Performance

Internal standards, which are compounds not found in environmental samples, will be spiked into samples, blanks, MS/MSDs, and laboratory control samples (LCSs) at the time of sample preparation. Internal standards must meet retention time and performance criteria specified in the analytical method or the sample will be reanalyzed.

Surrogate Recovery

Accuracy and matrix biases for individual samples are monitored for organic analyses using surrogate additions. Surrogates are compounds similar in nature to the target analytes; the surrogates are spiked into aqueous and solid samples, blanks, and QC samples prior to sample preparation for organic analyses. The evaluation of the results of these surrogate spikes is not necessarily straightforward. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the review and validation of data based on specific sample results is frequently subjective.

Laboratory Control Samples

LCSs are standard solutions that consist of known concentrations of the complete list of target analytes spiked into laboratory analyte-free water or sand. They are prepared or purchased from a certified manufacturer from a source independent from the calibration standards to provide an independent verification of the calibration procedure. These QC samples are then prepared and analyzed following the same procedures employed for environmental sample analysis to assess method accuracy independently of sample matrix effects. The laboratory will prepare and analyze a LCS with each group of samples of similar matrix that are extracted, digested, or analyzed at the same time. For VOC analysis, one LCS will be analyzed with each analytical sequence in a 12-hour period for each matrix. Percent recoveries will be evaluated to assess the efficiency of the preparation and analysis method independent of sample matrix effects.

MS/MSD Samples

MS/MSD data are generated to determine long-term precision and accuracy of the analytical method with respect to sample matrices. Generally, the MS/MSD data alone are not used to evaluate the precision and accuracy for associated organic samples since data may reflect specific matrix effects only present within one sample.

One set of MS/MSD samples will be collected for every 20 samples per matrix (minimum frequency of 5%) or one per matrix for less than 20 samples. If less than 20 samples are collected, one MS/MSD set will be collected. Whenever possible, MS/MSD samples will be prepared and analyzed within the same batch as the environmental samples. MS/MSD samples will be spiked at the laboratory with the complete list of target analytes.

Compound Identification and Quantitation

The objective of the qualitative criteria is to minimize the number of erroneous identifications of compounds.

An erroneous identification can either be a false positive (reporting a compound present when it is not) or a false negative (not reporting a compound that is present). The identification criteria can be applied much more easily in detecting false positives than false negatives. Negatives, or non-detect compounds on the other hand, represent an absence of data and are therefore much more difficult to assess. The objective for quantitative requirements is to maximize the accuracy of data and sensitivity of the instrument. Unless sample screening indicates the presence of high concentration target analytes, samples will be analyzed undiluted to maximize sensitivity. Samples must be reanalyzed at the appropriate dilution when concentrations exceed the linear calibration range to maximize accuracy. Matrix interferences will be identified and documented. Samples may be diluted only if analytes of concern generate responses in excess of the linear range of the instrument.

10.2 Corrective Action

Generally, the following corrective actions may be taken by the laboratory. When analytical parameters that are within the control of the laboratory, including calibration, instrument performance, and blank criteria, are not met, the cause of the problem will be located and corrected. The analytical system will then be recalibrated.

Sample analysis will not begin until calibration, instrument performance, and blank criteria are met. When matrix spike, standard, or duplicate analyses are out of control, samples analysis will cease. The problem will be investigated. Depending on the results of the overall QC program for the sample set, the data may be accepted, accepted with qualification, or determined to be unusable. If, through the application of the corrective actions listed in this QAPP, the data is determined to be unusable, the QC analysis will be re-prepared and reanalyzed. If QC criteria are met upon reanalysis, only the new results are reported. If QC criteria are still not met upon reanalysis, both sets of sample results will be reported.

If matrix interferences are suspected, the Consultant QAO will be contacted. Unless sample screening indicates the presence of high concentration target analytes, samples may be diluted in the analysis only if analytes of concern generate responses in excess of the linear range of the instrument.

The Laboratory Project Manager will document, in the data package case narrative, how the laboratory demonstrated good analytical practices in order to attempt to achieve the specified reporting detection limits.

11.0 DATA VALIDATION AND USABILITY

Data review will be conducted by the Quality Assurance Officer who will validate the data, evaluate its usability and prepare Data Usability Summary Reports (DUSRs) in accordance with DER-10. Validation will be performed on the groundwater data generated during the RA activities for this project for each analytical method. Data validation consists of a review of data summary forms and raw analytical data that are provided in the data packages. During the data validation, data validators will recalculate selected laboratory sample calculations using raw data when verifying sample results. In addition, data validators will review raw data to verify that compound identification was performed correctly, and transcription errors are not present.

The following parameters will be evaluated as part of the data validation for organic and inorganic analyses, where applicable for each analysis method, unless otherwise noted:

- QAPP compliance;
- Chain-of-custody records;
- Sample collection and sample preservation;
- Percent solids;
- Holding times;
- GC/MS tuning criteria;
- Instrument performance;
- Calibration;
- Analytical sequence;
- Blank analysis;
- Surrogate recovery;
- MS/MSD analysis;
- Laboratory duplicate analysis;
- Field duplicate analysis;
- LCS analysis;
- ICP interference check sample analysis;
- ICP serial dilution analysis;
- Internal standards performance;
- Target analyte identification, quantitation, and QLs;
- Confirmation analysis; and
- Deliverables and documentation completeness.

11.1 Data Usability Evaluation

The specific data quality requirements including precision, accuracy, representativeness, comparability, sensitivity, and completeness will be assessed during data validation. Data usability with respect to the DQOs and data uses will be compared to the project requirements.

Based on the QA/QC information review and the qualifiers assigned to the analytical data, an overall evaluation of the data's usability will be performed.

The data usability evaluation considers the data quality objectives (DQO), as presented in Section 7.0 (precision, sensitivity, accuracy, representativeness, comparability, and completeness) which are described as follows:

- Precision is evaluated through the review of field duplicate samples, laboratory duplicates, and MS/MSD samples;
- Sensitivity is evaluated through the review of reported detection limits;
- Accuracy is evaluated through the review of MS/MSD samples, internal standards, surrogate recoveries, LCS recoveries, calibration, and instrument performance checks;
- Representativeness is evaluated through the review of holding times, sample preparation, blank analysis, and target compound identification and quantification;
- Comparability is evaluated through the review of the analytical methods and reporting procedures for consistency; and
- Completeness is defined as the overall percentage of sample results that are determined to be usable.

11.2 Data Usability Summary Report

The Data Usability Summary Report (DUSR) will contain separate QA sections in which data quality information collected during the investigation is summarized. In accordance with DER-10, Utilizing the DUSR process as guidance, the following questions will be considered during the validation:

1. Is the data package complete as defined under the requirements for the most current DEC ASP Category B or USEPA Contract Laboratory Program (CLP) deliverables?
2. Have the holding times been met?
3. Do all the QC data: blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, duplicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?
4. Have the data been generated using established and agreed upon analytical protocols?
5. Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?
6. Have the correct data qualifiers been used and are they consistent with the most current DEC ASP?
7. Have any QC exceedances been specifically noted in the DUSR and have the corresponding QC summary sheets from the data package been attached to the DUSR?

The DUSR will be prepared by or under the direction of the QAO.



TABLES

TABLE 1

245 WEST 55TH ST LLC
245 West 55th Street
Block 1027, Lot 7
New York, New York

Sample Summary Table

Sample ID	Sample Depth (feet)	Sample Matrix	Parameters
MW-5 (upgradient) MW-1, MW-1D, MW-6, and MW-7 (plume)	5-15'	Groundwater	VOCs
IA-1 through IA-7, AA	Sample intake height of approximately 3 to 5 feet above the ground/slab	Air	Full TO-15 (VOCs)

TABLE 2

245 WEST 55TH ST LLC
245West 55th Street
Block 1027, Lot 7
New York, New York

Analytical Methods/Quality Assurance Summary Table

Parameter	Matrix	USEPA Analytical Method	Number of Post-Remedial Samples	Number of Field Duplicates	Number of Field Blanks	Number of Trip Blanks	Number of MS/MSD Samples	Sample Preservation	Sample Container Volume & Type	Sample Holding Time
VOCs	Groundwater	8260D	5 Per Round	1 per 20 samples	1 per 20 samples	1 per cooler with VOC samples	1 per 20 samples	HCL, Ice	3 - 40 mL Vials	14 days
	Air	TO-15 with SIM analysis	8	1 per 20 samples	--	--	--	--	6-liter Summa canisters	14 days

Notes:
VOC+15 - Volatile Organic Compounds plus a forward library search
SIM - Selected Ion Monitoring
HCL - Hydrochloric Acid

Date Created: 05/24/24
Created By: Nadine Yakes
File: PM16792-1
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TCL Volatiles - EPA 8260D (WATER)

Holding Time: 14 days
Container/Sample Preservation: 3 - Vial HCl preserved

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
Methylene chloride	75-09-2	2.5	0.7	ug/l	70-130	20	70-130	20	20			
1,1-Dichloroethane	75-34-3	2.5	0.7	ug/l	70-130	20	70-130	20	20			
Chloroform	67-66-3	2.5	0.7	ug/l	70-130	20	70-130	20	20			
Carbon tetrachloride	56-23-5	0.5	0.134	ug/l	63-132	20	63-132	20	20			
1,2-Dichloropropane	78-87-5	1	0.137	ug/l	70-130	20	70-130	20	20			
Dibromochloromethane	124-48-1	0.5	0.149	ug/l	63-130	20	63-130	20	20			
1,1,2-Trichloroethane	79-00-5	1.5	0.5	ug/l	70-130	20	70-130	20	20			
Tetrachloroethene	127-18-4	0.5	0.181	ug/l	70-130	20	70-130	20	20			
Chlorobenzene	108-90-7	2.5	0.7	ug/l	75-130	20	75-130	20	20			
Trichlorofluoromethane	75-69-4	2.5	0.7	ug/l	62-150	20	62-150	20	20			
1,2-Dichloroethane	107-06-2	0.5	0.132	ug/l	70-130	20	70-130	20	20			
1,1,1-Trichloroethane	71-55-6	2.5	0.7	ug/l	67-130	20	67-130	20	20			
Bromodichloromethane	75-27-4	0.5	0.192	ug/l	67-130	20	67-130	20	20			
trans-1,3-Dichloropropene	10061-02-6	0.5	0.164	ug/l	70-130	20	70-130	20	20			
cis-1,3-Dichloropropene	10061-01-5	0.5	0.144	ug/l	70-130	20	70-130	20	20			
1,3-Dichloropropene, Total	542-75-6	0.5	0.144	ug/l				20	20			
1,1-Dichloropropene	563-58-6	2.5	0.7	ug/l	70-130	20	70-130	20	20			
Bromoform	75-25-2	2	0.65	ug/l	54-136	20	54-136	20	20			
1,1,2,2-Tetrachloroethane	79-34-5	0.5	0.167	ug/l	67-130	20	67-130	20	20			
Benzene	71-43-2	0.5	0.159	ug/l	70-130	20	70-130	20	20			
Toluene	108-88-3	2.5	0.7	ug/l	70-130	20	70-130	20	20			
Ethylbenzene	100-41-4	2.5	0.7	ug/l	70-130	20	70-130	20	20			
Chloromethane	74-87-3	2.5	0.7	ug/l	64-130	20	64-130	20	20			
Bromomethane	74-83-9	2.5	0.7	ug/l	39-139	20	39-139	20	20			
Vinyl chloride	75-01-4	1	0.0714	ug/l	55-140	20	55-140	20	20			
Chloroethane	75-00-3	2.5	0.7	ug/l	55-138	20	55-138	20	20			
1,1-Dichloroethene	75-35-4	0.5	0.169	ug/l	61-145	20	61-145	20	20			
trans-1,2-Dichloroethene	156-60-5	2.5	0.7	ug/l	70-130	20	70-130	20	20			
Trichloroethene	79-01-6	0.5	0.175	ug/l	70-130	20	70-130	20	20			
1,2-Dichlorobenzene	95-50-1	2.5	0.7	ug/l	70-130	20	70-130	20	20			
1,3-Dichlorobenzene	541-73-1	2.5	0.7	ug/l	70-130	20	70-130	20	20			
1,4-Dichlorobenzene	106-46-7	2.5	0.7	ug/l	70-130	20	70-130	20	20			
Methyl tert butyl ether	1634-04-4	2.5	0.166	ug/l	63-130	20	63-130	20	20			
p/m-Xylene	179601-23-1	2.5	0.7	ug/l	70-130	20	70-130	20	20			
o-Xylene	95-47-6	2.5	0.7	ug/l	70-130	20	70-130	20	20			
Xylene (Total)	1330-20-7	2.5	0.7	ug/l				20	20			
cis-1,2-Dichloroethene	156-59-2	2.5	0.7	ug/l	70-130	20	70-130	20	20			
1,2-Dichloroethene (total)	540-59-0	2.5	0.7	ug/l				20	20			
Dibromomethane	74-95-3	5	1	ug/l	70-130	20	70-130	20	20			
1,2,3-Trichloropropane	96-18-4	2.5	0.7	ug/l	64-130	20	64-130	20	20			
Acrylonitrile	107-13-1	5	1.5	ug/l	70-130	20	70-130	20	20			
Styrene	100-42-5	2.5	0.7	ug/l	70-130	20	70-130	20	20			

Please Note that the RL information provided in this table is calculated using a 100% Solids factor (Soil/Solids only)
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TCL Volatiles - EPA 8260D (WATER)

Holding Time: 14 days
Container/Sample Preservation: 3 - Vial HCl preserved

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
Dichlorodifluoromethane	75-71-8	5	1	ug/l	36-147	20	36-147	20	20			
Acetone	67-64-1	5	1.46	ug/l	58-148	20	58-148	20	20			
Carbon disulfide	75-15-0	5	1	ug/l	51-130	20	51-130	20	20			
2-Butanone	78-93-3	5	1.94	ug/l	63-138	20	63-138	20	20			
Vinyl acetate	108-05-4	5	1	ug/l	70-130	20	70-130	20	20			
4-Methyl-2-pentanone	108-10-1	5	1	ug/l	59-130	20	59-130	20	20			
2-Hexanone	591-78-6	5	1	ug/l	57-130	20	57-130	20	20			
Bromochloromethane	74-97-5	2.5	0.7	ug/l	70-130	20	70-130	20	20			
2,2-Dichloropropane	594-20-7	2.5	0.7	ug/l	63-133	20	63-133	20	20			
1,2-Dibromoethane	106-93-4	2	0.65	ug/l	70-130	20	70-130	20	20			
1,3-Dichloropropane	142-28-9	2.5	0.7	ug/l	70-130	20	70-130	20	20			
1,1,1,2-Tetrachloroethane	630-20-6	2.5	0.7	ug/l	64-130	20	64-130	20	20			
Bromobenzene	108-86-1	2.5	0.7	ug/l	70-130	20	70-130	20	20			
n-Butylbenzene	104-51-8	2.5	0.7	ug/l	53-136	20	53-136	20	20			
sec-Butylbenzene	135-98-8	2.5	0.7	ug/l	70-130	20	70-130	20	20			
tert-Butylbenzene	98-06-6	2.5	0.7	ug/l	70-130	20	70-130	20	20			
o-Chlorotoluene	95-49-8	2.5	0.7	ug/l	70-130	20	70-130	20	20			
p-Chlorotoluene	106-43-4	2.5	0.7	ug/l	70-130	20	70-130	20	20			
1,2-Dibromo-3-chloropropane	96-12-8	2.5	0.7	ug/l	41-144	20	41-144	20	20			
Hexachlorobutadiene	87-68-3	2.5	0.7	ug/l	63-130	20	63-130	20	20			
Isopropylbenzene	98-82-8	2.5	0.7	ug/l	70-130	20	70-130	20	20			
p-Isopropyltoluene	99-87-6	2.5	0.7	ug/l	70-130	20	70-130	20	20			
n-Propylbenzene	103-65-1	2.5	0.7	ug/l	69-130	20	69-130	20	20			
1,2,3-Trichlorobenzene	87-61-6	2.5	0.7	ug/l	70-130	20	70-130	20	20			
1,2,4-Trichlorobenzene	120-82-1	2.5	0.7	ug/l	70-130	20	70-130	20	20			
1,3,5-Trimethylbenzene	108-67-8	2.5	0.7	ug/l	64-130	20	64-130	20	20			
1,2,4-Trimethylbenzene	95-63-6	2.5	0.7	ug/l	70-130	20	70-130	20	20			
1,4-Dioxane	123-91-1	250	60.8	ug/l	56-162	20	56-162	20	20			
1,4-Diethylbenzene	105-05-5	2	0.7	ug/l	70-130	20	70-130	20	20			
4-Ethyltoluene	622-96-8	2	0.7	ug/l	70-130	20	70-130	20	20			
1,2,4,5-Tetramethylbenzene	95-93-2	2	0.542	ug/l	70-130	20	70-130	20	20			
Ethyl ether	60-29-7	2.5	0.7	ug/l	59-134	20	59-134	20	20			
trans-1,4-Dichloro-2-butene	110-57-6	2.5	0.7	ug/l	70-130	20	70-130	20	20			
1,2-Dichloroethane-d4	*17060-07-0*									*70-130*		
Toluene-d8	*2037-26-5*									*70-130*		
4-Bromofluorobenzene	*460-00-4*									*70-130*		
Dibromofluoromethane	*1868-53-7*									*70-130*		

Please Note that the RL information provided in this table is calculated using a 100% Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Air Analysis (TO-15) - Soil Vapor

Method	CAS Number	Compound	RL	Units		Method	CAS Number	Compound	RL	Units
TO15	71-55-6	1,1,1-Trichloroethane	1.09	ug/m3		TO15	71-55-6	1,1,1-Trichloroethane	0.2	ppbV
TO15	79-34-5	1,1,2,2-Tetrachloroethane	1.37	ug/m3		TO15	79-34-5	1,1,2,2-Tetrachloroethane	0.2	ppbV
TO15	79-00-5	1,1,2-Trichloroethane	1.09	ug/m3		TO15	79-00-5	1,1,2-Trichloroethane	0.2	ppbV
TO15	75-34-3	1,1-Dichloroethane	0.809	ug/m3		TO15	75-34-3	1,1-Dichloroethane	0.2	ppbV
TO15	75-35-4	1,1-Dichloroethene	0.793	ug/m3		TO15	75-35-4	1,1-Dichloroethene	0.2	ppbV
TO15	120-82-1	1,2,4-Trichlorobenzene	1.48	ug/m3		TO15	120-82-1	1,2,4-Trichlorobenzene	0.2	ppbV
TO15	95-63-6	1,2,4-Trimethylbenzene	0.983	ug/m3		TO15	95-63-6	1,2,4-Trimethylbenzene	0.2	ppbV
TO15	106-93-4	1,2-Dibromoethane	1.54	ug/m3		TO15	106-93-4	1,2-Dibromoethane	0.2	ppbV
TO15	95-50-1	1,2-Dichlorobenzene	1.2	ug/m3		TO15	95-50-1	1,2-Dichlorobenzene	0.2	ppbV
TO15	107-06-2	1,2-Dichloroethane	0.809	ug/m3		TO15	107-06-2	1,2-Dichloroethane	0.2	ppbV
TO15	78-87-5	1,2-Dichloropropane	0.924	ug/m3		TO15	78-87-5	1,2-Dichloropropane	0.2	ppbV
TO15	108-67-8	1,3,5-Trimethylbenzene	0.983	ug/m3		TO15	108-67-8	1,3,5-Trimethylbenzene	0.2	ppbV
TO15	106-99-0	1,3-Butadiene	0.442	ug/m3		TO15	106-99-0	1,3-Butadiene	0.2	ppbV
TO15	541-73-1	1,3-Dichlorobenzene	1.2	ug/m3		TO15	541-73-1	1,3-Dichlorobenzene	0.2	ppbV
TO15	106-46-7	1,4-Dichlorobenzene	1.2	ug/m3		TO15	106-46-7	1,4-Dichlorobenzene	0.2	ppbV
TO15	123-91-1	1,4-Dioxane	0.721	ug/m3		TO15	123-91-1	1,4-Dioxane	0.2	ppbV
TO15	540-84-1	2,2,4-Trimethylpentane	0.934	ug/m3		TO15	540-84-1	2,2,4-Trimethylpentane	0.2	ppbV
TO15	78-93-3	2-Butanone	1.47	ug/m3		TO15	78-93-3	2-Butanone	0.5	ppbV
TO15	591-78-6	2-Hexanone	0.82	ug/m3		TO15	591-78-6	2-Hexanone	0.2	ppbV
TO15	107-05-1	3-Chloropropene	0.626	ug/m3		TO15	107-05-1	3-Chloropropene	0.2	ppbV
TO15	622-96-8	4-Ethyltoluene	0.983	ug/m3		TO15	622-96-8	4-Ethyltoluene	0.2	ppbV
TO15	108-10-1	4-Methyl-2-pentanone	2.05	ug/m3		TO15	108-10-1	4-Methyl-2-pentanone	0.5	ppbV
TO15	67-64-1	Acetone	2.38	ug/m3		TO15	67-64-1	Acetone	1	ppbV
TO15	71-43-2	Benzene	0.639	ug/m3		TO15	71-43-2	Benzene	0.2	ppbV
TO15	100-44-7	Benzyl chloride	1.04	ug/m3		TO15	100-44-7	Benzyl chloride	0.2	ppbV
TO15	75-27-4	Bromodichloromethane	1.34	ug/m3		TO15	75-27-4	Bromodichloromethane	0.2	ppbV
TO15	75-25-2	Bromoform	2.07	ug/m3		TO15	75-25-2	Bromoform	0.2	ppbV
TO15	74-83-9	Bromomethane	0.777	ug/m3		TO15	74-83-9	Bromomethane	0.2	ppbV
TO15	75-15-0	Carbon disulfide	0.623	ug/m3		TO15	75-15-0	Carbon disulfide	0.2	ppbV
TO15	56-23-5	Carbon tetrachloride	1.26	ug/m3		TO15	56-23-5	Carbon tetrachloride	0.2	ppbV
TO15	108-90-7	Chlorobenzene	0.921	ug/m3		TO15	108-90-7	Chlorobenzene	0.2	ppbV
TO15	75-00-3	Chloroethane	0.528	ug/m3		TO15	75-00-3	Chloroethane	0.2	ppbV
TO15	67-66-3	Chloroform	0.977	ug/m3		TO15	67-66-3	Chloroform	0.2	ppbV
TO15	74-87-3	Chloromethane	0.413	ug/m3		TO15	74-87-3	Chloromethane	0.2	ppbV
TO15	156-59-2	cis-1,2-Dichloroethene	0.793	ug/m3		TO15	156-59-2	cis-1,2-Dichloroethene	0.2	ppbV
TO15	10061-01-5	cis-1,3-Dichloropropene	0.908	ug/m3		TO15	10061-01-5	cis-1,3-Dichloropropene	0.2	ppbV
TO15	110-82-7	Cyclohexane	0.688	ug/m3		TO15	110-82-7	Cyclohexane	0.2	ppbV
TO15	124-48-1	Dibromochloromethane	1.7	ug/m3		TO15	124-48-1	Dibromochloromethane	0.2	ppbV
TO15	75-71-8	Dichlorodifluoromethane	0.989	ug/m3		TO15	75-71-8	Dichlorodifluoromethane	0.2	ppbV
TO15	64-17-5	Ethanol	9.42	ug/m3		TO15	64-17-5	Ethanol	5	ppbV
TO15	141-78-6	Ethyl Acetate	1.8	ug/m3		TO15	141-78-6	Ethyl Acetate	0.5	ppbV
TO15	100-41-4	Ethylbenzene	0.869	ug/m3		TO15	100-41-4	Ethylbenzene	0.2	ppbV
TO15	76-13-1	Freon-113	1.53	ug/m3		TO15	76-13-1	Freon-113	0.2	ppbV
TO15	76-14-2	Freon-114	1.4	ug/m3		TO15	76-14-2	Freon-114	0.2	ppbV
TO15	142-82-5	Heptane	0.82	ug/m3		TO15	142-82-5	Heptane	0.2	ppbV
TO15	87-68-3	Hexachlorobutadiene	2.13	ug/m3		TO15	87-68-3	Hexachlorobutadiene	0.2	ppbV
TO15	67-63-0	Isopropanol	1.23	ug/m3		TO15	67-63-0	Isopropanol	0.5	ppbV
TO15	1634-04-4	Methyl tert butyl ether	0.721	ug/m3		TO15	1634-04-4	Methyl tert butyl ether	0.2	ppbV
TO15	75-09-2	Methylene chloride	1.74	ug/m3		TO15	75-09-2	Methylene chloride	0.5	ppbV
TO15	91-20-3	Naphthalene	1.05	ug/m3		TO15	91-20-3	Naphthalene	0.2	ppbV
TO15	110-54-3	n-Hexane	0.705	ug/m3		TO15	110-54-3	n-Hexane	0.2	ppbV
TO15	95-47-6	o-Xylene	0.869	ug/m3		TO15	95-47-6	o-Xylene	0.2	ppbV
TO15	179601-23-1	p/m-Xylene	1.74	ug/m3		TO15	179601-23-1	p/m-Xylene	0.4	ppbV
TO15	100-42-5	Styrene	0.852	ug/m3		TO15	100-42-5	Styrene	0.2	ppbV
TO15	75-65-0	Tertiary butyl Alcohol	1.52	ug/m3		TO15	75-65-0	Tertiary butyl Alcohol	0.5	ppbV

Air Analysis (TO-15) - Soil Vapor

Method	CAS Number	Compound	RL	Units		Method	CAS Number	Compound	RL	Units
TO15	127-18-4	Tetrachloroethene	1.36	ug/m3		TO15	127-18-4	Tetrachloroethene	0.2	ppbV
TO15	109-99-9	Tetrahydrofuran	1.47	ug/m3		TO15	109-99-9	Tetrahydrofuran	0.5	ppbV
TO15	108-88-3	Toluene	0.754	ug/m3		TO15	108-88-3	Toluene	0.2	ppbV
TO15	156-60-5	trans-1,2-Dichloroethene	0.793	ug/m3		TO15	156-60-5	trans-1,2-Dichloroethene	0.2	ppbV
TO15	10061-02-6	trans-1,3-Dichloropropene	0.908	ug/m3		TO15	10061-02-6	trans-1,3-Dichloropropene	0.2	ppbV
TO15	79-01-6	Trichloroethene	1.07	ug/m3		TO15	79-01-6	Trichloroethene	0.2	ppbV
TO15	75-69-4	Trichlorofluoromethane	1.12	ug/m3		TO15	75-69-4	Trichlorofluoromethane	0.2	ppbV
TO15	593-60-2	Vinyl bromide	0.874	ug/m3		TO15	593-60-2	Vinyl bromide	0.2	ppbV
TO15	75-01-4	Vinyl chloride	0.511	ug/m3		TO15	75-01-4	Vinyl chloride	0.2	ppbV

Air Analysis (TO-15) - Indoor Air / Ambient Air

Method	CAS Number	Compound	RL	Units		Method	CAS Number	Compound	RL	Units
TO15	79-34-5	1,1,2,2-Tetrachloroethane	1.37	ug/m3		TO15	79-34-5	1,1,2,2-Tetrachloroethane	0.2	ppbV
TO15	79-00-5	1,1,2-Trichloroethane	1.09	ug/m3		TO15	79-00-5	1,1,2-Trichloroethane	0.2	ppbV
TO15	75-34-3	1,1-Dichloroethane	0.809	ug/m3		TO15	75-34-3	1,1-Dichloroethane	0.2	ppbV
TO15	120-82-1	1,2,4-Trichlorobenzene	1.48	ug/m3		TO15	120-82-1	1,2,4-Trichlorobenzene	0.2	ppbV
TO15	95-63-6	1,2,4-Trimethylbenzene	0.983	ug/m3		TO15	95-63-6	1,2,4-Trimethylbenzene	0.2	ppbV
TO15	106-93-4	1,2-Dibromoethane	1.54	ug/m3		TO15	106-93-4	1,2-Dibromoethane	0.2	ppbV
TO15	95-50-1	1,2-Dichlorobenzene	1.2	ug/m3		TO15	95-50-1	1,2-Dichlorobenzene	0.2	ppbV
TO15	107-06-2	1,2-Dichloroethane	0.809	ug/m3		TO15	107-06-2	1,2-Dichloroethane	0.2	ppbV
TO15	78-87-5	1,2-Dichloropropane	0.924	ug/m3		TO15	78-87-5	1,2-Dichloropropane	0.2	ppbV
TO15	108-67-8	1,3,5-Trimethylbenzene	0.983	ug/m3		TO15	108-67-8	1,3,5-Trimethylbenzene	0.2	ppbV
TO15	106-99-0	1,3-Butadiene	0.442	ug/m3		TO15	106-99-0	1,3-Butadiene	0.2	ppbV
TO15	541-73-1	1,3-Dichlorobenzene	1.2	ug/m3		TO15	541-73-1	1,3-Dichlorobenzene	0.2	ppbV
TO15	106-46-7	1,4-Dichlorobenzene	1.2	ug/m3		TO15	106-46-7	1,4-Dichlorobenzene	0.2	ppbV
TO15	123-91-1	1,4-Dioxane	0.721	ug/m3		TO15	123-91-1	1,4-Dioxane	0.2	ppbV
TO15	540-84-1	2,2,4-Trimethylpentane	0.934	ug/m3		TO15	540-84-1	2,2,4-Trimethylpentane	0.2	ppbV
TO15	78-93-3	2-Butanone	1.47	ug/m3		TO15	78-93-3	2-Butanone	0.5	ppbV
TO15	591-78-6	2-Hexanone	0.82	ug/m3		TO15	591-78-6	2-Hexanone	0.2	ppbV
TO15	107-05-1	3-Chloropropene	0.626	ug/m3		TO15	107-05-1	3-Chloropropene	0.2	ppbV
TO15	622-96-8	4-Ethyltoluene	0.983	ug/m3		TO15	622-96-8	4-Ethyltoluene	0.2	ppbV
TO15	108-10-1	4-Methyl-2-pentanone	2.05	ug/m3		TO15	108-10-1	4-Methyl-2-pentanone	0.5	ppbV
TO15	67-64-1	Acetone	2.38	ug/m3		TO15	67-64-1	Acetone	1	ppbV
TO15	71-43-2	Benzene	0.639	ug/m3		TO15	71-43-2	Benzene	0.2	ppbV
TO15	100-44-7	Benzyl chloride	1.04	ug/m3		TO15	100-44-7	Benzyl chloride	0.2	ppbV
TO15	75-27-4	Bromodichloromethane	1.34	ug/m3		TO15	75-27-4	Bromodichloromethane	0.2	ppbV
TO15	75-25-2	Bromoform	2.07	ug/m3		TO15	75-25-2	Bromoform	0.2	ppbV
TO15	74-83-9	Bromomethane	0.777	ug/m3		TO15	74-83-9	Bromomethane	0.2	ppbV
TO15	75-15-0	Carbon disulfide	0.623	ug/m3		TO15	75-15-0	Carbon disulfide	0.2	ppbV
TO15	108-90-7	Chlorobenzene	0.921	ug/m3		TO15	108-90-7	Chlorobenzene	0.2	ppbV
TO15	75-00-3	Chloroethane	0.528	ug/m3		TO15	75-00-3	Chloroethane	0.2	ppbV
TO15	67-66-3	Chloroform	0.977	ug/m3		TO15	67-66-3	Chloroform	0.2	ppbV
TO15	74-87-3	Chloromethane	0.413	ug/m3		TO15	74-87-3	Chloromethane	0.2	ppbV
TO15	10061-01-5	cis-1,3-Dichloropropene	0.908	ug/m3		TO15	10061-01-5	cis-1,3-Dichloropropene	0.2	ppbV
TO15	110-82-7	Cyclohexane	0.688	ug/m3		TO15	110-82-7	Cyclohexane	0.2	ppbV
TO15	124-48-1	Dibromochloromethane	1.7	ug/m3		TO15	124-48-1	Dibromochloromethane	0.2	ppbV
TO15	75-71-8	Dichlorodifluoromethane	0.989	ug/m3		TO15	75-71-8	Dichlorodifluoromethane	0.2	ppbV
TO15	64-17-5	Ethanol	9.42	ug/m3		TO15	64-17-5	Ethanol	5	ppbV
TO15	141-78-6	Ethyl Acetate	1.8	ug/m3		TO15	141-78-6	Ethyl Acetate	0.5	ppbV
TO15	100-41-4	Ethylbenzene	0.869	ug/m3		TO15	100-41-4	Ethylbenzene	0.2	ppbV
TO15	76-13-1	Freon-113	1.53	ug/m3		TO15	76-13-1	Freon-113	0.2	ppbV
TO15	76-14-2	Freon-114	1.4	ug/m3		TO15	76-14-2	Freon-114	0.2	ppbV
TO15	142-82-5	Heptane	0.82	ug/m3		TO15	142-82-5	Heptane	0.2	ppbV
TO15	87-68-3	Hexachlorobutadiene	2.13	ug/m3		TO15	87-68-3	Hexachlorobutadiene	0.2	ppbV
TO15	67-63-0	Isopropanol	1.23	ug/m3		TO15	67-63-0	Isopropanol	0.5	ppbV
TO15	1634-04-4	Methyl tert butyl ether	0.721	ug/m3		TO15	1634-04-4	Methyl tert butyl ether	0.2	ppbV
TO15	75-09-2	Methylene chloride	1.74	ug/m3		TO15	75-09-2	Methylene chloride	0.5	ppbV
TO15	91-20-3	Naphthalene	1.05	ug/m3		TO15	91-20-3	Naphthalene	0.2	ppbV
TO15	110-54-3	n-Hexane	0.705	ug/m3		TO15	110-54-3	n-Hexane	0.2	ppbV
TO15	95-47-6	o-Xylene	0.869	ug/m3		TO15	95-47-6	o-Xylene	0.2	ppbV
TO15	179601-23-1	p/m-Xylene	1.74	ug/m3		TO15	179601-23-1	p/m-Xylene	0.4	ppbV
TO15	100-42-5	Styrene	0.852	ug/m3		TO15	100-42-5	Styrene	0.2	ppbV
TO15	75-65-0	Tertiary butyl Alcohol	1.52	ug/m3		TO15	75-65-0	Tertiary butyl Alcohol	0.5	ppbV
TO15	109-99-9	Tetrahydrofuran	1.47	ug/m3		TO15	109-99-9	Tetrahydrofuran	0.5	ppbV
TO15	108-88-3	Toluene	0.754	ug/m3		TO15	108-88-3	Toluene	0.2	ppbV
TO15	156-60-5	trans-1,2-Dichloroethene	0.793	ug/m3		TO15	156-60-5	trans-1,2-Dichloroethene	0.2	ppbV
TO15	10061-02-6	trans-1,3-Dichloropropene	0.908	ug/m3		TO15	10061-02-6	trans-1,3-Dichloropropene	0.2	ppbV
TO15	75-69-4	Trichlorofluoromethane	1.12	ug/m3		TO15	75-69-4	Trichlorofluoromethane	0.2	ppbV
TO15	593-60-2	Vinyl bromide	0.874	ug/m3		TO15	593-60-2	Vinyl bromide	0.2	ppbV

Air Analysis (TO-15) - Indoor Air / Ambient Air

Method	CAS Number	Compound	RL	Units		Method	CAS Number	Compound	RL	Units
TO15-SIM	71-55-6	1,1,1-Trichloroethane	0.109	ug/m3		TO15-SIM	71-55-6	1,1,1-Trichloroethane	0.02	ppbV
TO15-SIM	75-35-4	1,1-Dichloroethene	0.079	ug/m3		TO15-SIM	75-35-4	1,1-Dichloroethene	0.02	ppbV
TO15-SIM	56-23-5	Carbon tetrachloride	0.126	ug/m3		TO15-SIM	56-23-5	Carbon tetrachloride	0.02	ppbV
TO15-SIM	156-59-2	cis-1,2-Dichloroethene	0.079	ug/m3		TO15-SIM	156-59-2	cis-1,2-Dichloroethene	0.02	ppbV
TO15-SIM	127-18-4	Tetrachloroethene	0.136	ug/m3		TO15-SIM	127-18-4	Tetrachloroethene	0.02	ppbV
TO15-SIM	79-01-6	Trichloroethene	0.107	ug/m3		TO15-SIM	79-01-6	Trichloroethene	0.02	ppbV
TO15-SIM	75-01-4	Vinyl chloride	0.051	ug/m3		TO15-SIM	75-01-4	Vinyl chloride	0.02	ppbV

FIGURES



NEW YORK
QUADRANGLE LOCATION

USGS The National Map
USGS 7.5 Minute Series Topographic Map of Central Park, New York

GRAPHIC SCALE

0 1,000 2,000 4,000

(IN FEET)

N
W E
S

Environmental LOGIC

11 Princess Road Suite B,
Lawrenceville, NJ 08648

Scale: AS SHOWN		PROJECT: 23-0001
Date: 6/14/23		
Drawn By: PM	Checked By: BM	

SITE LOCATION ON USGS QUADRANGLE
245 WEST 55TH STREET
BLOCK 1027, LOT 7
MANHATTAN, NEW YORK

FIGURE # 1

PM File: 245W55_ManhattenNY-F1_SLM.mxd

LEGEND

APPROXIMATE SITE BOUNDARY

PARCEL BOUNDARY

Block: 1027
Lot: 63

Block: 1027
Lot: 60

Italia D.
Block: 1027
Lot: 160

Kozinn 238 LLC
Block: 1027
Lot: 58

236 West 56th
RealtyCRP
Block: 1027
Lot: 57

Block: 1027
Lot: 56

One-Story Brick
Building

Yard

Block: 1027
Lot: 104

Block: 1027
Lot: CA

Block: 1027
Lot: 103

Block: 1027
Lot: 103

Block: 1027
Lot: 101

Block: 1027
Lot: 102

Block: 1027
Lot: 5

Japas
Enterprises Inc.
Block: 1027
Lot: 6

Twelve-Story
Brick Building
Block: 1027
Lot: 7

Block: 1027
Lot: 9

Block: 1027
Lot: 2

Block: 1027
Lot: 1

Eleven-Story
Brick Building

Concrete Sidewalk

Concrete Sidewalk

Eighth Avenue

W. 55 th Street

GRAPHIC SCALE

0 10 20 40

(IN FEET)

Environmental LOGIC
15 Princess Road, Suite K
Lawrenceville, NJ 08648

SCALE: AS SHOWN		PROJECT # 23-0001
DATE: 6/15/23		
DRAWN BY: PM		
CHECKED BY: BM		

SITE MAP
245 WEST 55TH STREET
BLOCK 1027, LOT 7
MANHATTAN, NEW YORK

FIGURE # 2

File: X:\EnvironmentalLogic\Manhatten_NY\245W55thStreet\Drawings\245W55_ManhattenNY.dwg, F2_SM

ATTACHMENT A

Resumes of Key Personnel

Matthew Carroll, P.E.
Environmental Engineer/Principal

Experience Summary

Matthew Carroll is an environmental engineer experienced in all aspects of site assessment and development and implementation of remedial strategies. He has managed projects from inception through investigation, remediation and closure. His expertise includes soil, soil gas, and groundwater remediation, preparation of cost estimates, remedial alternative selection and design, soil characterization for disposal, field safety oversight, and preparation of work plans and reports to satisfy New York and New Jersey state requirements, and New York City "e" designation and restrictive declarations. Mr. Carroll's project management experience includes past management of a New York City School Construction Authority hazardous materials contract. He is responsible for all engineering work performed by Tenen and is currently the project manager and remedial engineer for several New York State Brownfield Cleanup Program sites.

Selected Project Experience

470 Kent Avenue, Brooklyn
As project manager, supported the client in due diligence and transactional activities, including a Phase I ESA, preliminary site investigation, and remedial cost estimate; preparation of BCP application and remedial investigation work plan. The former manufactured gas plant, sugar refinery and lumberyard will be developed as a mixed-use project with market rate and affordable housing and public waterfront access. As remedial engineer, will be responsible for development of remedial alternatives and oversight and certification of all remedial activities.

500 Exterior Street, Bronx
Designed and implemented the investigation of this former lumberyard and auto repair shop that will be redeveloped as mixed use development with an affordable housing component; prepared BCP application and subsequent work plans and reports. Designed a remedial strategy incorporating both interim remedial measures (IRMs) and remediation during the development phase.

Gateway Elton I and II, Brooklyn
Conducted soil disposal characterization, prepared Remedial Action Work Plans and designed methane mitigation systems for two phases of a nine-building residential development and commercial space; prepared and oversaw implementation of a Stormwater Pollution Prevention Plan during construction and prepared and certified the remedial closure reports for the project.

Affordable Housing Development, Rye, NY
Consultant to the City of Rye on environmental issues pertaining to a county-owned development site slated for an afford senior housing; reviewed environmental documentation for the project and prepared summary memorandum for City Council review; recommended engineering controls to address potential exposure to petroleum constituents, presented report findings at public meetings and currently providing ongoing environmental support during project implementation.

Queens West Development BCP Site, Long Island City, New York
Assistant Project Manager for two developers involved in the site.

- Responsible for oversight of remediation under the New York State Brownfield Cleanup Program
- Technical review of work plans and reports and coordination of the Applicant's investigation and oversight efforts
- Provided input for mass calculations and well placement for an in-situ oxidation remedy implemented on a proposed development parcel and within a City street
- Conducted technical review of work pertaining to a former refinery. Documents reviewed included work plans for characterization and contaminant delineation; pilot test (chemical oxidation); remediation (excavation and groundwater treatment). Managed field personnel conducting full time oversight and prepared progress summaries for distribution to project team
- Following implementation of remedial action, implemented the Site Management Plan and installation/design of engineering controls (SSDS, vapor barrier/concrete slab, NAPL recovery). Also responsible for coordination with NYSDEC

Brownfield Cleanup Program Redevelopment Sites – West Side, New York City
Managed remediation of a development consisting of four parcels being addressed under one or more State and city regulatory programs (NYS Brownfield Cleanup Program, NYS Spills, and NYC "e" designation program). Remediation includes soil removal, screening and disposal; treatment of groundwater during construction dewatering and implementation of a worker health and safety plan and community air monitoring plan (HASP/CAMP)

Managed an additional BCP site, supported the Applicant in coordination with MTA to create station access for the planned No. 7 subway extension; also provided support the client in coordination with Amtrak to obtain access for remedial activities on the portion of the site that is within an Amtrak easement. The site will eventually be used for construction of a mixed-use high-rise building.

BCP Site, Downtown Brooklyn, New York
Performed investigation on off-site properties and designed an SSDS for an adjacent building, retrofitting the system within the constraints of the existing structure; coordinated the installation of the indoor HVAC controls and vapor barrier; provided input to the design of a SVE system to address soil vapor issues on the site.

West Chelsea Brownfield Cleanup Program Site
Designed an in-situ remediation program and sub-slab depressurization system to address contamination remaining under the High Line Viaduct; SSDS design included specification of sub-grade components, fan modeling and selection, identifying exhaust location within building constraints and performance modeling; prepared the Operations Maintenance and Monitoring Plan and Site Management Plan sections pertaining to the SSDS.

Historic Creosote Spill Remediation – Queens, New York – New York State Voluntary Cleanup Program
Modeled contamination volume and extent and prepared mass estimates of historic fill constituents and creosote-related contamination; designed a soil vapor extraction (SVE) and dewatering system to address historic creosote release both above and below static

water table; coordinated with the Metropolitan Transit Authority and prepared drawings to secure approval to drill in the area of MTA subway tunnels.

NYSDEC Spill Site– Far West Side, Manhattan
Provided support to client during negotiations with a major oil company regarding allocation of remedial costs. Worked with client's attorney to develop a regulatory strategy to address the client's obligations under the NYSDEC Spills Program and the New York City "e" designation requirements.

Affordable Housing Site, Brooklyn, New York
Modified prior work plans for soil, soil vapor and groundwater investigation to address requirements for site entry into the New York City Brownfield Cleanup Program. Prepared technical basis for use of prior data previously disallowed by OER. Currently conducting site investigation.

New York City School Construction Authority Hazardous Materials Contract
Provided work scopes and cost estimates, managed and implemented concurrent projects, including Phase I site assessments, Phase II soil, groundwater and soil gas investigations, review of contractor bid documents, preparation of SEQR documents, specifications and field oversight for above- and underground storage tank removal, and emergency response and spill control.

Former Manufacturing Facility, Hoboken, New Jersey
Evaluated site investigation data to support a revision of the current property use to unrestricted; modified the John & Ettinger vapor intrusion model to apply the model to a site-specific, mixed use commercial/residential development; implemented a Remedial Action Work Plan that included the characterization, removal and separation of 9,500 cubic yards of historic fill; designed and implemented a groundwater characterization/delineation program using a real-time Triad approach; designed and implemented an innovative chemical oxidation technology for the property.

F**ormer Varnish Manufacturer – Newark, New Jersey**
Prepared a Phase I environmental site assessment; implemented soil and groundwater sampling to assess presence of petroleum and chlorinated compounds; prepared alternate cost remediation scenarios for settlement purposes and implemented a groundwater investigation plan, including pump tests and piezometer installation to assess the effect of subsurface utilities and unique drainage pathways upon contaminant transport.

Education and Certifications

Professional Engineer, New York
Bachelor of Engineering, Environmental; Stevens Institute of Technology, 2002
Bachelor of Science, Chemistry, New York University, 2002
Technical and Regulatory Training in Underground Storage Tanks, Cook College, Rutgers University, 2006

Gary Weissberger
Associate

OVERVIEW
Mr. Weissberger joined Environmental Logic, LLC in 2018. He has over 25 years' experience in the environmental industry. As an Associate, his responsibilities include management and oversight of investigation and remediation projects, supervision and mentoring of junior staff members, client management, proposal preparation, project budgeting, and scheduling.

His project experience includes evaluating and investigating residential, commercial, and industrial properties in New Jersey, New York, and Pennsylvania. Gary has extensive experience in the implementation and management of environmental investigations, site assessments and audits, waste characterization and disposal, remedial investigations and remedial design, as well as the preparation and implementation of Phase I and II Environmental Assessments in compliance with ASTM standards.

He has performed and supervised all aspects of site investigations and remediation conducted pursuant to the provisions of the NJDEP's Industrial Site and Recovery Act and Site Remediation Reform Act.

EDUCATION
- Bachelors in Geology, University of Rochester, Rochester, New York

CAREER POSITIONS
- Environmental Logic, LLC, Associate (2018-Present)
- The Whitman Companies, Project Manager/Senior Project Manager (1996 – 2018)
- Rare Earth Envirosciences, Inc., Hydrogeologist (1992-1996)
- Dynamac Inc., Staff Geologist (1991-1992)

PROFESSIONAL CERTIFICATIONS AND SPECIAL TRAINING
- Licensed Site Remediation Professional (NJDEP License #746717)
- NJ Underground Storage Tank Certification in Closure and Subsurface Evaluation (License #0017920)
- New York Professional Geologist, (License #000828-1)
- Completed 40-Hour OSHA HAZWOPER Training and Annual Updates

KEY PROJECTS

Auto Repair Facility, Summit, NJ

- PCE Soil and ground water contamination identified by potential purchaser during due diligence activities.
- Designed and implemented field investigations to complete Remedial Investigation (RI) phase.
- Oversaw and implemented on-site and off-site Vapor Intrusion (VI) investigations due to Immediate Environmental Concern (IEC) conditions identified during RI activities.
- Designed and oversaw the Soil Remedial Action Program which included structurally supporting the building to remove source material beneath the slab and installation of a vapor barrier to mitigate VI concerns.
- Currently working on Monitored Natural Attenuation (MNA) program to address remaining ground water contaminants.

Former Industrial Client, Linden, NJ

- Advised client through multiple ISRA investigations and filings beginning in 1996.
- Coordinated ISRA filing, Remediation Certification, and Remediation Funding Source with the legal team.
- Conducted Preliminary Assessments (PAs) of the site to identify AOCs.
- Designed Site Investigations (SI) based on the PA.
- Directed the registration and removal of several Underground Storage Tanks identified during SI activities.
- Directed the assessment and removal of contaminated soils from AOCs related to site operations.
- Prepared deed notices and applied for remedial action permits to address historic fill.
- Designed groundwater investigations and implemented a MNA program to address ground water contaminants.

Municipal Park, Old Tappan, NJ

- Chlordane impacted soils were identified during a PA/SI conducted to obtain NJ Green Acres funding for the acquisition of former agricultural property converted to a municipal park.
- Oversaw hybrid remedial action consisting of hot spot excavation and risk based spatially weighted compliance averaging.

William Major
Assistant Project Manager

OVERVIEW

Mr. Major joined Environmental Logic in 2018. As an Assistant Project Manager, Mr. Major's responsibilities encompass all aspects of environmental property assessments, including:

- Performance of all facets of NJDEP remedial phase reporting, including Preliminary Assessments, Site Investigation Reports, Remedial Investigation Reports, Remedial Action Reports and Receptor Evaluations in full accordance with the New Jersey Department of Environmental Protection (NJDEP) standards and under Licensed Site Remediation Professional (LSRP) oversight.
- Performance of all facets of Phase I and II Environmental Site Assessments in full accordance with ASTM International standards, including site inspections and preparation of associated reports.
- Sampling of various media including soil, ground water, drinking water, soil vapor, and indoor air at various sites in accordance with the respective NJDEP field sampling procedures and practices

EDUCATION

- B.S. Environmental Science from Stockton University, Galloway, New Jersey

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

- Completed 40-Hour OSHA HAZWOPER Training and Annual Updates
- Completed ASTM Phase I and Phase II Training Course

CAREER POSITIONS

- Environmental Logic, LLC, Assistant Project Manager (2018-Present)
- Whitman, Staff Scientist/Project Scientist (2014 – 2018)

Jeri L. Rossi

(908) 370-3431; richjerirossi513@gmail.com

Ms. Rossi has over 35 years of experience in the environmental industry and is a Certified Environmental Analytical Chemist through the National Registry of Certified Chemists. Ms. Rossi has extensive experience in the data review process having examined data for a variety of matrices for compliance with state and federal validation guidelines. She has over seven years experience preparing NYSDEC DUSRs and assisting in the preparation of EDDs for submittal. Her background includes sample preparation and analysis, method development, analytical data review and reduction, data validation, and project management. She has prepared and analyzed samples of various matrices in a laboratory setting. Her experience as a quality assurance/quality control (QA/QC) director coupled with her experience as an analyst has provided her with a thorough understanding of the entire laboratory process - six years as Quality Assurance/Quality Control Director for two laboratories as well as over 15 years in the laboratory as both Manager and analyst. She has extensive experience in reviewing data from the perspective of both an analyst and QA/QC Director. As a Project Manager, she has managed all aspects of client projects from coordinating sampling events through reporting results.

Professional Experience:

Sr. Environmental Chemist
Performed validation of analytical data for samples analyzed pursuant to the U.S. EPA Contract Laboratory Program Statement of Work (CLP), U.S. EPA SW-846, and various other EPA methodologies. Thoroughly understands the U.S. EPA Functional Guidelines for data validation, as well as various regional and other agency guidelines. She has performed data validation for numerous projects.
Actively providing data validation and evaluation services for sites located in Connecticut, California, Florida, Pennsylvania, and New Jersey. Activities include coordination of laboratory analyses, data review, comparison of results with historical data to determine trends, and preparation of validation and evaluation reports.

QA/QC Director
Implemented and maintained Quality System for entire laboratory. Strong emphasis placed on meeting State regulations as well as complying with NELAC standards. Performed internal audits on each department to confirm compliance with method requirements and laboratory quality standards. Implemented Corrective Action procedures based on results of internal audits. Reviewed and updated Standard Operating Procedures (SOPs) on an annual basis. Developed and implemented ethics training program. Ensured laboratory compliance with current State and Federal regulations. Evaluated laboratory compound lists and limits against various States' cleanup standards. Reviewed and approved all client QAPPs. Performed technical review of final reports prior to release to client. Resolved all client data inquiries. Maintained excellent relations with clients as well as State agencies through ongoing communication.

Authored technical memorandum delineating the analytical requirements for various agency regulatory programs. Used internally and as a resource for clients, these documents were created to ensure the laboratory analytical process complied with agency requirements.

Assisted with development, installation, and implementation of air analysis at the analytical level. Tasks included a comparative review of laboratory Standard

Education

BS, Environmental Science, Cook College, Rutgers University - New Brunswick, NJ - 1993

Professional Affiliations

NJ LSRPA – member

TNI – The NELAC Institute – member. Mentoring Subcommittee member.

NEMC - National Environmental Monitoring Conference – session chair.

Chair, Environmental Laboratory Advisory Committee (ELAC) 2011.

Secretary, Environmental Laboratory Advisory Committee (ELAC) 2009-2010.

Certifications

Certified Environmental Analytical Chemist with the National Registry of Certified Chemists.

40-Hour OSHA Hazardous Waste Safety Training

Operation Procedures (SOPs) and agency approved methodologies, a review of method detection limits (MDLs), and coordination of the analyst-specific demonstration of capabilities necessary for certification. In addition, assisted with establishing analysis programs, reviewed data packages, and resolved client inquiries.

Reviewed project specific QAPPs to confirm the laboratory's ability to achieve project goals. Verified QC tables, required reporting limits, and parameter lists. Identified QC requirements that could not be met by the lab and confirmed that the laboratory held the necessary certifications. Summarized project QAPP for use internally, identifying any anomalies affecting the sample preparation and analysis.

Prepared and presented technical seminars to clients detailing changes which had the potential to impact project needs. Topics included modifications to analytical methods, technical rules, and NELAC standards.

Chair/Secretary - New Jersey Environmental Laboratory Advisory Committee
Ms. Rossi held the positions of Chair (1yr) and Secretary (2yrs) of the New Jersey ELAC committee. During this time she actively contributed to the development and implementation of the NJ EPH method. She also co-chaired an analytical sub-committee that evaluated and recommended alternate methods for the analysis of 1,4-Dioxane. This effort led to the DEP offering certification for 1,4-Dioxane analysis by Method 8270 using isotopic dilution.

Project Manager
Managed projects for over 25 clients. Reviewed QAPPs to ensure laboratory met project and client needs. Efforts concentrated on coordinating sampling events with the laboratory, serving as technical resource for clients, meeting turn-around times and review and release of technically sound data.

Analyst/Manager
Performed analysis on various matrices for Volatile Organics, Semi-Volatile Organics, Total Petroleum Hydrocarbons and Petroleum Fingerprinting. Managed Volatile Organic and Semi-Volatile Organic departments. Ensured analyses were method compliant and were performed in accordance with project-specific requirements. Developed, implemented and trained laboratory personnel in laboratory-specific Standard Operating Procedures, focusing on good lab practices. Performed routine and non-routine maintenance of analytical instrumentation.

Professional Publications/Presentations:

"Uncertainty Associated with Field and Laboratory Activities"; CIANJ EBC Spring Conference presentation, May 2015.

"Final Data Interpretation/Usability: What's the Next Step?'; NJ LSRPA Fall 2017 Seminar.

"Data Interpretation"; NJ Site Remediation Conference, January 2018.

Jeri L. Rossi

Continuing Education/Specialized Training:

‘New Jersey DEP/Stroud Center Macroinvertebrate Fall Stream School, Rutgers University, October 2016.

“Advanced Petroleum Forensics”, Rutgers University, October 2013.

“Interpretation of Mass Spectra," conducted by Environmental Analytical Consulting, Inc., Edison, New Jersey, March 1990.

ATTACHMENT B

Sample Calibration Form

Environmental LOGIC www.env-logic.com

15 Princess Road, Suite K
Lawrenceville, NJ 08648
P: (609) 910-0720
F: (609) 275-9608

Name of Analyst:_____ **Date:**_____
Signature of Analyst:_____
Project:_____ **Rental Company:** _____
Meter Serial Number/Unit:_____ **Display:**_____

Calibration Solution Information

Parameter	Solution Value	Manufacturer	Lot Number	Expiration Date
Conductivity	1.413 mS/cm			
Turbidity	126 / 100 NTU (Circle Value)			
	0 NTU			
pH	4.00			
	7.00			
	10.00			
DO	0.0			

Initial Calibration pH Calibration and Parameter Check

	Time	Temp. (°C)	Calibration Standard pH	Pre-Calibration Reading	Post-Calib. Reading Allowable Ranges: 9.95 - 10.05 3.95 - 4.05	Calibration Check Reading (Measurement Mode)	Allowable Range: 6.9 - 7.1 [Pass = P Fail = F]
Calibrate			10			NA	NA
Calibrate			4			NA	NA
Check			7	NA	NA		
If Fail recalibrate							
Calibrate			10			NA	NA
Calibrate			4			NA	NA
Check			7	NA	NA		
If Fail twice, replace meter.							

pH Calibration Check

Check pH 7.0 solution every 3 hours after initial calibration.

	Time	Temp. (°C)	Calibration Standard	Calibration Check Reading (Measurement Mode)	Allowable Range: 6.8 - 7.2 [Pass = P Fail = F]
Check			7		
Check			7		
Check			7		

Environmental LOGIC www.env-logic.com

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Lawrenceville, NJ 08648
P: (609) 910-0720
F: (609) 275-9608

If Fail, recalibrate. If Fail twice, replace meter.

Conductivity Calibration Check – YSI

	Time	Temp. (°C)	Calibration Standard (mS/cm)	Pre-Calibration Reading (mS/cm)	Post-Calibration Reading (mS/cm)	Calibration Check Reading (Measurement Mode)	Allowable Range: 1.398 - 1.427 (mS/cm) [Pass = P Fail = F]
Check			1.413	NA	NA		
If Fail, proceed to conductivity - Calibration table							

Conductivity Calibration – YSI

	Time	Temp. (°C)	Calibration Standard (mS/cm)	Pre-Calibration Reading (mS/cm)	Post-Calibration Reading (mS/cm)	Calibration Check Reading (Measurement Mode)	Allowable Range: 1.398 - 1.427 (mS/cm) [Pass = P Fail = F]
Check			1.413	NA	NA		
Calibrate			1.413				
			1.413				
			1.413				

Conductivity Calibration Check – Horiba

	Time	Temp. (°C)	Calibration Standard (mS/cm)	Pre-Calibration Reading (mS/cm)	Post-Calibration Reading (mS/cm)	Calibration Check Reading (Measurement Mode)	Allowable Ranges: -0.01 - 0.01 0.989 - 1.009 (mS/cm) [Pass = P Fail = F]
Check			0.0	NA	NA		
Check			0.999	NA	NA		
If Fail, proceed to conductivity - Calibration table							

Environmental LOGIC www.env-logic.com

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Lawrenceville, NJ 08648
P: (609) 910-0720
F: (609) 275-9608

Conductivity Calibration – Horiba

	Time	Temp. (°C)	Calibration Standard (mS/cm)	Pre-Calibration Reading (mS/cm)	Post-Calibration Reading (mS/cm)	Calibration Check Reading (Measurement Mode)	Allowable Range: -0.01 - 0.01 (mS/cm) [Pass = P Fail = F]
Check			0.0	NA	NA		
Calibrate			0.0				
			0.0				
			0.0				

Calibrate if Fail after Check

Conductivity Calibration – Horiba

	Time	Temp. (°C)	Calibration Standard (mS/cm)	Pre-Calibration Reading (mS/cm)	Post-Calibration Reading (mS/cm)	Calibration Check Reading (Measurement Mode)	Allowable Range: 0.989 - 1.009 (mS/cm) [Pass = P Fail = F]
Check			0.999	NA	NA		
Calibrate			0.999				
			0.999				
			0.999				

Calibrate if Fail after Check

Environmental LOGIC www.env-logic.com

15 Princess Road, Suite K
Lawrenceville, NJ 08648
P: (609) 910-0720
F: (609) 275-9608

Turbidity Calibration Check

	Time	**Temp. (°C)**	**Calibration Standard** (NTU) (Circle Value)	**Pre-Calibration Reading**	**Post-Calibration Reading**	**Calibration Check** (Measurement Mode)	**Allowable Range** 113.4 - 138.6 (YSI) 90 - 110 (Horiba) [Pass = P Fail = F]
Check			126 / 100	NA	NA		
Check			126 / 100	NA	NA		
Check			126 / 100	NA	NA		
If Fail, proceed to Turbidity - Calibration table							

Check Turbidity solution every 3 hours after initial calibration.

Turbidity Calibration

	Time	**Temp. (°C)**	**Calibration Standard** (NTU) (Circle Value)	**Pre-Calibration Reading**	**Post-Calibration Reading**	**Calibration Check** (Measurement Mode)	**Allowable Range** 113.4 - 138.6 (YSI) 90 - 110 (Horiba) [Pass = P Fail = F]
Calibrate			0			NA	NA
Calibrate			126 / 100			NA	NA
Check			126 / 100	NA	NA		
If Fail, recalibrate							
Calibrate			0			NA	NA
Calibrate			126 / 100			NA	NA
Check			126 / 100	NA	NA		
If Fail, replace meter.							

126 NTU Standard Provided with YSI / 100 NTU Standard Provided with Horiba

Environmental LOGIC www.env-logic.com

15 Princess Road, Suite K
Lawrenceville, NJ 08648
P: (609) 910-0720
F: (609) 275-9608

Turbidity Calibration

	Time	**Temp. (°C)**	**Calibration Standard** (NTU) (Circle Value)	**Pre-Calibration Reading**	**Post-Calibration Reading**	**Calibration Check** (Measurement Mode)	**Allowable Range** 113.4 - 138.6 (YSI) 90 - 110 (Horiba) [Pass = P Fail = F]
Calibrate			0			NA	NA
Calibrate			126 / 100			NA	NA
Check			126 / 100	NA	NA		
If Fail, recalibrate							
Calibrate			0			NA	NA
Calibrate			126 / 100			NA	NA
Check			126 / 100	NA	NA		
If Fail, replace meter.							

126 NTU Standard Provided with YSI / 100 NTU Standard Provided with Horiba

DO Calibration Check

	Time	**Temp. (°C)**	**Calibration Standard** mg/L	**Check Reading**	**Allowable Range:** -0.3 - 0.3 Mg/L [Pass = P Fail = F]
Check			0		
If Fail, proceed to DO - Calibration table					

DO - Calibration (% DO Sat.)

	Time	**Temp. (°C)**	**Calibration Standard** % DO Sat.	**Pre-Calibration Reading** % DO Sat.	**Post-Calibration Reading** % DO Sat.	***Calibration Check Reading** mg/L (Measurement Mode)	**Allowable Range:** -0.3 - 0.3 [Pass = P Fail = F]
Calibration			100				
			100				
			100				
			100				

*Calibration check uses zero oxygen standard. If Fail, recalibrate with % DO Sat.

Environmental LOGIC www.env-logic.com

15 Princess Road, Suite K
Lawrenceville, NJ 08648
P: (609) 910-0720
F: (609) 275-9608

Temperature

	Time	Thermometer Correction Factor (°C)	• Reference NIST Temperature Certification from the rental company's certification packet. • Check thermometer correction factor. • If thermometer correction factor is greater than ±0.5 °C, record the difference on calibration sheet. • Any temperature correction factor > 0.5 °C must be applied to all measurements thereafter or a new meter must be obtained.
Check			

Notes:

ATTACHMENT C

Sample Well Purge Form

Project Name: **Env-Logic Personnel:** **Project Location:**

Project Number: **Date:** **Weather:**

Environmental LOGIC www.env-logic.com

Monitoring Well ID:			Time	Temp.	Change	Cond.	Change	DO	Change	pH	Change	ORP	Change	Turbidity	Change	DTW	Change	Pump Rate
			24-Hour	°C	± 3%	µmol L^{-1}	± 3%	mg/L	± 10%		± 0.1 unit	mV	± 10 mV	NTU	± 10%	ft	< 0.3	GPM
Well Information	Well Diameter (in)																	
	Depth of Well (ft)																	
	Screen Length (ft)																	
	Casing Type																	
Equipment Information	Pump Type																	
	Tubing Type																	
	Water Quality Meter Type																	
	Calibration Time																	
	Equipment Number																	
Initial Readings	PID (Initial)																	
	Initial DTW (ft)																	
	Depth to Product																	
	Saturated Thickness (ft)																	
	Volume of Water (G or L)																	
	Volume to Purge (G or L)																	
Purge Information	Purge Method																	
	Pump Intake Depth (ft)																	
	Purge Start Time																	
	Purge End Time																	
	Total Purge Time																	
	Post-Purge DTW (ft)																	
	Purge Rate (GPM or LPM)																	
	Purge Volume (G or L)																	
	Max. Drawdown (ft)																	
Sample Information	Sampling Type																	
	Sample Time																	

Well Conversions: Diameter to Volume (Gallons)	2" = 0.16	4" = 0.65	6" = 1.46	8" = 2.61	10" = 4.08	12" = 5.87	Sample Analysis	
Comments:								

ATTACHMENT D

Sample Label and Chain of Custody

NEW JERSEY CHAIN OF CUSTODY

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page of

Date Rec'd in Lab

ALPHA Job #

Client Information
Client:
Address:
Phone:
Fax:
Email:

Project Information
Project Name:
Project Location:
Project #
(Use Project name as Project #) ☐
Project Manager:
ALPHAQuote #:

Turn-Around Time
Standard ☐ Due Date:
Rush (only if pre approved) ☐ # of Days:

Deliverables
☐ NJ Full / Reduced
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other

Regulatory Requirement
☐ SRS Residential/Non Residential
☐ SRS Impact to Groundwater
☐ NJ Ground Water Quality Standards
☐ NJ IGW SPLP Leachate Criteria
☐ Other

Billing Information
☐ Same as Client Info
PO #

Site Information
Is this site impacted by Petroleum? Yes ☐
Petroleum Product:

These samples have been previously analyzed by Alpha ☐

For EPH, selection is REQUIRED:
☐ Category 1
☐ Category 2

For VOC, selection is REQUIRED:
☐ 1,4-Dioxane
☐ 8011

Other project specific requirements/comments:

Please specify Metals or TAL.

ANALYSIS

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

Total Bottle

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Sample Specific Comments

Container Type
Preservative

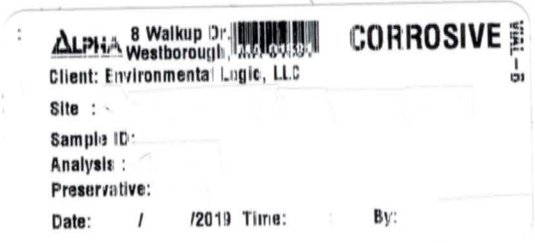
Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Relinquished By:	Date/Time	Received By:	Date/Time

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)


ALPHA
8 Walkup Dr.
Westborough,
CORROSIVE
Client: Environmental Logic, LLC
Site :
Sample ID:
Analysis :
Preservative:
Date: / /2019 Time: By:

AIR ANALYSIS

PAGE_____ OF _____

CHAIN OF CUSTODY

320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab:

ALPHA Job #:

Client Information

Client:

Address:

Phone:

Fax:

Email:

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name:

Project Location:

Project #:

Project Manager:

ALPHA Quote #:

Turn-Around Time

☐ Standard ☐ RUSH *(only confirmed if pre-approved!)*

Date Due: **Time:**

Report Information - Data Deliverables

☐ FAX
☐ ADEx
Criteria Checker: _____
(Default based on Regulatory Criteria Indicated)
Other Formats: _____
☐ EMAIL (standard pdf report)
☐ Additional Deliverables: _____

Report to: (if different than Project Manager)

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed	Program	Res / Comm

Other Project Specific Requirements/Comments:

Project-Specific Target Compound List: ☐

ANALYSIS

All Columns Below Must Be Filled Out

ALPHA Lab ID (Lab Use Only)	Sample ID	COLLECTION End Date	Start Time	End Time	Initial Vacuum	Final Vacuum	Sample Matrix*	Sampler's Initials	Can Size	I D Can	I D - Flow Controller	TO-15	TO-15 SIM	APH Subtract Non-petroleum HCs ☐	Fixed Gases	Sulfides & Mercaptans by TO-15			Sample Comments (i.e. PID)

*SAMPLE MATRIX CODES

AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side.

Relinquished By:	Date/Time	Received By:	Date/Time:

ATTACHMENT E

NYDOH Indoor Air Quality Questionnaire and Building Inventory

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors_____ Building age_____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	_____
1st Floor	_____
2nd Floor	_____
3rd Floor	_____
4th Floor	_____

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y / N

b. Does the garage have a separate heating unit? Y / N / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA Please specify_____

d. Has the building ever had a fire? Y / N When?_____

e. Is a kerosene or unvented gas space heater present? Y / N Where? _____

f. Is there a workshop or hobby/craft area? Y / N Where & Type? _____

g. Is there smoking in the building? Y / N How frequently? _____

h. Have cleaning products been used recently? Y / N When & Type? _____

i. Have cosmetic products been used recently? Y / N When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____

l. Have air fresheners been used recently? Y / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / N If yes, where vented?_____

n. Is there a bathroom exhaust fan? Y / N If yes, where vented?_____

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type?_____

Are there odors in the building? Y / N
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	Public Water	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	Public Sewer	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:

First Floor:

12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y / N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

ATTACHMENT F

Summa Canister Operation Instructions

Sampling Instructions for Soil Vapor

Composite Sampling Using Canisters

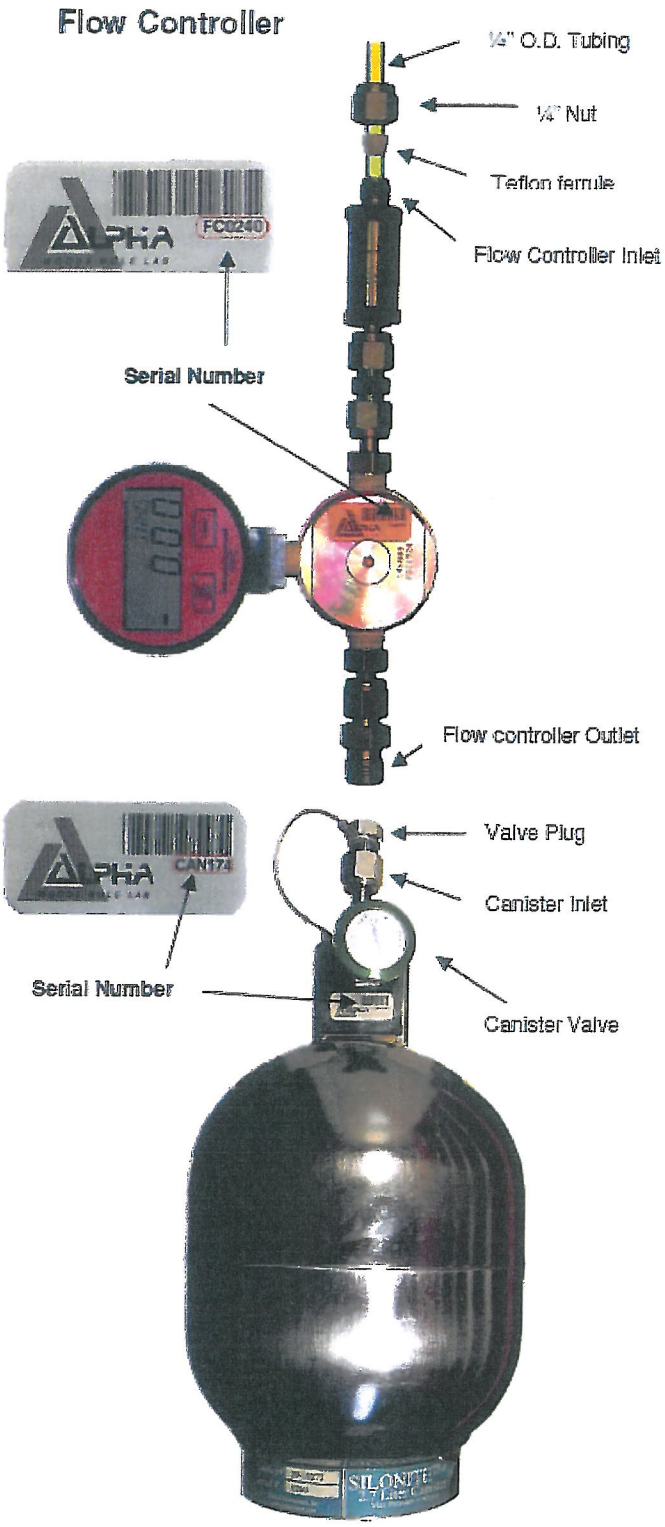
1. Remove plastic cap from the flow controller outlet. Check to see that the o-ring is still in place on the VCO fitting. Extra o-rings and ferrules are located on the inside cover of the shipping container. Remove valve plug from canister inlet.
2. Connect the flow controller outlet to the canister inlet; hand-tight will suffice since this is an o-ring fitting.
3. Press the ON/OFF button to turn digital gauge on. Units should be in "in. Hg". Re-zero if necessary by pressing the "ZERO" button. Gauge will automatically turn off after 20 minutes.
4. Attach tubing (if necessary) to the ¼ in. fitting (Teflon ferrule included) on the flow controller inlet.
5. Open the valve on the canister; the vacuum gauge should drop from zero to 28 in. Hg. If the gauge does not decrease to 28 in. Hg, the canister may have developed a leak and should not be used for sampling. Record the start time on the canister label.
6. Allow canister to fill for the duration of the sampling period (i.e. 1 hr., 2 hr.). After the composite time has elapsed, close the valve on the canister. DO NOT OVER-TIGHTEN. The vacuum gauge should be near 5 in. Hg; the flow controller is calibrated so that the composite will complete without completely filling the canister. This ensures that a constant flow was maintained throughout the sampling event.
7. Disconnect the tubing from the flow controller and the flow controller from the canister. Re-attach the plastic cap on the flow controller outlet. Re-install the valve plug on the canister inlet. Record final vacuum, date, & time on COC and/or canister label.
8. Chain of Custody (COC) documentation: record the sample ID, canister serial # and the flow controller serial #. Record start/stop sampling times and vacuum readings (to one decimal place only).

DO NOT STICK ANY LABELS ONTO THE CANISTER OR WRITE ON THE CANISTER. PLEASE USE THE MANILA TAG ATTACHED TO THE CANISTER.

Rental Terms and Conditions

Canisters are supplied free of charge for two weeks. A $10 per calendar day rental fee will be assessed for each canister after two weeks. A cleaning fee of $54 will be assessed for any canister returned to the laboratory unused. A replacement fee of $550 will be charged for any canister that is damaged or not returned to the laboratory.

Calibrated flow controllers are supplied at a cost of $27 for an initial two week period. A $27 per 2 week rental fee will be assessed for each flow controller after two weeks. A replacement fee of $750 will be charged for any flow controller that is damaged or not returned to the laboratory.



Soil Vapor Sampling - Troubleshooting Guide

1. Digital vacuum gauge-additional instructions:

    a. Units should be in in. Hg. To change units, press and hold both the ON/OFF and ZERO button. Allow display to scroll through and stop at the in. Hg unit.

    b. If a vacuum gauge is not functioning, vacuum readings can be obtained using a second flow controller (if available) or an independent vacuum gauge. Independent vacuum gauges are available upon request from the laboratory.

2. A problem often encountered with soil vapor sampling is that there is simply insufficient vapor available to fill the canister, possibly due to tight soil conditions or high moisture content. Canister samples collected under these conditions may not fill the canister completely. At a minimum, the canisters should reach a pressure of -15 in Hg in order to have a valid sample.

3. If at the end of the sampling event, the canister has not reached a pressure of -15 in. Hg, then the laboratory may have to pressurize the canister slightly in order to have an acceptable level of pressure in the canister to conduct analysis. This pressurization of the canister will result in a dilution factor of 2-3 fold being applied to the final results.

4. The valve must be manually closed at the end of the designated sampling period (i.e. 1 hr) in order for the canister to stop sampling. If valve is not closed, canister will continue sampling for a short period of time until the canister pressure is equal to ambient pressure.

5. If additional assistance is needed, please contact Alpha's Mansfield laboratory at **508-822-9300.**

ATTACHMENT H

Citizen Participation Plan

NEW YORK STATE | Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
245 West 55th Street

March 2024

C231157
245 West 55th Street
Manhattan, NY10019

Contents

Section **Page Number**

1. What is New York's Brownfield Cleanup Program? 3

2. Citizen Participation Activities 3

3. Major Issues of Public Concern 9

4. Site Information 10

5. Investigation and Cleanup Process 11

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Appendix B - Site Contact List 17

Appendix C - Site Location Map 27

Appendix D - Brownfield Cleanup Program Process 30

* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **245 WEST 55TH ST LLC ("Applicant")**
Site Name: **245 West 55th Street ("Site")**
Site Address: **245 West 55th Street**
Site County: **New York**
Site Number: **C231157**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants who conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at:
http://www.dec.ny.gov/chemical/8450.html .

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision-makers form or adopt final positions.

Involving citizens affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

Site Contact List

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.
The site contact list includes, at a minimum:

- Chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;
- Residents, owners, and occupants of the site and properties adjacent to the site;
- The public water supplier which services the area in which the site is located;
- Any person who has requested to be placed on the site contact list;
- The administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- Location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

Note: The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site. See http://www.dec.ny.gov/chemical/61092.html .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

CP Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

- The 53rd street branch of the New York Public library has been designated as a document repository for this project. Documents are available on the internet at the following link: www.nypl.org/about/locations/53rd-street

- Manhattan Community Board 5 has also been established as a document repository.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

Technical Assistance Grant

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

As of the date the declaration (page 2) was signed by the NYSDEC project manager, the significant threat determination for the site had not yet been made.

To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at
http://www.dec.ny.gov/regulations/2590.html

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

Citizen Participation Activities	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repository(ies)	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement (BCA):	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation **Note:** Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA.
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report • Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)	At the time the cleanup action has been completed. **Note:** The two fact sheets are combined when possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

The primary issue of public concern at the site is the potential for soil vapor intrusion to occur within structures surrounding the site. Soil vapor intrusion refers to the process by which chemicals that readily evaporate move from a subsurface source into the indoor air of overlying buildings. Soil vapor, or soil gas, is the air found in the pore spaces between soil particles. Soil vapor enters buildings through cracks in slabs or basement floors and walls, and through openings around sump pumps or where electrical wires go through the foundation. If soil vapor is contaminated, and enters a building as described above, indoor air quality may be affected. This issue can be of concern to local residents, homeowners, businesses, and several community groups.

A sub-slab depressurization system (SSDS) and a vapor barrier are planned for installation in the onsite structure to mitigate any potential vapor intrusion issues. Evaluation of vapor intrusion issues is ongoing.

The Site is not located within and Environmental Justice Area. Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities.

Because the Site is not located in and Environmental Justice Area, there is no need to translate future fact sheets into another language.

For additional information, visit: https://statisticalatlas.com/tract/New-York/New-York-County/013700/Race-and-Ethnicity

However, as the site cleanup goes on, there may be issues with regards to truck traffic, noise, or odors.

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

The Site (i.e., 245-249 West 55th Street) is in an urban area within the city of Manhattan, New York, and is approximately 1,000 feet southwest of Central Park. Site Features: The Site is developed with one twelve-story commercial/office building with a basement, which was constructed circa 1914. The site is 0.14 acres in size and the building is 6,026 square feet. The site is currently vacant and is located within a C6-4/C6-6 Commercial District (i.e., a General Central Commercial Zoning district in NYC). In zones C6-4 and C6-6 you can build a variety of commercial building uses, community facilities, and residential buildings. To the north of the site, there are two multi-family residential buildings. To the south, east, and west of the site there are multiple commercial/office buildings.

Site Geology and Hydrogeology: Based on soil sampling conducted by EL in January and February 2023, shallow soils consisted of sands and silty sands underlain by more clayey material. One soil boring was advanced to the presumed depth of bedrock, approximately 35 feet below the basement floor (i.e., approximately 48 to 50 feet below grade). Bedrock observed in this boring consisted of weathered schist at approximately 32.5 feet below the basement floor. Bedrock underlying the site consists of the Hartland Formation, which is comprised of a dark grey, medium- to coarse-grained muscovite-biotite-garnet (mica) schist and grey fine-grained quartz feldspar granulite biotite and garnet, with localized concentrations of granite and intrusions of coarse-grained granitic pegmatite. Based on ground water sampling conducted by Environmental Logic in January 2023, ground water at the site was encountered at approximately 27 feet below grade.

History of Site Use, Investigation, and Cleanup

Past Use of the Site: The site was utilized by DuArt Media Services/DuArt Film Labs for cinematographic film cleaning and film processing from approximately 1922 through 2011. Film production including voiceover work, audio recording, and film editing continued to take place at the Site until 2021. Cinematographic film cleaning operations utilized cleaning and degreasing compounds including tetrachloroethene (PCE) and 1,1,1-trichloroethane (1,1,1-TCA) to remove dirt, grease, and minor scratches from film negatives prior to print. The on-site storage, use, and disposal of these cleaning and degreasing compounds over a period of approximately 90 years is the likely source of the chlorinated volatile organic compounds (CVOCs) identified in ground water, soil gas, and indoor air at the site.

The primary contaminants of concerns identified at the site include tetrachloroethene (PCE), 1,1,1-Trichloroethane (1,1,1-TCA), Trichloroethylene (TCE), and their

derivatives. As noted above, these contaminants can be traced back to DuArt who would use PCE and 1,1,1-TCA solvents to remove dirt, grease, and minor scratches from film negatives prior to print. These contaminants can be found within ground water as well as in sub-slab soil gas and indoor air.

Asbestos-containing materials have been confirmed to be present and are being abated as part of building renovations. Since the building was constructed circa 1914, lead based paint is suspected to be present but has not yet been confirmed any lead based paint will be abated or encapsulated as part of building renovation activities.

Soil, Ground Water, and Vapor intrusion sampling were conducted at the Site to investigate potential impacts from the historic solvent use. Sampling activities identified the following conditions at the site:

- Shallow ground water is impacted with these solvents at concentrations greater than the NYS Groundwater Quality Standards.
- Contaminants associated with the solvents were detected in sub-slab soil gas and in indoor air within the basement of the site building.
- In soils, contaminants were either not detected or were detected at concentrations below the NYS Unrestricted Use Soil Cleanup Objectives (UUSCOs).

Based on the investigation conducted to date, ground water contamination appears to be limited to the shallow overburden aquifer and is not found at depth. Vapor intrusion is occurring in the on-site building because of the identified shallow overburden ground water impacts.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used unrestricted purposes.

To achieve this goal, the Applicant will conduct investigation and/or cleanup activities at

the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement (BCA) executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant will conduct an investigation of the site officially called a “remedial investigation” (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment.

The remedial investigation has several goals:

1) Define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) Identify the source(s) of the contamination;
3) Assess the impact of the contamination on public health and the environment; and
4) Provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant submits a draft “Remedial Investigation Work Plan” to NYSDEC for review and approval. NYSDEC makes the draft plan available to the public review during a 30-day public comment period.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the investigation report to determine if the site poses a significant threat to public health or the environment. If the site is a “significant threat,” it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Interim Remedial Measures

An Interim Remedial Measure (IRM) is an action that can be undertaken at a site when a source of contamination or exposure pathway can be effectively addressed before the site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period.

Remedy Selection

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a "Certificate of Completion" (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a "Remedial Work Plan". The Remedial Work Plan describes the Applicant's proposed remedy for addressing contamination related to the site.

When the Applicant submits a draft Remedial Work Plan for approval, NYSDEC would announce the availability of the draft plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a Final Engineering Report (FER) that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

Certificate of Completion

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the FER. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been

achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

Site Management

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An *institutional control* is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An *engineering control* is a physical barrier or method to manage contamination. Examples include caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A -
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Erick Bower
Project Manager
NYSDEC
Division of Environmental
Remediation 625 Broadway
Albany, NY 12233
518-402-9824
Erick.bower@dec.ny.gov

Thomas V. Panzone
Public Participation Specialist
Division of Communications,
Education and Engagement
NYSDEC Region 2
1 Hunter's Point Plaza
47-40 21st Street
Long Island City, NY 11101-5401
(718) 482-4953
Thomas.panzone@dec.ny.gov

New York State Department of Health (NYSDOH):
Chris Budd
Project Manager
NYSDOH
Empire State Plaza
Corning Tower Room 1787
Albany, NY 12237
518-402-7860
beei@health.ny.gov

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents

New York Public Library
53rd Street Branch
Genevieve Rodriguez, Managing Librarian
18 West 53rd Street
New York, NY 10019
212-714-8400
53stbranch@nypl.org

Manhattan Community Board 5
450 7th Avenue, Rm. 2109
New York, NY 10123
Phone: 212-465-0907
Email: office@cb5.org
Chairperson: Samir Lavingia

Manhattan Community Board 5
(continued)
Vice Chair: Sam Levy
Transportation and the Environment Committee
District Manager: Marisa Mack

Site-related documents are also available for review through the DECInfo Locator on-line at:
https://extapps.dec.ny.gov/data/DecDocs/C231157/

Appendix B - Site Contact List

NY Chief Executive Officer
Mayor Eric Adams
City Hall
New York, NY 10007

New York City Planning Commission
David Gold, Esq. Manhattan Office
120 Broadway, 31st Floor
New York, NY 10271

Manhattan Borough President
Hon. Mark Levine, Manhattan Borough President
The David N. Dinkins Municipal Building
1 Centre Street, 19th Floor
New York, NY 10007

Hon. Brad Lander
NYC Comptroller
1 Centre Street
New York, NY 10007

Hon. Jumaane Williams
Public Advocate
1 Centre Street 15th Floor North
New York, NY 10007

Rohit Aggarwala
Commissioner, NYC Dept. of Environmental Protection
59-17 Junction Boulevard
Flushing, NY 11373

Mark McIntyre, Acting Director/General Counsel
NYC Office of Environmental Remediation
100 Gold Street - 2nd Floor
New York, NY 10038

Hon. Gail Brewer
NYC Councilmember
563 Columbus Ave
New York, NY 10024

Hon. Liz Krueger
NYS Senator
211 E 43rd Street Suite 2000
New York, NY 10017

Hon. Tony Simone
NYS Assemblymember
214 West 29th Street Suite 1401
New York, NY 10001

Hon. Jerrold Nadler
US House of Representatives
201 Varick Street, Suite 669
New York, NY 10014

Hon Charles Schumer
U.S. Senator
780 Third Avenue, Suite 2301
New York, NY 10017

Hon. Kirsten Gillibrand
U.S. Senator
780 Third Avenue, Suite 2601
New York, NY 10017

Hon. Milton Tingling
Manhattan County Clerk
New York County Courthouse
60 Centre Street, Room 161
New York, NY 10007

Local Media Outlets:

New York Daily News
PO Box 7180
New York, NY 10008

New York Post
1211 Avenue of the Americas
New York, NY 10036

Spectrum NY 1 News
75 Ninth Avenue
New York, NY 10011

AM New York
1 Metrotech Center
Brooklyn, NY 11201
West Side Spirit
20 West Avenue
Chester, NY 10918

Manhattan News Network
509 West 38th Street
New York, NY 10018

The West Sider Chelsea Clinton News
8th Avenue & 35th Street
New York, NY 10018

Schools & Daycare Facilities:

M933 City Knoll Middle School
https://www.cityknollms.org/
President/Executive Director/Principal
440 West 53rd Street
New York, NY 10019
212-492-9062

P.S. 212 Midtown West School
https://insideschools.org/school/02M212
President/Executive Director/Principal
328 West 48th Street
Manhattan, NY 10036
212-247-0208

Success Academy Charter School - Hell's Kitchen Elementary
President/Executive Director/Principal
https://www.successacademies.org/school/hells-kitchen/
439 W 49th St, 2nd Floor
New York, NY 10019
(646) 790-2153

Park West Educational Campus
President/Executive Director/Principal
https://insideschools.org/school/02M535
525 West 50th Street
Manhattan, NY 10019
(646) 557-2840

Park West Educational Campus
President/Executive Director/Principal
https://insideschools.org/school/02M535
525 West 50th Street
New York, NY, 10019
(646) 557-2840

M303 The Facing History School
President/Executive Director/Principal
525 West 50th Street
New York, NY, 10019
(212) 757-2680

Polly Dodge Center
President/Executive Director/Principal
538 W 55th St,
New York, NY 10019
(212) 757-2047

Family School West
President/Executive Director/Principal
308 W 46th St,
New York, NY 10036
(212) 688-5950
https://thefamilyschoolsnyc.org/

Success Academy Charter School - Hudson Yards Elementary & Middle School
President/Executive Director/Principal
500 W 41st St,
New York, NY 10036
(212) 845-9683

M296 High School of Hospitality Management
President/Executive Director/Principal
https://hshm.ss6.sharpschool.com/
525 West 50th Street
New York, NY 10019
212-586-0963

Bright Horizons Children's Centers LLC
President/Executive Director/Principal
745 7 Avenue
New York, NY 10019
(877) 242-2737
https://www.brighthorizons.com/-/media/back-up-centers/Barclays_BU-detailed-info-slick_1179.ashx?as=1

Bright Horizons at West 53RD
President/Executive Director/Principal
540 W 53rd St,
New York, NY 10019
(646) 348-9013

Hudsonway Immersion School
President/Executive Director/Principal
525 WEST 52 STREET
New York, NY 10019
(212) 787-8088
https://hwis.org/nyc-campus/

Bright Horizons Children's Centers
President/Executive Director/Principal
1271 AVENUE OF THE AMERICAS
New York, NY 10020
(877) 242-2737
https://www.brighthorizons.com/-/media/back-up-centers/Ave-of-Americas_BU-detailed-info-slick_0406.ashx?as=1

Bright Horizons Children's Centers LLC
President/Executive Director/Principal
https://child-care-preschool.brighthorizons.com/ny/newyork/columbuscircle
910 9 AVENUE
New York, NY 10019
(212) 542-5285

Bright Minds Center
President/Executive Director/Principal
341 WEST 50 STREET
New York, NY 10019
https://www.brightmindsnyc.com/

AHRC New York City
Walter and Evelyn Redfield Day Services
President/Executive Director/Principal
https://www.ahrcnyc.org/locations/walter-evelyn-redfield-center/
450 West 56th Street, 2nd Floor
New York, NY 10019
212-513-7489

Star America Preschool
President/Executive Director/Principal
https://www.timessquarenyc.org/locations/star-america-preschool
780 8th Avenue, 301
New York, NY 10036
212-262-4896

West Side YMCA
President/Executive Director/Principal
https://ymcanyc.org/locations/west-side-ymca
5 WEST 63 STREET
New York, NY 10023
212-912-2600

High School For Environmental Studies
President/Executive Director/Principal
https://www.envirostudies.org/
444 West 56th Street
New York, NY 10019
(212) 262-8113

Professional Childrens School
President/Executive Director/Principal
https://pcs-nyc.org/
132 WEST 60 STREET
New York, NY 10023
212-582-3116

P.S. 035 Manhattan High School
President/Executive Director/Principal
https://www.manhattanhs.org/
317 WEST 52 STREET
New York, NY 10019

Beacon School
President/Executive Director/Principal
https://www.manhattanhs.org/
522 West 44th Street, 2nd Floor
New York, NY 10036

City Knoll Middle School
President/Executive Director/Principal
https://www.manhattanyouth.org/programs/city-knoll-middle-school
440 WEST 53 STREET
New York, NY 10019
212-766-1104 (105)

PS 111 The Adolph S. Ochs School
President/Executive Director/Principal
http://www.ps111adolphsochs.org/
440 West 53rd Street
New York, NY 10019
212-582-7420

M139 Stephen T. Mather Building Arts & Craftsmanship High School
President/Executive Director/Principal
https://www.matherhsnyc.org/
439 WEST 49 STREET
New York, NY 10019
212-399-3520

Urban Assembly Gateway School For Technology
President/Executive Director/Principal
https://www.theuagway.org/
439 West 49th Street
New York, NY 10019
212-246-1041

The Speyer School
President/Executive Director/Principal
https://www.speyerschool.org/
925 9 AVENUE
New York, NY 10019
212-581-4000

Ethical Culture Fieldston School
President/Executive Director/Principal
33 Central Park West
New York, NY 10023
https://www.ecfs.org/contact-and-directions/
212-712-6220

Professional Performing Arts High School
President/Executive Director/Principal
http://www.ppasnyc.org/
328 WEST 48 STREET
New York, NY 10036
212-247-8652

Independence High School
President/Executive Director/Principal
850 10 AVENUE
New York, NY 10019
https://www.ihsnyc.com/
212-262-8067

Success Academy Cs Midtown West
President/Executive Director/Principal
https://www.successacademies.org/school/midtown-west-middle/
439 West 49th Street
New York, NY 10019

646-558-0050

M393 The Business of Sports School
President/Executive Director/Principal
439 West 49th Street
New York, NY 10019
https://www.nycboss.org/
212-246-2183

Community, Civic, Religious and Other Environmental Organizations:

Kimberly Williams – Director Manhattan Regional and Community Affairs
Consolidated Edison Corporate Affairs
4 Irving Place
New York, NY 10003

President Delores Rubin
Midtown North Precinct
306 West 54th Street
New York, NY, 10019

Engine 23
FDNY
215 West 58th Street
New York, NY 10019

Lincoln Square Business Improvement District (BID)
1881 Broadway, Ste 2R
New York, NY 10023
https://www.nyctourism.com/attractions-tours/lincoln-square-business-improvement-district/

Times Square Alliance
Tom Harris – President
1560 Broadway
Suite 1001
New York, NY 10036
Phone: (212) 768-1560
info@timessquarenyc.org
https://www.timessquarenyc.org/about-the-alliance

Fifth Avenue Association Business Improvement District (BID)
16 East 52nd Street Suite 302
New York, NY 10022
212-265-1310
Marie Boster – President
https://fifthavenue.nyc/

Housing Conservation Coordinators, Inc.
https://www.hcc-nyc.org/
Leslie Thrope, Executive Director
777 Tenth Avenue,
New York, NY 10019
212-541-5996
info@hcc-nyc.org

Trinity Presbyterian Church
422 W 57th St,
New York, NY 10019

Fifth Avenue Presbyterian Church
7 W 55th St,
New York, NY 10019

Times Square Church
237 W 51st St,
New York, NY 10019

Church of the City New York
417 W 57th St,
New York, NY 10019

Randolph Weber (Church)
7 W 55th St,
New York, NY 10019

St. Bartholomew's Church
325 Park Ave,
New York, NY 10022

St. Patrick's Cathedral
5th Avenue Between 50th and 51st Streets
New York, NY 10022

St. Mary the Virgin's Church
145 W 46th St,
New York, NY 10036

Alive Church NYC
417 W 57th St
New York, NY 10036

St. Paul the Apostle Church
405 W 59th St
New York, NY 10019

Appendix C - Site Location Map



LEGEND

APPROXIMATE SITE BOUNDARY

GRAPHIC SCALE

0 50 100 200

(IN FEET)

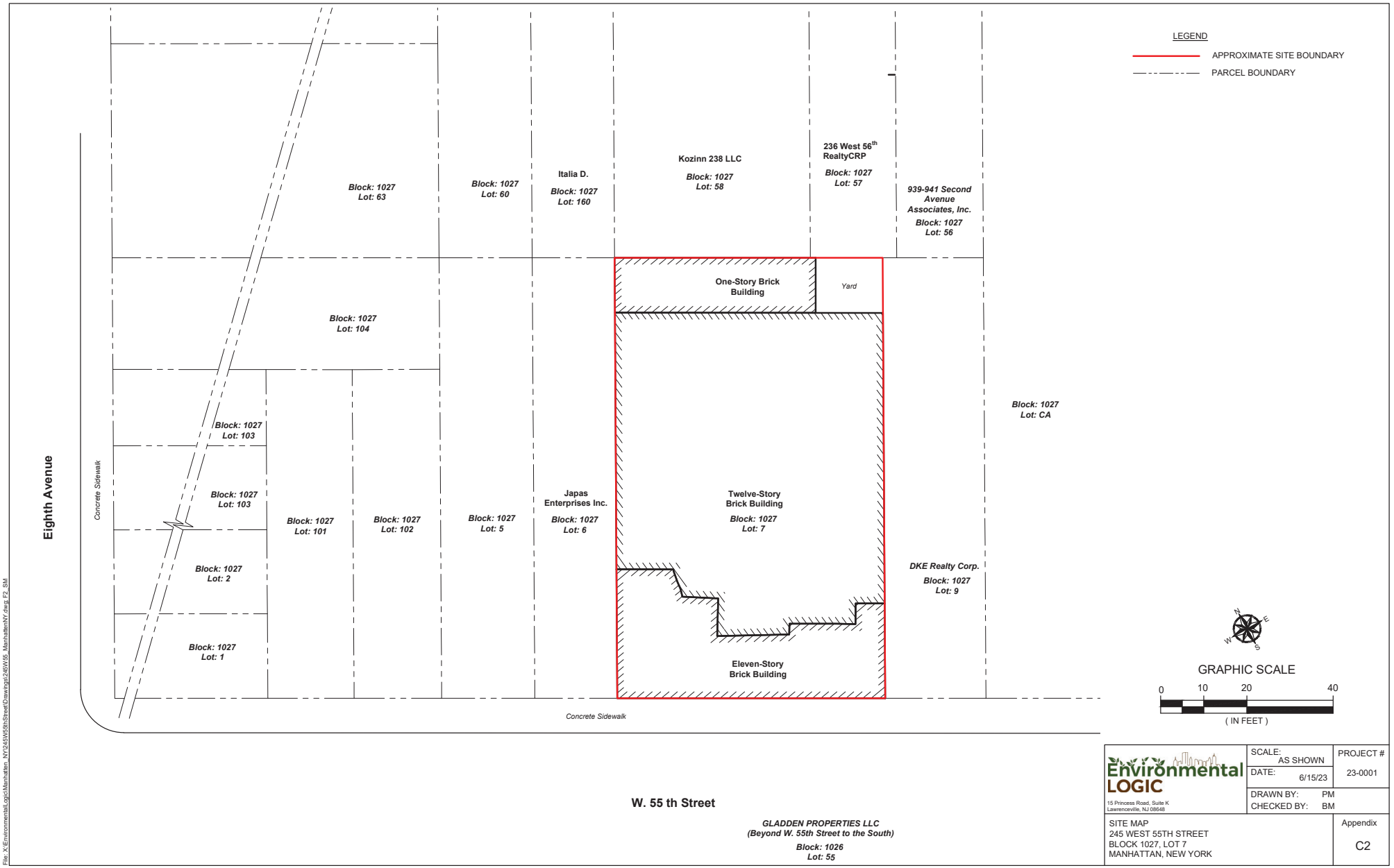
Environmental LOGIC
15 Princess Road, Suite K
Lawrenceville, NJ 08648

	SCALE: AS SHOWN	PROJECT # 23-0001
	DATE: 3/25/24	
	DRAWN BY: PM CHECKED BY: BM	

SITE LOCATION MAP
245 WEST 55TH STREET
BLOCK 1027, LOT 7
MANHATTEN, NEW YORK

APPENDIX C1

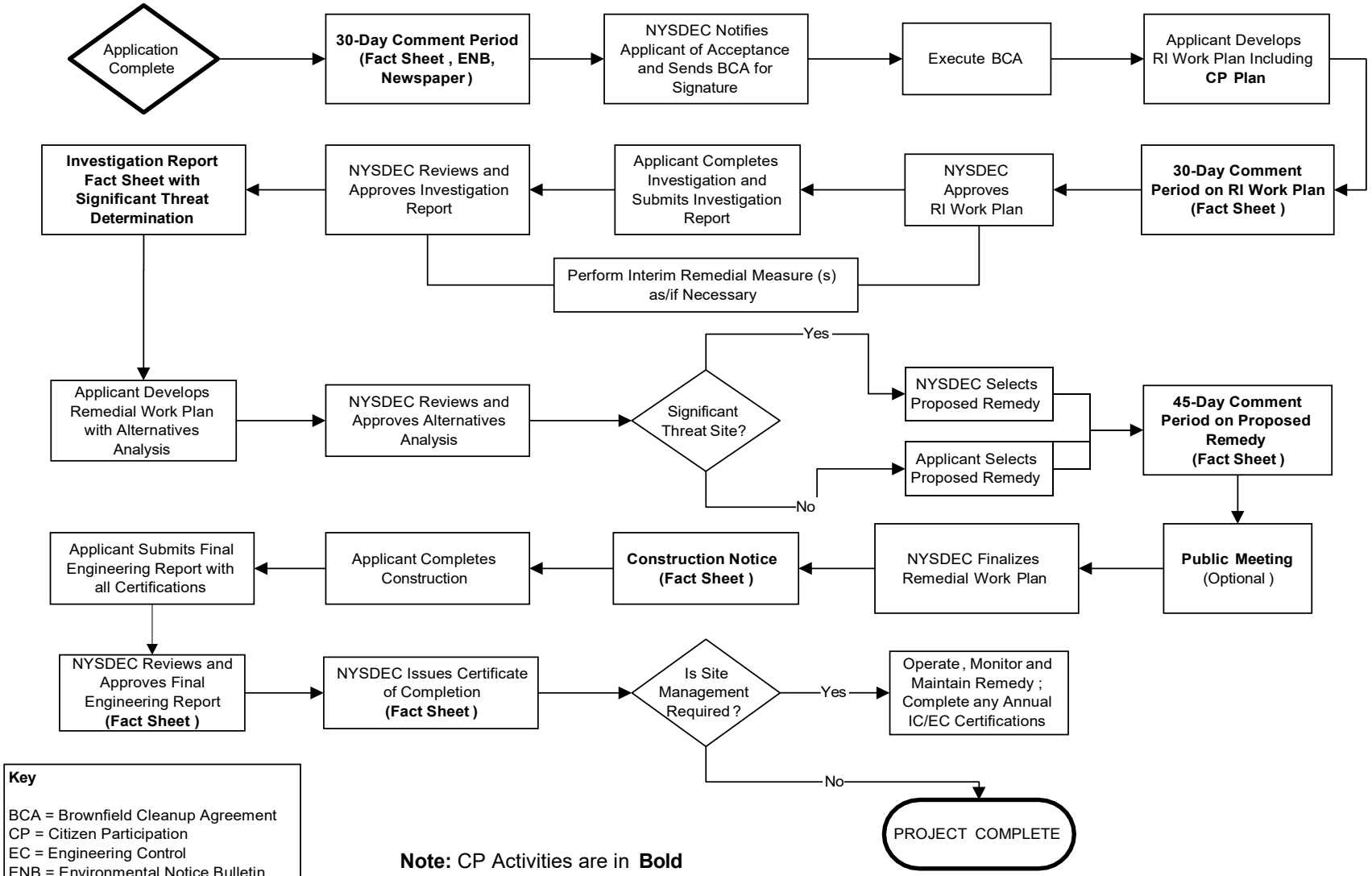
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Environmental LOGIC 15 Princess Road, Suite K Lawrenceville, NJ 08648	SCALE: AS SHOWN DATE: 6/15/23 DRAWN BY: PM CHECKED BY: BM	PROJECT # 23-0001
SITE MAP 245 WEST 55TH STREET BLOCK 1027, LOT 7 MANHATTAN, NEW YORK		Appendix C2

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Appendix D– Brownfield Cleanup Program Process



Key

BCA = Brownfield Cleanup Agreement
CP = Citizen Participation
EC = Engineering Control
ENB = Environmental Notice Bulletin
IC = Institutional Control
RI = Remedial Investigation

Note: CP Activities are in **Bold**

ATTACHMENT I

Basement Finished Elevations



NOTE:
CELLAR LAYOUT FOR DESIGN PURPOSES ONLY. ELEVATION OF EXISTING SLAB, COLUMN BASE, LOCATION OF EXISTING CONCRETE POSTS, AND NW CORNER CONDITION ARE UNKNOWN AT TIME OF ISSUANCE.

1 CELLAR SLAB EDGE PLAN
SCALE: 1/4" = 1'-0"

LEGEND

- STRUCTURAL SLAB (S.S.D.)
- STRUCTURAL CONCRETE WALL AND STRUCTURAL COLUMN
- TOP OF GRADE BEAM AND FOOTING (S.S.D.)
- SLOPED CONCRETE
- INFILL CONCRETE DECK, EXISTING PORTION
- OVER POURED CONCRETE

GENERAL NOTES

1. EXISTING CONDITIONS ARE ESTIMATED PER INFORMATION PROVIDED BY CLIENT. TO BE CONFIRMED AND REVISED ONCE FULL EXISTING SURVEY IS PROVIDED.
2. REFER TO STRUCTURAL ENGINEER'S DRAWING FOR ANY ADDITIONAL INFORMATION REQUIRED IN ESTABLISHING THE SLAB EDGE THAT MAY NOT BE SHOWN ON THIS DRAWING.
3. PROVIDE SHOP DRAWINGS INDICATING THE SLAB EDGE FOR ALL FLOORS FOR REVIEW AND APPROVAL BY THE ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO COMMENCING WORK. IF SAID DRAWINGS ARE NOT PROVIDED AND THE FLOOR ARE POURED. THE GC WILL BE RESPONSIBLE FOR ANY CORRECTIVE STEPS.
4. SUBMIT SHOP DRAWINGS FOR ELEVATORS PRIOR TO SETTING ELEVATOR SHAFT WALLS AND FLOOR OPENINGS. COORDINATE ELEVATOR OPENING SIZES WITH CONCRETE WORK PRIOR TO FORMING.
5. SEE ELEVATION AND RCP FOR LIGHT FIXTURE J-BOX AND OUTLET J-BOX TO BE CAST INTO CONCRETE.
6. REFER TO STRUCTURAL ENGINEER'S DRAWINGS FOR COLUMN SIZE DIAGRAM PER FLOOR

SHAFT OPENING NOTES

1. REFER TO STRUCTURAL ENGINEER'S DRAWING FOR INFORMATION ON REINFORCING AT PERIMETERS OF SHAFT OPENINGS.
2. REFER TO MECHANICAL ENGINEER'S DRAWINGS FOR THE TYPE OF EQUIPMENT AND SIZE WITHIN EACH SHAFT. COORDINATE OPENING SIZE OF SHAFT WITH SAID EQUIPMENT. IF SIZE OF SHAFT REQ'D DIFFERES FROM WHAT IS INDICATED ON THIS DRAWING. NOTIFY ARCHITECT AND AWAIT DIRECTION.
3. PROVIDE A SHOP DRAWING INDICATING ALL SHAFT OPENING LOCATION FOR REVIEW AND APPROVAL BY ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO COMMENCING THE WORK. IF SAID DRAWINGS IS NOT PROVIDED AND SHAFT LOCATIONS ARE NOT AS INDICATED ON THIS DRAWING. THE GC WILL BE RESPONSIBLE FOR ANY CORRECTIVE STEPS.
4. REVIEW & COORDINATE ALL MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION DRAWING FOR ANY ADDITIONAL REQUIRED OR NECESSARY SHAFTS THAT ARE NOT SHOWN ON THIS DRAWING.

KEY NOTES

1	PROPERTY LINE
2	ADJACENT BUILDING
3	EXISTING FOUNDATION WALL
4	EXISTING VAULT BELOW SIDEWALK
5A	EXISTING STEEL COLUMN. LOCATION OF EXISITING ELEMENTS: STEEL BEAMS, COLUMNS, AND ENCASEMENTS. TO BE VERIFIED IN FIELD VIA DEMO.
5B	EXISTING STEEL BEAM. LOCATION OF EXISITING ELEMENTS: STEEL BEAMS, COLUMNS, AND ENCASEMENTS. TO BE VERIFIED IN FIELD VIA DEMO.
5C	EXISTING STEEL BASE. SIZE AND ELEVATION TO BE VERIFIED IN FIELD VIA DEMO.
6	NEW CONCRETE COLUMN
7	TRASH CHUTE OPENING
8	MECHANICAL DOUBLE HEIGHT SLAB OPENING @ 5TH FL
9	THERMALLY BROKEN CONCRETE BALCONY W/ 1" STEP DOWN
10	NEW STEEL CANOPY OVER RESIDENTIAL ENTRY
11	FACE OF BUILDING
12A	SHEAR WALL 14" THICK IN CELLAR AND 1ST FLOOR
12B	FULL HEIGHT SHEAR WALL OPENING
12C	COLUMN TO BE LEFT OUT FOR ELEVATOR CAB INSTALL, SEE STRUCTURAL DRAWINGS.
13	EDGE OF SLAB. LOCATION TO BE VERIFIED IN FIELD VIA DEMO FOR EXISITING FLOORS
14	FACE OF BUILDING AT TERRACE/BALCONY
15	SEISMIC GAP
16	ELEVATOR DRAIN. LOCATION TO BE COORDINATED WITH STRUCTURAL AND FIRE PROOFING REQUIREMENTS.
17A	8" WIDE X 10.5" TALL CMU AT BALCONY
17B	8" WIDE X 1'0" TALL CMU AT TERRACE
18	THERMALLY BROKEN EYEBROW
19	FOLDED SLAB W/ 12" DROP FOR TERRACE ROOF FINISH. 1/8" SLOPE TO DRAIN TO BE PROVIDED VIA TOPPING SLAB AS REQUIRED. GC TO COORDINATE.
20A	SLAB OPENING/PENETRATIONS/SLEEVES TO CLEAR EXISITING STEEL BEAMS AND COLUMNS. TO BE COORDINATED WITH MEP AND STRUCTURAL. ONCE LOCATION OF EXISITING STEEL IS VERIFIED - ANY CONFLICTS SHOULD BE FLAGGED FOR THE ARCHITECT TO REVIEW.
20B	SLAB OPENING/PENETRATIONS/SLEEVES. TO BE COORDINATED WITH MEP AND STRUCTURAL.
21A	ROOF & OVERFLOW DRAINS TO BE LOCATED NEAR SLAB FOLD, BUT TO CLEAR ANY BEAMS AND COLUMNS. DRAINS LOCATED IN THE CEILING OF CLOSETS AND BATHROOMS. SEE MEP FOR SPEC.
21B	BALCONY SCUPPER, PROVIDE OPENING IN CURB AS NEEDED.
22	NEW INFILL DECK SLAB. SEE STRUCTURAL DRAWINGS FOR DETAILS.
23A	5" STEP IN SLAB TO ACCOMODATE ACOUSTICAL PLATFORM. SEE ACOUSTICAL/ ID DRAWINGS FOR DETAILS.
23B	LOBBY ENTRANCE AN RELATIVE ELEVATIONS TO COMPLY WITH ALL REQUIREMENTS FOR ADA ACCESS TO THE BUILDING AND ALIGN WITH ALL SIDEWALK ELEVATIONS AND SLOPES AS SET FORTH ON THE BPP DRAWINGS.
23C	1.5" DEPRESSION IN SLAB TO ACCOMMODATE 2.5" THICK FITNESS TILE, SEE ACOUSTICAL /ID DRAWINGS FRO DETAILS.
25	1" RAISED PORTION OF SLAB AT STAIR LANDING, STAIR OPENING INCLUDES 9" FIRST STEP AND 3" KEY, PER STRUCTURAL. REFER TO STRUCTURAL DRAWINGS FOR FURTHER DETAILS.
26A	PLUMBING PENETRATIONS FOR DESIGN PURPOSES ONLY. LOCATION AND DISTANCE BETWEEN SLEEVES TO BE PROVIDED ON MEP AND SHOP DRAWINGS. ONCE LOCATION OF EXISTING STEEL IS VERIFIED - ANY CONFLICTS SHOULD BE FLAGGED FOR THE ARCHITECT TO REVIEW.
26B	PLUMBING PENETRATIONS FOR DESIGN PURPOSES ONLY. LOCATION AND DISTANCE BETWEEN SLEEVES TO BE PROVIDED ON MEP AND SHOP DRAWINGS.
27A	12TH FLOOR SLAB ELEVATION TO BE FULLY DETERMINED BY SURVEY OF THE 11TH FLOOR CEILING STEEL
27B	EXISTING TERRACE SLAB: EL OF SLAB AND STEEL IN TERRACE TO BE DETERMINED VIA DEMO.
28	FINAL AMENITY DESIGN TO BE PROVIDED IN 100% INTERIOR CDS ISSUANCE TO BE ISSUED ALONG WITH ARCHITECTURAL BULLETIN # 1.
29	1" RECESS IN SLAB TO ACCOMMODATE SHOWER DEPRESSION, TYP.
31	ELEVATOR DIVIDER RAILS AND POST, SEE STRUCTURAL DRAWINGS.
32	1:12 ADA RAMP AND (2) 3"STEPPED PLATFORMS IN AMENITY CINEMA, FOR DETAILS SEE CSS DRAWINGS.
34	DAVIT SLEEVE FIXED TO TERRACE SLAB.
35	TRENCH DRAIN AT RESIDENTIAL ENTRY
36	LV EMBEDDED IN SLAB, TO BE LOCATED IN FURNITURE. FOR COORDINATE REQUIREMENTS WITH LOW VOLTAGE.
37	1" STEP DOWN AT BALCONY DOOR
38	1:20 RAMP
39	LINE OF BEAM BELOW, SEE STRUCTURAL FOR DETAILS.
40A	LINE OF COLUMN BELOW
40B	LINE OF SHEAR WALL BELOW
40C	LINE OF COLUMN BELOW BEAM
41	UPTURN BEAM, SEE STRUCTURAL DRAWINGS.
42	CONCRETE KNEE WALL SUPPORTING STAIR LANDING.
43	ROOFTOP PERGOLA
44A	SHEAR WALL, SEE STRUCTURAL DRAWINGS CELLAR TO 2ND SLAB.
44B	SHEAR WALL, SEE STRUCTURAL DRAWINGS 3RD TO 11TH SLAB.
45	CONTRACTOR TO PROVIDE CONCRETE CUTOUT PER REVOLVER SPEC TO ACCEPT SPEED CONTROL UNIT AND FLOOR RING
46	UNDERSIDE OF TERRACE SLAB 13TH & 18TH FLRD: PROVIDE 4" WIDE X 2" DEEP NOTCH TO RECIEVE SHADE POCKET.



CLIENT:
245 WEST 55TH St. LLC
354 EISENHOWER PARKWAY, SUITE 1900
LIVINGSTON, NJ 07039

ARCHITECT:
Fogarty Finger
69 Walker Street
New York, NY 10013
212.966.7450
www.fogartyfinger.com

STRUCTURAL ENGINEER:
DESIMONE
140 BROADWAY, FLOOR 25
NEW YORK, NY 10005

MEP ENGINEER:
ETTINGER ENGINEERING ASSOCIATES
505 8TH AVENUE, FLOOR 24
NEW YORK, NY 10018

FACADE:
MADOCKS ARCHITECTURE
917-974-6870

ELEVATOR:
VDA
120 EAGLE ROCK AVE STE 310
EAST HANOVER, NJ 07936

INTERIOR DESIGN:
CHRIS SHAO STUDIO
515 GREENWICH ST
NEW YORK, NY 10013

CIVIL ENGINEER:
SULLIVAN GROUP DESIGN LLC
56 PINE STREET, 16A
NEW YORK, NY, 10005

LIGHTING:
L DESIGN STUDIO
1460 BROADWAY, OFFICE 11025
NEW YORK, NY 10036

GEOTECH / SOE ENGINEER:
JZN ENGINEERING
99 MORRIS AVE, SUITE 302
SPRINGFIELD, NJ 07081

CODE CONSULTANT/ EXPEDITOR:
DESIGN 2147
52 DIAMOND ST
BROOKLYN, NY, 11222

CONSTRUCTION MANAGER:
CM & ASSOCIATES
2 GATEWAY CENTER, SUITE 200
NEWARK, NJ 07102

KEY PLAN:



No.	DATE	ISSUE
D	08.29.2025	BULLETIN D: UPDATES
B	04.30.2025	BULLETIN B: CoY UPDATES
6	05.10.2024	100% CONSTRUCTION DCCUMENTS
2	12.01.2023	DD ISSUANCE

PROJECT:
245 WEST 55TH STREET
NEW YORK, NY 10019
DOB JOB #: M00940950-I1

DRAWING TITLE:
CELLAR SLAB EDGE PLAN

SEAL & SIGNATURE:

DATE (YYYY/MM/DD):	08/29/2025
PROJECT No.:	Project Number
DRAWING BY:	Checker
CHK BY:	Author
DRAWING No.:	A-150.00

ATTACHMENT J

SSDS Design Drawings

ACTIVE VAPOR INTRUSION MITIGATION SYSTEM
245 WEST 55TH STREET
NEW YORK, NY 10019

JANUARY 28, 2025
REVISION 1 2-27-26

DRAWING LIST

C	Cover
V-1.0	Sub-Slab Piping Plan
V-1.1	Cellar Riser Plan
VD-1.0	Mechanical Details
VD-1.1	Mechanical Details
VS -1	Specifications
VS -2	Specifications

245 WEST 55TH ST.
NEW YORK, NY 10019

No.	Description	Date
Rev 1	Active System	2-27-26

MATTHEW CARROLL, PE
NEW YORK LICENSE NO. 091629
1085 SACKETT AVENUE
BRONX, NY 10461
646-606-2332

STATE OF NEW YORK
MATTHEW M. CARROLL
091629
LICENSED PROFESSIONAL ENGINEER

ACTIVE VAPOR INTRUSION MITIGATION SYSTEM

NEW YORK, NY

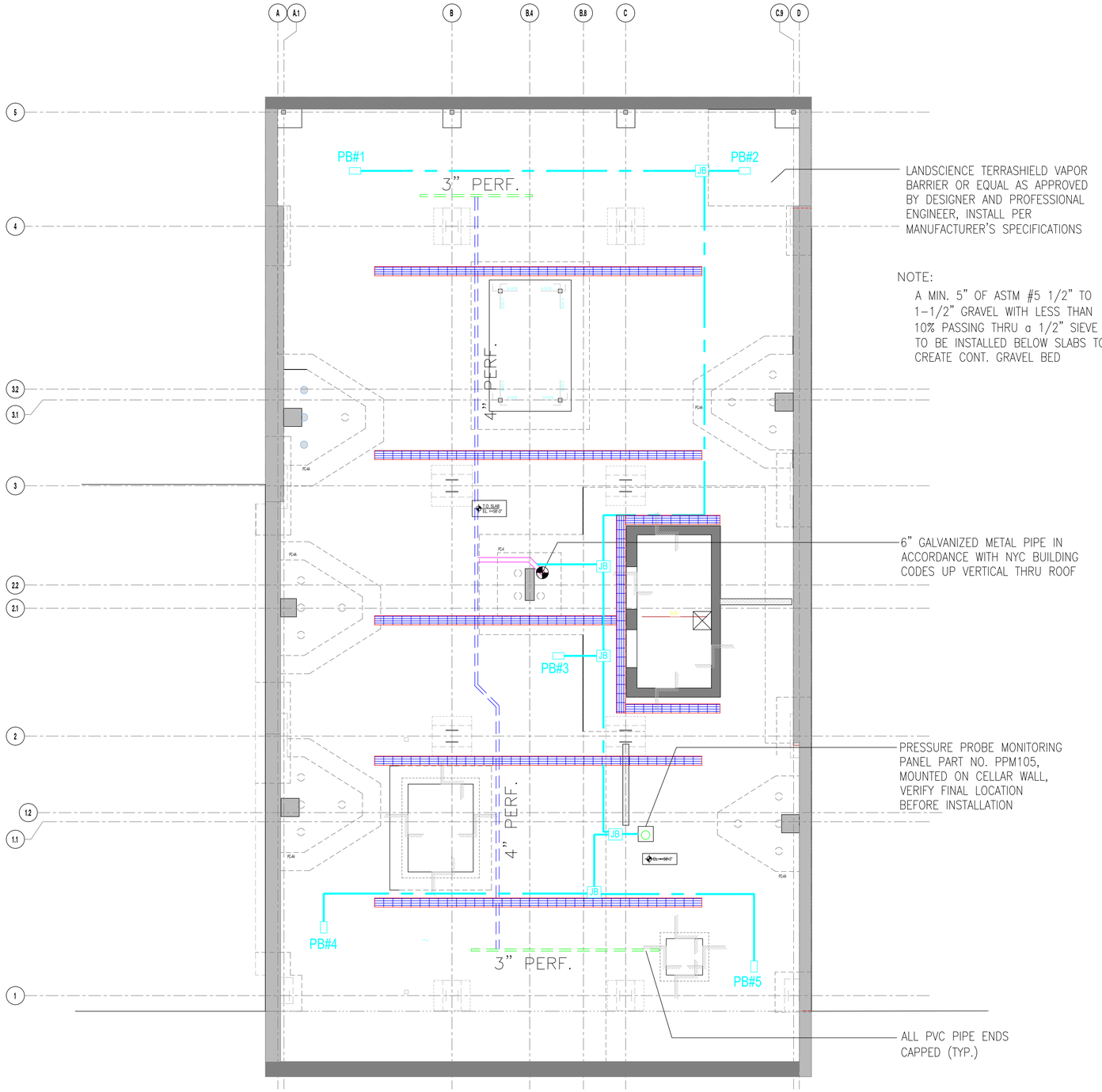
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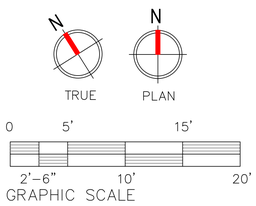
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Checked By	MC

C



FOUNDATION PLAN

NOTE: Do not puncture vapor barrier or other components of vapor mitigation system under any circumstances. Should the vapor barrier or other components of vapor mitigation system be damaged – damage shall be repaired as required and specified by the system manufacturer/installer.



LEGEND

- MONITORING / MAGNEHELIC PANEL
- VERTICAL GALVANIZED METAL RISER PER PLANS
- 3" PERFORATED PVC PIPE 5/8" HOLES 6"O.C. @ 4/6/8 O'CLOCK
- 4" PERFORATED PVC PIPE 5/8" HOLES 6"O.C. @ 4/6/8 O'CLOCK
- SOLID 6" PVC PIPE W/ 1/2" DRAINAGE HOLES @ 4'O.C. FACING DOWN
- TERRAVENT
- PB#1 PRESSURE PROBE
- PRESSURE PROBE CONDUIT
- PRESSURE PROBE JUNCTION BOX

245 WEST 55TH ST.
NEW YORK, NY 10019

No.	Description	Date
Rev 1	Active System	2-27-26

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NEW YORK LICENSE NO. 091629
1085 SACKETT AVENUE
BRONX, NY 10461
646-605-2332

ACTIVE VAPOR INTRUSION MITIGATION SYSTEM

NEW YORK, NY

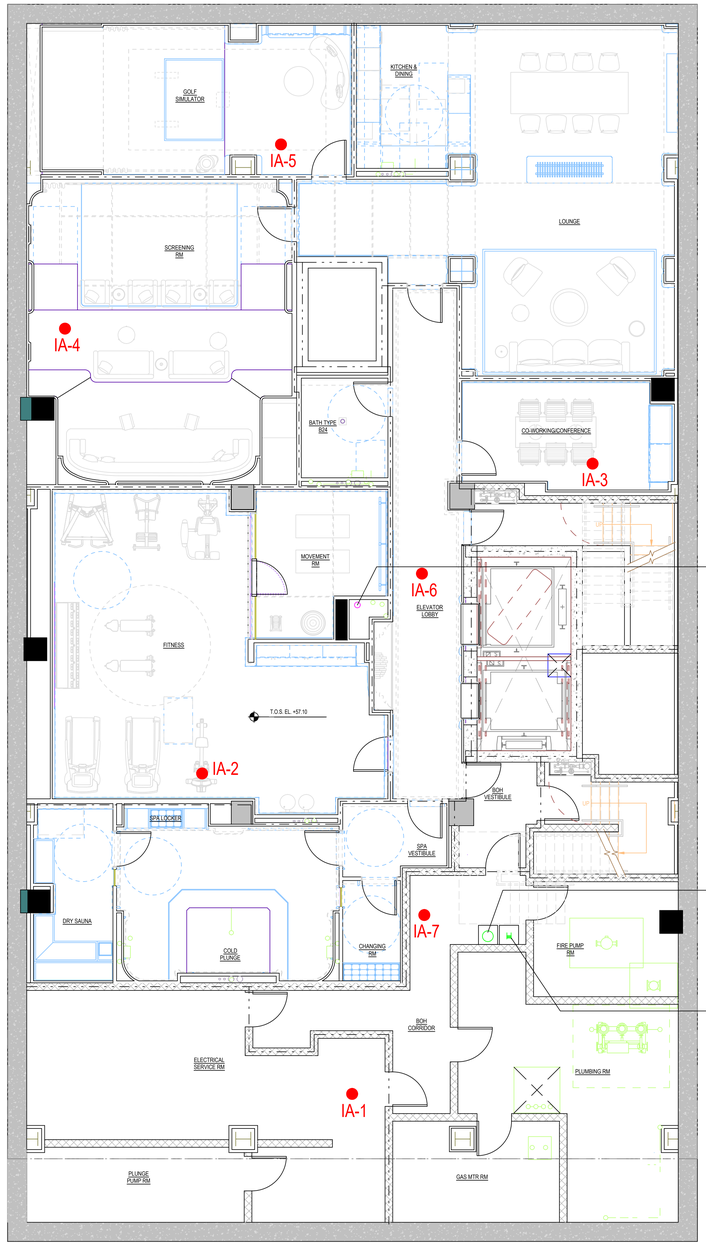
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SUB-SLAB PIPING PLAN

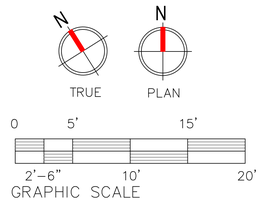
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	Checked By	MC

V-1.0

245 WEST 55TH ST.
NEW YORK, NY 10019



CELLAR PLAN



LEGEND

- 6" GALV. METAL RISER PER PLANS
- PPM MONITORING PANEL – ACTIVE
- VAPOR GUARDIAN MONITORING PANEL
- IA-1 PROPOSED INDOOR AIR (IA) SAMPLE LOCATION
- AA PROPOSED OUTDOOR / AMBIENT SAMPLE LOCATION (LOCATION TO BE ADJUSTED BASED ON FIELD CONDITIONS)

Rev 1	Active System	2-27-26
No.	Description	Date

MATTHEW CARROLL, PE
NEW YORK LICENSE NO. 091629
1085 SACKETT AVENUE
BRONX, NY 10461
646-606-2332

STATE OF NEW YORK · MATTHEW M. CARROLL · 091629 · LICENSED PROFESSIONAL ENGINEER

ACTIVE VAPOR INTRUSION MITIGATION SYSTEM

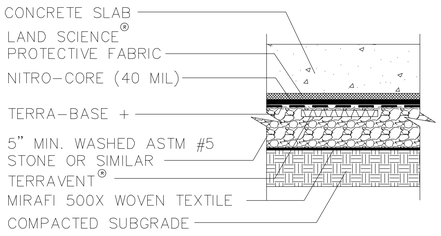
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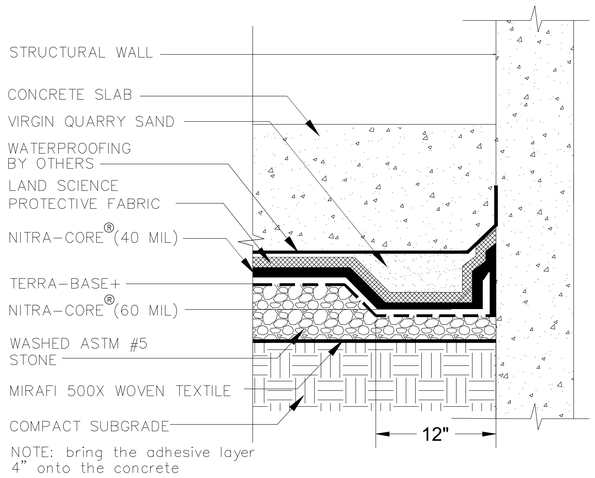
CELLAR RISER PLAN

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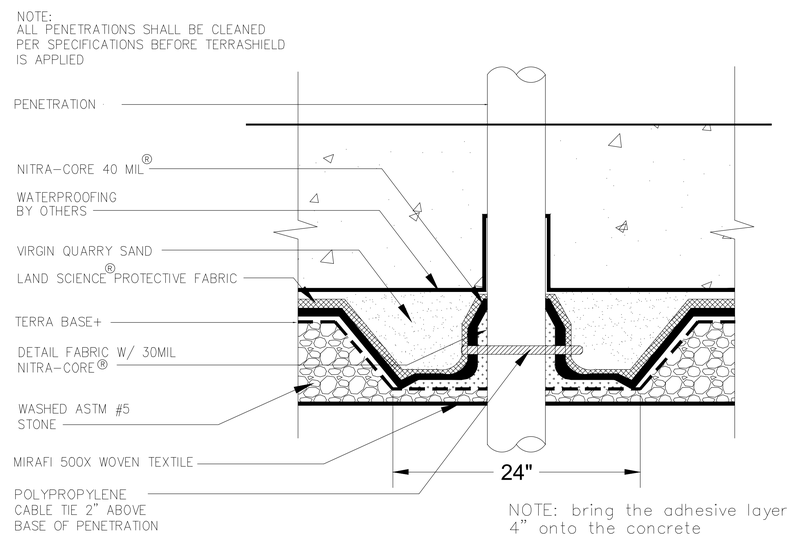
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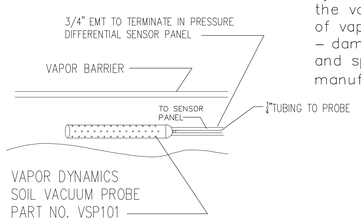


2 GAS VAPOR BARRIER VERTICAL ATTACHMENT
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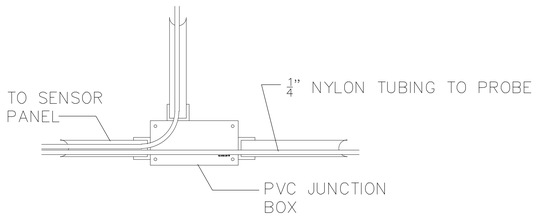


3 GAS VAPOR BARRIER PENETRATION ON GRAVEL SUBGRADE
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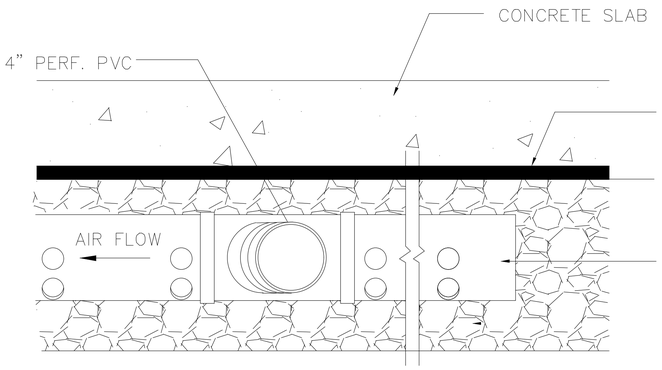
NOTE: Do not puncture vapor barrier or other components of vapor mitigation system under any circumstances. Should the vapor barrier or other components of vapor mitigation system be damaged – damage shall be repaired as required and specified by the system manufacturer/installer.



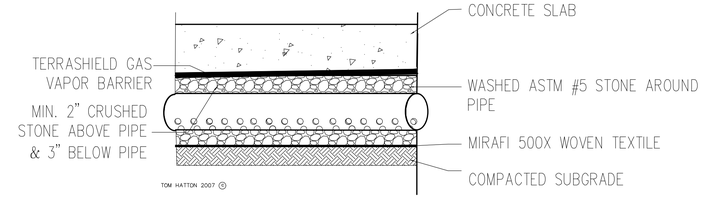
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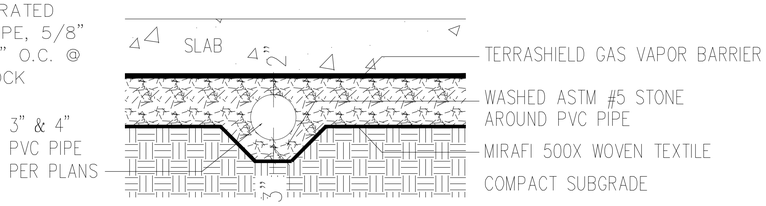
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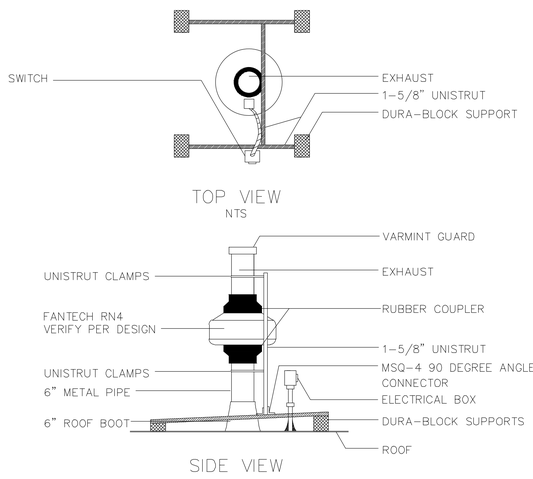
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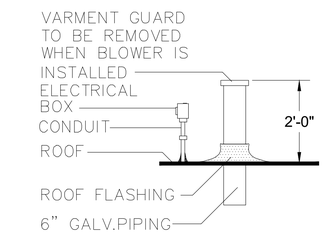
7 RISER PIPE/HORIZ. COLLECTION PIPE
NOT TO SCALE



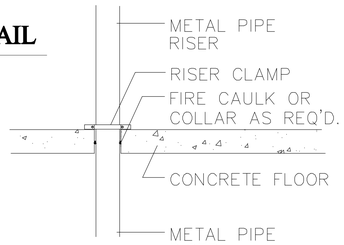
8 UNDERSLAB VAPOR PIPE CROSS SECTION
NOT TO SCALE



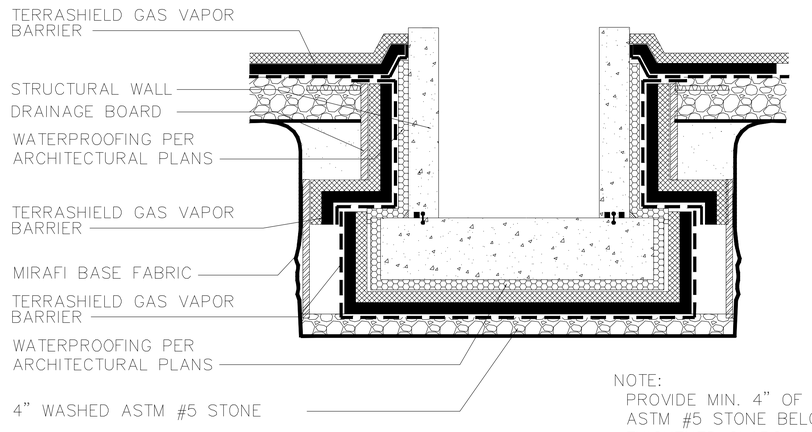
9 BLOWER DETAIL
NOT TO SCALE



10 PENETRATION DETAIL
NOT TO SCALE



11 FLOOR PENETRATION DETAIL
NOT TO SCALE



12 GAS VAPOR BARRIER PENETRATION AT ELEVATOR, PITS AND POOLS
NOT TO SCALE

245 WEST 55TH ST.
NEW YORK, NY 10019

Rev No.	Description	Date
1	Active System	2-27-26

MATTHEW CARROLL, PE
NEW YORK LICENSE NO. 091629
1085 SACKETT AVENUE
BRONX, NY 10461
646-606-2332

STATE OF NEW YORK · MATTHEW M. CARROLL · 091629 · LICENSED PROFESSIONAL ENGINEER

ACTIVE VAPOR INTRUSION MITIGATION SYSTEM

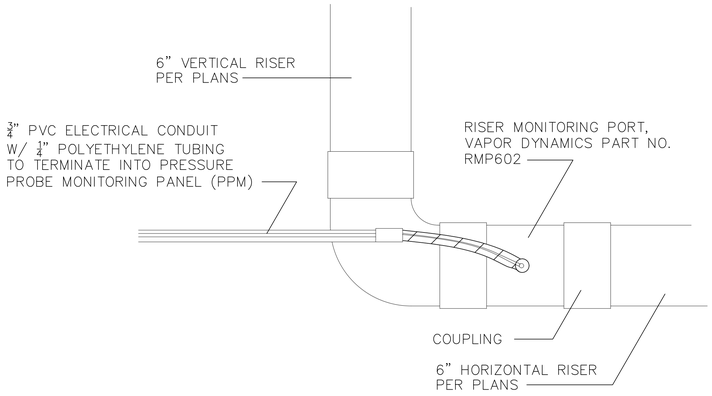
NEW YORK, NY

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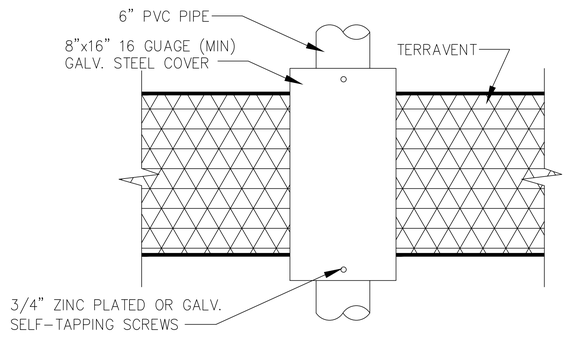
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	Checked By	MC

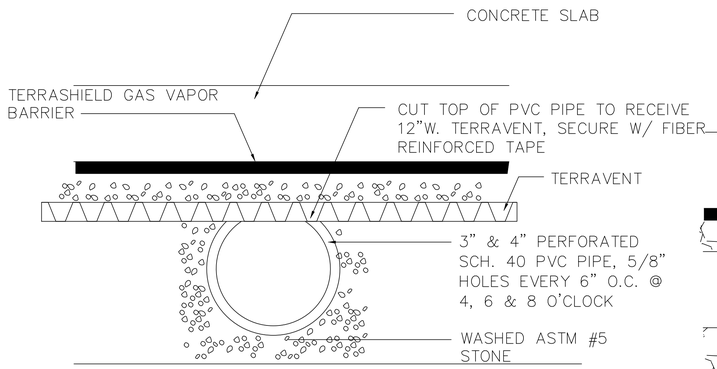
VD-1.0



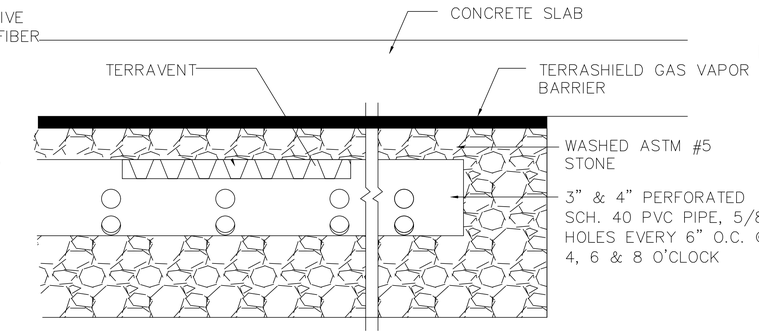
13 HORIZONTAL RISER MONITORING PROBE
NOT TO SCALE



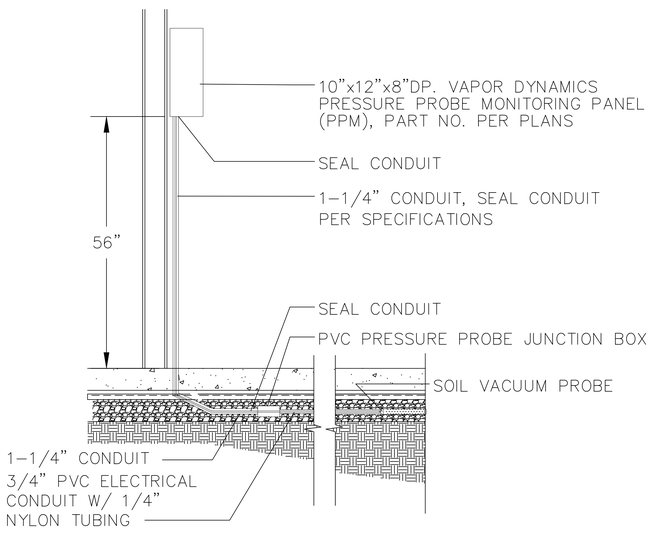
14 TERRAVENT PIPE PROTECTION DETAIL
NOT TO SCALE



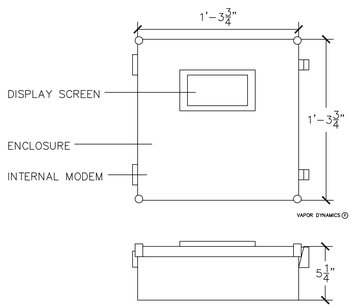
15 GEO-VENT TO PVC DETAIL
SCALE: 3" = 1'-0"



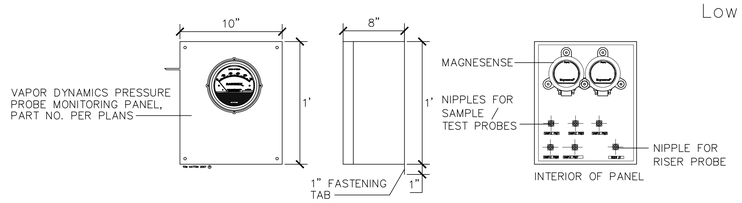
16 PERFORATED PVC DETAIL
SCALE 3" = 1'-0"



17 MONITORING DETAIL
NOT TO SCALE



18 VAPOR DYNAMICS VAPOR GUARDIAN 7000 DETAIL
NOT TO SCALE



19 PRESSURE PROBE MONITORING PANEL (PPM) DETAIL
NOT TO SCALE

EQUIPMENT SCHEDULE

Vapor Vent Piping
- PVC schedule 40 pipe and fittings (ASTM D-2665)
  Hollow Core PVC is not permissible
- Galvanized Steel Pressure Tubing (ASTM A513), fittings and Clamp on Connector
- PVC cement clear primer will comply with ASTM F-656
- PVC cement adhesive will comply with ASTM D-2564
- TerraVent by Land Science

Piping Supports and Hardware
- 6" Hanging Pipe Supports
- Swivel ring or standard bolt type clevis
- Adjustable band hanger
- Double Expansion Anchors
- 3/8" threaded rod
- 1/2" threaded rod
- Assorted bolts, nuts & washers
- 6" Pipe Secured to Building
- Slotted Conduit Channel
- Conduit Clamps
- Assorted bolts, nuts & washers

Sealing Materials
- Urethane sealant will comply with Federal Specification TT-S-00230C, Subject to compliance with contract requirements; the following manufacturers of urethane caulking sealants may be used:
  - Sika, Corp. (Sika FLEX)
  - Mameco, Inc. (Vulkem)

Monitoring

Monitoring Conduit
- 3/4" & 1-1/4" PVC Schedule 40 Conduit and Fittings

Sub Slab Sampling Probes Ends
- (5) Vapor Dynamics – VSP 101

Wall Mounted Sub Slab Monitoring Panels
- (1) Vapor Dynamics PPM 105

Horizontal Monitoring Ports
- (1) Vapor Dynamics – RMP 601

Hilti is a suggested manufacturer of fire stopping fastening products

Vapor Blower
- Vapor Blower (Fantech RN4 to be Verified)
- 6" to 6" rubber boots with stainless steel hose clamps

Blower Support Frame
- 1 5/8'' C- Profile Galvanized Unistrut
- MSQ-2 Two Hole 90 degree Angle Connector
- MSQ-4 Four Hole 90 degree Angle Connector
- MSQ Pushbutton fastening bolt
- Pipe Pier style supports for roof contact

Sensors & Monitoring
- Vapor Guardian Monitoring & Control Panel
  - (1) Vapor Dynamics – VG7000
- (2) Dwyer Magnesense Vacuum Sensor 0-3" w.c.
- 4G Weatherproof Modem
- Low Voltage Signal Wire (18-2 Guage)

245 WEST 55TH ST.
NEW YORK, NY 10019

Rev No.	Description	Date
1	Active System	2-27-26

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NEW YORK LICENSE NO. 091629
1085 SACKETT AVENUE
BRONX, NY 10461
646-606-2332

STATE OF NEW YORK · MATTHEW M. CARROLL · 091629 · LICENSED PROFESSIONAL ENGINEER

ACTIVE VAPOR INTRUSION MITIGATION SYSTEM

NEW YORK, NY

DRAWING TITLE:

MECHANICAL DETAILS

Date	1-28-25
Scale	3/16" = 1'-0"
Drawn By	DAB
Checked By	MC

PE Seal

VD-1.1

SPECIFICATION

1.0 GENERAL INFORMATION

This active vapor intrusion mitigation system design is for the existing building located at 245 West 55th Street in New York, New York. This vapor intrusion mitigation system is designed to be a highly efficient, active soil gas ventilation system that protects the building from potential vapor intrusion from the contaminants of concern. The Land Science TerraShield® has been selected as a vapor barrier because of its extremely low chemical transmission rate and low leakage rate that is a result of the spray applied seam joining process.

1.1 This design is for a active vapor intrusion mitigation system (VIMS).

1.2 The information including text, diagrams, and drawings is intended to facilitate the vapor intrusion mitigation of the existing building located in New York, NY. Any reproduction of the content of this report in part or total for any other purpose is prohibited without the written consent of Clean Vapor, LLC.

2.0 BUILDING INFORMATION

2.1 The existing building has a cellar below grade with approximately 5,761 square feet of ground contact. The building has perimeter concrete walls and interior columns for a support system.

3.0 GENERAL INSTALLATION REQUIREMENTS

Throughout these specifications, the Architect of Record shall be referred to as the "Architect." The Active Vapor Intrusion Mitigation Contractor shall be referred to as the "VIMS Contractor". The Professional Engineer will be referred to as the "Professional Engineer" or "PE". All portions of the active Vapor Intrusion Mitigation System will abide by the relevant ANSI/AARST CC-1000 specifications as described in Section 3.0 to and including Section 16.0 (ANSI/AARST, 2018).

3.1 The VIMS installation shall be installed so as to coordinate with other building components especially those that require maintenance or clearance of any type. All mitigation system components shall be installed to facilitate servicing, maintenance and repair or replacement of other equipment components in or outside the building. Where mounting heights are not detailed or dimensions given, system materials and equipment are to be installed to provide the maximum side clearance as is possible. The general contractor must be contacted in cases where a conflict exists between these or other requirements and the drawings or specifications. All systems, materials and equipment shall be installed level, plumb, parallel or perpendicular to other building systems and components unless otherwise specified. Field coordination of overhead pipe location should be done by the mechanical trades and final approval by the general contractor and architect.

3.2 The VIMS contractor shall take every possible precaution to avoid any damage to utilities located anywhere in the building or those located in or below the slab floor. The drawings indicating utility piping in or under the slab should be examined and the installation contractor consulted prior to installation. This will avoid any sub slab elevation conflicts.

3.3 There shall be no placement of piping or conduit that would inhibit intended use of any areas. The VIMS contractor should coordinate with the general contractor as early in the process as possible.

3.4 The VIMS contractor shall ensure that any foreign materials are not left in the plenum or at a location where they can be drawn into the mitigation system piping.

3.5 After testing is completed (see section 12), the vapor intrusion mitigation system blower(s) shall have UL or equivalent ratings where applicable and installed by contractor.

3.6 During construction the VIMS designer will require inspections of various phases of the VIMS system installation. These inspections are required for the VIMS designers to sign off on the complete system for the compliance. Coordinated inspection with the VIMS designer for the following construction phases:

- 3.6.1 After installation of Mirafi woven geo-textile
- 3.6.2 After installation of base aggregate
- 3.6.3 Periodically during the installation of the base layer
- 3.6.4 After installation of vent piping
- 3.6.5 Prior to installation of the aggregate above the vent pipe
- 3.6.6 During spray application of the vapor barrier
- 3.6.7 During the smoke testing
- 3.6.8 After the installation of the protective geo-textile layer, reinforcing steel, and all foundation form work
- 3.6.9 Prior to placement of concrete floor slab
- 3.6.10 During performance Testing of the slab
- 3.6.11 During the installation and completion of the vertical vent riser piping
- 3.6.12 During the installation of the blowers

4.0 VAPOR BARRIER (Land Science TerraShield® Vapor Barrier)

A continuous Land Science TerraShield® vapor barrier shall be installed at slab on grade location between the ASTM #5 stone gravel bed and the concrete slab. The vapor barrier shall be installed by a Land Science licensed applicator. The TerraShield® shall be smoke tested and certified following the installation according to the attached specifications. VIMS designer shall witness the smoke test and sign off test was performed per manufactures specifications. Because of the large footprint of the building, the number of recommended sample coupons may be reduced if permitted by the manufacturer and licensed applicator. Coordinate with VIMS designer for sample coupon requirements. The TerraShield® vapor barrier shall not be punctured under any circumstances for any reason. The concrete batch plant shall be contacted in advance to ensure that the concrete delivered is of sufficient slump to ensure that there is not excess water to be drained off. The structural and onsite consulting engineer shall coordinate this task with concrete contractor.

TerraShield is a laminate vapor barrier system consisting of a TerraBase layer sheet to cover the min. 5 inch washed ASTM #5 stone base. Then 40 mils of NitraCore is then spray applied to the TerraBase layer. A protective layer of Land Science Protective Fabric is then applied directly to the TerraShield layer once cured. An Alternate substitute for Protective Fabric can be Land Science Bond.

Concrete trucks or other heavy equipment cannot cross the vapor mitigation system without bridging. Laser screeds and concrete buggies are allowed providing the concrete contractor coordinates the placement of equipment with the vapor mitigation contractor. Using a truck based pump arm is the preferred method of concrete delivery.

5.0 GRAVEL BED

After the soil has been proof rolled and before the stone layer has been installed, Mirafi® 500X (or equivalent) woven geotextile shall be installed by others over the soil. This material is inert to biodegradation and chemical resistant to acids and alkalis. This material has a high water permeance coefficient and is not easily clogged by fine soil particles. Maintaining a gravel bed that remains free of soil is a key component of an efficient active ventilation system.

The gravel bed shall be 9 inches in height within 1 foot radius of where the 4 inch conveyance pipes are located. The specified 9 inches allows for 3 inches of crushed stone below the perforated pipe and 2 inches above. The gravel bed field shall be a minimum of 5 inches thick at all other locations throughout the footprint of the building. The stone gravel bed shall be washed/clean ASTM #5 or similar 1/2" to 1-1/2" poorly grade gravel with less than 10% passing thru a 1/2" sieve. The gravel bed height shall be maintained under any areas requiring a thicker slab. The gravel bed will be installed by the Site Contractor.

6.0 UNDER SLAB COLLECTION PLENUM

In order to minimize drag and increase system efficiency, soil gases will be vented from the sub slab through 3 inch and 4 inch perforated PVC which shall be installed in the crushed stone layer with approximately 3 inches below the pipe and 2 inches above.

Geo-Vent roll out flat pipe shall be installed across the top of the gravel bed. The top of the Geo-Vent shall be level with the top of the stone bed. A 2" by 12" section of cloth shall be removed from the bottom of the Geo-Vent and fitted over a 2" by 12" slot that is to be removed from the top of the 6 inch PVC conveyance pipe. See Geo-Vent to PVC Detail 23 and 24. The Geo-Vent shall be taped in place and attached to the pipe using the manufacturers supplied fiber reinforced tape in a manner that shall secure the Geo-Vent and not allow sand or gravel to enter the conveyance pipe. The open end of the Geo-Vent that is distant from the PVC pipe connection shall be taped closed using the same manufacturers supplied tape. At no point should the Geo-Vent be compressed. Crushing the Geo-Vent will result in the soil gas conveyance properties being compromised. The top of the Geo-Vent to 6" PVC pipe connection shall be protected using 8" x 16" 14-gauge galvanized steel metal cover. The cover plate shall be prefabricated with holes to accommodate tech screws one inch from either end of the metal cover. The protective cover shall be attached to the top of the pipe using galvanized tech screws. (See Detail 22)

7.0 EMBEDDED UNDER SLAB MONITORING / SAMPLING PROBES

Indoor air sampling needs to be performed in minimal one room at the lowest part of the building in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York. The ANSI/AARST CC-1000 requires verification that a negative sub slab pressure differential be achieved which will be measured via the vacuum port locations. To avoid puncturing the vapor barrier, embedded probe installation must be integrated with construction. Monitoring probes shall be installed in the crushed stone layer as part of construction prior to the installation of the geotextile layer. The probes and associated tubing also provide a conduit for collecting soil gas samples from below the slab. Probes shall be installed below the slab as per drawings.

VRT VSP101 monitoring probes shall be used for pressure monitoring and soil gas sampling and installed by a certified installer. A continuous piece of ¼" nylon tubing shall run from the probe to the (1) 10"x12"x8" wall mounted sampling and Pressure Probe Monitoring panel (PPM).

Tubing shall be ¼" nylon tubing sleeved in ¾" Schedule 40 PVC conduit transitioning up to 1-1/4" conduit in the final section from the sub slab into the (1) 10"x12"x8" wall mounted Pressure Prone Monitoring (PPM) Panel. Probe tubing that terminates inside the enclosure shall have a brass valve installed to prevent the conveyance of soil gas into the building. The origin of the tubes shall be identified and labeled on the enclosure back mounting panel as monitoring probes, PB#. A diagram of the probe location shall remain inside the enclosure. Upon system start up sub slab pressure differentials shall be measured using a digital differential pressure instrument capable of measuring pressure differences of ±0.001 "w.c. Once vacuum fields measurements are collected, sensors and magnahelic will be sized and installed in the panel enclosure.

If the tubing cannot be terminated in the permanent enclosure during this phase of construction, then special precautions shall be made to protect the integrity of the tubing. The tubing shall be coiled and placed in a protective enclosure. If VRT sample port probe ends and sample enclosures are not purchased, the Contractor shall provide shop drawings for approval of alternative prior to installation. The assembly shall be constructed and installed in accordance with Detail 4/VD-1.0.

8.0 RISER VACUUM / SAMPLING PORTS

Measuring the applied vacuum is a key regulatory component of maintaining an active soil depressurization system. This tubing shall be installed during construction. VRT horizontal and/or vertical riser ports shall be installed for this application. A 3/4" PVC threaded electrical conduit coupler shall be threaded into the flange with the brass barbed connector in the center. Conduit shall be installed connecting the riser vacuum port in the sub slab to the bottom of the sampling panel enclosure. The conduit and tubing shall be sloped back from the enclosure to the sampling brass barbed port mounted on the conveyance pipe. At no time should the conduit containing the tubing be configured to create a water trap. If VRT riser ports are not purchased, the Contractor shall provide shop drawings for approval prior to installation. The assembly shall be constructed and installed in accordance with Detail 13/VD-1.1.

9.0 PIPE INSTALLATION

9.1 There shall be solid Schedule 40 PVC conveyance pipe that will run from the sub slab collection plenums to the riser pipes. The solid pipe shall have 5/8 inch holes facing down at 4 foot intervals. The hole pattern in the 4" & 6" Schedule 40 perforated PVC pipe that extends from the plenum boxes shall have three rows of 5/8" holes six inches on center, rows at 4 o'clock, 6 o'clock and 8 o'clock. When installed, the center row of holes shall face down.

9.2 In order to achieve the vacuum field distribution and not disrupt building use objectives, the riser pipe is located in a wall cavity. The specific location of the VIMS riser pipe is delineated on the sheets V-1.0 & V1.1 and will be coordinated and agreed upon by the VIMS Contractor, the General Contractor and the Architect prior to initiating installation. The riser pipe shall be temporarily capped and labeled prior to pouring the concrete slab to avoid damage during construction.

9.3 The vertical VIMS riser pipe shall be metal made of ASTM A513 Steel .065" thickness with air tight connectors and secured above the slab with pipe clamps attached to the column, wall or overhead truss.

9.4 Above slab horizontal pipe shall be metal made of ASTM A513 Steel .065" thickness. Pipe runs between the roof vent and the suction hole shall be installed with 1 inch slope back to a suction hole for each ten feet of horizontal pipe run. The vertical pipe run shall be installed plumb. In no case shall the piping be installed so as to create a possible water trap in the piping.

9.5 The metal pipe will be supported at least every six feet of horizontal run and at least every ten feet of vertical run. All horizontal pipe runs will have a support with an appropriate device within two feet of each fitting. The ceiling supporting devices shall be a 1/2 inch all thread rod to structural members capable of providing the necessary support. Conduit channel with pipe clamps can also be used to support pipe routed along the ceiling or walls. Pipe cannot be supported by other building piping or ducts. Swivel ring or standard bolt type clevis shall be used to support pipe.

9.6 All support straps and anchors installed outdoors shall be either stainless steel or galvanized.

9.7 The roof penetration flashing specification and detail shall be provided by the architect.

9.8 The final flashing and pipe to roof seal shall be provided by the roofing contractor. Pipe vent termination shall be 10 feet from air intakes and active relief openings. The vent pipes shall terminate at least 6 inches above the roof parapet.

9.9 The pipe termination shall be fitted with a varmint guard consisting of ½ inch stainless steel mesh or equal.

10.0 SEALING

10.1 Slab Crack and Expansion Joint Sealing

Any visible expansion joints or slab cracks in the areas where vapor piping is being installed that have 1/16 inch or greater opening shall be sealed. Any cracks to be sealed will first be ground out and vacuumed to prepare them for installation of gun-grade urethane caulk sealant. Cracks or open expansion joints in the concrete floor shall be sealed by applying a bead of urethane caulk on top of the joint. The gun-grade caulk shall then be mechanically pressed down into the crack in order to maximize its seal. Any openings into the slab such as may occur around conduit pipe penetrations through the slab will be cleaned and sealed with gun-grade urethane caulk.

10.2 Expansion Joints

Any expansion strips in the concrete slab of the area being mitigated that are accessible shall be sealed with urethane caulking. Any accessible perimeter floor joints shall be sealed with gun-grade urethane caulking after the joint has been vacuumed.

10.3 Monitoring Probes

The area between the tubing and the up to 1-1/4" conduit sleeve shall be sealed at the conduit opening in the control panel with a silicone-based sealant.

10.4 Pipe and Conduit Openings

All pipe and conduit openings shall be sealed as per manufacturer's specifications.

11.0 SYSTEM LABELING

11.1 All labels shall be non-water soluble weather resistant material. Every 20 feet of exposed and every 10' of concealed vapor vent pipe length shall have a label that reads "VAPOR MITIGATION SYSTEM, DO NOT ALTER" attached to the pipe. All labels must be readable from 3 feet away. The sub slab probe termination tubes shall be labeled in the enclosure to comply with Section 7.0.

12.0 PRE-OCCUPATION TESTING (Commissioning)

12.1 Pressure field extension testing must be completed following SSDS start-up to document adequate vacuum across the entire building slab prior to occupancy. Measurements shall be confirmed following activation and balancing of any HVAC components.

12.2 Confirmatory indoor air samples must be taken after the HVAC system for the development is installed and running.

12.3 Following SSDS start-up indoor air and ambient air samples will be collected from the locations shown on Sheet V-1.1. Samples will be collected following the procedures documented in NYSDOH's Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH 2006, rev. 2024).

13.0 BLOWER AND SENSOR WIRING

13.1 The breakers used for the vapor system should be dedicated breakers. This prevents the blower from being shut off when a portion of the panel is powered down for an unrelated function. The breaker shall be labeled Active Soil Depressurization Blower.

13.2 The Electrical Contractor is responsible for providing outdoor rated conduit, interior conduit and pull string for the Active Blower. During construction, conduit should be brought to an electrical junction box to terminate within approximately 14 inches of the riser pipe on the roof.

13.3 120-volt power should be made available to the monitoring panel location. Wiring for the Active Vapor Guardian 7000 shall occur during construction and the circuit should be identified as "Vapor System Monitoring". This circuit shall be a different circuit from the circuit designated to power the vapor blowers.

14.0 BLOWERS

A blower will be used to activate the riser and induce negative pressure differential beneath the slab. A Fantech RN4 will be verified to be adequate once performance testing can be done on the newly poured slab. Air flow calculations to verify blower size and blower model to be approved by Professional Engineer.

15.0 SENSORS & GAUGES

System performance should be monitored for applied vacuum, which is the static vacuum in the riser pipes, and the sub slab vacuum at the probes. Dwyer Magnesense ® vacuum sensors shall be used for each of the system performance metrics to meet the requirements set forth in the local Vapor Intrusion Technical Guidance Documents. Sensors will be installed for the sub slab and for the static vacuum. All sub slab sensors should be mounted in the existing (1) 10x12x6 monitoring panels. System vacuum sensors should be installed in panel as well. System monitoring and performance data is to be transferred to a Vapor Guardian administrator and the consultant responsible for the system.

245 WEST 55TH ST.
NEW YORK, NY 10019

Rev No.	Description	Date
1	Active System	2-27-26

MATTHEW CARROLL, PE
NEW YORK LICENSE NO. 091629
1085 SACKETT AVENUE
BRONX, NY 10461
646-606-2332

STATE OF NEW YORK · MATTHEW M. CARROLL · 091629 · LICENSED PROFESSIONAL ENGINEER

ACTIVE VAPOR INTRUSION MITIGATION SYSTEM

NEW YORK, NY

DRAWING TITLE:

SPECIFICATIONS

PE Seal		
	Date	1-28-25
	Scale	3/16" = 1'-0"
	Drawn By	DAB
	Checked By	MC

VS-1

16.0 OPERATIONS, MAINTENANCE AND MONITORING

Operations, Maintenance and Monitoring (OM&M) is the practice of systematic monitoring of the vapor mitigation systems' performance metrics and instituting corrective actions to confirm their ongoing performance relative to the stated design objectives. The required elements, procedures, and documentation, as described in this section, be implemented to support the ongoing demonstration of system performance.

OM&M should occur on a schedule that prevents, to the extent practical, emergencies or unscheduled shutdowns. In addition to the metrics that are monitored electronically, the full suite of system performance metrics should be measured manually using sensitive instrumentation at annual intervals. Drawings showing locations of relevant system components are to be stored and readily available on the Site for easy reference. The onsite OM&M inspector should complete the OM&M data measurements and collection to include:

- Physical Conditions Assessment
- Sub-Slab Vacuum
- System Maintenance and Cleaning

The Vapor Guardian is programmed to monitor vacuum set points and provide notification to the system's administrators (persons) in the event of a performance deviation from programmed set points.

Along with measuring pressure differential and other system performance metrics, the physical components of the VIMS should be inspected annually. Monitoring and maintenance of a VIMS system should be performed by knowledgeable, qualified personnel who have studied and are acquainted with the operations of this system. The Vapor Guardian remote monitoring system at the Site enables continual surveillance with automated fault notifications. If no abnormalities are observed between inspections and if no faults are received, no other inspections may be required beyond the annual visit.

16.1 OM&M Inspections and Observations

In addition to measuring field data and recording data readings, the following items should be inspected and completed during OM&M and recorded.

- **Pipe:** Pipes should be checked to assess whether damage or leaks have occurred, including inlet bleed air piping, louvers, vent riser piping and outlet condition
- **Floor Sealing:** Floor wall joints or any slab openings created by tenants should be inspected for leakage.
- **Risers:** The system risers should be inspected; vacuum and airflow, should be measured and recorded. Riser vacuum should be measured with a calibrated manometer capable of reading to a sensitivity of 0.01" w.c. Airflow should be measured with a hot-wire anemometer.
- **Permanent Sub-Slab Test Ports:** All test ports, tubing and probes need to be flushed with air annually and recommended prior to sampling. The sub-slab vacuum at each PT port should be measured with a calibrated micromanometer capable of reading to a sensitivity of 0.001" w.c. and recorded to confirm that the sub-slab vacuum has not dropped below a vacuum level of 0.004 "w.c. Monitoring enclosures, valves, exposed tubing, and conduit conditions should be visually observed and repairs conducted if needed.
- **Remote Monitoring Sensors:** Sensor accuracy should be verified with a calibrated micromanometer capable of reading to a sensitivity of 0.001"w.c. Sensor enclosures, riser vacuum, exposed tubing, and conduit conditions should be visually observed and noted.
- **Alarm Panels:** Do a visual inspection of panels and components.

17.0 REFERENCES

1. ASNI/AARST. 2020. ANSI/AARST CC-1000, “Soil Gas Control Systems in New Construction Buildings.”
2. New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH 2006, rev. 2024).

   New York City Office of Environmental Remediation OER Design Policy for Active SSD System: New Construction Scenario (NYC OER 2022)

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Rev 1	Active System	2-27-26
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STATE OF NEW YORK · MATTHEW M. CARROLL · 091629 · LICENSED PROFESSIONAL ENGINEER

ACTIVE VAPOR INTRUSION MITIGATION SYSTEM

NEW YORK, NY

DRAWING TITLE:

SPECIFICATIONS

PE Seal

Date	1-28-25
Scale	3/16" = 1'-0"
Drawn By	DAB
Checked By	MC

VS-2

ATTACHMENT K

NYSDOH Structure Sampling Questionnaire and Building Inventory

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors_____ Building age_____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	_____
1st Floor	_____
2nd Floor	_____
3rd Floor	_____
4th Floor	_____

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y / N

b. Does the garage have a separate heating unit? Y / N / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA Please specify_____

d. Has the building ever had a fire? Y / N When?_____

e. Is a kerosene or unvented gas space heater present? Y / N Where? _____

f. Is there a workshop or hobby/craft area? Y / N Where & Type? _____

g. Is there smoking in the building? Y / N How frequently? _____

h. Have cleaning products been used recently? Y / N When & Type? _____

i. Have cosmetic products been used recently? Y / N When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____

l. Have air fresheners been used recently? Y / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / N If yes, where vented?_____

n. Is there a bathroom exhaust fan? Y / N If yes, where vented?_____

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type?_____

Are there odors in the building? Y / N
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	Public Water	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	Public Sewer	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:

First Floor:

12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y / N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.